

NAIC

Examination of NCCI

Section I: Data Collection and Data Quality

Volumes I through III
DCI Development Project

Book 1

National
Association
of Insurance
Commissioners

TO: All NAIC Members

FROM: William H. McCartney, Chair
(EX) NCCI Examination Subgroup

DATE: December 9, 1991

RE: NCCI Examination Report

The examination of the National Council on Compensation Insurance (NCCI) has been completed. This letter accompanies your copy of the examination report and executive summary. This examination was performed by Milliman and Robertson with Arthur Andersen as primary subcontractor under the supervision of the participating insurance departments (Florida, Maine, Nebraska and Utah) and through the coordination of the NAIC. The exam began in late 1990 with an ultimate cost of \$3.2 million. In addition, substantial amounts of unbilled time were expended by the NCCI, participating departments and the NAIC. In short, it was a major undertaking.

Why did we undertake this examination? There were a number of reasons, including an anticipated conversion to loss costs, but the primary reasons were:

1. Many regulators have expressed reservations concerning NCCI rate filings. We wanted to make certain that the data underlying these filings was accurate.
2. Workers' compensation rate filings are complex documents which most states only see once each year. A number of the ratemaking techniques contained therein are unique to workers' compensation and the NCCI is virtually the only entity which updates them.

How did we address these questions? The examination was divided into three sections:

- (a) Section I documented NCCI data handling and evaluated the quality of the data processed by the NCCI. The intent was to open the NCCI "black box" where company data was accumulated for use in rate filings. Company data was tracked from receipt by the NCCI through computer programs and manual processing to input for inclusion in NCCI rate filings and experience modification calculations.

- (b) Section II analyzed NCCI ratemaking methods. NCCI procedures and the assumptions underlying these procedures were analyzed and tested.
- (c) Section III analyzed the practical considerations in implementing a loss cost system for workers' compensation. The loss cost portion of the examination was completed and released last December.

How does this exam relate to the indicated handling of NCCI rate change requests? Most ratemaking criticisms and recommendations concern various adjustments and are to be expected in such a complex system. While such adjustments can have a minimal effect on overall rate level indications, this will not always be the case. The report criticisms and recommendations relating to data quality were substantially more fundamental, but no evidence was found to indicate that data handling weaknesses might result in biased rate level indications.

The following is a sampling of the findings of the examination:

1. NCCI data processing systems are poorly integrated and are not well documented. Excessive amounts of manual intervention are required and data quality and timeliness policies are not adequately defined and enforced. These system faults notwithstanding, the examination found NCCI data processing to be acceptably accurate, with no biases which should cause rate requests to be inflated. (The NCCI already has plans in motion to address many of these concerns.)
2. NCCI's ratemaking system has a number of areas in which it can be improved, but it still constitutes a sophisticated system which can generally be expected to produce reasonable loss projections.
3. Expense provisions in NCCI filings run to the high side, notably the provision for production expenses.
4. Until just recently, the NCCI utilized linear trending models. The experience period which was examined (1983 through 1988) involved unprecedented rates of increase for both medical and indemnity losses. As a result, linear trending, which tends to give lower trend estimates, did a generally poorer job of keeping up with these trends than would have been the result with an exponential trend model. The report finds that models using exponential trending are acceptable for use in workers' compensation, but this is a subject that is impossible to describe adequately in anything less than the full report.
5. Standard NCCI procedures ignore changes in experience rating off-balances, which can distort trends and rate-need indications. These distortions have tended to be downward in the recent past, but would appear to have a greater potential for upward distortions in the next few years.

These examples only hint at the scope of the exam and do nothing to demonstrate the degree of complexity involved. Many findings in the report, particularly those in the complex classification ratemaking and experience rating areas, are less than absolutely final. In some cases, a fairer characterization would be that research done during the examination provided a meaningful indication of the sorts of changes that would be beneficial, but it was agreed that further testing would be necessary before implementation would be prudent.

It is not possible to adequately cover the nature of these complications in an executive summary; hence it is particularly important that the entire portion

of the report dealing with a specific subject be studied before it forms the basis for regulatory action. How these items relate to the next rate request in a specific state will depend on many factors.

What didn't the examination cover? Major areas/questions not covered by the examination include:

- (a) Ratemaking: The examination did not address the proper assumptions for underwriting profit in NCCI manual rates. Upon request, the NCCI will provide documentation which seeks to demonstrate that a manual rate underwriting profit provision of 2.5% (sometimes 0%) will produce a reasonable return on capital after deviations and dividends have been considered. While the examining states were not convinced that the rates should permit insurers to earn a 2.5% underwriting profit, it does not necessarily follow that a 2.5% provision in manual rates (which are subject to deviations, dividends, and the like) would be improper. The exam did not cover investment income because of the move to loss costs, but it should also be noted that investment income and profitability have already been addressed extensively by many researchers, including the NAIC.
- (b) Data collection: Company data was not examined prior to its receipt by the NCCI. While a complete evaluation of workers' compensation data quality would require comparison of NCCI data to original company documents, this was an examination of the NCCI, not of its member companies. (In addition, audits of insurer data would have added greatly to the expense and the duration of the examination.) Generally, audits of insurer data should occur through individual financial and market conduct examinations.
- (c) Other areas: not covered related to NCCI performance in the application of experience rating, NCCI classification inspection services and NCCI administration of residual market mechanisms. Performance in these areas might be expected to vary among NCCI's various servicing offices and we are aware that a number of states have conducted examinations in these areas.

For a regulatory oversight group, this report will provide a blueprint for a cooperative effort with the NCCI to improve its data and ratemaking systems. The NAIC intends to establish such a group to oversee implementation of the consultants' recommendations. The NCCI has committed to such an effort. For individual insurance departments, this will represent the latest but not the final word on the subject of workers' compensation ratemaking. We urge that the appropriate staff within each department take the time to study the full report.

Should you have further questions with regard to this report, please contact either of the two casualty actuaries who acted as coordinators. Jim Watford's telephone number at the Florida Department is (904) 922-3146, extension 5368, and Alan Wickman's telephone number at the Nebraska Department is (402) 471-4646.

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NCCI EXAM

NCCI COMMENTS

Section I: Data Collection and Data Quality

Summary and Conclusion

NCCI believes the exam to be a fair and accurate representation of NCCI's data collection and data quality processes and systems.

The findings of the exam, in summary, are that NCCI maintains high data quality throughout its systems and processes. However, NCCI's data processes are inefficient, and NCCI needs to strengthen the appropriate policies and procedures, along with accompanying internal systems changes, to effect improvements. NCCI has development initiatives in process or planned that are intended to resolve the major deficiencies of its current systems.

The exam's major findings are on the mark, and NCCI strongly supports the exam's major recommendations.

1) *Data Quality*

NCCI takes pride in maintaining quality data throughout its systems and as used in its ratemaking procedures. As expected, the exam confirmed that the data used in NCCI's ratemaking procedures accurately reflects the data submitted by insurers.

2) *Data quality and timeliness policies*

NCCI recognizes the need to strengthen and develop new policies on data quality and timeliness, and has been working closely with its member insurers to effect the necessary changes. These changes were not reviewed by the NAIC examiners as they were in progress during the exam, and were thus not within the exam scope. However, the examiners did acknowledge these initiatives and have cited instances where shortcomings they identified are intended to be addressed by these efforts. The Unit Report Control (URC), Unit Report Quality (URQ), Detailed Claim Information (DCI), and Policy Review initiatives all address data quality and timeliness, and include specific penalties for failure to comply.

3) *Data handling systems and procedures*

NCCI has long recognized the need to improve efficiency in working with data. NCCI also recognized there was no short-term "quick fix" solution; rather, sweeping changes were required to set the stage for the future, and these changes must be implemented while maintaining current high data quality. As above, the examiners cited NCCI's initiatives aimed at improving efficiency in working with its data, even though these projects were out of the scope of the exam.

The examiners noted that these findings are more applicable to WCSP systems than to aggregate ratemaking systems. The aggregate ratemaking process is the most important determinant of overall rate levels. While there remains a significant manual validation effort, this is by design, as actuaries examine the data for anomalies and deal directly with insurers supplying the data. NCCI's WCSP processing constitutes the bulk of its data validation efforts, and most improvement initiatives are focused in this area.

Several key components of NCCI's efficiency improvement efforts were completed during and shortly following the exam. The most important of these, the WCSP (unit report) database, positions NCCI to automate its unit report quality validations, link unit report data with corresponding policies, eliminate hard copy printouts of data and the associated files, and move its data validation efforts to the point of receipt of the data. With these changes, NCCI has not merely automated its data processes, but has and is re-engineering those processes to take advantage of modern data processing technology.

4) *Current NCCI initiatives*

The NAIC examiners appropriately cited NCCI's systems initiatives as they relate to their findings. NCCI believes this serves as an endorsement of its current improvement activities. Although the examiners did not review these initiatives in detail, they did, through an addendum to the exam contract, review the new DCI development project. NCCI used modern systems development techniques to develop this system, now in production. NCCI is pleased the DCI exam conclusions were positive, and that the examiners approve NCCI's systems development procedures. NCCI has used, and is using, these same techniques with all its systems development initiatives.

Priority Recommendations

NCCI agrees with and strongly supports the four priority recommendations of the NAIC examination. In fact, the recommendations serve to endorse the objectives and direction of most of NCCI's current initiatives. The following are NCCI's responses to the four priority recommendations.

1) *Clearly define data quality policies and standards*

NCCI is working with the industry to develop data policies that meet the needs of rating bureaus and insurers alike, while ensuring the right data are collected to maintain the long-term viability of the workers compensation insurance system. At the July 1991 meeting, NCCI's Board of Directors unanimously passed a resolution that directs staff in conjunction with appropriate Board committees to define unified data objectives, policies, and implementation plans. The following is an excerpt from this resolution:

NCCI recognizes the importance of information that is complete, accurate, and timely. Reliable information is fundamental to an equitable workers compensation system that provides for fairly priced services, effective reform when needed, and protection from fraud/profitteering.

In concert with the industry, NCCI has initiated several key programs to enhance the data that are collected, both in terms of comprehensiveness and quality; these programs include the expanded DCI format, the unit report control timeliness and quality projects, and NCCI's broadened policy review responsibilities. In addition, NCCI has initiated a number of internal projects, guided by the recently developed Enterprise Data Model, which will result in significant improvements to NCCI's data collection and access capabilities/efficiencies.

These policies will place primary responsibility for data verification and error correction with NCCI's data suppliers; insurance companies. NCCI has developed a proposed data integrity plan addressing six dimensions; completeness, quality, timeliness, assurance, efficiency, and accessibility. This plan will be presented to the NCCI Board for review in December 1991.

NCCI also supports the development of industry standards, and stands ready to work with the NAIC and industry representatives. NCCI believes the implementation of the Workers Compensation Data Monitoring (WCDM) program with the expanded DCI program can serve as a model to be applied to all other areas of data collection. This effort, undertaken to support the NAIC model data reporting regulation, was a successful first step toward industry-wide data quality policies and standards.

- 2) *Measure and report carrier and NCCI performance against those standards*
- 3) *Build effective incentives to achieve performance objectives*

Measurement and reporting of performance to standards is an essential element of WCDM. Data quality principles being developed with the unit report quality, unit report control timeliness, and the WCDM efforts will be applied to all data collection activities in the future.

Likewise, effective incentives are integral to the enforcement of standards and, as detailed in the following section, appropriate incentives are incorporated into existing and future programs.

- 4) *Build integrated systems which support policies and objectives*

The examiners recommended NCCI build integrated systems that support policies and objectives, and listed 10 specific systems initiatives that should be included in NCCI's systems plan. NCCI agrees, and as shown below, is already working on each.

NCCI has begun a comprehensive long-range systems planning process that includes an enterprise data model, a strategic information systems planning function, development of a tactical systems plan, and an overall "vision of the future" of how NCCI should operate. Several systems projects have been completed or are under way in building toward the plan. These initiatives will deliver on the recommendations in the NAIC examination.

- a) *NCCI should implement systems to track and control the due date and receipt of all information submitted by carriers*

Aggregate financial data submissions are controlled via independent sources such as insurance company financial statements and A.M. Best information on premium writings. Workers Compensation Statistical Plan (WCSP) data are controlled through the "unit report control" (URC) program, which now applies to all experience rated sized reports. URC is planned for extension to all WCSP data in 1992. Policies will be controlled through the "automated policy review" initiative, which will include a tracking mechanism similar to that used in URC to monitor policy renewals. DCI data are currently controlled via sample control forms and periodic cross-validation against aggregate claim information.

- b) *NCCI should develop an electronic data transfer mechanism for submission of data from the carriers to NCCI.*

NCCI's 1991 objectives include implementing electronic data interchange (EDI) with its member carriers. NCCI has an established electronic communications capability via the IBM Information Network, and is in a position to conduct bi-directional communications with its data suppliers.

NCCI is testing the ability to print reports at company sites, distribute information electronically, and accept data submissions via the network. NCCI has already established a product (the DCI edit package) which includes options for electronic updates of edit tables via the network.

- c) *NCCI should develop data validation software and distribute it to carriers.*

NCCI has had the "financial calls on disk" product available for more than two years, which provides suppliers of aggregate financial information with a PC-based data validation package. The DCI edit package has been developed and is in production; this provides suppliers of detailed claim information with on-site data validation edits. The "unit report quality" project is under way; a principal component of this effort is to deliver an edit package for suppliers of WCSP data in late 1992.

- d) *NCCI should develop systems which validate all data at the time of receipt.*

Aggregate financial data, policy data, and DCI data have always been validated at the point of receipt. Policy data validations are being expanded significantly through the automated policy review effort. The new "unit report system" (URS), installed in production in August, 1991, now provides the capability to centralize all WCSP data validation on receipt. The "unit report quality" effort will implement those front-end edits and place the burden of correction of WCSP data on the data suppliers.

- e) *NCCI should develop systems which provide regular carrier performance reporting.*

The DCI system includes carrier performance reports. The "automated policy review" effort will deliver comprehensive edits, automated criticism of data failing edits, automated follow up for corrections, and performance reports for carriers. The "unit report quality" project will deliver comprehensive edits, follow-up, and performance reports for WCSP data quality. The "unit report control" system, in production now, delivers performance reports for WCSP submission timeliness.

- f) *NCCI should develop systems which support consistent, effective financial incentive programs to encourage carrier compliance with timeliness and quality standards.*

Financial incentive programs are now in place for many types of data: aggregate financial data, WCSP timeliness, DCI data quality, WCSP electronic submission, and policy electronic submission. Some of these incentive programs are credits for early reporting or for using electronic formats. Others are penalties for late reporting or for data failing edits. As the "unit report control" and "unit report quality" systems take effect, they will establish a standard in how NCCI will implement financial incentive programs consistently across all areas.

- g) NCCI should develop an integrated corporate database.**

The construction of the WCSP database as an integral part of NCCI's "unit report system" is the final cornerstone to an integrated corporate database. NCCI's policy database, WCSP database, and related databases for residual market, DCI, and other insured-related information may now be linked at the insured level. A "risk information system" project is now underway to create this linkage and integrate these key databases.

- h) NCCI should re-engineer and automate many of its current manually intensive areas.**

The construction of the WCSP database, and the installation of the "risk information system" are the keys to this objective. Much of NCCI's manually intensive operations are in data validation (which will be automated via "unit report quality", "automated policy review," and "automated auditing") and document filing and handling (which are planned for automation via database storage and image processing). NCCI now has several "effectiveness projects" under way, each focusing on specific business areas with the objective of streamlining operations and improving efficiency.

- i) NCCI should explore alternatives and decide upon an appropriate identification number for insured businesses.**

NCCI is now exploring these options, which are an integral part of its plans for the "risk information system." NCCI plans to establish positive identification for all data, where it now maintains risk identification only for experience rated insureds. NCCI is researching the federal employee identification number as an alternative to an internally-generated NCCI number, but either will meet its needs. Furthermore, NCCI is designing its systems to avoid requiring submission of an identification number from data suppliers except where absolutely necessary.

- j) NCCI should implement more stringent controls over its end user computing environments. NCCI should move stable, regularly executed end user applications into a production environment.**

A new end user computing policy has been developed, to be administered by Information Resources (data processing). The policy calls for strict controls over system availability, documentation, backup and recovery, and program change control for key business systems. These controls will be similar to those established and proven for NCCI's mainframe production systems.

The examiners also recommended NCCI use modern software engineering techniques, follow a structured systems development methodology and use consistent documentation standards for development of new systems.

Since 1985, NCCI has used the Spectrum systems development lifecycle methodology, which provides a structured development method and requires appropriate levels of documentation. In addition, NCCI has maintained a "standards and procedures" committee and manual. A change control area monitors all new and enhanced systems prior to placing them in production. NCCI's new Detailed Claim Information system, reviewed in this examination, is an example of how systems are developed at NCCI. Furthermore, NCCI is now implementing more modern tools and techniques, including an on-line time management and project status reporting tool, PC-based project management tools, sophisticated code generation software, and a new systems development methodology using modern information engineering techniques.

Section II: Ratemaking Procedures

Summary and Conclusion

NCCI is pleased with the overall tone of the report, since it validates the thrust of NCCI's current rate making methodology. No major errors were found. All actuarial principles have been followed. A careful reading of all the reports leads to the conclusion that for the areas studied, NCCI has asked for reasonable rate levels. NCCI will follow up on the areas for which further research is recommended.

Milliman & Robertson, Inc. did not find any significant deficiencies in the NCCI actuarial area. In particular there are no elements of the M&R report that would lead to the conclusion that the NCCI has asked for rate indications that are too high. Indeed, after reading the report, the conclusion would be that NCCI has understated the rate level need over the past few years.

In particular, three areas were identified in which there is the possibility of aggregate rate level inaccuracy: trend, loss development and expenses. Both trend and loss development have, by M&R's analysis, been understated by NCCI. The underestimate, for an average state, could be in the range of 10 percent to 20 percent. The only area of overestimation was expenses. In particular, production expense and general expense provisions may have been overstated between 2 percent to 4 percent.

NCCI had already moved to implement several of the recommendations. The M&R report recommends the use of exponential trend for medical costs. For indemnity losses, the M&R results, while not conclusive, tend to favor exponential trend. Over the past year, NCCI has been moving to use exponential trend where appropriate.

In the area of loss development, NCCI has been analyzing additional methods as part of the standard procedure. The M&R report recommends the combination of two procedures as showing promise. NCCI will continue to investigate all methods, and use the most appropriate method or combination of methods. In particular, NCCI agrees with the M&R finding that all methods tended to understate the ultimate losses. Our concern remains that all methods, including the M&R proposed methods, will still underestimate ultimate losses.

In the area of expenses, NCCI will continue to analyze their recommendations. In the past, most expense provisions were calculated on a net premium basis. We have recently begun to review all expenses on a direct premium basis, as recommendations suggest. Also, as indicated in the report, the inclusion of stock and mutual company data will not materially change the indicated general expense provision.

There are many areas where the current NCCI procedure was examined as part of the RFP, and found acceptable. For example, the area of law amendments was, by the conclusion on page 13 of the summary, found to yield satisfactory results.

Another area of approval was the alternate exposure base, which has been a very controversial item in the past. The conclusion on page 13 states that while no single exposure base is ideal, the current method of unlimited payroll appears to be the most reasonable compromise between theoretical and practical considerations for most insureds. A possible alternate method for a very restricted number of cases is proposed; NCCI will investigate and move to implementation if feasible.

The revised experience rating plan (RERP) was found to perform better than the prior rating plan. While an alternate experience rating formula was tested, it showed no material improvement over NCCI's RERP.

There are a substantial number of recommendations included in the report. The majority of them are to be implemented if additional testing by NCCI for more states and time periods substantiates the results of the limited testing which M & R was able to perform. We endorse performing the indicated further testing to determine the appropriateness of the recommendations. The following are NCCI's responses to the specific recommendations.

Section II-B Part 1: Premium and Loss Development Factors

It is important to mention that for the time period studied, the report showed conclusively that all the loss development methodologies on average, understated ultimate losses by approximately 10 percent for indemnity losses and approximately 4 percent for medical losses. Thus total losses on average were understated by approximately 8 percent. We believe the conditions that led to this understatement of ultimate losses still hold today in workers compensation. While the report acknowledges that a trended loss development factor would have produced more accurate results during the time period studied, it implies that proof is needed that the trend will continue in order to utilize trended factors. NCCI strongly believes that when a strong trend is recognizable in the historical factors, trended loss development factors are warranted and lead to a more accurate prediction of ultimate losses.

"That future NCCI filings develop projections of ultimate trended loss ratios based on the latest two or three policy years or the latest two or three policy and accident years."

Although this recommendation was not tested in the report, it seems reasonable. Due to the lengthening of the trend period, care would have to be taken to make sure that the accurate rate level is achieved. The report also discusses a variable weighting system when using more than one year of experience. NCCI believes an equal weighting system has the benefit of not being subject to any subjective criteria, which probably tends to outweigh the advantages of variable weights.

"That an average of the ultimate losses resulting from paid and paid plus outstanding projection methods be used as the primary basis for the rate indications."

Although there is no testing in the report to support this procedure and the resulting formula seems fairly arbitrary, the suggestion is not unreasonable. The report does endorse deviations from the primary methodology if it is felt that a more accurate result can be achieved.

"That NCCI expand the diagnostic tests to enhance their ability to analyze loss development patterns."

NCCI agrees that more tests are needed and will do more research to determine which ones will be most useful.

"The collection of additional claim count data for use in diagnostic tests of loss development."

NCCI agrees that this data would be useful as an additional diagnostic tool.

"That NCCI also utilize tail factors based on paid losses and paid plus outstanding losses."

The report is very complimentary regarding NCCI's current procedure for calculating tail factors; saying that NCCI makes best use of available incurred loss data. While the suggested method is an interesting idea, it is not tested in the report to make sure that it works as well as the present formula.

"That NCCI review at least four years of premium development factors, and that a three year average be used as the standard procedure."

NCCI strongly agrees with this recommendation and will implement early next year with rate levels that utilize 12/91 data.

"The adjustment of calendar year earned premium to current rate level does not take into account the contributions to calendar year premium arising from audit adjustments to older policy years."

NCCI agrees that this is an idea worth pursuing and is already investigating what modification to make to the present procedure.

Section II-B Part 2: Expenses

"NCCI expense provisions have overstated the amount of expenses incurred by the companies."

For calendar years 1987-1989, actual general expenses were one-half percent to 1 percent lower than the provision in the rates. Total market actual production expenses for stock companies were 2 percent to 3 percent lower than the provision in the rates. Based on the M&R analysis, 1.5 to 2.0 points of this difference may be explained by the lower commission levels in involuntary business and the remaining difference is due to 1) the expense gradations, and 2) the fact that some stock companies use the non-stock premium discount table.

M&R acknowledges that negative underwriting results may have reduced the amount of commission rates or contingent commissions paid to agents. M&R also states that the "relatively dramatic decline in commission rates during the last five years may reverse itself if underwriting results improve and the residual market is depopulated."

In addition to the M&R points, NCCI believes negotiated commissions on larger accounts result in lower actual commissions.

"To the extent that verifiable trends are apparent, NCCI should reflect them."

NCCI has not reflected trends in the calculation of expense provisions in the past. Recognition of trends would tend to decrease the general expense provision and increase the loss adjustment expense provision.

"NCCI compares general expense to net earned premium. We recommend that NCCI compare general expenses to direct earned premium."

NCCI agrees with this recommendation. The 1991 review of general expenses based on 1990 data used both direct general expenses as a ratio to direct earned premium and net general expenses as a ratio to net earned premium. Both methods produced similar results.

"NCCI should combine the expense experience of stock and mutual companies in establishing general expense indications. Based on recent experience this is not expected to have a material impact on the selected expense provisions."

NCCI agrees with this recommendation. For the past two years, NCCI has reviewed the general expenses of stock and mutual companies individually.

"The expense study by size of risk should incorporate all production expenses (i.e., commission brokerage and other acquisition expenses) in order to determine the appropriateness of the expense gradations."

The NCCI expense by size of risk call included other acquisition expenses but not commissions and brokerages. The Actuarial Committee did not approve the inclusion of commissions and brokerage in previous calls.

"We recommend that NCCI review production expenses annually, as it does for other expenses, in establishing production expense provisions."

The NCCI annual review of production expenses shows that a 15 percent provision in voluntary rates is appropriate for stock companies.

"We recommend that NCCI rely on the special call data (direct experience) by accident year in establishing the LAE provision. Based on reviewing the special call data, a LAE provision between 12 percent and 12.5 percent is indicated."

NCCI believes that a provision of at least 12.5 percent of losses is indicated, based upon the recent special call data (direct experience).

"We recommend that NCCI collect Allocated Loss Adjustment Expense (ALAE) experience by claim and that ALAE be treated like losses for ratemaking purposes."

NCCI agrees with this recommendation. We are currently in the process of working with NCCI committees and other rating bureaus to finalize a definition of ALAE and potential changes to the Workers Compensation Statistical Plan.

"We recommend that loss costs include ALAE and ULAE where not prohibited by statute or regulation."

NCCI agrees with this recommendation. This is NCCI's current procedure.

"The NAIC RFP asked M&R to address the following question -- 'Should expense loadings for an individual state be tempered when that state experiences a rate increase larger than the countrywide average?' While we concluded that tempering is not appropriate, the analysis led to valuable research in the area of state-specific

expense levels ... The following factors suggest that tempering expenses is not appropriate and that the current NCCI procedure is appropriate.

- "1. If expenses are reflected correctly on a countrywide basis, any adjustment for large rate increases will result in an inadequate countrywide expense provision.*
- "2. The downward trend in general expense, noted above, is due in part to the level of rate increases implemented in the past.*
- "3. If rates are deficient over a period of time, it is likely that expenses are also deficient.*
- "4. There are a number of factors to mediate the expense impact of a large rate increase in a state including the fact that more than 40 percent of the premium is from multi-state risks and the majority of the countrywide premium is generated from risks subject to the premium discount tables."*

NCCI agrees with this recommendation.

"NCCI data suggest that there are variations from state to state and we recommend that additional research be performed to determine the appropriateness of varying expense levels by state."

NCCI agrees that additional research is necessary. However, based on M&R's survey of 16 companies, 13 of the 16 companies allocate general expenses based on earned or written premium. Therefore, it appears it will be difficult to determine actual differences by state.

Section II-B Part 3: Trend

NCCI endorses the major recommendations included in the NAIC Trend report. As the report shows, the move from linear to exponential trend, which NCCI instituted in 1990, represents a significant improvement in ratemaking methodology. The testing included in the report for the time period studied, showed, on average, linear trend understated medical losses by more than 11 percent, while indemnity losses were understated by more than 5 percent. Thus, total losses for this time period were underestimated by approximately 8 percent. This testing showed that even the exponential trend underestimated medical losses by approximately 5 percent. NCCI strongly believes the conditions that held for the time period used in the testing still hold today, and the use of exponential trends will lead to more accurate (and adequate) rate level indications.

Other recommendations included in the report were:

"That adjustments be made to the lengths of the trend periods to reflect distributions of premium writings by month."

NCCI agrees that this represents an improvement over present procedure and will implement beginning early next year with rate level calculations using 12/91 data.

"That, when sufficient claim count data are available, NCCI perform tests of the projection accuracy of frequency and severity trends."

NCCI agrees the availability of this data would represent a significant improvement in our ratemaking tools.

"That projection accuracy may be improved through the use of double exponential smoothing."

NCCI believes this is an idea that deserves further investigation, although there is concern that the selection of the smoothing constant necessary in this approach leaves NCCI open to criticism of being overly subjective.

"That NCCI consider extending the experience period to seven or eight years"-

NCCI believes this is a suggestion worth pursuing and, in fact, has begun to do some research to determine what the optimum number of years should be.

"That NCCI move toward the adoption of a Bayesian Credibility approach."

Although this was not tested at all in the report, NCCI believes Bayesian Credibility is a very reasonable approach, and is committed to testing it in the future to see if it is an improvement over our current procedure. This testing will include looking into the use of a "volume plus a constant" technique that is discussed in the report.

"That NCCI perform extensive analysis of econometric models."

NCCI is in favor of the use of economic analysis in ratemaking and, in 1991, has reinstated an economic research unit that will concentrating on econometric modeling.

"Further analysis of historical experience to evaluate which benefit changes have tended to have a predictable impact on trend."

The report is generally complimentary regarding NCCI's procedures for recognizing the impact of major benefit changes (including medical fee schedules) on trend. If anything, the report implies NCCI has assumed that many benefit changes will be more effective in lowering benefit costs than they actually turn out to be, thus overstating the downward impact on rates. NCCI is somewhat concerned regarding the suggestions in the report on how to categorize fee versus non-fee states. NCCI's current methodology has the advantage of being relatively objective in its implementation.

"That the alternative approach (adjustments for automatic benefit changes) be adopted."

NCCI agrees this modification to the benefit on-level calculation may be a slight theoretical improvement, but has strong practical concerns regarding the implications of joining the benefit component of the rate filing with the trend. The trend factor has been received by some people as controversial, while the benefit change has not.

Section II-B Part 4: Classification Ratemaking

Classification Ratemaking at NCCI distributes the overall rate level indication derived from aggregate financial data to three industry groups -- manufacturing, contracting and all other -- and then to the approximately 600 classifications. Therefore, Classification Ratemaking has no impact on the statewide indication. Recommendations and NCCI's responses follow.

"...none of the alternative number of years tested proved to generally provide more accurate identification of relative differences among industry groups than the others."

The current method of developing industry group differentials was found to be at least as good as any alternatives.

"Our tests indicated that increasing the length of the experience period ... from three to five years enhances the consistency of the ratemaking methodology... Furthermore, our accuracy tests, which were necessarily limited to first report for only one policy year and five states, suggest that this aspect of the ratemaking process would also improve with a longer experience period."

"We recognize the possibility, however, that the tests using other policy years, more mature data and other states may result in different conclusions."

NCCI is not opposed to using five years of data but we believe additional testing is necessary to provide sufficient proof this is a better predictor of class experience.

"The consistency tests reflect similar indications. This should not be surprising since the use of more years of experience automatically adds to the number of years necessary to completely replace the data in the methodology."

"This regional pure premium application generally showed small differences... There appears to be little evidence to support making any change in this direction at this time."

NCCI agrees.

"We tested several alternatives to NCCI's classification ratemaking credibility formulas. None of the alternatives tested proved to be generally more accurate or more consistent in identifying relative cost differences than the current formula."

NCCI agrees.

"None of our alternatives to the current loss limitations proved to significantly improve upon the current methodology."

NCCI is considering using a loss limit based on the State Reference Point used in the Revised Experience Rating Plan. Milliman and Robertson agrees with this, having found nominal improvement from a lowering of the current loss limit to a similar value. The more losses are limited, the increased importance of distributing the excess.

"An apparent inconsistency of loss limits used in the various components of the partial pure premiums."

NCCI has implemented a change in the classification ratemaking procedure to correct the inconsistency in the three partial pure premiums. Given that the excess losses above the current limit represent 3 percent to 5 percent of total losses, the impact of this change will be minor. Within each industry group, classifications with high credibility, such as office workers, trucking, and restaurants, will receive a slight rate increase. Classification with low state and national credibility and therefore a high reliance on the current rate, will receive a slight decrease.

"NCCI should further examine the extent that classes have different expected losses in excess of the limitation contained in classification ratemaking data."

NCCI's current procedure treats excess losses as random events within each industry group. To the extent that classifications within the industry group have different excess losses expectations, for example proportional to other serious losses, NCCI will modify its procedure. This issue increases in importance if the loss limit is significantly reduced.

"...calculating separate trend factors by policy year makes the least difference of all tested alternatives in all but one state."

NCCI will implement separate trend factors by policy year.

"We reviewed the composition of the 'All Other' industry group. We recommend that NCCI further investigate subdividing this industry group into smaller, more homogeneous industry groups."

NCCI agrees to review subdividing the "All Other" industry groups into two or more smaller groups of classifications. This review will include input from the Underwriting Committee.

"...NCCI modify its (F classifications) procedure to reflect the effect of such trend."

NCCI will implement trend in F classifications.

Section II-B Part 5: Law Amendments

"For "formula" benefit changes, NCCI's pricing methodology seems to be working satisfactorily ("formula" benefit changes are those for which NCCI applies standard benefit tables and distributions in its cost evaluation)."

NCCI agrees with this conclusion. NCCI recognizes the need to update and refine the detailed pricing distributions. This activity has already begun to yield positive results in the form of an updated wage distribution and a distribution of medical procedures.

"In some non-formula situations, NCCI appears to apply formula techniques when those techniques are not appropriate. In other more recent cases, NCCI has applied new data sources and new estimation techniques. NCCI should improve the method of identifying law changes significant enough to require the use of "non-formula" techniques."

NCCI believes that the extent of misapplication of formula techniques is limited and does not reflect current practice and resource levels. We concur with the observation regarding non-formula techniques. An increased level of resources has been assigned to this function.

"NCCI should increase the utilization of state specific information regarding the workers compensation benefit system being analyzed."

The foundation for such refinements has already been established through the expansion of the Detailed Claim Information system to include additional data elements and to cover all states.

"NCCI should improve the explanatory material included with a benefit pricing report."

NCCI agrees additional explanatory material may be helpful. The large volume of supporting information required to determine the effect of the benefit change makes it unavoidably complex.

Section II-B Part 6: Alternative Exposure Base

"No single exposure base for workers compensation (or any other line of insurance) is ideal for all circumstances. A usable exposure base must balance theoretical and practical considerations."

NCCI clearly agrees with these and subsequent conclusions.

"Unlimited payroll appears to provide the most reasonable compromise between theoretical and practical considerations for most insureds."

Total payroll comes out substantially ahead for workers compensation as practical, always available, and verifiable.

"The introduction of the Revised Experience Rating Plan (RERP) will mitigate the premium inequities inherent in the current rating system for many insureds."

RERP is more responsive than the plan it replaced. The average high wage payer benefits from RERP.

"Residual inequity is most likely to exist for insureds with the following joint characteristics:

- "1) They are concentrated in classes with a wide range of verifiable average hourly wages.*
- "2) The wage variation has no logical relationship to occupational hazard specific to a given type of locale and activity.*
- "3) The insureds are either too small to qualify for or have low credibility under RERP.*

"The residual inequity can be further mitigated through a wage rate recognition plan limited to those classes with a demonstrated problem and with hours worked data readily available and verifiable."

NCCI agrees a study must first be done to demonstrate that any residual inequity exists. Also, hours-worked data must be verifiable. Milliman and Robertson states under Expense Impact that "The availability, quality, and verifiability of hours worked varies greatly by jurisdiction and type of employment."

Milliman and Robertson further cautions against use of wage rates for all classes of insureds:

"Such a universal change would provoke a largely unnecessary disturbance."

"There is no guarantee that such data would be available or meaningful at any cost to all insureds."

"The intent of this recommendation is to introduce wage rate differentials as a refinement of the classification system without creating new inequities or extraordinary expenses."

"It is intended to limit application of wage rate credits to employers where an identifiable problem may exist; e.g., the construction industry. This industry group has a high population of both union and non-union workers; the situation most likely to result in a residual inequity through the use of unlimited payroll."

NCCI agrees with the limited application notion, but has shown that construction workers do not necessarily have a demonstrated inequity. Higher wage earners, especially in unions, have greater expectation from medical care, more access to specialists and technology, and more knowledge of benefit programs. NCCI studies have shown that high wage earners have longer benefit durations.

Section II-B Part 7: Experience Rating Plan

"We have evaluated the accuracy of the Revised Experience Rating Plan, and find it to be more accurate, on average, than the Prior Experience Rating Plan it replaces."

"We conclude that the NCCI's method of introducing the RERP does not tend to result in a premium increase or decrease."

"There is evidence that the calculations resulting in ELR and D-ratios are appropriately checked and documented in NCCI files. Further, reasonable safeguards exist against manipulation of the data by the insured. Finally, the experience rating modification is calculated by computer, and a worksheet is produced showing the calculation and underlying data. This worksheet is sent to the carrier of record, and is made available to the insured and its agent or service provider."

M&R's testing of the Revised Experience Rating Plan (RERP) confirmed that this plan will perform better than the Prior Experience Rating Plan (PERP). The introduction of the new plan has not and will not result in significant changes to the overall premium level. Experience rating in general is fairly administered and well documented by NCCI.

"We have developed an Alternate Experience Rating Formula which directly incorporates primary losses as a predictor of future excess losses."

For risks with premiums between \$5,000 and \$500,000, RERP performed as well as the Alternate Plan. Since the premium for these risks is less likely to be modified by retrospective rating or some other large risk rating option, the performance of experience rating is of greater importance than that for the larger risks.

The Alternate Plan performs only marginally better than NCCI's RERP for risks with premiums over \$500,000.

"We conclude that if these recommended changes (to ELRs and D-ratios) are implemented and if ELRs are updated on a regular basis, any persistent off-balance that results will be due to real cost differences between experience rated risks and the average of all risks."

M&R suggests several improvements in the calculation of rating values that were not tested by M&R. Prior to the NAIC exam, NCCI had started projects addressing most of these improvements.

With adequate manual rates, NCCI's experience rating plan procedures will produce results with minimum off-balance.

"Based on our test results using the optimized RERP and Alternate Plan, it appears likely that the accuracy of the experience rating plan would be improved by expanding the experience period to five years from the current three years."

M&R's testing was limited to a relatively small number of states and they did not perform the test using NCCI's version of RERP or PERP which are the plans currently in use.

"Some policyholders already consider it inappropriate to use data as old as the oldest year currently used in experience rating..."

M&R recognized there are practical considerations against using 5 years of data.

"In addition to developing the Alternate formula, we have developed a technique for estimating the credibility parameter which best fit a given set of data."

NCCI believes the M&R technique could be used to supplement those developed for RERP. After a review of the M&R test results, it appears that the RERP credibility performs as well as the M&R credibility for risks with premium under \$500,000.

"If the decision is made to implement a CFCP (Claim Free Credit Plan), we recommend that NCCI estimate the indicated credits and debits using the method we have described...."

M&R recommends NCCI not implement CFCP for small risks that are not now subject to experience rating. NCCI agrees such a plan will result in rating inequities.

"The current split point of \$5,000 represents a reasonable compromise between minimizing 'linearization error' and maximizing the amount of data classified as primary."

NCCI agrees the current split point is reasonable and should be reviewed on a periodic basis.

"Reporting data (losses) in this way (net of deductibles) significantly complicates and degrades the application of an experience rating plan."

NCCI has been active in promoting the reporting of losses gross of any deductible. We have developed a prototype Deductible Experience Rating Formula (DERF) to be used only in the event that our efforts fail to achieve gross reporting.

Section II-B Part 8: Miscellaneous

"Minimum premium risks appear to have consistently worse loss ratios than all other risks."

"The expense provisions for small risks are moderately greater than their expense needs."

The report describes consistently worse loss ratios for minimum premium risks than other risks and an apparent slight redundancy of expense for very small risks. It should be noted that the loss ratio disparity for these risks (loss ratios more than 35 percent greater on average than those of all other risks) greatly overshadows the very slight redundancy indicated by M&R's analysis.

"Pricing of minimum premium risks should be governed by its practical effects rather than its actuarial significance."

It is NCCI's responsibility to file actuarially appropriate indications that will result in rates for all insureds that are adequate, not excessive, and not unfairly discriminatory. Any type of subsidization of one category of risks by another mandated by regulators should be identified.

"The potential future problem of double-counting adverse experience through a single set of experience modification plan parameters applied to both voluntary business and assigned risk business."

The current critical state of the residual market in terms of size and rate inadequacy should override any concerns regarding double-counting. M&R even states on pages 20-21 that:

"the overall impact of the current assigned risk plans was quite a bit less than the current assigned risk revenue shortfalls."

"At the present time, we would characterize the issue of potential double counting as a design consideration for future surcharge programs rather than as something likely to be a problem with current plans."

Furthermore, the report fails to highlight the fact that residual market differential indications are on a standard premium (i.e., after experience rating) basis. As a result, the extent to which experience mods are higher in the residual market has already been accounted for. Thus, residual market insureds on average would be paying the appropriate amount when the fully indicated differential is reflected.

In addition, NCCI notes there is justification for a uniform set of experience rating values beyond easier administration of the plan. There should be only one experience modification per insured, regardless of in which market the policy is written. This is an objective standard which can be interpreted consistently by all users of this information.

"We also recommend that NCCI strengthen the process for editing carriers' future calendar and policy year premium reports."

NCCI is investigating additional modifications to the present procedure.

NAIC

Examination of NCCI

Section I: Data Collection and Data Quality

Volume I: Overview of Findings and Recommendations

May 15, 1991



Milliman & Robertson, Inc.

**ARTHUR
ANDERSEN**
ARTHUR ANDERSEN & CO., S.C.

DATA COLLECTION AND DATA QUALITY

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* "Section" refers to the sections of the examination defined in the NAIC Request for Proposal, not sections of this report.

DATA COLLECTION AND DATA QUALITY

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- A. Overall Rate Level
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- H. Appendix: Summary of Sample Testing Results

* "Section" refers to the sections of the examination defined in the NAIC Request for Proposal, not sections of this report.

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Executive Summary

1. INTRODUCTION

This report presents the approach, findings and recommendations of the review of data collection and data quality at the National Council on Compensation Insurance (NCCI) performed by Arthur Andersen & Co. and Milliman & Robertson, Inc. It contains the written deliverables of Section I of the NAIC examination of NCCI.

Project Background

Milliman & Robertson, Inc. and Arthur Andersen & Co. performed an examination of the structure and operations of NCCI under the examination authorities of the Florida Department of Insurance, the Maine Bureau of Insurance, the Nebraska Department of Insurance and the Utah Department of Insurance. The National Association of Insurance Commissioners (NAIC) coordinated the activities of the four departments in administering the examination. The specific requirements and conditions of the examination are specified in the Request for Proposal for this project (included in the Appendix to Volume I).

The overall purpose of this examination was to evaluate the data collection and data handling activities of NCCI, certain aspects of its ratemaking activities and practical considerations involved in implementing a loss cost system.

The examination was conducted in three sections:

- I. Data Collection and Data Quality;
- II. Ratemaking Procedures; and
- III. Loss Cost Implementation.

Arthur Andersen & Co. had primary responsibility for Section I of the examination; Milliman & Robertson had primary responsibility for Sections II and III.

This executive summary provides an overview of Section I of the examination and outlines the contents of the Section I report.

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Section I Project Objectives

The primary objectives of Section I of the examination were to (1) document NCCI's data collection and data handling systems and procedures and (2) evaluate the quality of NCCI's systems, procedures and data.

Section I Project Scope

The scope of Section I of the examination included only systems and procedures currently used in ratemaking, experience rating and detailed claim information applications. It did not include systems which were in development during the examination. We have also provided comments on current NCCI development initiatives, where appropriate, but we have not formally examined systems in development.

Content and Structure of Section I Report

Our report for Section I of the examination is organized in three volumes:

- I. Overview of Findings and Recommendations;
- II. Description of Data Collection and Data Handling; and
- III. Evaluation of Data Collection and Data Quality.

Volume I includes: (1) this Executive Summary, which presents our approach, major findings and recommendations; (2) a very brief description of current NCCI data collection and handling systems and procedures (Overview of Section IA); (3) our evaluation of NCCI's data collection and data quality (Overview of Section IB); and (4) responses to eight questions concerning NCCI data collection and data quality from the NAIC Request for Proposal for this examination.

Volume II provides detailed documentation of the current NCCI systems and procedures which were within the scope of the examination.

Volume III contains a report on each functional area we examined within NCCI. Each report includes an overall evaluation of the area, a description of our evaluation approach, general observations and recommendations, and detailed findings and recommendations.

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2. EXAMINATION APPROACH

We conducted Section I of the examination in two phases:

- o Section IA: **Description of Data Collection and Data Handling Procedures; and**
- o Section IB: **Evaluation of Data Collection and Data Quality.**

Section IA

In Section IA of the examination, a team of Arthur Andersen and Milliman & Robertson personnel, with direct assistance from NCCI personnel, reviewed and documented the existing NCCI systems and procedures which were within the scope of the examination. We developed documentation of current systems in several forms:

- (1) An overview of current systems and procedures, which includes high-level descriptions and process flow diagrams of each major area;
- (2) Detailed data and process flow diagrams of existing systems and procedures;
- (3) Statistical call data documentation for selected calls, including a description of each call, NCCI edits performed on each data element in the call, error correction procedures and NCCI modifications to carrier data, and file documentation for key NCCI computerized data files containing call data; and
- (4) A computerized data dictionary, which cross-references data elements collected by NCCI with the NCCI computer programs which use them.

Items (1) through (3) are included in Volume II (and its Appendix) of this report. Item (4) was developed primarily to support our testing phase (Section IB) and is not included in this report.

Section IB

In Section IB of the examination, our team evaluated NCCI data collection, data handling and data quality. Our evaluation included statistical sampling of NCCI

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data, detailed review of NCCI control procedures, and detailed review and analysis of NCCI's automated systems.

3. OVERVIEW OF NCCI FUNCTIONS

NCCI's stated mission is to provide information and services to support adequate rates and the long term viability of the workers compensation insurance system. NCCI's stated organizational objectives are to achieve adequate and equitable pricing and to facilitate workers compensation reform efforts.

NCCI pursues its objectives by collecting detailed financial and statistical data and using this data to produce rate filing proposals in each state in which NCCI is authorized to file rates. These rates, and the ultimate premiums charged for workers compensation coverage, are based on a three-tiered system.

Aggregate Ratemaking establishes overall rate level recommendations based on analysis of insurance company financial results. Carriers report their summarized annual results to NCCI on "financial calls". Rate levels derived from this information are the primary determinants of overall pricing, and form the basis of NCCI's filed rate change requests.

Class Ratemaking distributes the recommended overall rate change to the more than 600 individual rate classifications. These classifications are used to group insureds according to similar types of business and exposure to hazards. NCCI uses summarized exposure and loss results (unit reports) filed under the Workers Compensation Statistical Plan (WCSP) to accomplish this distribution.

Experience Rating develops factors which enable carriers to adjust an individual insured's premium. These factors reflect an insured's actual loss history relative to expected losses of insureds in the same rate classifications. As in Class Ratemaking, Experience Rating uses WCSP data, but at a detailed, insured level.

Other types of data collected by NCCI contribute to their mission. Policy data is used to assist in controlling the receipt of WCSP data and in combining WCSP data for experience rating. Detailed Claim Information (DCI) data is used to analyze the underlying factors that cause workers compensation results to change over time, and is used in proposing system reforms to control rising insurance costs.

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4. MAJOR FINDINGS

The major findings from Section I of our examination of NCCI may be grouped into four categories:

- 1) **Data quality:** Our findings indicate NCCI is accurately converting information received from insurers to NCCI electronic data files. We did not evaluate the quality of the data submitted by the insurers.
- 2) **Data quality and timeliness policies:** We found NCCI's data quality and timeliness policies require clarification and stronger enforcement. Current policies do not provide adequate incentives for carrier compliance.
- 3) **Data handling systems and procedures:** NCCI mission critical ratemaking and experience rating systems manage excessive hard copy input, lack integration, and perform minimal automated validation of data at the time of data capture. NCCI currently compensates through extensive manual intervention. The problems are less severe for aggregate ratemaking systems than for WCSP systems, largely due to the lower volumes of data processed for aggregate ratemaking and more timely validation of input.
- 4) **Current NCCI initiatives:** NCCI has development initiatives in process or planned which are intended to resolve the major deficiencies of its current systems. NCCI has planned a very aggressive schedule to implement these new systems. While we did not assess NCCI's progress in completing these projects, we believe NCCI's management is committed to achieving its systems development objectives.

These findings are discussed briefly on the following pages and presented in greater detail in Volume I, Overview of Section 1B, and Volume III of this report.

Data Quality

Our findings indicate NCCI is accurately converting information received from insurers to NCCI electronic data files. This finding is based on the results of our random statistical sampling and judgmental sampling of NCCI's key data files. Our detailed sampling results are presented in the Appendix to Volume III of this report and discussed in Volume I, Overview of Section 1B, and Volume I, Response to RFP Question 1.

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Our findings on NCCI data quality are limited by the scope of our study. We traced data in NCCI's computerized ratemaking, experience rating and detailed claim information files to input NCCI received from the insurers. We did not test the accuracy of the data submitted by the insurers.

Data Quality Policies

NCCI's data quality policies require clarification and stronger enforcement. NCCI's constitution and membership agreements provide very broad statements of data quality policies and responsibilities. Standards are currently defined and enforced for each of the major calls by the departments responsible for administering them. The effectiveness of current standards and enforcement varies greatly by department.

- o For the financial calls, data timeliness and accuracy standards are clearly defined but not effectively enforced.
- o Data timeliness and accuracy standards are less precisely defined for unit report data and no policy to impose fines for delinquent or inaccurate reports is yet in place. NCCI plans to assess fines for late or inaccurate unit reports beginning late in November, 1992.
- o NCCI's Data Administration procedures authorize NCCI staff to modify carrier data to correct certain types of unit report errors without carrier approval. The limits of this authority are not clearly defined.
- o NCCI does not have a consistent carrier performance measurement and reporting policy. In the case of financial calls, performance is measured, reported to the individual carriers, and used as a basis for assessing fines. For unit reports, carrier performance is measured, but current performance reporting does not provide an effective performance feedback mechanism.
- o NCCI's current monetary incentive programs do not provide effective incentives to improve carrier performance.
 - Under its Performance Evaluation Monetary Incentive Program (PEMIP), NCCI fines carriers for failure to meet clearly defined timeliness and accuracy standards for financial calls and credits carriers for early submission of financial calls. The fines do not appear to be large enough

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to provide an effective monetary incentive to improve performance and are not imposed for failure to correct errors.

- Fines are not currently imposed for late or inaccurate unit reports.
- o NCCI does not accurately allocate error handling costs among the carriers.
 - NCCI does not currently measure the true cost of error handling for each carrier.
 - NCCI does not currently assess any penalties to cover the cost of handling errors in unit report data. NCCI plans to assess fines for late or inaccurate unit reports beginning in November, 1992.
 - Fines currently assessed for late or inaccurate financial calls are not adequate to cover the true costs of error handling.

The major consequence of the lack of clear data quality policies and enforcement at NCCI is that too much of the burden of ensuring data quality falls on NCCI, and too little on the carriers, agents and insureds. This results in a very inefficient data verification and error correction process and may not assure data quality. A potential additional consequence is inequitable distribution of processing costs among the carriers.

Current Data Handling Systems and Procedures

NCCI systems which support ratemaking and experience rating are the systems most critical to NCCI's mission. These systems have major shortcomings which include excessive reliance on hard copy input, lack of integration and minimal automated validation of data at the time of data capture. NCCI currently compensates for many of its systems shortcomings through extensive manual intervention.

System Architecture

Many of NCCI's systems reflect the outdated design techniques and development technology of the period in which they were developed. This is particularly true of the WCSP systems.

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- o Systems were designed to support narrow functions within departmental boundaries. Processes and data are duplicated across different functions, with little or no integration.
- o Many processes are only partially automated, require extensive manual intervention and rely upon paper inputs and outputs.
- o File structures in many systems support efficient batch processing but do not allow on-line access.
- o Application programs are poorly structured and undocumented, making modifications difficult.

These redundancies, lack of integration, barriers to access and poor structure create inefficiencies and inconsistencies throughout NCCI's systems.

Data Collection and Validation

NCCI's critical data inputs are the financial calls, used to determine overall rate levels, and the unit reports, used for class ratemaking and experience rating. Policy information will become increasingly important as NCCI begins to integrate its systems. Current NCCI systems which collect and validate these critical inputs provide incomplete control over data timeliness, completeness and accuracy. Manual procedures help compensate for system deficiencies, but the resulting process is very inefficient.

Data Collection

NCCI's current data collection systems and procedures do not effectively control the timeliness and completeness of data collected from carriers.

- o **The problem is most severe for unit report data. NCCI recently started phased implementation of the Unit Report Control (URC) system, which is ultimately intended to track all unit reports due, received and missing. Under the current schedule, this system is to be fully implemented by mid-1992.**
- o **NCCI has inadequate controls to ensure all carriers submit financial calls. The principal controls over data completeness are reasonableness tests,**

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in which NCCI actuaries make year-to-year comparisons of data during aggregate ratemaking.

NCCI currently manages excessive amounts of hard copy input.

- o NCCI received approximately 1,200,000 hard copy unit cards in 1990.
- o All of this hard copy input requires data entry into NCCI's systems.
- o Unit reports received on hard copy are retained for three years in the field offices in hard copy form. Unit reports are also stored on microfilm.

Data Validation and Error Correction

NCCI's data validation and error correction systems provide incomplete validation, are poorly controlled and are very inefficient. These problems are most severe for WSCP systems and are largely the result of insufficient and ineffective automation. NCCI has several major systems development initiatives planned or in process which are intended to resolve many of the problems noted in these findings.

- o WSCP systems do not thoroughly validate data at the time of receipt.
- o Unit report validation for Class Ratemaking is a cumbersome, time consuming process which requires extensive manual effort.
- o NCCI's unit report data collection and verification systems allow entry of duplicate data.
- o There is no validation to verify that unit report data for a specific risk is consistent with policy specifications, risk inspections or previously submitted data.

End User Computing

Critical ratemaking applications are developed, maintained and controlled by actuarial personnel. These end user controlled applications do not have the degree of automated application control required of most production systems.

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In our control procedure tests of Overall Rate Level and Class Ratemaking end user computing applications, we did not find any errors which had resulted from weak controls. However, given the importance of end user computing to the NCCI's ratemaking process, NCCI is exposed to significant risk due to the lack of controls.

Current NCCI Initiatives

NCCI has development initiatives in process or planned which are intended to resolve the major deficiencies of its current systems. We have outlined some of the leading projects and their objectives below.

Systems Planning

NCCI's Enterprise Data Modeling (EDM) project is a key part of an ongoing Strategic Information Systems Planning effort. The stated objective of the EDM project is to define a strategic framework for designing and developing integrated systems.

The EDM report provides valuable analysis of NCCI's business functions and information requirements, and presents a very high-level model of applications and data. The EDM report also contains a very realistic assessment of NCCI's current systems. This assessment clearly acknowledges many of the major defects of NCCI's current systems.

The EDM report does not, however, present a clear vision of NCCI's future systems, a complete definition of an architecture upon which to build these systems, or a detailed data model. Additional steps are required, and NCCI has begun to take these steps.

NCCI's Information Resources management team is currently refining its vision of NCCI's future systems. They intend to present their vision and plans to achieve it to NCCI's Board of Directors in July 1991.

Systems Development

A number of systems development projects are planned or currently in process at NCCI. Four of these projects are intended to provide the core of NCCI's new information systems and provide a foundation for new ratemaking and experience rating systems.

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- o **URC** - The objective of the Unit Report Control (URC) system is to improve the timeliness and completeness of unit reporting.
- o **URQ** - The objectives of the Unit Report Quality (URQ) system are to provide "front end" data quality edits which validate unit report data immediately upon receipt and to provide an efficient correction process for errors.
- o **URS** - The objective of the Unit Report System (URS) is to provide an integrated unit report database to serve both experience rating and ratemaking applications.
- o **Risk Information System** - The objectives of the Risk Information System project are to develop a database that will contain risk information and establish linkages to all risk-related information in NCCI's systems.

Systems in development during the examination were beyond the scope of our project. Accordingly, we have not evaluated the designs or ongoing development of these initiatives. It is clear to us, however, that the projects noted above address NCCI's major systems deficiencies.

NCCI has planned a very aggressive schedule for implementing these new systems. By the end of 1992, NCCI plans to have designed and fully implemented seven new systems while continuing to support and enhance existing systems. Strong management, adequate resources, and effective training will be required for NCCI to succeed with its current plans.

End User Computing Standards

Recently, NCCI's Internal Audit department developed a set of guidelines for implementing new end user computing standards. NCCI executive management has approved these guidelines and development of new standards will begin soon. NCCI has not set a date for implementation of the new standards.

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5. PRIORITY RECOMMENDATIONS

Our detailed recommendations for each of the areas we examined are presented in Volume III of this report. They may be summarized in four major recommendations:

- 1) **Clearly define data quality policies and standards;**
- 2) **Measure and report carrier and NCCI performance against those standards;**
- 3) **Build effective incentives to achieve performance objectives; and**
- 4) **Build integrated systems which support policies and objectives.**

Clearly define data quality policies and standards.

NCCI Policy

NCCI needs a clear and unified policy on data collection and data quality. This policy should provide the overall framework within which NCCI collects and processes carrier data.

We recommend that NCCI adopt policies which place appropriate responsibility for data verification and error correction with the carriers, and sharply limit its own authority to modify carrier data. NCCI should reject data known to be in error and return it to carriers for correction. NCCI policies should also specify carrier and risk audit standards.

Industry Standards

For NCCI to be truly effective in the implementation of its data quality standards, comparable standards must be developed for carriers, agents and insureds. Every entity involved in developing data, transmitting data or processing data must be held to the same standards. The quality of data used to set rates is only as good as the weakest link in the chain.

We recommend that the NAIC, through the appropriate task force, develop a model Workers Compensation data quality regulation. The overall objective of this

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Executive Summary

regulation should be to promote consistent, timely and accurate data reporting by all parties.

Measure and report carrier and NCCI performance against the new standards.

NCCI should implement systems and procedures which measure timeliness and accuracy of carrier data reporting against very specific standards. NCCI should establish a program of regular carrier performance reporting.

NCCI should also implement systems and procedures which measure the timeliness and accuracy of its own processing.

Build effective incentives to achieve performance objectives.

The NAIC and NCCI must provide more powerful incentives for carriers to submit timely and accurate data and correct errors promptly. The model regulation noted above would be a strong first step. NCCI incentives to carriers should include mechanisms which provide an accurate allocation of NCCI's processing costs, including error handling costs, among the carriers.

Build integrated systems which support the new policies and objectives.

First, NCCI should complete and publish its Strategic Information Systems Plan. This document should provide clear direction for building systems which will support NCCI's strategic objectives. The plan should include a statement of objectives, an overall application architecture, system definitions for all mission-critical applications and an implementation schedule.

We believe the specific systems initiatives outlined below are essential to achieving NCCI's business objectives and should be included in NCCI's systems plan:

- 1) NCCI should implement systems to track and control the due date and receipt of all information submitted by carriers.
- 2) NCCI should develop an electronic data transfer mechanism for submission of data from the carriers to NCCI.

OVERVIEW OF FINDINGS AND RECOMMENDATIONS

Executive Summary

- 3) NCCI should develop data validation software and distribute it to carriers.
- 4) NCCI should develop systems which validate all data at the time of receipt.
- 5) NCCI should develop systems which provide regular carrier performance reporting.
- 6) NCCI should develop systems which support consistent, effective financial incentive programs to encourage carrier compliance with timeliness and quality standards.
- 7) NCCI should develop an integrated corporate database.
- 8) NCCI should re-engineer and automate many of its current manually intensive areas.
- 9) NCCI should explore alternatives and decide upon an appropriate identification number for insured businesses.
- 10) NCCI should implement more stringent controls over its end user computing environments. NCCI should move stable, regularly executed end user applications into a production environment.

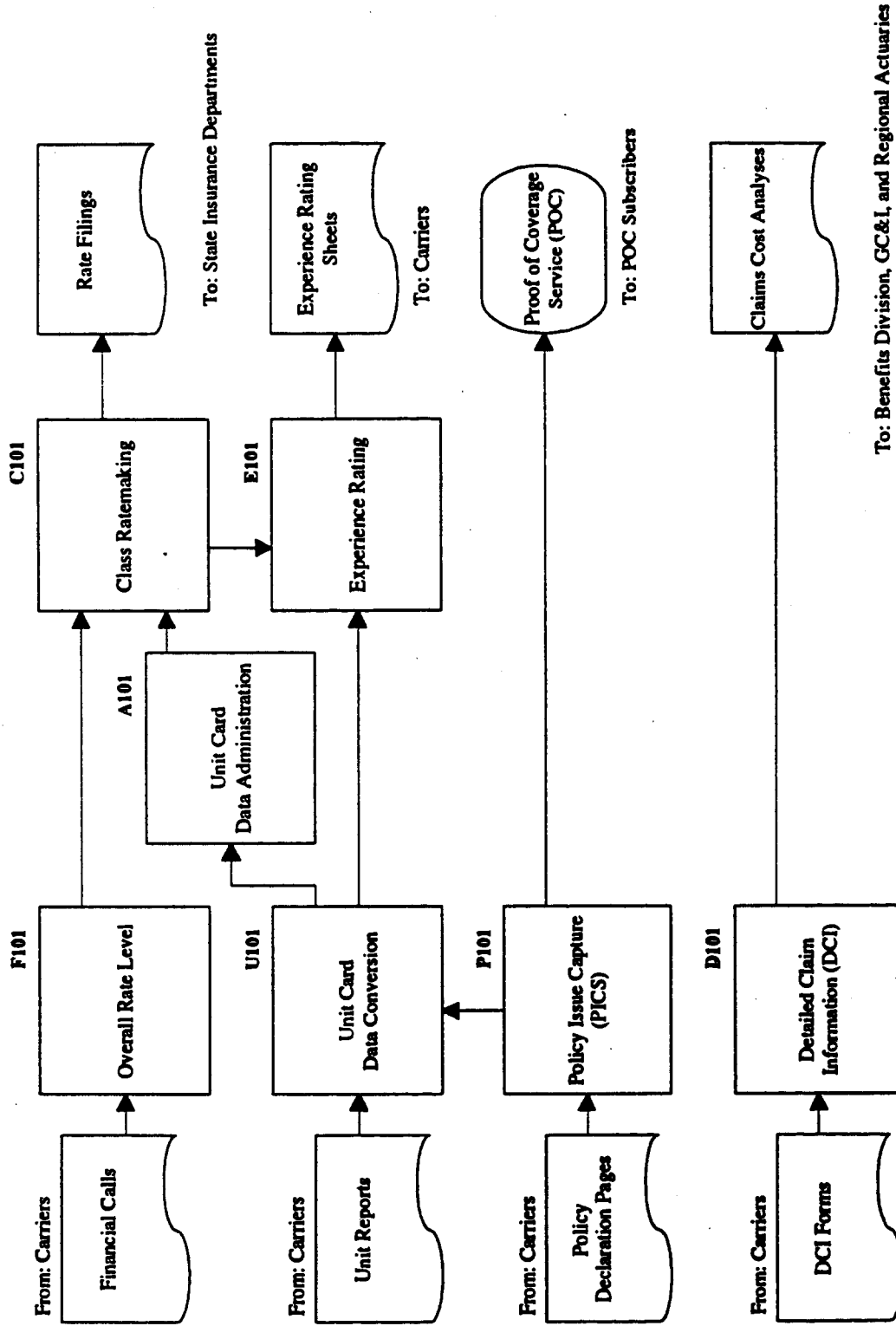
NCCI should use modern software engineering techniques, follow a structured systems development methodology and use consistent documentation standards for development of new systems. This approach will contribute to development productivity, system flexibility and maintainability.

NCCI's management supports these recommendations and has taken steps to implement them. NCCI plans to address these points in its response to this report.

OVERVIEW OF DATA COLLECTION AND DATA HANDLING PROCEDURES

This section of the report provides a high level overview of the data collection and data handling procedures at NCCI. The accompanying diagrams and text include four digit codes which reference more detailed diagrams in Volume II, Description of Data Collection and Data Handling Procedures. Readers who wish to review the detailed descriptions of NCCI procedures should refer to Volume II.

OVERVIEW OF DATA COLLECTION AND DATA HANDLING PROCEDURES

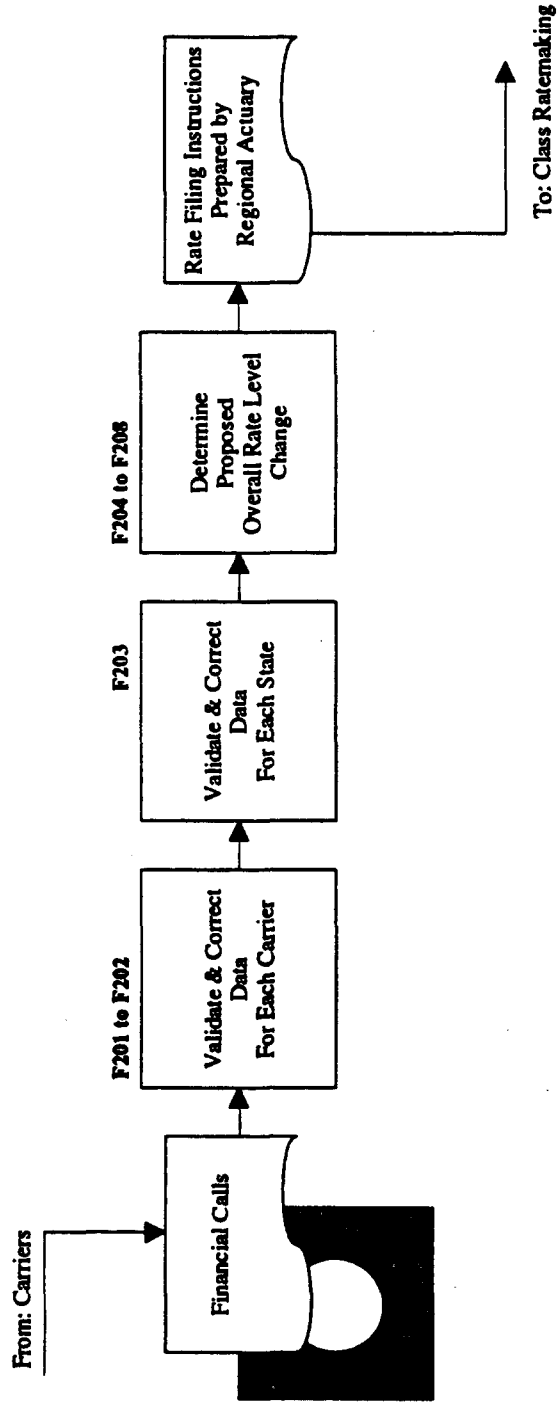


OVERVIEW OF DATA COLLECTION AND DATA HANDLING PROCEDURES

- F101:** NCCI receives aggregate premium and loss information from carriers on financial calls. This information is used to determine proposed overall rate level changes for each state.
- U101:** NCCI receives payroll, premium and loss information for specific policies from carriers on Unit Reports. This information is known as Workers Compensation Statistical Plan (WCSP) data.
- A101:** NCCI validates and summarizes WCSP data for use in ratemaking.
- C101:** NCCI uses summarized WCSP data and proposed overall rate level changes to determine proposed classification rate changes. NCCI distributes rate filings, indicating proposed overall rate levels and class rate levels, to state insurance departments. NCCI also determines key factors for use in producing experience ratings.
- E101:** NCCI validates WCSP data and key factors derived from WCSP data and uses them to calculate experience modification factors. NCCI distributes experience rating sheets indicating individual risks' historical loss experience and the resulting modification factors to insurance carriers.
- P101:** NCCI receives policy information from carriers on Policy Declaration Pages. This information is used to provide the Proof of Coverage (POC) service and to research WCSP data questions.
- D101:** NCCI receives detailed claim information (DCI) from carriers on standard forms. This information is used to analyze cost components and trends in workers compensation claims.

OVERVIEW OF DATA COLLECTION AND DATA HANDLING PROCEDURES

Overall Rate Level (F101)



OVERVIEW OF DATA COLLECTION AND DATA HANDLING PROCEDURES

Overall Rate Level (F101)

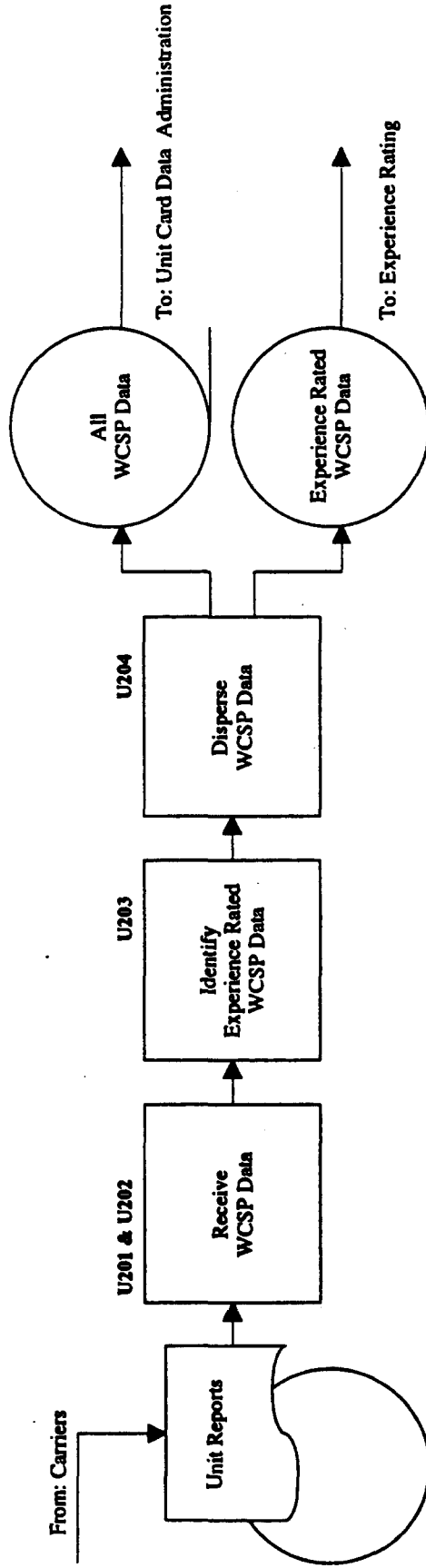
F201 to F202: NCCI clerical staff receive aggregate premium and loss information from carriers on financial calls. Carriers may submit this information on either hard copy documents or on microcomputer diskette. Overall Rate Level actuarial staff validate financial call submissions from each carrier for completeness, consistency and reasonableness. Actuarial staff resolve questions arising out of this validation process through contact with the carrier and make corrections as appropriate.

F203: Overall Rate Level actuarial staff extract the most recent aggregate premium and loss information for a state and combine it with two previous valuations of this information. Actuarial staff validate combined aggregate data for each state for completeness, consistency, and reasonableness. They resolve questions arising out of this validation through contact with carriers and make corrections as appropriate.

F204 to F208: Overall Rate Level actuarial staff use experience, development, and trend information to determine proposed overall rate level changes. An average of one policy year and one accident year are used to provide experience information. Three valuation dates (eg., 1988, 1989 and 1990) of loss and premium data are used to provide development information. Five policy years of data, valued as of the same date, are used to provide trend information. Overall rate level indications are forwarded to the appropriate Regional Actuary for analysis. The Regional Actuary then forwards the proposed overall rate level change to the Class Ratemaking area for use in calculating proposed class rate levels.

OVERVIEW OF DATA COLLECTION AND DATA HANDLING PROCEDURES

Unit Card Data Conversion (U101)



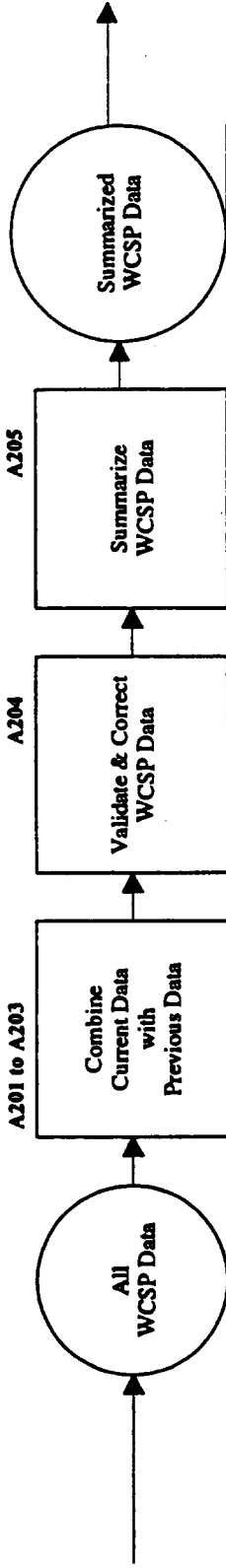
OVERVIEW OF DATA COLLECTION AND DATA HANDLING PROCEDURES

Unit Card Data Conversion (U101)

- U201 & U202:** Data Conversion clerical staff receive payroll, premium and loss information for specific policies from carriers on unit reports. Carriers may submit unit reports on either hard copy documents (unit cards) or magnetic tape. The information on unit reports is known as Workers Compensation Statistical Plan (WCSP) data.
- U203:** Data Conversion computer programs and Data Administration clerical staff identify WCSP data for experience rated policies through the use of a risk identification number (risk ID). Risk IDs uniquely identify all insured businesses subject to experience rating. NCCI uses the risk ID to associate WCSP policy experience with the proper insured business.
- U204:** Data Conversion clerical staff forward all WCSP data received to the Unit Card Data Administration area for eventual use in Class Ratemaking. Only WCSP data for experience rated risks is forwarded to the Experience Rating area.

OVERVIEW OF DATA COLLECTION AND DATA HANDLING PROCEDURES

Unit Card Data Administration (A101)



From: Unit Card
Data Conversion

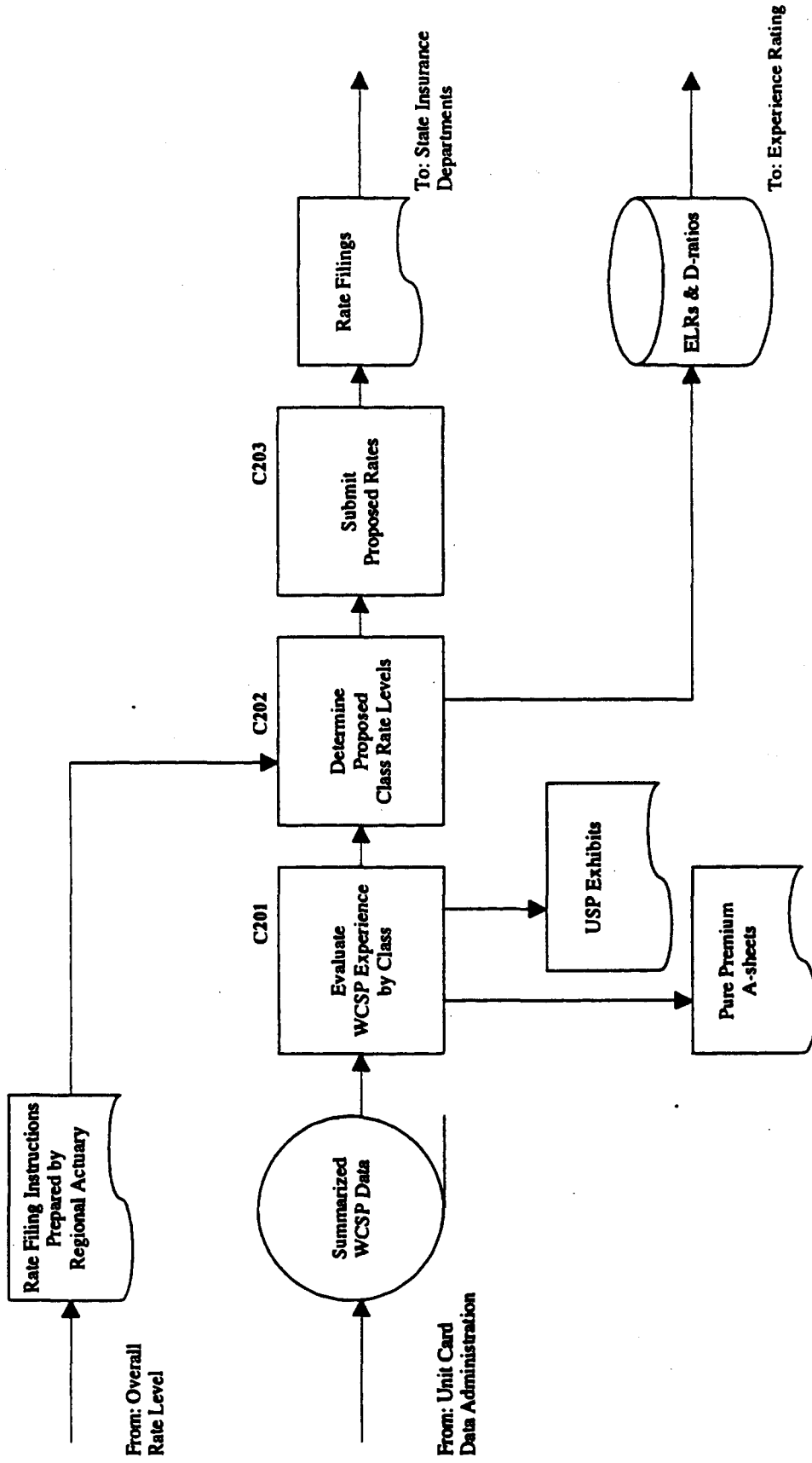
OVERVIEW OF DATA COLLECTION AND DATA HANDLING PROCEDURES

Unit Card Data Administration (A101)

- A201 to A203:** Data Administration clerical staff use automated applications to extract current year WCSP data for a state and combine it with data from the four previous years.
- A204:** Data Administration clerical staff use system generated error listings to validate five years of WCSP data for a state for completeness, reasonable loss development, reasonable payroll fluctuations by class, and to identify duplicate data. Clerical staff make corrections to WCSP data based on standard rules. In some cases, they will contact carriers to resolve WCSP data problems.
- A205:** Data Administration clerical staff execute automated applications to summarize WCSP data by payroll classification code. The summarized data is forwarded to the Class Rating area for use in determining proposed class rate levels.

OVERVIEW OF DATA COLLECTION AND DATA HANDLING PROCEDURES

Class Ratemaking (C101)



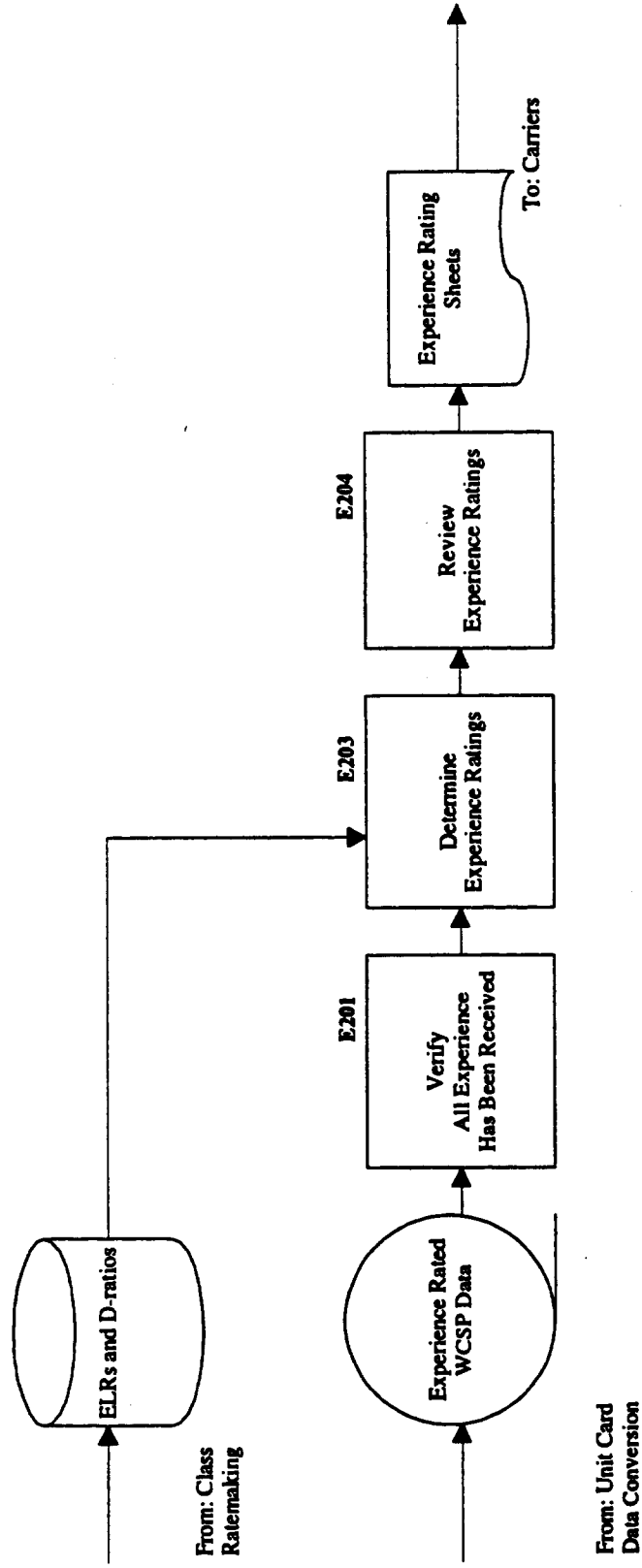
OVERVIEW OF DATA COLLECTION AND DATA HANDLING PROCEDURES

Class Ratemaking (C101)

- C201:** Class Ratemaking actuarial staff use three years of WCSP data, summarized by payroll classification, to evaluate pure premiums, and five years of summarized WCSP data to evaluate loss development. Loss trends are evaluated using trend factors provided by Overall Rate Level. A-sheets indicate pure premium required to cover current losses. USP Exhibits indicate trends and loss development.
- C202:** Class Ratemaking actuarial staff use proposed rate filing instructions from the Regional Actuary and information from A-sheets and USP Exhibits to determine the proposed class rate levels.
- Expected Loss Rates (ELRs) and D-ratios are also calculated at this time and, following rate filing approval, are forwarded to the Experience Rating area for use in calculating experience modification factors. ELRs indicate the expected losses for a classification per unit of exposure. D-ratios indicate the portion of those losses that are expected to be below a specified dollar threshold.
- C203:** NCCI submits proposed rate levels to State Insurance Departments in standard rate filing packages.

OVERVIEW OF DATA COLLECTION AND DATA HANDLING PROCEDURES

Experience Rating (E101)



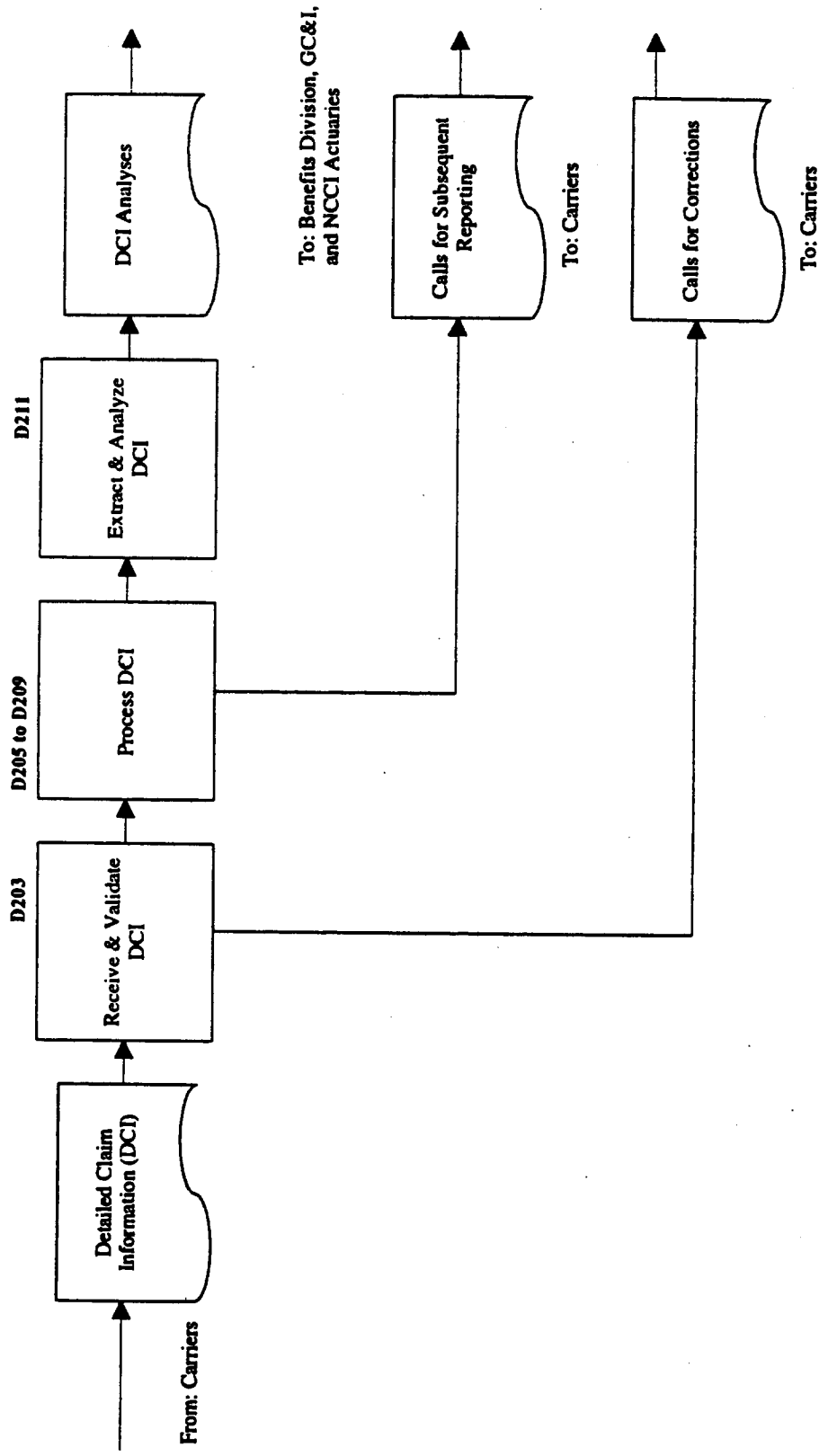
OVERVIEW OF DATA COLLECTION AND DATA HANDLING PROCEDURES

Experience Rating (E101)

- E201:** Experience Rating clerks verify that all required policy experience for the last three years has been received for rated risks. NCCI will contact carriers for missing WCSP data as necessary.
- E203:** Experience Rating clerks use all available WCSP data for the last three years for a risk and ELRs and D-ratios to calculate an experience modification factor for a risk.
- ELRs indicate the expected losses for a classification per unit of exposure. D-ratios indicate the portion of those losses that are expected to be below a specified dollar threshold.
- An experience modification factor is a number less than one for risks with fewer actual losses than expected and greater than one for risks with greater actual losses than expected. This number is used by carriers to adjust an insured's total premium.
- E204:** Experience Rating clerks visually review all experience rating sheets produced for reasonableness. Experience rating sheets indicate the actual WCSP experience used as well as the final experience modification factor. NCCI distributes rating sheets to carriers.

OVERVIEW OF DATA COLLECTION AND DATA HANDLING PROCEDURES

Detailed Claim Information (D101)



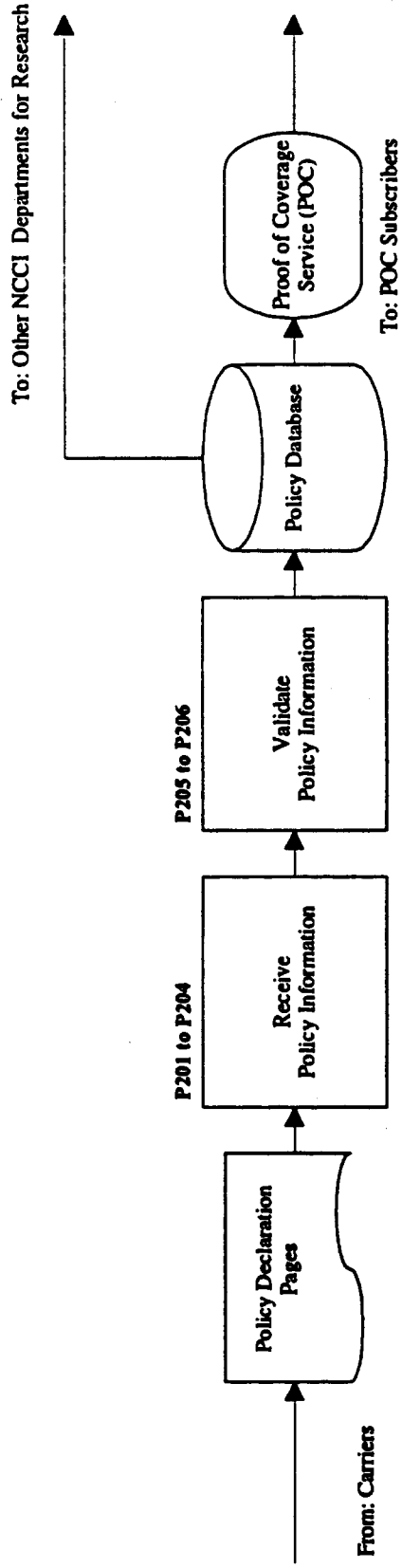
OVERVIEW OF DATA COLLECTION AND DATA HANDLING PROCEDURES

Detailed Claim Information (D101)

- D203:** Detailed Claim Information (DCI) clerks receive detailed claim information from carriers on standard forms. Detailed claim information must be reported for a specified percentage of workers compensation claims. Carriers may submit this information on either hard copy documents or magnetic tape. DCI systems validate the data for completeness and consistency. Correction requests are automatically generated for data in error. Carriers are required to correct data in error through resubmission.
- D205 to D209:** NCCI automatically generates requests for subsequent reports on established claims and forwards these requests to the carrier.
- D211:** Quarterly, DCI personnel extract detailed claim information for use in claims analysis. NCCI actuarial staff, Government, Consumer, and Industry Affairs (GC&I) personnel and Benefits division personnel use detailed claim information on an ad hoc basis to respond to requests for information.

OVERVIEW OF DATA COLLECTION AND DATA HANDLING PROCEDURES

Policy Issue Capture (P101)



OVERVIEW OF DATA COLLECTION AND DATA HANDLING PROCEDURES

Policy Issue Capture (P101)

- P201 to P204:** NCCI receives policy information from carriers in the form of policy declaration pages. Carriers may submit this information on either hard copy documents or magnetic tape. Carriers send hard copy documents to NCCI field offices. Magnetic tapes are sent directly to NCCI's headquarters for processing.
- P205 to P206:** NCCI validates policy information through a series of automated processes. Policy information is checked for correct field values, completeness and consistency. Valid policy data is loaded into the Policy Issue Capture System (PICS) database. The PICS database is used internally by NCCI for problem research and to provide the Proof of Coverage (POC) service to subscribers.

OVERVIEW OF FINDINGS AND RECOMMENDATIONS

Evaluation of Data Collection and Data Quality

I. INTRODUCTION

As described in the Executive Summary, we conducted Section I of the NAIC examination of NCCI in two phases:

- o Section IA: Description of Data Collection and Data Handling Procedures; and
- o Section IB: Evaluation of Data Collection and Data Quality.

In Section IA of the examination, our team reviewed and documented NCCI's current data collection and data handling systems and procedures. In Section IB of the examination, our team evaluated the quality of these systems and procedures.

This section of our report describes the approach, findings and recommendations of Section IB: Evaluation of Data Collection and Data Quality.

The scope of Section I of the examination included only systems and procedures currently used in ratemaking, experience rating and detailed claim information applications. It did not include systems which were in development during the examination. We have also provided comments on current NCCI development initiatives, where appropriate, but we have not formally examined systems in development.

OVERVIEW OF FINDINGS AND RECOMMENDATIONS

Evaluation of Data Collection and Data Quality

2. EVALUATION APPROACH

We applied several approaches to our evaluation, including statistical and judgmental sampling of NCCI data, detailed review of NCCI control procedures and detailed review and analysis of NCCI's automated systems. These approaches are described on the following pages.

2.1 Data Sampling

The objective of our data sampling tests was to determine the completeness and accuracy of NCCI data used for overall rate level, class ratemaking, experience rating and reporting detailed claim information. We tested ten statistical samples and two judgmental samples from NCCI data files.

Our analysis of data accuracy was limited to testing NCCI's computerized data files against the data NCCI received from insurers. We did not verify NCCI data against member company records.

Statistical Sampling

Our general approach to statistical sampling was to determine the accuracy of critical computer data files by randomly sampling records from these files and comparing the sampled records to the input data received from the carriers.

Our statistical sampling approach is outlined below:

- o Identified critical computer data files for sampling;
- o Determined the number of records in each of the selected files to identify the population sizes.
- o Defined required sample sizes, based on the population sizes, desired confidence level, tolerable error rate and expected error rate.
- o Generated random numbers for the appropriate sample size and used them to identify records for extraction from the data files;
- o Extracted samples and printed records in a form suitable for visual comparison to source documents;

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Evaluation of Data Collection and Data Quality

- o Obtained supporting source documents from hard copy, microfilm or microfiche files;
- o Compared appropriate fields on the computer file records with corresponding fields from source documents and identified all discrepancies; and
- o Investigated discrepancies, identified errors and summarized results.

We used an attribute sampling approach to design and conduct our tests. Attribute sampling evaluates the occurrence rate of a condition in a population, such as the rate of errors. Consequently, our statistical inferences are based upon the number of errors encountered, rather than the magnitude of the errors. Our approach is explained in greater detail in Volume III and its Appendix.

Judgmental Sampling

A second approach we applied to data sampling was to evaluate the completeness of critical computer files by judgmentally sampling hard copy source documents and magnetic tape input.

Our judgmental sampling approach is outlined below:

- o Identified critical hard copy document files and their corresponding electronic data files;
- o Defined required sample sizes based on audit judgment;
- o Selected hard copy source documents;
- o Extracted identifying information from input documents and used it to extract records from the critical data files;
- o Compared hard copy source documents to data on critical data files; and
- o Investigated discrepancies, identified errors and summarized results.

In addition to evaluating the completeness of computer files, we used the judgmental samples to evaluate the consistency of unit report data between Experience Rating and Data Administration computer files. We also used these

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Evaluation of Data Collection and Data Quality

samples to evaluate the consistency of factors calculated by Class Ratemaking and used by Experience Rating.

The specific procedures and results of each test are presented in detail in the Appendix to Volume III of this report.

2.2 Systems and Procedures Review and Analysis

Many of our Section IB findings and recommendations are the result of systems analysis. During the Section IA review and documentation phase, we reviewed available NCCI systems documentation, interviewed data processing and system user personnel, examined system inputs and outputs, reviewed computer program code, and documented data and process flows, system functions and procedures. In our Section IB evaluation, we applied these approaches to further investigate the structure and function of NCCI's systems.

2.3 Control Procedures Testing

The objective of our control procedures testing was to identify key control procedures and evaluate the adequacy of these procedures to ensure the completeness and accuracy of data used in ratemaking and experience rating.

Control procedures are intended to reduce the likelihood of errors. They may include both manual and computerized application controls. They may be designed to detect or prevent errors.

We reviewed control procedures in the following areas (the functions of each area are described in Volume II):

- o Data Conversion
- o Data Administration
- o Overall Rate Level
- o Class Ratemaking
- o Experience Rating

OVERVIEW OF FINDINGS AND RECOMMENDATIONS

Evaluation of Data Collection and Data Quality

Our evaluation of each area followed the same basic approach:

- o Identified key control procedures for review in each area and designed tests for each;
- o Tested control procedures to ensure they are operating effectively;
- o Documented observations, exceptions and conclusions regarding the adequacy of control procedures tested; and
- o Documented recommendations for improvement.

2.4 Information Systems Controls Review

In assessing the effectiveness of NCCI's information systems controls, we used several approaches:

- o Reviewed NCCI systems-related Internal Audit reports and investigated current status of control deficiencies indicated in the reports;
- o Evaluated NCCI responses to a systems controls checklist designed to identify risks within the major areas of activity in computer application systems;
- o Interviewed NCCI Information Resources management personnel to address potential systems control deficiencies;
- o Examined the effectiveness of application-specific controls in computerized applications in each functional area as part of our control procedures review;
- o Reviewed controls in end user computing (EUC) applications used in ratemaking; and
- o Reviewed NCCI's emerging EUC standards.

OVERVIEW OF FINDINGS AND RECOMMENDATIONS

Evaluation of Data Collection and Data Quality

3. MAJOR FINDINGS

The major findings from Section I of our examination of NCCI may be grouped into four categories.

- 1) **Data quality:** Our findings indicate NCCI is accurately converting information received from the insurers to NCCI's electronic data files. We did not evaluate the quality of the data submitted by the insurers.
- 2) **Data quality and timeliness policies:** We found NCCI's data quality policies require clarification and stronger enforcement. Current policies do not provide adequate incentives for carrier compliance.
- 3) **Data handling systems and procedures:** NCCI mission critical ratemaking and experience rating systems manage excessive hard copy input, lack integration, and perform minimal automated validation of data at the time of data capture. NCCI currently compensates through extensive manual intervention. The problems are less severe for aggregate ratemaking systems than for WCSP systems, largely due to the lower volumes of data processed for aggregate ratemaking and more timely validation of input.
- 4) **Current NCCI initiatives:** NCCI has development initiatives in process or planned which are intended to resolve the major deficiencies of its current systems. NCCI has planned a very aggressive schedule to implement these new systems. While we did not assess NCCI's progress in completing these projects, we believe NCCI's management is committed to achieving its systems development objectives.

These findings are discussed briefly on the following pages and presented in greater detail in Volume III of this report.

3.1 NCCI Data Quality

Our findings indicate NCCI is accurately converting information received from insurers to NCCI electronic data files. This finding is based on the results of our random statistical sampling and judgmental sampling of NCCI's key data files. Our detailed sampling results are presented in the Appendix to Volume III of this report, are discussed in Volume I, Response to RFP Question 1, and are summarized below.

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Evaluation of Data Collection and Data Quality

Our statistical sampling tests compared randomly selected records from NCCI's computerized files with input data received from the carriers.

- o We tested five financial calls used in developing Overall Rate Levels: Policy Year, Calendar-Accident Year, Calendar Year, Reconciliation Report and Insurance Expense Exhibit. For each call, we tested several critical data elements. The sample size for each data element ranged from 176 to 181 data records. For each sample, an acceptable upper error limit (or tolerable error rate) of 5% was established. In the five calls sampled we did not count as an error any discrepancy of less than \$5,000, as these were deemed to be immaterial.

For one call, Calendar-Accident Year, the sample error rate ranged from 2.8 to 4.4%. The upper error limit, at a 95% confidence level, ranged from 5.7 to 7.9%. This exceeds the acceptable upper error limit, however, the higher error rates were primarily due to NCCI's procedure of excluding or "zeroing out" unusual data which the carrier cannot or does not explain. Actuarial personnel delete such unusual data to avoid distortion of overall rate level indications. In our sample, we found data for eight carriers that was either partially or completely deleted for this reason. The inclusion of these items in our error statistics presents a worst case scenario of the potential error rate. Excluding these items from the error statistics would have resulted in an actual sample error rate ranging from zero to 0.6% and an upper error limit ranging from 1.6 to 2.6%, at a 95% confidence level. The appropriateness of "zeroing-out" data is discussed further in Volume III in the Overall Rate Level section.

In four of five financial calls tested, the sample error rate ranged from zero to 1.7%. The upper error limit ranged from 1.6 to 4.2%, at a 95% confidence level. Excluding occurrences of zeroed out data from the error statistics would have resulted in an actual sample error rate ranging from zero to 0.6% and an upper error limit ranging from 1.6 to 2.6%, at a 95% confidence level.

For a more detailed discussion of our conclusion relating to the appropriateness of the zeroing out procedure, see General Observation #6 and Specific Finding #5 in the Overall Rate Level Area Report in Volume III.

OVERVIEW OF FINDINGS AND RECOMMENDATIONS

Evaluation of Data Collection and Data Quality

- o In our tests of **Class Ratemaking** data we tested seven critical data elements in samples of 181 each. For each sample, an acceptable upper error limit of 5% was established. In evaluating the samples every discrepancy was counted as an error regardless of dollar amount.

For six of the seven data elements tested, the actual sample error rate ranged from 1.7 to 2.8%. The upper error limit ranged from 4.2 to 5.7%, at a 95% confidence level.

One data element, "medical claim amount", had an actual sample error rate of 3.9% and an upper error limit of 7.1%. This was due to seven errors, of which three related to unlocated unit reports.

For all errors noted, the majority were related to unlocated unit reports. Other errors noted were due to duplicate records, data entry errors or other missing documentation. The inclusion of unlocated unit reports in our error statistics presents a worst case scenario of the potential error rate. Exclusion of these items would have resulted in an actual sample error rate ranging from 0.6 to 2.2% and an upper error limit ranging from 1.6 to 5.0%, at a 95% confidence level.

- o In our tests of **Experience Rating** data we tested six critical data elements in samples of 181 each. An acceptable upper error limit of 5% was established for each sample. In evaluating the samples any discrepancy was counted as an error regardless of dollar amount.

The sample error rate ranged from 0.6 to 1.1%. The upper error limit ranged from 1.6 to 3.4%, at a 95% confidence level, which is within an acceptable range. Again, approximately 50% of the errors were due to unlocated unit reports or rating sheets.

The inclusion of unlocated unit reports in our error statistics presents a worst case scenario of the potential error rate. Exclusion of these items would have resulted in an actual sample error rate ranging from 0.0 to 0.6% and an upper error limit ranging from 1.6 to 2.6%, at a 95% confidence level.

- o For **DCI**, we tested all 54 data fields on the call form. An acceptable upper error limit of 5% was established and all errors were counted, regardless of dollar amount.

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Evaluation of Data Collection and Data Quality

The sample error rate was .5%. The upper error limit ranged from 1.5 to 2.3%, at a 95% confidence level, which is well within the acceptable range. Errors noted were primarily due to data entry.

The low sample error rate for DCI data can partially be attributed to the fact that there were no missing DCI calls in our sample (data sampled for DCI was more recent than other NCCI data sampled -- all DCI data sampled was received after 8/1/90) and NCCI does not "zero out" DCI data. We would also expect the error rate for DCI to be lower because of NCCI's policy of editing DCI data at the time of receipt and requiring carriers to correct their own errors. These policies are not yet in effect for other types of data NCCI collects, as discussed below.

There were no errors noted in two **judgmental samples** designed to test the completeness of financial call and unit report records. We used the same samples to test the consistency of data used by both Class Ratemaking and Experience Rating. We noted one inconsistency error out of 29 records tested. This represents 3.4% of the sample.

In summary, our results indicate NCCI accurately converts carrier data to its own electronic files.

Our findings on NCCI data quality are limited by the scope of our study. We traced data in NCCI's computerized ratemaking, experience rating and detailed claim information files to input NCCI received from the insurers. We did not test the accuracy of the data originally submitted by the insurers.

3.2 NCCI Data Quality Policies

NCCI's data quality policies require clarification and stronger enforcement. NCCI's constitution and membership agreements provide only very broad statements of data quality policies and responsibilities. Standards are currently defined and enforced for each of the major calls by the departments responsible for administering them. The effectiveness of current standards and enforcement varies greatly by department.

For the financial calls, data timeliness and accuracy standards are clearly defined but not effectively enforced. A recent NCCI publication, The Reporting Guidebook for the Annual Calls for the Experience, defines specific standards and

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responsibilities for the timeliness, accuracy and error correction of financial calls. The same publication also specifies fines for failures to meet these standards. These fines, however, are not large enough to provide an effective financial incentive for timeliness and accuracy of initial submissions, and are not currently imposed for failure to respond to inquiries concerning possible errors.

Data timeliness and accuracy standards are less precisely defined for unit report data and no policy to impose fines for delinquent or inaccurate reports is yet in place. Responsibilities for error correction of unit report data are neither clearly defined nor effectively enforced. A new system, the Unit Report Control (URC) system, is intended to provide additional control by automating requests for specific unit reports, and providing a turnaround error report for carriers to use for correcting errors. This system is in the very early stages of a phased implementation which extends into 1992. A clear definition of standards and responsibilities will be required for this initiative to succeed.

NCCI's Data Administration procedures authorize NCCI staff to modify carrier data to correct certain types of unit report errors without carrier approval. The limits of this authority are not clearly defined. NCCI's Data Administration department made approximately 513,000 corrections to unit report data last year. Although sample results suggest that 55% of corrections should involve carrier contact, NCCI contacted carriers to resolve only about 1,000 errors last year. While one error may lead to multiple corrections on NCCI's systems, it is clear that NCCI contacted carriers for only a very small percentage of corrections made to unit report data last year.

NCCI does not have a consistent carrier performance measurement and reporting policy. Carrier performance measurement is currently administered by the departments responsible for processing each of the major calls. In the case of financial calls, performance is measured, reported to the individual carriers and used as a basis for assessing fines. For unit reports, carrier performance is measured, but current performance reporting does not provide an effective performance feedback mechanism. A new system, URC, is intended to support performance measurement, performance reporting and administration of fines for unit reports. No new policy for performance measurement and reporting, or assessment of fines for errors, has yet been officially announced.

NCCI's current monetary incentive programs do not provide effective incentives to improve carrier performance.

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Evaluation of Data Collection and Data Quality

- o Under its Performance Evaluation Monetary Incentive Program (PEMIP), NCCI fines carriers for failure to meet clearly defined timeliness and accuracy standards for financial calls, and credits carriers for early submission of financial calls. As noted above, these fines do not appear to be large enough to provide an effective monetary incentive to improve performance.

In 1990, 565 carriers were fined for the late submissions and for failing "basic" and "actuarial" edits for their five PEMIP financial calls. The total fines assessed in 1990 were \$364,272 which is approximately 0.6% of NCCI's carrier-contributed operating budget. NCCI will bill an estimated \$245,141 of this total. \$54,806 of the remaining \$119,131 is applicable to state funds. As a matter of policy, state funds do not pay fines. The remaining discrepancy is due to limitations of fines assessed against carriers.

For early submission of PEMIP financial calls, NCCI credits carriers. Total early reporting credits calculated for 1990 were \$702,762. NCCI will apply \$462,940 of this total. Of the remaining \$239,822, \$1,067 is applicable to state funds not participating in the program, and \$238,755 is applicable to credits subject to maximum limitations.

Fines are not currently imposed for late or inaccurate unit reports. It is our understanding that the new URC system has been designed to administer fines. NCCI plans to assess fines beginning in November 1992.

NCCI does not accurately allocate error handling costs among the carriers.

- o NCCI does not currently measure the true cost of error handling for each carrier.
- o NCCI does not currently assess any penalties to cover the cost of handling errors in unit report data. NCCI plans to assess fines for late or inaccurate unit reports beginning in November 1992.
- o Fines currently assessed for late or inaccurate financial calls are not adequate to cover the true costs of error handling.

The major consequence of the lack of clear data quality policies and enforcement at NCCI is that too much of the burden of ensuring data quality

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falls on NCCI, and too little on the carriers, agents and insureds. This results in a very inefficient data verification and error correction process and may not assure data quality. A potential additional consequence is inequitable distribution processing costs among the carriers.

3.3 Current Data Handling Systems and Procedures

The NCCI systems which support ratemaking and experience rating are the systems most critical to NCCI's mission. These systems have major shortcomings which include excessive reliance on hard copy input, lack of integration, and minimal automated validation of data at the time of data capture. NCCI currently compensates for many of its systems shortcomings through extensive manual intervention.

This section summarizes our major findings concerning NCCI's current systems and procedures. It is organized in three subsections:

- o System Architecture;
- o Data Collection and Verification; and
- o End User Computing.

System Architecture

Many of NCCI's systems reflect the outdated design techniques and development technology of the period in which they were developed. This is true of the WCSP systems.

- o Systems were designed to support narrow functions within departmental boundaries. Processes and data are duplicated across different functions, with little or no integration. The most striking examples are in the Experience Rating and Class Ratemaking systems. Unit report information is redundantly verified and corrected by two separate systems and stored in separate files for experience rating and class ratemaking, with potentially inconsistent results. There is currently no system or formal procedure to reconcile corrections made for Experience Rating with those made for Class Ratemaking.

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- o **Many processes are only partially automated, require extensive manual intervention and rely upon paper inputs and outputs.** An extreme example of this problem is the procedure used to add corrections to the financial call files. During the validation process, correction records are entered on a separate correction file. After all edits have been completed and corrections have been verified, the contents of the correction file are printed on a report. The report is then sent to NCCI's data entry service. The corrections are re-entered and transmitted back to NCCI, where they are merged with the final financial call file which will be used to produce rates in the following year. Other examples are noted below in the discussion of NCCI's data collection and verification procedures.
- o **File structures support efficient batch processing but do not allow on-line access.** The lack of on-line access results in procedural inefficiencies. Current procedures in some departments rely on hard copy or micro-image (microfilm and microfiche) information for research and verification. So great is this reliance that the 200,000 experience rated unit reports received on magnetic tape each year are subsequently printed on hard copy and microfiche and stored in the field offices.
- o **Application programs are poorly structured and undocumented, making modifications difficult.** Work-around solutions have been adopted, often increasing manual effort, until new systems can be developed. An extreme example of this problem are class ratemaking application programs which truncate the leading digit in payroll amounts of \$10 billion or more. A time-consuming manual procedure is used to determine accurate amounts and adjust program output.

These redundancies, lack of integration, barriers to access and poor structure create inefficiencies and inconsistencies throughout NCCI's systems.

Data Collection and Validation

NCCI's critical data inputs are the financial calls, used to determine the overall rate level, and the unit reports, used for class ratemaking and experience rating. Policy information will become increasingly important as NCCI begins to integrate its systems. Current NCCI systems which collect and validate these critical inputs provide incomplete control over data

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timeliness, completeness and accuracy. Manual procedures help compensate for system deficiencies, but the resulting process is very inefficient.

Data Collection

NCCI's current data collection systems and procedures do not effectively control the timeliness and completeness of data collected from carriers. The problem is most severe for unit report data. NCCI has a new system, in the earliest stage of a phased implementation, which is intended to significantly improve this situation (see discussion below).

- o NCCI does not currently have a mechanism to ensure all required unit reports are submitted by carriers. NCCI receives approximately 250,000 unit reports each month. NCCI has a system which tracks unit reports due and received for experience rated policies. Unit reports for experience rated policies represent about 35% of unit reports due. NCCI does not have a system to identify unit reports due, received or missing for policies which are not experience rated. NCCI recently started a phased implementation of the Unit Report Control (URC) system, which is ultimately intended to track all unit reports due, received and missing. Under the current schedule, this system is to be fully implemented by July of 1992.**
- o NCCI currently uses an identification number known as "Risk ID" to uniquely identify each experience rated business. NCCI does not currently require or use Risk ID to control unit reports for businesses too small to be experience rated, even though approximately 65% of all unit reports submitted to NCCI are for non-experience rated risks.**
- o NCCI has inadequate controls to ensure all carriers submit financial calls. The current completeness control mechanism depends upon carrier responses to an annual questionnaire. This system is no longer adequate for the volume of data NCCI now manages. The principal controls over data completeness are reasonableness tests, in which NCCI actuaries make year-to-year comparisons of data during aggregate ratemaking.**
- o NCCI does not currently have a mechanism to ensure all required policy information is submitted by carriers. NCCI started capturing policy information for non-experience rated policies in May 1991. Complete policy**

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information will become more important with the implementation of the URC system. URC will identify unit reports due on the basis of policy information.

NCCI currently manages excessive amounts of hard copy input.

- o NCCI received approximately 1,200,000 hard copy unit cards in 1990. This represents approximately 40% of the total 3,000,000 unit reports submitted last year. The remaining 60% were submitted on magnetic tape.
- o NCCI receives approximately 40,000 hard copy policies each month, which is about 35% of all policies received. The remaining policies are submitted on magnetic tape.
- o NCCI received approximately 30,000 financial calls in 1990. Approximately 95% of this total were submitted on hard copy. The remaining calls were submitted on diskettes.
- o All of this hard copy input requires data entry into NCCI's systems. The majority of this data entry is currently performed by an outside service.
- o All 1st, 2nd and 3rd unit reports received on hard copy are retained for three years in the field offices in hard copy form. Unit reports are also stored on microfilm.
- o The 200,000 experience rated unit reports received on magnetic tape each year are subsequently printed on hard copy and microfiche and stored in the field offices.

Data Validation and Error Correction

NCCI's data validation and error correction systems provide incomplete validation, are poorly controlled and are very inefficient. These problems are most severe for WCSP systems and are largely the result of insufficient and ineffective automation. NCCI has several major systems development initiatives planned or in process which are intended to resolve many of the problems noted in these findings. The most notable of these initiatives are discussed later in this section.

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- o **WCSP systems do not thoroughly validate data at the time of receipt; unit reports may be validated more than one year later when they are extracted for input to class ratemaking.**
- o **Unit report validation for Class Ratemaking is a cumbersome, time consuming process which requires extensive manual effort. The State Validation program identifies errors and potential errors and prints a validation report. Data Administration clerks review every page of this report and manually identify required corrections. These error reports are typically very long; the most recent report for Florida, for example, was more than 10,000 pages long. NCCI currently requires between five and six months to validate unit report data for large states.**
- o **NCCI applies "rules of thumb" to simplify unit report validation and error correction for class ratemaking. These rules define correction procedures which minimize research and requests for additional information from carriers for certain types of exceptions. They also create a risk of modifying data on the basis of inaccurate assumptions, rather than verification from carriers.**
- o **Despite the large number of NCCI corrections to unit report data, NCCI corrects a very small percentage of unit report data. NCCI created approximately 22,500,000 unit report detail records from the 3,000,000 unit reports captured in 1990. NCCI entered 513,000 corrections to these records last year. These corrections are approximately 2.3% of the total number of records created last year. Since we do not know the true error rate in the data provided by the carriers, we do not know how well current data validation and error correction procedures accomplish their objectives.**
- o **NCCI personnel manually review each of the 600,000 experience rating sheets NCCI produces each year. The primary purpose of this review is to verify the accuracy of the ratings. These manual audits are also a key mechanism for verifying experience rated unit report input.**
- o **NCCI's unit report data collection and verification systems allow entry of duplicate data. Systems and procedures used to remove these duplicate records before they are used in ratemaking applications require extensive manual intervention and do not eliminate all duplicates.**

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- o NCCI does not currently perform risk-level validation for unit report data used in Class Ratemaking. **There is no validation to verify that unit report data for a specific risk is consistent with policy specifications, risk inspections or previously submitted data.**
- o NCCI currently uses an identification number known as "Risk ID" to uniquely identify each experience rated business. NCCI uses Risk ID to match unit report data with a specific insured business for developing experience ratings. **Carriers frequently omit or inaccurately report Risk ID on unit reports. Correcting these errors and omissions is a very time consuming task for NCCI. NCCI personnel manually reviewed Risk IDs on more than 1,000,000 unit reports in 1990. This function required five full-time clerks.**

End User Computing

Critical ratemaking applications are developed, maintained and controlled by actuarial personnel. These end user controlled applications do not have the degree of automated application control required of most production systems. Some of these applications could be implemented as Information Resources controlled production systems to achieve the required control objectives and increase overall efficiency. Other applications require an end user computing environment, but also require more comprehensive and effective control in that environment.

For mainframe computer based end user systems, we noted the following deficiencies:

- o There are no processing control reports or audit trails which document the activity of extraction and update programs.
- o Documentation of existing applications is limited.
- o There are no documented standards for testing new end user application programs or for testing changes to existing end user application programs.

For microcomputer based end user systems we noted all of the above and the following deficiencies:

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- o There are no documented procedures to control program changes. It should be noted, however, that in some areas efforts have been made to provide control over program changes by assigning program maintenance responsibility to one individual.
- o There are no formal backup procedures. Although most applications and data sets are backed up, most backups are not stored off-site and a documented retention schedule does not exist.
- o Access to microcomputer applications is not restricted through use of passwords or other security measures.
- o Microcomputer applications reside on unsecured personal computers.

In our control procedure tests of Overall Rate Level and Class Ratemaking end user computing applications, we did not find any errors which had resulted from weak controls. However, given the importance of end user computing to the NCCI's ratemaking process, NCCI is exposed to significant risk due to the lack of controls. We understand that NCCI is developing an end user computing policy which is intended to address data processing controls. NCCI has not set a date for implementation of this policy.

3.4 Current NCCI Initiatives

NCCI has development initiatives in process or planned which are intended to resolve the major deficiencies of its current systems. We have outlined some of the leading projects and their objectives below.

Systems Planning

NCCI's Enterprise Data Modeling (EDM) project is a key part of an ongoing Strategic Information Systems Planning effort. The stated objective of the EDM project is to define a strategic framework for designing and developing integrated systems.

The developers of the EDM conducted their project without a clearly defined strategic business plan to guide their efforts. The EDM project added value in helping define such a plan, however. The process encouraged a rethinking of NCCI's mission and priorities and led to a better understanding of its business functions.

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The EDM report provides valuable analysis of NCCI's business functions and information requirements, and presents a very high-level model of applications and data. The EDM report also contains a very realistic assessment of NCCI's current systems. This assessment clearly acknowledges many of the major defects of NCCI's current systems.

The EDM report does not, however, present a clear vision of NCCI's future systems, a complete definition of an architecture upon which to build these systems, or a detailed data model. Additional steps are required, and NCCI has begun to take these steps.

NCCI's Information Resources management team is currently refining its vision of NCCI's future systems. They have begun to use their emerging vision statement to obtain the required commitment from NCCI's executive team. They intend to present their vision and plans to achieve it to NCCI's Board of Directors in July 1991.

NCCI's Information Resources management team has also been actively engaged in tactical planning. This includes further developing the EDM by refining the data model and application architecture to the next level of detail. It also includes reconciling the emerging vision of future systems with ongoing development projects and defining new projects. Some major ongoing projects were initiated before the EDM project began or the emerging vision of future systems had been formulated. There is some risk that the ongoing planning process will produce data and application architectures which are not entirely consistent with recently completed systems or systems in development.

Systems Development

A number of systems development projects are planned or currently underway at NCCI. Four of these projects (URC,URQ,URS, and the Risk Information System) are intended to provide the core of NCCI's new information systems and provide a foundation for new ratemaking and experience rating systems. A review of these development projects was beyond the scope of our examination. We have, however, provided a brief outline of the objectives, planned implementation schedules and some critical issues of the four core projects and four other important projects.

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- o **URC** - The objective of the Unit Report Control (URC) system is to improve the timeliness and completeness of unit reporting. The system will identify unit reports due, based on information in an existing policy information database. The system will notify carriers of unit reports due and provide the basis for assessing fines for delinquent reports. The system is also intended to provide rudimentary edits and a turnaround error report to be used by carriers to correct rejected records. The URC system is currently being tested with selected carriers. An industry-wide phased implementation is scheduled to be completed by July 1992.
- o **URQ** - The objectives of the Unit Report Quality (URQ) system are to provide "front end" data quality edits which validate unit report data immediately upon receipt and to provide an efficient correction process for errors. This system is intended to replace the "back-end" edit and correction procedures which are now part of Experience Rating and Class Ratemaking applications. URQ will provide error turnaround reports and administer fines using the processes developed for URC. NCCI also plans to develop an insurance company edit package as part of this initiative. Carriers will use this package to validate data before they submit it to NCCI. URQ is currently in the early stages of design. The system is scheduled for a phased implementation to be completed in October 1992.
- o **URS** - The objective of the Unit Report System (URS) is to provide an integrated unit report database to serve both experience rating and ratemaking applications. NCCI plans to provide on-line access to this database and to develop a "routing and retrieval system" to feed unit report data to experience rating applications. NCCI plans to capture new unit reports in the URS database in September 1991. The issue of how much historic data to convert to this database has not yet been resolved.
- o **Risk Information System** - The objectives of the Risk Information System project are to develop a database that will contain risk information and establish linkages to all risk-related information in NCCI's systems. NCCI plans to use a common Risk ID to access all information for the risk, including policies, unit report data, residual market applications and inspections. NCCI is currently evaluating whether to use their current Risk ID or the Federal tax identification number as this identifier.

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- o **PICS 3.0** - The objective of the PICS 3.0 project is to implement approximately twenty change order requests to the existing PICS system. The two most significant planned enhancements are: (1) capture of additional policy information and (2) automated name and address standardization for policy information submitted on magnetic tape. The first of these enhancements will provide the additional information necessary to validate unit report data under the URQ system. Automated name and address standardization will significantly reduce the manual standardization effort now performed by eleven clerks. The PICS 3.0 enhancements are scheduled to be implemented by January 1992.
- o **Automated Policy Review** - The objective of the Automated Policy Review system is to provide automated "front end" data quality edits which verify policy information immediately upon receipt. The system is intended to produce weekly error reports known as "criticism letters" which will be distributed to carriers. This system is also intended to identify those risks that had policies in the previous year, but do not have policies in the present year. This system is intended to replace manual review of over 1.5 million policies per year. The Automated Policy Review system is scheduled for implementation by October 1992.
- o **Automated Auditing** - The objective of the Automated Auditing system is to provide automated "back-end" data quality edits which verify experience rating sheet data. This system is intended to replace manual review of over 600,000 rating sheets per year. The Automated Auditing System is scheduled for implementation in October 1991.
- o **DCI** - The objectives of the new Detailed Claim Information (DCI) system are to increase the detailed information captured for reported claims, enhance the analysis and access of the data and conform to the DCI model data reporting regulation. This system is scheduled for a phased implementation, with the new data collection system to be completed by July 1991. The current schedule calls for all carriers to submit expanded data by January 1992. Enhanced analysis and access capabilities are to be available by June 1992.

Systems in development during the examination were beyond the scope of our project. Accordingly, we have not evaluated the designs or ongoing

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development of these initiatives. It is clear to us, however, that the projects noted above are intended to address NCCI's major systems deficiencies.

Specific issues critical to the success of these projects include the following:

- o URC will use the Policy Information Control System (PICS) to identify unit reports due. NCCI began capturing policies for businesses not large enough to be experience rated in April 1991. URC will not provide effective control over completeness of unit report collection until PICS data is complete. There is no completeness control yet for PICS.
- o The initial implementation of the URS database is scheduled for August 1991, along with the first phase of the URQ system. NCCI plans to expand data quality edits for URQ through October 1992, and perhaps beyond. The quality of data on the URS database will be only as good as the edits in URQ. NCCI will not reap the full benefit of its integrated URS database until all "back-end" experience rating and class ratemaking edits are replaced and enhanced by "front-end" edits in URQ.
- o NCCI is currently evaluating whether to use its current Risk ID or the Federal tax identification number as the risk identifier. This is an important issue which has been debated at NCCI for a long time. The clear advantage of Federal tax ID is that it is readily available to the carriers and easily verifiable. It will be important to resolve this issue soon for NCCI's systems integration plans to proceed on schedule.

NCCI has identified the major flaws in its systems and has conceptualized viable systems development initiatives to address these flaws. NCCI has planned a very aggressive schedule for implementing these new systems. By the end of 1992, NCCI plans to have designed and fully implemented seven of the new systems previously discussed in this report, while continuing to support and enhance existing systems.

NCCI has been aware of the major flaws in its systems for some time. An NCCI internal document entitled "Technical Services Long Range Plan" dated June 1988 identified major problems with NCCI systems and proposed initiatives to resolve these problems. This report highlighted NCCI's "archaic systems" and "independent unsynchronized data."

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Significant recommendations from this 1988 report include:

- o Automate policy name and address standardization;
- o Develop a tracking and notification process for unit cards based on policy information;
- o Develop an integrated database for unit report data;
- o Eliminate the retention of hard copy source documents;
- o Develop a risk system to link policies and unit reports; and
- o Develop an electronic submission mechanism between the carriers and NCCI for policies, unit reports and experience rating information.

While NCCI currently has initiatives in process for most of these recommendations, none of the recommendations has yet been fully implemented. Strong management, adequate resources, and effective training will be required for NCCI to succeed with its current plans.

End User Computing Standards

NCCI's Internal Audit department has conducted several audits of end user computing in ratemaking applications. Findings from these audits have generally been that controls were not commensurate with the importance of these applications to NCCI's mission. Recently, NCCI's Internal Audit department developed a set of guidelines for implementing new end user computing standards. NCCI executive management has approved these guidelines and development of new standards will begin soon. NCCI has not set a date for implementation of the new standards.

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4. PRIORITY RECOMMENDATIONS

Our detailed recommendations for each of the areas we examined are presented in Volume III of this report. They may be summarized in four major recommendations:

- 1) **Clearly define data quality policies and standards;**
- 2) **Measure and report carrier and NCCI performance against those standards;**
- 3) **Build effective incentives to achieve performance objectives; and**
- 4) **Build integrated systems which support policies and objectives.**

4.1 Clearly define data quality policies and standards.

NCCI Policy

NCCI needs a clear and unified policy on data collection and data quality. This policy should provide the overall framework within which NCCI collects and processes carrier data. This policy should clearly define:

- o Standards for timeliness, completeness and accuracy of all critical data collected from carriers;
- o Approved input media (electronic file transfer, magnetic tape, diskettes);
- o Specific responsibilities and time frames for error correction;
- o The exact limits of NCCI's authority to modify carrier data;
- o NCCI's data quality verification approach (reconciliation of policy experience to aggregate data, carrier audits, risk audits);
- o NCCI's carrier performance monitoring and reporting approach; and
- o Specific monetary incentives for carrier performance.

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We recommend that NCCI adopt policies which place appropriate responsibility for data verification and error correction with the carriers, and sharply limit its own authority to modify carrier data. NCCI should reject data known to be in error and return it to carriers for correction. Clearly, this policy must be implemented with concurrence from the insurance companies, and should be developed with their active participation via the appropriate committees and the NCCI Board of Directors.

- o It should be NCCI's responsibility to draft policies and plans to implement them.
- o It should be the Board's responsibility to approve new policies and plans to implement them.
- o It should be NCCI's responsibility to implement and enforce policies.
- o Once policies have been established, members should be required to comply.

Industry Standards

For NCCI to be truly effective in the implementation of its data quality standards, comparable standards must be developed for carriers, agents and insureds. Every entity involved in developing data, transmitting data or processing data must be held to the same standards. The quality of data used to set rates is only as good as the weakest link in the chain.

We recommend that the NAIC, through the appropriate task force, develop a model Workers Compensation data quality regulation. The overall objective of this regulation should be to promote consistent, timely and accurate data reporting by all parties.

Specific issues which should be addressed by the model regulation include the following:

- o Data requirements (type and level of detail);
- o Data timeliness and quality standards for NCCI and carriers;
- o Data timeliness and quality standards for insureds and agents;

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- o Carrier and risk audit standards;
- o NCCI's role as a statistical agent.

4.2 Measure and report carrier and NCCI performance against the new standards.

NCCI should implement systems and procedures which measure timeliness and accuracy of carrier data reporting against very specific standards. NCCI should establish a program of regular carrier performance reporting. Carrier performance reports should be distributed to carrier operational and executive management, and possibly to regulators.

NCCI should also implement systems and procedures which measure the timeliness and accuracy of its own processing. NCCI's data quality measurement process should include tests which compare randomly selected ratemaking data to the source information collected by insurers.

4.3 Build effective incentives to achieve performance objectives.

The NAIC and NCCI must provide more powerful incentives for carriers to submit timely and accurate data and correct errors promptly. The model regulation noted above would be a strong first step. NCCI incentives to carriers should include mechanisms which provide an accurate allocation of NCCI's processing costs, including error handling costs, among the carriers.

4.4 Build integrated systems which support the new policies and objectives.

First, NCCI should complete and publish its Strategic Information Systems Plan. This document should provide clear direction for building systems which will support NCCI's strategic objectives. It should be presented in a clear, concise format suitable for executive management. It should be used to achieve agreement and commitment from NCCI and carrier executive teams and the regulators. The plan should include a statement of objectives, an overall application architecture, system definitions for all mission-critical applications and an implementation schedule.

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We believe the specific systems initiatives outlined below are essential to achieving NCCI's business objectives and should be included in NCCI's plans.

- 1) NCCI should implement systems to track and control the due date and receipt of all information submitted by carriers, including aggregate financial data, unit report data and policy data. The overall objective of these systems should be to ensure complete and timely submission of data to NCCI.
- 2) NCCI should develop an electronic data transfer mechanism for submission of data from the carriers to NCCI. Carriers should be strongly encouraged to use this mechanism for submission of aggregate financial data, unit report data, policy data and DCI data.
- 3) NCCI should develop data validation software and distribute it to carriers. Carriers should use this software to validate data before submitting it to NCCI. Such validation should be applied to aggregate financial data, unit report data, policy data and DCI data.
- 4) NCCI should develop systems which validate all data at the time of receipt, reject data found to be in error and support efficient correction of errors by the carriers.
- 5) NCCI should develop systems which provide regular carrier performance reporting.
- 6) NCCI should develop systems which support consistent, effective financial incentive programs to encourage carrier compliance with timeliness and quality standards.
- 7) NCCI should develop an integrated enterprise database. This database should provide access to aggregate financial data, unit report data, policy data, DCI data, rates, experience ratings, inspection information and risk information. The database and surrounding applications should enforce integrity between these types of data based on established relationships.
- 8) NCCI should re-engineer and automate many of its current manually intensive areas. This effort should be orchestrated from an enterprise perspective. Unintegrated departmental systems should be avoided.

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- 9) NCCI should explore alternatives and decide upon an appropriate identification number for insured businesses.
- 10) NCCI should implement more stringent controls over its end user computing environments.
- 11) NCCI should move stable, regularly executed end user applications into a production environment.

NCCI should use modern software engineering techniques, follow a structured systems development methodology and use consistent documentation standards for development of new systems. This approach will contribute to development productivity, system flexibility and maintainability.

NCCI should complete its strategic information system plan, refine its enterprise data model through further decomposition of functions and data, and define its computer aided software engineering (CASE) and database management systems (DBMS) strategies before undertaking major new application development projects.

NCCI management supports these recommendations and has taken steps to implement them. NCCI plans to address these points in its response to this report.

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Responses to RFP Section IB Questions

This section of the report responds specifically to questions on page 14 of the Request for Proposal (RFP). The questions are reproduced on the pages which follow. Responses to the questions are based on detail tests of data collection and data handling procedures. In almost all cases, the overall question posed in the RFP consists of several questions. We have addressed each question separately where deemed appropriate. The response to a question is presented in an outline format for ease of referencing to sections of the response. Section I, Part C of this report provides more extensive detail of our approach, findings, and recommendations.

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Response to RFP Section IB Question 1

RFP Question 1. (I.) How accurate is the database? (II.) Are adequate quality control procedures in place to ensure the accuracy of the data as they are reported by insurers and processed by the NCCI? (III.) How could these procedures be improved?

(I.) How accurate is the database?

A) Introduction

A fundamental objective of our examination was to assess the accuracy of the data which is used to create overall rate level indications, class rates and experience modifications. In addition, we have performed a limited examination of detailed claim data which is used for analysis of trends in workers compensation loss costs.

B) Definition of the Database

There is no single integrated database at NCCI. The data for each major system is processed and stored independently. This results in a large collection of very loosely integrated or unintegrated files. As a part of our Section I-A research, we identified the key computer files containing aggregate financial data, WCSP data and detailed claim data. The critical files used to store the data are the following:

- 1) Financial call data by state:
 - a) Policy Year library
 - b) Accident Year library
 - c) Calendar Year library
 - d) Calendar Year Reconciliation Report file
 - e) Insurance Expense Exhibit file
- 2) Payroll and Loss (P/L) Detail file which contains unit report (WCSP) data used in class ratemaking
- 3) Compress file which contains unit report (WCSP) data used in experience rating calculations

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Response to RFP Section IB Question 1

- 4) DCI Valid file which contains all edited and corrected detailed claim data.

C) Testing Approach

In order to assess the accuracy of aggregate financial data, WCSP data and detailed claim data, we randomly selected data records contained in key computer files. We tested ten random samples to evaluate the critical data inputs to overall rate levels, class rates, experience mods and DCI analyses. The data contained in key files was reconciled to other available sources of information to verify that all data was represented in the populations from which the random samples were drawn.

We tested the data using a statistical approach known as attribute sampling. This sampling method tests the frequency of errors in a population. Our statistical samples were defined to achieve a 95% confidence level in the test results. Errors were defined as unsupported differences between system stored data and data submitted by carriers. This approach allowed us to quantify NCCI's success in accurately capturing and processing data submitted by carriers. It does not allow us to evaluate the accuracy of data submitted by carriers.

In order to assess NCCI's success rate in capturing all data it receives, we selected judgmental samples of hard copy documents and attempted to locate the corresponding data stored in electronic files. Additionally, data for those unit reports with sufficient premium to be experience rated was compared between the experience rating and class ratemaking systems. We also used this unit report sample to compare the Expected Loss Rate factors and D-ratios in the Experience Rating system to the Experience Rating Plan manuals which are generated by the Class Ratemaking system.

D) Results of Statistical Sample Tests

In comparing our randomly sampled data to source documents, we encountered a high rate of initial exceptions. Difficulty in locating hard copy unit card data was a primary cause of these exceptions. For example, unit reports submitted to NCCI on magnetic tape were not microfiched for the first nine months of 1986. Another difficulty was encountered in obtaining unit reports which are not stored by NCCI, such as unit reports submitted by state funds and self-insured risks. Resolving these exceptions disclosed certain problems encountered by

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Response to RFP Section IB Question 1

NCCI. Many of these exceptions are not errors as defined for our samples; however, they indicate problems in retrieving and analyzing NCCI's data.

Detailed sampling results are documented in the Appendix to Volume III of this report. The following summarizes some of our observations and errors noted:

1) Financial Calls

a) In our sample of 180 Calendar-Accident Year calls, we noted the following:

- i) The data for eight carriers was either partially or completely deleted. We determined that this was done because the data failed validation edits and was not corrected or explained by the carrier. Actuarial personnel deleted this data to avoid distortion of overall rate level indications. See General Observation #6 and Specific Finding #5 in the Overall Rate Level Area Report in Volume III for a more detailed discussion of this finding.
- ii) One carrier-submitted correction to aggregate financial data was received after the overall rate levels had been produced. The correction was incorporated into aggregate financial data which will be used in the subsequent year rate determinations.
- iii) In three cases, aggregate financial data was associated with a "dummy" carrier code. This was done because a change in carrier reporting practices caused losses to be inconsistent from one year to the next.

When a major change in a carrier's reserving or settlement procedures is judged to distort development patterns, NCCI associates any affected data with a "dummy" carrier code. The dummy code prevents data reported under one reserving or settlement procedure from being evaluated for development against data reported under a different procedure. While deletion of the distorted data would also prevent this, use of a "dummy" carrier code allows data which is being excluded from loss and premium development to at the same time be included in cost ratio and trend calculations.

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- iv) Due to a change in reporting convention, NCCI backed out earned but not reported (EBNR) amounts from premium amounts reported by two carriers. This was done to avoid distortion of trend analysis. While the carriers had reported the amount of EBNR premium for both premiums net of discounts and premiums at their company level, they had failed to report the amount of EBNR premium at NCCI's designated statistical reporting (DSR) level. NCCI contacted these carriers, but was unable to obtain the needed EBNR data. NCCI then estimated the needed EBNR premium amounts. NCCI's estimation of EBNR and adjustments to premium amounts appear to have been reasonable for each of the carriers. However, in those instances where we observed that the reported earned premium data was adjusted for EBNR, there was no explanation of the methodology or magnitude of the adjustments included in the rate filing. As a result, the regulator may be unaware of an issue he or she may wish to investigate further, or may lack the information needed for the investigation.

- b) In our sample of 180 Policy Year calls, we noted the following:
 - i) The data for three carriers was deleted. We determined that this was done because the data failed validation edits and was not corrected or explained by the carrier. Actuarial personnel deleted this data to avoid distortion of overall rate level indications. See General Observation #6 and Specific Finding #5 in the Overall Rate Level Area Report in Volume III for a more detailed discussion of this finding.

 - ii) One carrier reported EBNR premium which was adjusted by NCCI, as noted above.

 - iii) Data for one carrier was assigned to dummy carrier codes. This was done because a change in carrier reporting practices caused data to be inconsistent from one year to the next, as noted above.

- c) In our sample of 176 Calendar Year calls, we noted the following:

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- i) The data for two carriers was deleted. We determined that this was done because the data failed validation edits and was not corrected or explained by the carrier. Actuarial personnel deleted this data to avoid distortion of overall rate level indications. See the Overall Rate Level Area Report in Volume III of this report for a more detailed discussion of this finding.
 - ii) One carrier filed a correction call which was received after the overall rate levels were produced. The correction was incorporated into aggregate financial data which will be used in the subsequent year rate determinations.
 - d) In our sample of 181 Insurance Expense Exhibits, we noted that one amended call was not reflected in the Overall Rate Level System.
 - e) In our sample of 177 Reconciliation Reports, we noted no significant exceptions.
- 2) Unit Reports (WCSP data)
- a) In our two samples of 181 unit report data elements used to calculate class rates, we noted the following:
 - i) Two duplicate records. One of these was not eliminated because of Data Administration procedures which specify that identical exposure records should not be treated as duplicates if the payroll amount is divisible by 100. (See discussion of data administration "rules of thumb" in Volume III, Unit Card Data Administration Area Report, General Observation # 6.) The reason the other duplicate record was not removed is unclear. Despite the extensive amount of time dedicated to duplicate record identification and removal in the Data Administration validation process, duplicate records still exist in the final data. See the discussion of duplicate records in Volume III, Unit Card Data Administration Area Report, General Observations # 3, # 4, and # 7, and Specific Finding # 5.
 - ii) Seven hard copy unit reports could not be located. This was reduced from an initial number of 78 unit reports. Unit report

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data had to be retrieved from several locations, including Data Administration files, field offices, state funds and carriers.

- iii) One data entry transposition error.
- iv) One instance of a carrier submitting two first unit reports for a single policy, with different payroll amounts. Since data used in class ratemaking is not validated at the risk level, there is currently no procedure in effect to detect this type of error. Class ratemaking's sensitivity to these errors is low, however, because class ratemaking distributes rate increases across classes and not to individual risks. In experience rating, where sensitivity to these errors is higher, data is validated at the risk level to provide error detection.

Ongoing NCCI systems development initiatives are intended to provide increased control over unit report collection, more thorough and timely validation of unit report collection, more thorough and timely validation of unit report data, and a centralized data base for unit reports. If these new systems have been designed properly, they should eliminate the duplicate report problem. (See the discussion of the URC, URQ and URS projects in Volume I, Overview of Section IB, Section 3.4, Current NCCI Initiatives.)

It is important to note, however, NCCI will not reap the full benefits of improved control over unit report input until these systems are fully implemented late in 1992. See the discussion of specific issues in Volume I, Overview of Section IB, Current NCCI Initiatives. Also for several years after full implementation of the new systems, NCCI will be using old data which was not edited by the new systems. (For a short term recommendation see Volume III, Unit Card Data Administration Area Report, General Observation # 4.)

- b) In our two samples of 181 unit report data elements used to produce experience modification factors (experience mods), we used experience rating sheets to identify and compare the data. As a result of our testing, we noted the following:

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- i) There were 47 instances, or 13% of the sample, in which the risk identification (risk ID) number was either not reported by carriers or did not agree with the risk ID of the current rating. In some cases this was due to ownership changes or because the insured became a multistate business. Either case necessitates a change in risk ID under current NCCI standards. Inaccurate reporting of risk IDs on unit reports is a significant problem for NCCI. For experience rated policies, the matching of unit reports with the correct risk ID requires five full time clerks to perform manual research to resolve discrepancies or omissions. Approximately 45% of rated or rated size unit reports received flow through the system to Experience Rating without any manual review or correction required; the other 55% require manual review and possibly correction.
 - ii) Relevant loss experience was omitted from two ratings . In both cases, the missing data was submitted on a second unit report. One unit had the correct risk ID, while the other was reported without a risk ID.
 - iii) The rating sheet and associated unit reports could not be located for one record in our sample.
- 3) Detailed Claim Information
- a) In our sample of 200 calls for Detailed Claim Information, we noted the following:
 - i) One carrier submitted a first report indicating that the claim had been reopened. This failed an edit and was not corrected on the correction call submitted by the carrier. Since there is only one valid value for this indicator, an NCCI clerk corrected the field without contacting the carrier.
 - ii) Two data entry errors.

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E) Results of Judgmental Sample Tests

The testing results of our two judgmental samples indicate that NCCI adequately and accurately captures the data which it receives. Also, based on this sample, there is no evidence that the separate processing and validation of experience rating and class ratemaking data creates material inconsistencies in the WCSP data.

1) Financial Calls

We noted that all hard copy Calendar-Accident Year and Policy Year calls in our sample were captured and reside in system files.

2) Unit Reports

In our judgmental sample to test completeness of WCSP data in the experience rating and class ratemaking systems, we noted the following:

- a) One unit report was omitted from an experience rating due to late receipt of the data.
- b) We noted that all hard copy unit reports in our sample were captured and reside in the Class Ratemaking files.
- c) We noted that all unit reports which had sufficient premium to be experience rated were captured and reside in the Experience Rating files.
- d) We noted that the ELRs and D-Ratios on the experience rating sheets agreed with data from the Experience Rating Plan Manuals produced by Class Ratemaking.

F) Conclusion

Our findings indicate NCCI converts information received from the insurers to NCCI electronic data files with reasonable accuracy. This finding is based on the results of our random statistical sampling and judgmental sampling of NCCI's key data files. Our detailed sampling results are presented in the Appendix to Volume III of this report and summarized below.

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- 1) Our statistical sampling tests compared randomly sampled records from NCCI's computerized files with input data (in hard copy or microfiche format) received from the carriers.
 - a) We tested five financial calls used in developing Overall Rate Level: Policy Year, Calendar-Accident Year, Calendar Year, Reconciliation Report and Insurance Expense Exhibit. For each call, we tested several critical data elements. The sample size for each data element ranged from 176 to 181 data records. For each sample, an acceptable upper error limit (or tolerable error rate) of 5 percent was established. In the five calls sampled we did not count as an error any discrepancy of less than \$5,000 (a defined materiality threshold). However, for informational purposes, the Appendix to Volume III specifies all discrepancies noted.
 - b) In four of five financial calls tested, the actual sample error rate ranged from zero to 1.7%. At a 95% confidence level, the achieved upper error rate ranged from 1.6 to 4.2%, which is within the acceptable error range.
 - c) For one call, Calendar-Accident Year, the actual sample error rate ranged from 2.8 to 4.4%. At a 95% confidence level, the achieved upper error limit ranged from 5.7 to 7.9%. The higher error rates were primarily due to NCCI's procedure of zeroing out data which appears unusual and which the carrier cannot or does not explain. The inclusion of these items in our error statistics presents a worst case scenario of the potential error rate. For a more detailed discussion of this finding and the appropriateness of the zeroing out procedure, see Section 3.1, of the Overview of Section 1B in Volume I and General Observation #6 and Specific Finding #5 in the Overall Rate Level Area Report in Volume III.
 - d) In our tests of Class Ratemaking data we tested seven critical data elements in samples of 181 each. For each sample, an acceptable upper error limit (or tolerable error rate) of 5% was established. In evaluating the samples every discrepancy was counted as an error, regardless of dollar amount. The actual sample error rate ranged from 1.7 to 3.9%. At a 95% confidence level, the achieved upper error limit for six of seven data elements ranged from 4.2 to 5.7%, which is within an acceptable range. One data element, "medical

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claim amount," had an achieved upper error limit of 7.1%. This was due to seven errors. Unlocated unit reports caused three of these errors, and the other errors consisted of one data entry error, one duplicate record, and two unexplained discrepancies. Of the errors noted in the seven data elements, the majority related to unlocated unit reports.

- e) In our tests of Experience Rating data we tested six critical data elements in samples of 181 each. For each sample, an acceptable upper error limit (or tolerable error rate) of 5% was established. In evaluating the samples every discrepancy was counted as an error, regardless of dollar amount. The sample error rate ranged from .6 to 1.1%. At a 95% confidence level, the achieved upper error limit ranged from 1.6 to 3.4%, which is within an acceptable range. Again, approximately 50% of the errors were due to unlocated unit reports or rating sheets.
 - f) For DCI, we tested all 54 data fields on the call form. An acceptable upper error limit (or tolerable error rate) of 5% was established. In evaluating the samples every discrepancy was counted as an error, regardless of dollar amount. The sample error rate was .5%. At a 95% confidence level, the achieved upper error limit ranged from 1.5 to 2.3%, which is well within the acceptable range. Errors noted were primarily due to data entry.
- 2) There were no errors noted in two judgmental samples designed to test the completeness of financial call and unit report records. The tests were based strictly on documents known to be received by NCCI. In one judgmental sample to test the consistency of unit report data used by both Class Ratemaking and Experience Rating, one inconsistency error was noted of 29 items tested. This represents 3.4% of the sample. There were no errors noted in our test of the consistency of ELR and D-Ratio data produced by Class Ratemaking.

Our findings on NCCI data quality are limited by the scope of our study. We traced data in NCCI's computerized ratemaking, experience rating and detailed claim information files to input NCCI received from the insurers. We did not test the accuracy of the data originally submitted by the insurers.

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(II.) Are adequate quality control procedures in place to ensure the accuracy of the data as they are reported by insurers and processed by the NCCI?

A) Introduction

The primary objective of control procedures is to ensure the accuracy, completeness and timeliness of the processing of data. We reviewed NCCI's controls to assess their effectiveness in achieving this objective. Testing techniques are described in Volume I, Section A of this report.

Detailed findings are included in the Area Reports in Volume III of this report.

B) Processing Controls

1) Processing controls are designed to ensure that the data received from carriers is accurately and completely processed into NCCI's systems. Carrier reporting controls are those controls designed to ensure that the carriers report accurate and complete data in a timely manner. The following section describes the major processing controls over aggregate financial data, WCSP data, detailed claim information and policy information.

a) Financial Calls

The primary processing controls over aggregate financial data in the Financial Data and Aggregate Ratemaking areas of the Overall Rate Level function are as follows:

- i) The Financial Data area is responsible for processing aggregate financial data into NCCI's overall rate level systems. Data handling procedures and responsibilities are defined and documented.
- ii) Financial calls are date stamped, individually logged and sorted into batches by call type. The data is tracked in manual logs up to the time it is delivered to Aggregate Ratemaking actuaries for use in rate level production. The logs are sufficiently detailed so that an individual call can be located in the system.

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- iii) Corrections are requested from carriers and tracked in manual logs.
- iv) Changes are not made directly to the financial call data used in calculating overall rate levels once the file is frozen for use in production. All changes are entered into a separate correction file, thereby segregating original carrier submitted data from corrections.

b) Unit Reports

The primary processing controls over unit report data used in the Class Ratemaking and Experience Rating systems are as follows:

- i) Unit reports are assigned unique administration numbers. Hard copy units are sorted into batches and tracked in manual logs up to the time they are released to Experience Rating and/or Class Ratemaking. The number of unit reports received on magnetic tape is verified to the transmittal letter sent by the carrier.
- ii) Unit report data used in class ratemaking is stored in Payroll and Loss Detail files by state. All changes to the data are made using a debit/credit approach. Although this makes working with the validation reports cumbersome, it provides a history of all modifications to the data.
- iii) Corrections are batched and controlled using manual logs.
- iv) Any changes to the data that are identified by actuaries in Class Ratemaking are processed by Data Administration.
- v) Unit report data used in experience rating calculations is passed to the experience rating system from Data Conversion. A manual reconciliation of system control totals is performed to ensure that all data is captured.
- vi) Error corrections are either made by ACS and controlled by a central group using batch controls and logs or are entered

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on-line by field office personnel where on-line screens provide limited validation of corrections.

c) **Detailed Claim Information (DCI)**

The primary processing controls over detailed claim data used in the DCI system are as follows:

- i) DCI calls, in both hard copy and magnetic tape formats, are batched for processing into the system. Manual logs are kept to ensure that all data is processed. Once the batches are processed, a reconciliation of all data received to all data processed is performed.
- ii) Calls for corrected information which are caused by edit failures of hard copy original submissions are manually compared to the original submission to ensure that the data was properly processed.

2) **Findings**

- a) The results of our sample testing for data accuracy indicate that NCCI controls over the processing of the data it receives are functioning effectively.
- b) NCCI continues to process large volumes of hard copy inputs. A significant amount of effort is devoted to sorting, batching and controlling these inputs.
- c) Certain error correction processes in Data Conversion, Data Administration and Experience Rating are not well controlled. We noted cases where corrections are not reviewed sufficiently before they are processed to update files. We also noted cases where the accuracy of corrections made was not sufficiently verified.
- d) A significant amount of manual processing and handling of carrier submitted data occurs before the data is captured in electronic files. While we noted no omissions of data in our judgmental samples, these practices increase the risk that data may be lost before it can be captured.

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C) Carrier Reporting Controls

Carrier reporting controls are those controls designed to ensure that the carriers report accurate and complete data in a timely manner. The following section describes the major carrier reporting controls over aggregate financial data, WCSP data, detailed claim information and policy information.

1) Current Control Procedures

a) Financial Calls

The primary carrier reporting controls over aggregate financial data are as follows:

- i) Carriers are required to submit a list of all calls by state for which they will be reporting aggregate financial data. This information is used to create a control log of calls expected by NCCI.**
- ii) Financial calls are validated for completeness and arithmetic accuracy as they are received. Errors are returned to carriers for correction.**
- iii) The five calls used in overall rate level calculations and the reconciliation to carrier financial data are subject to the Performance Evaluation Monetary Incentive Program (PEMIP). This program encourages timely submission of data by providing credits to carriers. Late and inaccurate data submissions are subject to financial penalties. The financial incentive program assesses modest penalties (a total of \$364,272 was assessed in 1990).**
- iv) Premium and loss information used in calculating overall rate levels is reconciled to carrier financial statements.**
- v) Financial call data is validated by a series of application programs. The major validation programs are:**

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- o Policy Year Validation; Accident Year Validation - which perform arithmetic and relational validations, both within the current year call and in comparison to prior years' data;
- o Deviation Analysis - which performs a reasonableness test of reported standard premium at Designated Statistical Reporting (DSR) level.
- o Policy Year - Accident Year (PY-AY) Check - Compares the losses by year on page 2 of the Policy Year and Accident Year calls for consistency.
- o Premium Analysis - This program verifies that calendar year premiums are consistent between years.
- o Calendar Year (CY) Check - Derives calendar year values from Calendar-Accident Year and Policy Year premium and loss values.
- o Prior Development - Analyzes the contribution, by carrier, of tenth-to-ultimate contribution to statewide development factors.
- o Development Checksheet - Identifies carriers whose policy year development factors are contributing to statewide fluctuations between years.

b) Unit Reports

The primary carrier reporting controls over unit report data are as follows:

- i) The primary control over the completeness of unit report data is the Profile system in Experience Rating. This system indicates all unit reports for experience rated policies required to produce ratings. If required unit reports have not been received, requests for missing data are sent to the appropriate carrier.

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- ii) The accuracy of unit report data used in calculating class rates is verified by a series of system generated exception reports in Data Administration. These are manually reviewed and corrected. The validation is performed primarily by class code or injury type. The major programs used are:
 - o RCDUPOFF - Program to automatically offset exact duplicate records with a matching credit.
 - o State Validation II - Exception report which identifies certain conditions. Examples are losses for a class code with no payroll, and losses in a premium only class code.
 - o RCDVALID - A procedure which contains nineteen reports that can be run on demand. Many edits are similar to the State Validation II program.
 - o Class Payroll Fluctuation Program (CPFI) - Program that investigates payroll by class code over a three year period. This is the primary tool used to ensure the completeness of WCSP data.
 - o Reasonableness Test - Program which examines loss development by industry group and injury type for a state. Manual research and explanation is required for certain percentages, between 70-100%, of fluctuation for flagged items.

- iii) Validation of unit report data for accuracy and consistency at the risk level is performed by Experience Rating in their manual audit of rating sheets. These procedures verify that:
 - o Name, risk ID and state agree to hard copy control document;
 - o Premium is sufficient to qualify policy for experience rating;
 - o Change in premium for two most recent years is less than 50%;

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- o Class codes are consistent between years;
- o Experience modification factor has not changed by more than 25% compared to the previous modification factor;
- o Payroll has not changed by more than 50% since the prior year;
- o No duplicate records are included in the rating;
- o All applicable and required experience has been included in the rating; and,
- o Name and policy effective date agree with the data in the policy system (PICS).

If a rating fails any of these edits, unit reports are pulled to verify the data used in the rating.

c) Detailed Claim Information (DCI)

The primary carrier reporting control over detailed claim data (DCI) is to subject the data to a series of edits. Basic edits are designed to ensure that claimant and policy information agrees with data already in the DCI system for subsequent and correction calls. Field level edits are performed to ensure that data submitted is mathematically accurate, consistent among fields and that benefits are reasonable.

d) Policy Information Capture (PICS)

The primary carrier reporting controls over policy information are:

- i) NCCI field office personnel perform a limited visual review of all policy information.
- ii) NCCI systems perform limited automated verification of carrier submitted data.

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2) Findings

- a) The reconciliation of financial call data to carrier statements is not completed for many states until after the overall rate level calculations are completed. This does not provide timely assurance that the data used in the calculations reconciles to audited annual statements.
- b) The procedures to ensure that all financial call data is received relies on the carriers providing a list of the calls they will file. Although the total number of calls submitted is checked for reasonableness and cross-referenced with A.M. Best written premium when it becomes available, there is no control which provides absolute assurance that all financial calls which should be filed are, in fact, received by NCCI.
- c) Unit report validation is performed separately by Data Administration and Experience Rating. Experience Rating uses the data first, but there are no procedures to ensure that all changes made to unit report data during the experience rating process are included in data used by Data Administration.
- d) NCCI performs very limited validation to ensure WCSP data is reported accurately and consistently for each risk. Data Administration relies on tests of data in aggregate to identify data inaccuracies. Experience Rating performs a visual review of data for each rated risk, but this review is limited and occurs at the end of the experience rating process.
- e) There is no means of ensuring that all unit report data due is actually received. The profile system in Experience Rating only serves as a control over the completeness of unit report data for experience rated policies. Data Administration reasonableness tests may identify missing data for very large risks. These controls are not sufficient to ensure that unit reports are received for all workers compensation policies written.
- f) There are not adequate controls to ensure the accuracy of unit report data as submitted by carriers. The validations performed by NCCI only assess the reasonableness of the data. Some form of external

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verification of carrier systems and reporting to NCCI should be performed to ensure data accuracy.

- g) There are not adequate controls in place to verify that policy information for all workers compensation policies written is captured by NCCI.

(III.) How could these procedures be improved?

A) Recommendations

- 1) NCCI should implement systems to track and control the due date and receipt of all information submitted by carriers including aggregate financial data, WCSP data, and policy data. The overall objective of these systems should be to ensure complete and timely submission of data to NCCI.
- 2) NCCI should validate all data at the time of receipt.
- 3) Errors identified in data submitted to NCCI by carriers should be corrected by the carriers through resubmission of data.
- 4) NCCI should develop data validation software and distribute it to carriers. Carriers should use this software to validate data before submitting it to NCCI. Such validation should be applied to aggregate financial data, WCSP data, policy data, and DCI data.
- 5) NCCI should develop an integrated enterprise database. This database should provide access to aggregate financial data, WCSP data, policy data, DCI data, rates, experience ratings, inspection information and risk information. The database and surrounding applications should enforce integrity between these types of data based on established relationships.
- 6) NCCI should develop an electronic data transfer mechanism for submission of data from the carriers to NCCI. Carriers should be strongly encouraged or required to use this mechanism for submission of aggregate financial data, WCSP data, policy data, and DCI data.

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- 7) NCCI should institute clear, precise, and consistent policies regarding the timeliness and quality of carrier submissions of data. These policies should apply to aggregate financial data, WCSP data, policy data, and DCI data.
- 8) NCCI should establish an internal quality control group to sample statistical data, monitor error rates and improve the quality of data. Target error rates should be established for NCCI processing departments and an incentive system should be implemented to encourage achievement of these targets.
- 9) NCCI should establish a program of regular carrier performance reporting. Carrier performance reports should be distributed to carrier operational and executive management, and possibly regulators.
- 10) NCCI should implement consistent, effective financial incentive programs and/or fines to encourage carrier compliance with timeliness and quality standards.
- 11) NCCI should automate many of its current manually intensive areas. This automation effort should be orchestrated from an enterprise perspective. Unintegrated departmental systems should be avoided.
- 12) State Insurance Regulators should establish a uniform statistical data quality standard that will require NCCI and carriers to achieve certain data quality and timeliness standards.

B) Current Initiatives

NCCI has addressed data quality concerns in its systems planning. Projects which are currently proposed or in development are as follows:

- 1) Enterprise Data Model (EDM) - This is a study of the data and processes currently in place at NCCI. Its purpose is to provide a candid appraisal of current systems and a conceptual framework for future systems.
- 2) Unit Report Control (URC) - This system is currently in the testing phase. It is designed to notify carriers of unit reports due, using the PICS database to ensure that data for all policies is captured. URC went into

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production as of May 1, 1991 and phased implementation is scheduled to be completed by July 1992.

- 3) **Unit Report Quality (URQ)** - This system is currently in the design phase. It is intended to provide front end validation of unit report data. URQ is scheduled for a phased implementation ending in October 1992.
- 4) **Unit Report System (URS)** - This system is currently in the installation phase. This is intended to provide a centralized database for unit report data which will be used in the calculation of class rates and experience mods. URS is scheduled for implementation in September 1991.
- 5) **PICS 3.0** - The objective of the PICS 3.0 project is to implement approximately twenty change order requests to the existing PICS system. The two most significant planned enhancements are: 1) capture of additional policy information and 2) automated name and address standardization for policy information submitted on magtape.
- 6) **PICS Automated Policy Review** - The objective of the Automated Policy Review System is to provide automated "front end" data quality edits which verify policy information immediately upon receipt. This system is intended to replace manual review of over 1.5 million policies per year. The automated Policy Review System is scheduled for implementation by October of 1992.
- 7) **Experience Rating Automated Auditing** - The objective of the Automated Auditing System is to provide automated "back-end" data quality edits which verify experience rating sheet data. This system is intended to replace manual review of over 600,000 rating sheets per year. The Automated Auditing System is scheduled to be completed in October of 1991.

Timely implementation of these proposed systems should enhance the controls over NCCI data quality and controls.

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Response to RFP Section IB Question 2

RFP Question 2. (I.) Does the NCCI reconcile data collected for ratemaking purposes with the data reported in insurers' annual statements? (II.) If so, how are these data reconciled and what is done when these data do not match? (III.) Are there additional reconciliation measures that could be beneficial?

(I.) Does the NCCI reconcile data collected for ratemaking purposes with the data reported in insurers' annual statements?

NCCI reconciles calendar year net earned premiums at company level and direct losses incurred from the financial calls to carrier financial data as reported by A.M. Best & Company. Calendar-accident year and policy year data used in calculating overall rate level indications is then reconciled to the calendar year data.

There is no reconciliation process in place to verify the accuracy of WCSP data to either the financial calls or to carrier annual statements.

(II.) If so, how are these data reconciled and what is done when these data do not match?

A) Reconciliation Calls

- 1) The financial calls used in the reconciliation process are:
 - a) Call #2 - Calendar Year Call for Compensation Experience by State
 - b) Call #6 - Insurance Expense Exhibit (IEE) - Calendar Year Basis
 - c) Call #8 - Reconciliation Report - Calendar Year Basis
 - d) Call #9 - "F" Classification Calendar Year Call for Compensation Experience by State - Calendar Year Basis
 - e) Call #18 - Annual Call for Coal Mine Compensation Experience: Calendar Period January 1 through December 31

These calls are used to reconcile the data used in calculating overall rate level indications to the annual statements.

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- 2) The data used in the development of overall rate level indications is taken from the following calls:
 - a) Call #3 - Policy Year Call for Compensation Experience by State Valued as of December 31
 - b) Call #5 - Calendar-Accident Year Call for Compensation Experience by State Valued as of December 31
 - c) Call #11 - "F" Classification Policy Year Call for Compensation Experience as of December 31

B) Reconciliation Process

- 1) The Reconciliation Report totals the calendar year net earned premium and direct incurred losses, respectively, for industrial classes, "F" classes, Coal Mine classes, National Defense Projects and Excess Policies data. Industrial class data is compared to call #2; "F" class data is compared to call #9; and Coal Mine data is compared to call #18.
- 2) The total of this calendar year experience is agreed to Part IV of the Insurance Expense Exhibit (IEE, call #6). The IEE is due at NCCI by April 1 of each year.
- 3) Part IV of the IEE is agreed to the A.M. Best & Company summarization of data from the Exhibit of Premiums and Losses on page 14 of the annual statement. This is done when the A.M. Best data becomes available in July.
- 4) The Policy Year (#3) and Calendar-Accident Year (#5) calls contain all workers compensation net earned premium and direct incurred losses data from the inception of writing the business. Calendar year data for industrial classes is derived by subtracting prior year cumulative to date totals from current year cumulative to date totals for both the Policy Year and Calendar-Accident Year calls. The derived calendar year experience is compared to the Calendar Year call data which is reconciled to carrier annual statements as described above.

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Response to RFP Section IB Question 2

C) Additional Tests

In addition to the reconciliation process, there are other checks performed to ensure the consistency of the data among the calls:

- 1) Premiums are compared between the Policy Year and Calendar-Accident Year Calls
- 2) The difference between Standard Earned Premium at Company level (SEP) and Standard Earned Premium at Designated Statistical Reporting level (DSR) is checked for consistency with filed deviations on record at NCCI
- 3) The difference between SEP at DSR before schedule rating adjustments and SEP at DSR after schedule rating adjustments from call #10 is reviewed for reasonableness.

D) Exception Resolution

If reported data fails any of the checks or does not reconcile within +/- \$1,000, the carrier is contacted for an explanation of the discrepancy. Carriers are required to respond and are fined if they fail to comply.

E) Conclusion

NCCI's reconciliation process is sufficient to ensure that the aggregate financial data used to calculate overall rate level indications reconciles to carriers annual statements. However, due to the timing of the process, the risk exists that overall rate levels may be filed prior to the availability of the summarized annual statement data. NCCI plans to complete the reconciliations earlier beginning in 1991 by using carrier financial information summarized by the NAIC. This data is available in June whereas A.M. Best & Company data is not published until July.

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Response to RFP Section IB Question 2

(III.) Are there additional reconciliation measures that could be beneficial?

A) Improvements

The lack of an integrated database at NCCI raises the question of whether the data used in NCCI systems is consistent across systems. There are currently no reconciliation procedures to ensure this. Since the financial call data is reconciled to carrier annual statements, the financial call data can be relied on to test the accuracy of other NCCI data. We recommend that the following reconciliations be performed.

- 1) Compare WCSP data to financial call data. This would provide some assurance that all WCSP data is being used to calculate class rates. However, a precise reconciliation cannot be performed due to the different valuation dates of the data. Financial call data is valued as of December 31, while WCSP data is valued 18 months after the policy inception date and every twelve months thereafter. We performed this comparison to ensure that our statistical sampling population of WCSP data used in class ratemaking was complete. We identified a problem with data missing from our sample population related to a District of Columbia filing as a result of the test. This problem did not occur in the production of class rates; however, the results of the test prove the potential benefit of performing the comparison.
- 2) Compare premium captured in the PICS database to financial call data to help assess the completeness of PICS. Another possibility would be to require carriers to submit the number of workers compensation policies written in each state on a financial call. This information could also be used to verify that all policies are captured in PICS; however, it would not provide the level of assurance that would be obtained by a reconciliation to audited financial data.
- 3) Reconcile WCSP data to policy data in the PICS database to ensure that data used in class ratemaking has been submitted for all workers compensation policies written. We understand that NCCI is implementing the Unit Report Control (URC) system. URC is designed to request unit reports from carriers for all policies in PICS. The effectiveness of URC as a timeliness and completeness control over receipt of WCSP data for class ratemaking is related to the completeness of the PICS database.

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Response to RFP Section IB Question 3

RFP Question 3. (L) Does the NCCI have adequate procedures to ensure that classification data are complete and accurate? Are additional checks of the data performed when unusual classification indications appear? (II.) Does the NCCI check to be sure that insurers report reimbursements by second injury funds, subrogation and funds associated with cases determined to be noncompensable?

(I) Does the NCCI have adequate procedures to ensure that classification data are complete and accurate. Are additional checks of the data performed when unusual classification indications appear?

A. Overview of Control Procedures

Misclassification of data may impact class ratemaking and/or experience rating. Misclassifications which impact ratemaking may occur in class codes or injury codes. If misclassifications occur, payroll, loss or premium data could be distorted. They may also result in misclasses among the three major industry groupings of manufacturing, contracting and all other industries.

Control procedures to detect misclassifications are as follows:

- 1) All aggregate WCSP payroll amounts are reviewed for unreasonable fluctuations between first and second unit reports, including correction reports. Such amounts are also reviewed between policy years. The review is first performed at the state level. The review is then extended to a class level comparison in the same manner as indicated above.
- 2) If an unusual payroll variation is noted at the class level, a risk level review is then performed. Carriers are contacted by a Data Administration analyst when deemed necessary to obtain explanations for fluctuations.
- 3) Aggregate WCSP loss amounts are reviewed at a state level and injury code level for a particular state.
- 4) If unusual loss development is noted at the injury code level, a review is then made at the class level. Finally, if an unusual fluctuation is noted at this level, a review is performed at the risk level. Carriers are contacted if it is deemed necessary to obtain explanations.

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Response to RFP Section IB Question 3

- 5) In connection with the explanation process, certain reports are generated to facilitate analysis. Examples of these reports are the Large Loss Exhibit (losses greater than \$500,000) and Large Accounts Listing (class codes with greater than \$100 million in payroll by insured). To identify unresolved fluctuations, an explanation letter is prepared by Data Administration personnel which is provided to Class Ratemaking and regional actuaries.
- 6) Review of experience rating sheets for each risk is performed to detect unusual fluctuations in payroll or changes in class codes.
- 7) Class level premium data is not utilized in the ratemaking process, therefore no premium validation procedures are performed by NCCI on such data.

B. Conclusions

NCCI's reasonableness tests are designed to identify basic (e.g., arithmetic) errors and actuarial edits to optimize the volume of usable data. Actuarial edits identify unusual indications in the data which are reviewed to determine whether the data is satisfactory for use in ratemaking. While NCCI performs these reasonableness reviews of the critical data elements, payroll and losses, there are limitations with their procedures. Limitations in the procedures utilized by NCCI are as follows:

- 1) Efforts to explain identified fluctuations or obtain the missing data may be unsuccessful for any number of reasons:
 - a) The data may not be received by NCCI in time for the production of the rate filing
 - b) The carrier may not have the data and may not be able to explain its absence. Also, the carrier may not respond to NCCI's request for data correction or information. NCCI estimates that no responses are received on approximately 10-15% of such requests
 - c) The risk may have become self insured, ceased operations or changed its name
 - d) The carrier may have ceased operations

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Response to RFP Section IB Question 3

- e) The risk may be reported in a different class code
- 2) In some cases, NCCI will identify class inconsistencies in the normal course of their review. However, NCCI procedures for class ratemaking validation of losses do not require class level reviews unless unusual fluctuations are noted in the injury code level review.
- 3) Finally, and most importantly, there are no procedures in effect for the verification of classification data through tests of carrier records.

In summary, for the reasons stated above, NCCI's procedures do not ensure that classification data submitted by the carrier is complete and accurate. This is the case even in situations where NCCI performs additional checks of the data because efforts to explain or obtain corrections to data may not be successful. We recommend procedures be developed wherein NCCI performs or obtains independent verification of carrier submitted data through audits of carrier records.

(II.) Does the NCCI check to be sure that insurers report reimbursements by second injury funds, subrogation and funds associated with cases determined to be noncompensable?

A. Overview of Control Procedures

The NCCI's instructions to the carriers for the preparation of financial call and WCSP data state that reimbursements from second injury funds, subrogation, etc., should be reflected in reported incurred losses.

Additionally, loss coverage codes are provided by the carrier on unit reports. The loss coverage code designates whether the loss is subject to recovery from a third party or special fund.

Financial call data is reconciled to the carrier's annual statement; specifically Part IV of the Insurance Expense Exhibit. This is largely accomplished through a separate call referred to as the Reconciliation Report Call.

There are no control procedures to verify that carriers report WCSP incurred losses net of reimbursements from second injury funds, subrogation and noncompensable cases.

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Response to RFP Section IB Question 3

B. Conclusions

NCCI's control procedures do not ensure that incurred loss data is reported net of reimbursements from third parties or special funds. This conclusion is based primarily on the lack of NCCI audits of carrier data and systems. Such audits would disclose whether the carrier is properly aggregating net incurred losses for statistical reporting and annual statement purposes. While the carrier reconciles financial call data with its annual statement in the Reconciliation Report Call and provides explanations of differences, without independent verification of carrier records and reporting systems, no assurances can be given that the data is reported completely and accurately. We recommend procedures be developed wherein NCCI performs or obtains independent verification of carrier submitted data through audits of carrier records.

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Response to RFP Section IB Question 4

RFP Question 4. What quality controls are used to ensure the accuracy of data collected under a detailed claim information call?

A) Introduction

The Detailed Claim Information (DCI) system collects information on a sample of all reported indemnity claims in thirteen states. Indemnity claims are reported to NCCI six months after they are reported to the carriers. Carriers continue to file reports every twelve months until a claim closes, no longer includes indemnity compensation or reaches its tenth year. Information is initially reported by carriers on a DCI call form. After the first report for a claim is processed into the system, all calls for corrected and subsequent information are generated by NCCI and sent to the carriers.

B) Quality Control Procedures

- 1) The Sample Control form submitted by carriers calculates the number of claims each carrier expects to report for each state in the sample.
 - a) The form is initially filed for each month sixty days after month end.
 - b) The total number of indemnity claims per the carrier is multiplied by the sampling ratio calculated by NCCI for each state. This calculation provides the sixty day estimate of the number of claims that the carrier will file for the month.
 - c) The form is updated six months after the month end to reflect the deletion of claims that were originally reported but do not include indemnity compensation, and to add claims reported after the first filing of the Sample Control form.
 - d) NCCI reconciles the number of claims from the Sample Control form to the actual number of claims received. However, discrepancies are not brought to carriers' attention unless there is a large difference between the numbers.
- 2) DCI calls are subjected to a series of edits as they are processed into the system. These edits can produce two types of errors which are each handled differently.

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Response to RFP Section IB Question 4

- a) The more serious error condition, known as a "fatal" error, is caused by edits which verify the completeness and accuracy of claim identification data. Carrier code, policy number and claim number are tested for valid values and agreement with data in the system for all corrected and subsequent reports. In addition, these edits ensure that duplicate claims do not exist, that any previously submitted reports are corrected and exist in the valid file and that all prior reports have been received. Fatal errors are not processed into the DCI system. They are returned to the carrier for correction and must be resubmitted on the same report type which generated the error. NCCI does not have any procedures to follow up on fatal errors to ensure that they are resubmitted. Once the fatal error is returned to the carrier, NCCI loses control of it. No diary or follow-up system is utilized to maintain control.

- b) The less serious error condition occurs when data fails field level edits that verify the completeness and internal consistency of fields on the call. These edits also perform limited reasonableness checks on loss coverage codes and benefit amounts. Each field on the call is subjected to between one and ten specific edits. If a call fails any of the edits, it is processed into a suspense file and a call for corrected information is generated and sent to the carrier. This call contains the data originally submitted and a list of the edits that were failed. If the call for corrected information is not submitted by the carrier, up to three additional notices will be generated and mailed. There are no formal procedures to follow up with carriers if corrections are not submitted after the fourth request has been sent.

- c) Once a valid claim is established in the DCI system, calls for subsequent information are generated each year until the claim closes, no longer includes indemnity compensation or reaches its tenth report. The first call for subsequent information is sent by NCCI one to two months prior to the due date of the call. If the carrier does not respond, up to three more calls will be sent. There are no formal procedures in place to follow up with carriers if a subsequent report is not submitted after the fourth request has been sent.

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Response to RFP Section IB Question 4

C) Conclusion

- 1) The DCI system has certain controls built into it; however they are ineffective due to a lack of enforcement of carrier reporting requirements.
 - a) Carriers should be required to either submit the total number of claims indicated on the Sample Control form or to provide explanations for claims not submitted.
 - b) NCCI should contact carriers that do not respond to requests for corrected and subsequent detailed claim information.
 - c) NCCI should implement a control to track fatal errors and ensure that they are returned by carriers.
 - d) We understand that the new DCI system, scheduled to go into production July 1,1991, has the capabilities to address the above noted control weaknesses.
- 2) The DCI system controls over data submitted on the detailed information call are not sufficient to ensure its accuracy. The current edits ensure that the data is reasonable and consistent within an individual call. However, there is no assurance that carriers' workers compensation reporting and processing systems are providing accurate data. NCCI should either obtain independent verification of these systems or obtain independent verification of the reporting of WCSP data and then compare DCI claims to WCSP data.
- 3) A data quality standard for all carriers should be promulgated by either NCCI or state regulators to require compliance by carriers in reporting DCI claims.

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Response to RFP Section IB Question 5

RFP Question 5. (I.) Are the data collected and maintained in such a way that the experience from a specific policy can always be traced? If not, how could this be accomplished? (II.) Are the data for risks in the residual markets maintained in such a way that the experience can be compiled separately for the residual market versus the voluntary market?

(L) Are the data collected and maintained in such a way that the experience from a specific policy can always be traced? If not, how could this be accomplished?

A. Overview of Data Collection Procedures

The loss experience of a specific policy for experience rated and rated size policies (see Glossary) can be traced in all cases.

The experience for other policies cannot be traced in all cases. This is due to the following reasons:

- 1) Policy numbers only became part of the payroll and loss detail file (P/L file) used for ratemaking commencing in July 1987. This encompasses policy years 1986 and forward.
- 2) Policy numbers were input to Data Conversion files prior to July 1987. However, as noted above, policy numbers were not captured in the P/L detail file until mid-1987. The policy number archived on Data Conversion files is not validated; therefore it does not represent usable data in its current state.

To incorporate policy number in the P/L detail file for data received before July 1987, archived Data Conversion files would have to be fully validated or selectively merged with existing P/L detail files.

In our opinion, it would not be practical to validate the archived data files. Each year, the Data Administration area spends up to six months per state validating unit report data. To validate several years of historical data, NCCI would have to devote excessive resources to this task.

It is also not feasible to extract policy numbers from archived Data Conversion files and merge this information with validated P/L detail file information. Since P/L detail file data received before July 1987 does not contain unique

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Response to RFP Section IB Question 5

identifiers such as policy numbers, it would be impossible to match the data with corresponding data in archived Data Conversion files.

While experience rated, rated size and other policies for which unit reports were received after July 1987 are traceable, complexities related to data storage do not facilitate retrieving the data readily. The data for each state is stored in an independent file. Therefore, due to lack of file integration, it is difficult to readily retrieve the data for a policy on a country-wide basis, for instance.

For traceable policies, NCCI is able to trace experience to a specific policy through its unit card tracking system (ICT). ICT contains unit card identifying information such as risk name, carrier code, risk I.D., policy effective date, policy number, unit report number and administration (or locator) number. Due to the information maintained on ICT, it is used by the functional departments as an effective research tool.

B. Recommendations

There are several improvements which could be implemented which would enhance NCCI's ability to trace experience for all policies:

- 1) An integrated database, versus the fragmented database which currently exists, would facilitate retrieval of individual policy experience.
- 2) Risk ID numbers are currently assigned to experience rated and rated size policies only. The assignment of risk IDs to all policies would facilitate retrieval of policy experience.
- 3) Retrieval and physical access to policy experience would be significantly enhanced by the inclusion of risk ID and administration numbers on policy experience reports generated.

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Response to RFP Section IB Question 5

(II.) Are the data for risks in the residual markets maintained in such a way that the experience can be compiled separately for the residual market versus the voluntary market?

A. Overview of Data Collection Procedures

The data for residual market risks (assigned risks) can be compiled separately from the voluntary market risks in most cases:

- 1) This is achieved by using an assigned risk code which is recorded on the unit report by the carrier. The code is input into NCCI's unit report files. The coding became part of the WCSP files commencing in July 1987. Therefore, the assigned risk data by policy is not accessible if it was submitted by the carrier prior to that date. However, NCCI is not currently validating or using the coding for segregation of the data.

Relative to validation of the assigned risk codes, there are no procedures in place to verify the assigned risk coding as submitted by the carrier, or to ensure that all assigned risk unit reports are coded as such. At a minimum, limited validation could be performed by matching policy numbers from the assigned risk pools serviced by NCCI with the data in the ratemaking files. NCCI administers the assigned risk pools in 33 states. This procedure, however, is not entirely effective since it cannot be performed for all states.

Currently, statewide class rates are developed using combined voluntary and assigned risk data. Twenty-four states require separate rates for the two markets. For those states, NCCI uses statewide adjustment factors to generate voluntary rates. A standard factor is then applied to the voluntary rates to arrive at assigned risk class rates.

- 2) There are three financial calls for assigned risk data. These calls became effective in 1990 requiring data to be reported for assigned risk policies written in 1989 and later. The calls are used in overall ratemaking for the development of assigned risk experience only. In addition, when used in conjunction with the Statewide Policy Year and Accident Year call, experience for the voluntary market can be developed separately. The three calls parallel data collected for all experience and are as follows:

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Response to RFP Section IB Question 5

- a) The Assigned Risk Calendar Year Call
- b) The Assigned Risk Policy Year Call
- c) The Assigned Risk Calendar-Accident Year Call.

B. Recommendations

The emerging trend in states is the requirement for separate voluntary and assigned risk rates. As a result, NCCI should develop validation procedures for assigned risk codes submitted on unit reports. They also should develop procedures which would validate this data with that submitted on the three assigned risk financial calls. To ensure proper reporting of assigned risk codes by the carrier, procedures should be developed by NCCI to perform carrier audits of such data. Other alternatives may be for the carrier to provide assurance to NCCI that the data has been audited (e.g., by external or internal auditors), or for such audits to be performed in conjunction with regulatory examinations.

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Response to RFP Section IB Question 6

RFP Question 6. Is sufficient information collected and maintained to test and implement reasonable alternative ratemaking methodologies? If not, what enhancements could be made to support alternative methodologies and identify the underlying causes of rate increases?

A. Overview of Sufficiency of Data Collection

This question addresses data collected in both financial calls and the WCSP. Sufficient information is currently collected and maintained to provide a means to evaluate numerous alternative ratemaking methodologies, identify findings and generate recommendations. This conclusion is based solely upon the results of the Ratemaking Procedures and Evaluation of Ratemaking Methodologies report in Section II of the Milliman & Robertson (M&R) portion of this examination. Various parts of Section II evaluated extensively current ratemaking methodologies and investigated alternative approaches using information currently collected. Section II also recommends collecting additional information which would enhance NCCI's methodology. NCCI is just beginning to collect or is planning to capture some of this additional information. Section II recommends the collection of one additional statistic in each of the Accident Year and Policy Year Financial Calls and one additional data element in the WCSP. It also recommends more frequent receipt of Size of Risk Expense Analysis Call.

NCCI is in the process of designing a new Detailed Claim Information (DCI) database and system to replace the existing DCI version. Comments about the new DCI system are included in a separate section of this report. We understand that one purpose of the new DCI system will be to serve as a source of data for special studies since the DCI system will contain more detailed loss experience data than the WCSP data and the summarized financial call information combined.

NCCI's policy is to retain detailed and summarized WCSP data in magnetic format for ten years. This policy has been in effect for approximately five years.

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Response to RFP Section IB Question 6

B. Suggested Enhancements

Enhancements which could be made to support alternative methodologies, identify underlying causes of rate increases and enhance NCCI's methodology are as follows:

- 1) **Policy Year and Calendar-Accident Year Financial Calls**
 - a) The M&R report on ratemaking procedures recommends the inclusion of a new element, "number of claims closed with indemnity" (or alternatively, the number of claims open with indemnity), which would support additional reserving techniques and diagnostic tests of loss development. The cost to implement this change would involve redesigning the call forms, modifying the overall rate level systems to include the additional data element and creation of or changes to actuarial applications for reserving and diagnostic testing. In addition, there would be carrier costs to derive this information. However, since carriers are already collecting total number of reported indemnity claims and a claim's open or closed status, we would not expect carrier costs to be significant.
 - b) The expansion of information from eight to fifteen reports by individual policy year and accident year will enhance ratemaking methodology. NCCI began collecting one additional report year of information beginning with data valued as of 12/31/87. The calls valued at 12/31/89 have data detailed for 12 years and a summarized line for all prior years. The number of additional years will increase each year until fifteen years of data is available. The additional report years will improve loss development analysis and reduce the impact of the loss development "tail" factor.
 - c) The collection of reported number of indemnity claims will be very beneficial. NCCI began to collect this data with 1989 calls received in 1990. The reported indemnity claim counts will support investigation of trends in severity and frequency in the future, and permit a reevaluation of the selection of data underlying the trend calculations.

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Response to RFP Section IB Question 6

2) Size of Risk Expense Analysis Call

This call should be collected more frequently and on a regular basis. The last call was for 1982. The next call is for 1991. More frequent collection of data would entail additional NCCI processing and data collection costs.

3) Workers Compensation Statistical Plan (WCSP)

- a) Section II of the examination relating to ratemaking procedures recommends the inclusion of a new data element, "wage recognition plan subclass code", to support use of wage recognition plans. The wage recognition plan subclass code, as discussed more fully in Section II of the examination, would only be used for those states and classes of employment identified as having residual inequities after application of the Revised Experience Rating Plan to the limited payroll exposure base. This subclass code would be used in the analysis to derive subclass differentials for inclusion in rate filings. The definition of the subclass codes would need to reflect average wage groupings, probably differ by state, and consider the impact of inflation. Costs to implement this recommendation would be the costs to change the statistical plan as well as development of actuarial applications to utilize the new data for subclass differentials.
- b) The M&R report on Ratemaking also recommends the collection of hours worked or average hourly wages for certain classes of insureds where it is most feasible. This will be used to reduce some of the inequities in the use of wage rate recognition plans. The costs to collect this data would include:
 - i) Changing carrier programs for those carriers capturing WCSP data on an automated basis.
 - ii) Creating NCCI data base programs to compile and maintain the data.
 - iii) Creating NCCI programs to access the data.
 - iv) Additional insured record keeping and insurer audits.

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Response to RFP Section IB Question 6

- c) NCCI's recent decision to begin collecting allocated loss adjustment expenses (ALAE) in the WCSP will be very beneficial. Such information will better support the analysis of ultimate ALAE costs and investigate relationships between loss and ALAE (e.g., differences by state).

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Response to RFP Section IB Question 7

RFP Question 7. Do the NCCI's data gathering procedures ensure that the database is not distorted by schedule rating?

A. Overall Rate Level

1) Overview of Data Collection Procedures

There are two financial calls which are critical to the determination of overall rate levels. They are the Policy Year and Calendar-Accident Year Calls. NCCI's instructions to the carriers for the preparation of these calls state that standard earned premiums at the designated statistical reporting (DSR) level should be reported prior to the application of schedule rating adjustments. Schedule rating adjustments are competitive pricing plans established by carriers in states which permit such premium adjustments. A separate call, the Supplemental Call for Schedule Rating Premium Adjustments (Schedule Rating Call), is intended to be used by NCCI to verify that carriers have properly accounted for schedule rating adjustments in the call submissions. NCCI performs the following procedures to determine whether the database may be distorted by schedule rating:

- a) NCCI reconciles DSR standard earned premiums per the Schedule Rating Call to the Policy Year Call. This is performed by reviewing variations between standard premiums prior to schedule rating (per the Policy Year Call) and standard premiums after the schedule rating (per the Schedule Rating Call). Unusual variations, or the lack of a variation, and relationship of premiums before and after schedule rating are evaluated. The carrier is contacted to obtain additional information, explain variations, or if an error is detected, to obtain corrected reports.
- b) NCCI compares the amount of reported schedule rating to the maximum limits permitted in a given state. If a state has no specified limits, NCCI compares the amount to a maximum tolerance which is reasonable relative to the other states' prescribed limits.
- c) In at least one state, NCCI is required to verify schedule rating information for each policy wherein schedule rating is applied. The

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Response to RFP Section IB Question 7

carriers provide Schedule Rating Worksheets and loss control reports by policy. This information is reviewed in conjunction with the premium audit reviews which NCCI performs at the carrier. The review determines whether loss control reports are completed within the specified time frame, the schedule rating adjustment is within the prescribed limits, and the Worksheets are properly completed. It is a compliance review and does not evaluate underwriting or other merits of the schedule rating. Exceptions noted in the compliance review are reported to the state's regulators.

- 2) Limitations in the procedures utilized by NCCI are as follows:
- a) The call data reported by the carrier is not verified through audits of carrier records. The key data element which should be audited is the standard premium at the DSR level.
 - b) The reconciliation described in the overview above is performed in August of each year, which may result in error detection subsequent to the rate filing.
 - c) If a carrier does not submit a Schedule Rating Call or does not comply with a correction/explanation request, the reconciliation cannot be performed. In addition, there are no monetary incentives or penalties associated with the calls' submission.
 - d) The stated primary reason for obtaining the Schedule Rating Call is to use the data in market analysis to measure the impact of this form of competitive pricing. Consequently, the reconciliation is not the higher priority.
 - e) The policy audits performed in one state as described above are performed on Schedule Rating Worksheets received, which may not represent the complete population of schedule rated policies.

Further, there is no reconciliation of the total premiums tested by NCCI to total premiums reported on the Schedule Rating Call, or a determination of the testing coverage achieved. It is estimated by NCCI that the testing coverage is approximately 10 percent of the schedule rating datafile for the state.

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Response to RFP Section IB Question 7

3) Conclusions

NCCI data gathering procedures do not ensure that the database for overall rate levels is not distorted by schedule rating. While NCCI has reasonableness review procedures in place to assist in detecting possible distortions, this assurance can only be achieved by auditing the carrier-submitted DSR standard premium data. This is not currently done.

B. Class Ratemaking

1) Overview of Data Collection Procedures

Schedule rating premium adjustments are reported on unit reports using one of two unique classification codes:

Code 9887 - for credit adjustment amounts

Code 9889 - for debit adjustment amounts

These class codes do not flow into the calculation of class rates. Additionally, premium adjustments do not impact the calculation of the rates. Lastly, schedule rating adjustments are classified in an industry group (Group 7) which is excluded from the database used for ratemaking.

NCCI's data gathering procedures include an analytical review of class code fluctuations between years. Unusual fluctuations are investigated. Limitations with the NCCI's procedures relate to the lack of carrier audits to ensure that class code data as reported by the carrier is accurate.

2) Conclusions

NCCI's data gathering procedures do not ensure that the database for class ratemaking is not distorted by schedule rating. This conclusion is based primarily on the lack of NCCI audits of the carrier data and systems to ensure proper reporting by class code.

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Response to RFP Section IB Question 7

C. Experience Rating

Premiums are not utilized in the determination of experience modifications, therefore the database is not impacted by possible schedule rating distortions.

D. Recommendations

Overall, the most effective means of providing assurance that the applicable databases are not distorted by schedule rating is for NCCI to audit the data submitted by the carrier. This would involve audits performed at the carrier's location and would include tracing the data to source documentation, including rating file level and policy level data. An alternative would be to require that the carrier provide for an independent audit of such data, with a report being issued to NCCI. This independent audit would be performed by external auditors in accordance with appropriate generally accepted auditing standards. While resources and frequency of review may be limited, another alternative may be for states to require the audit of such statistical data in examinations required by state statutes. As indicated in our Executive Summary, we recommend that the NAIC develop a model workers compensation data quality regulation, which among other standards, should specify carrier and risk audit standards.

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Response to RFP Section IB Question 8

RFP Question 8. (I.) What kinds of data on insurer expenses are collected and how are they processed and maintained? (II.) What controls are in place to ensure that insurers' reporting of expenses is reasonable and accurate? (III.) Are there ways in which reporting of expense data could be improved to make it more suitable for ratemaking? (IV.) Is separate information on the cost of loss prevention services collected, and if not, could it be collected?

(I.) What kinds of data on insurer expenses are collected and how are they processed and maintained?

A. Overview of Data Collected

Data collected relating to insurer expenses is as follows:

- 1) From each carrier's Insurance Expense Exhibit, expenses relating to the workers compensation line of business only:

From Part II:

- a) Loss adjustment expenses incurred
- b) Commission and brokerage incurred
- c) Other acquisition, field supervision and collection expenses incurred
- d) General expenses incurred
- e) Taxes, licenses and fees incurred
- f) Total expenses incurred
- g) Adjusted direct loss adjustment expenses incurred
- h) Direct commission and brokerage incurred
- i) Adjusted direct commission and brokerage incurred

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Response to RFP Section IB Question 8

From Part III:

- j) Same as a) - f) above
 - k) Effect of expense graduation
- 2) From the Calendar Year Expense Data Call, expense data collected is as follows:
- a) Acquisition, field supervision and collection expenses - commission and brokerage incurred
 - b) Acquisition, field supervision and collection expenses - Branch office - state share-incurred
 - c) Acquisition, field supervision and collection expenses - Home office - state share-incurred
 - d) Unallocated loss adjustment expense incurred
 - e) Allocated loss adjustment expense paid and incurred
 - f) Boards and bureau expense incurred
 - g) Audit, inspection and other general expenses incurred
 - h) Taxes, licenses and fees
- 3) From the Call for Loss Adjustment Expenses on Countrywide Direct Workers Compensation Business:
- a) Allocated loss adjustment expense paid and outstanding for all accident years
 - b) Unallocated loss adjustment expense paid and outstanding for all accident years

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Response to RFP Section IB Question 8

B. Overview of Processing and Maintenance Procedures

The data collected as described above is input and maintained in a separate file for each call and for each year of submission. The data collected is retained from three to fifteen years depending upon the call.

(II.) What controls are in place to ensure that insurers' reporting of expenses is reasonable and accurate?

A. Overview of Control Procedures

The singular control procedure which NCCI employs relative to expense data collected is a review to determine whether the expenses are within specified parameters. NCCI utilizes programs to facilitate this review. The programs generate ratio comparisons and tolerance level deviations which are then investigated with the carrier as deemed necessary. Examples of ratios analyzed are loss adjustment expenses as a percentage of losses, brokerage and commissions as a percentage of premiums, etc. The parameters, by necessity, have a wide range.

B. Conclusions

While the performance of reasonableness reviews mitigates the risk of a material error in the data, NCCI's procedures do not provide assurance that the data is complete and accurate as reported by the carrier. To provide such assurance, audits of carrier records are necessary, including a review of the reasonableness of the formulas used to allocate expenses.

(III.) Are there ways in which the reporting of expense data could be improved to make it more suitable for ratemaking?

A. Suggested Improvements

We believe the current expense data reporting system for ratemaking purposes could be improved. Expense data reporting is accomplished primarily through the submission of the Insurance Expense Exhibit Call (IEE), Calendar Year Expense by State Call and Call for Loss Adjustment Expense. We understand that NCCI plans to include incurred allocated loss adjustment expense (ALAE)

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Response to RFP Section IB Question 8

in WCSP. We concur with this plan and encourage NCCI to implement it as soon as practical.

The Calendar Year Expense By State Call is used to help support expense allowances in states. The expenses per the IEE Call are used to establish the provisions for general expenses and loss adjustment expenses used in rate filings. While many states (approximately 39 in 1990) require this call, we question the usefulness of the Calendar Year Expense By State Call. This is due to the fact that many carriers do not or are unable, for practical reasons, i.e., multistate writers, to report actual expense data on a state level and because the allocation methods utilized vary among companies. According to NCCI records, the percentage of calls which reported actual expense data, and the percentage of calls utilizing allocation methods, were as follows:

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Response to RFP Section IB Question 8

	ALLOCATION BASIS							TOTAL	
	ACTUAL EXPENSES	WRITTEN PREMIUM	EARNED PREMIUM	LOSSES	SALARIES	TIME STUDIES	OTHER		MISSING
Calendar Year 1989:									
Commission and brokerage	47.3%	39.3%	6.7%	.3%	.0%	.0%	2%	4.4%	100.0%
State share of branch office acquisition, field supervision and collection expenses	14.2%	33.9%	10.7%	.0%	.2%	1.9%	3.3%	35.8%	100.0%
State share of home office acquisition, field supervision and collection expenses incurred	3.6%	61.1%	20.0%	.0%	.2%	2.8%	4.0%	8.3%	100.0%
Unallocated loss adjustment expenses paid and incurred	4.6%	5.9%	15.2%	64.4%	.1%	2.0%	5.9%	1.9%	100.0%
Allocated loss adjustment expenses paid and incurred	58.5%	2.6%	3.8%	26.1%	.0%	.0%	3.4%	5.6%	100.0%
Boards and bureau expense incurred	14%	51.5%	26.1%	.0%	.0%	.0%	3.0%	5.4%	100.0%
Audit inspection and other general expenses incurred	3.5%	54.0%	34.2%	.0%	.4%	2.8%	3.5%	1.6%	100.0%
Calendar Year 1990:									
Commission and brokerage	46.1%	40.5%	6.5%	.2%	.0%	.0%	2.5%	4.2%	100.0%
State share of branch office acquisition, field supervision and collection expenses	14.9%	31.2%	12.4%	.0%	1.0%	1.8%	3.5%	35.2%	100.0%
State share of home office acquisition, field supervision and collection expenses incurred	4.3%	57.4%	22.9%	.0%	.2%	2.8%	4.9%	7.5%	100.0%
Unallocated loss adjustment expenses paid and incurred	4.4%	5.6%	13.5%	66.3%	.1%	2.1%	5.8%	2.2%	100.0%
Allocated loss adjustment expenses paid and incurred	59.2%	1.7%	3.4%	26.1%	.0%	.0%	3.1%	6.5%	100.0%
Boards and bureau expense incurred	15.6%	49.7%	26.8%	.0%	.0%	.0%	3.5%	4.4%	100.0%
Audit inspection and other general expenses incurred	4.0%	50.4%	36.1%	.0%	.4%	2.9%	4.1%	2.1%	100.0%

Note - Allocation basis data is not captured by NCCI for taxes, licenses and fees.

* Missing - This includes carriers with no data for that field and carriers who had data but neglected to fill in the field.

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Response to RFP Section IB Question 8

As indicated above, the carrier may allocate expenses to states based on any one of several methodologies (e.g., actual expenses, written premium, earned premium, losses, salaries, time studies, etc.). The instructions for preparing the call do not explicitly define "actual expenses" however it appears to mean expenses which are directly related to the state. The call instructions are located in Volume II, Calendar Year Expense Data By State tab, page 3. We recommend the following:

- 1) NCCI should define the term "actual expenses" in the instructions for completing the Calendar Year Expense Data by State call.
- 2) Where an allocation method is utilized, the Calendar Year Expense By State Call should require detailed documentation of the basis for the allocation to the workers compensation line of business and to the state.
- 3) Consideration should be given to requiring carriers to document by expense line of business and by state the basis for allocation in sufficient detail to provide a reasonable understanding of their methodology. This would enable the states to evaluate the reasonableness of the allocation methods utilized and the appropriateness of these methods for each expense classification. It would also enable the states to review the appropriateness of the allocation to the workers compensation line of business and to the state, to consider establishing guidelines for such allocations, and to request substantiation for the methods utilized as desired.

(IV.) Is separate information on the cost of loss prevention services collected, and if not, could it be collected?

Loss prevention cost data is not collected except in two states where state law requires it. This information is submitted as an addendum to the Calendar Year Expense Data By State Call. The specific data collected in the addendum is loss control services expense, safety engineering expense, remaining general expenses, total general expenses and type of insurer. Such information could be collected by a modification to the above call requiring carriers to provide such information for all states.

SUBMIT PROPOSAL TO:
 INA M. BOYKIN, PURCHASING DIRECTOR
 OFFICE OF TREASURER & INSURANCE COMMISSIONER
 ROOM G-59, LARSON BUILDING
 TALLAHASSEE, FLORIDA 32399-0300
 Telephone Number: 904/488-4984

STATE OF FLORIDA
REQUEST FOR PROPOSAL

CONTRACTUAL SERVICES
 Acknowledgement Form

Page 1 of 30 pages	PROPOSALS WILL BE OPENED JULY 27, 1990 @ 3:00 P.M. and may not be withdrawn within 60 days after such date and time.	PROPOSAL NO. RFP-90/91-01
AGENCY MAILING DATE: JUNE 29, 1990	PROPOSAL TITLE CONSULTING FIRMS FOR AN EXAMINATION OF THE STRUCTURE AND OPERATIONS OF THE NATIONAL COUNCIL ON COMPENSATION INSURANCE (NCCI)	
FEDERAL EMPLOYER IDENTIFICATION NUMBER OR S.S NUMBER		
VENDOR NAME	REASON FOR NO PROPOSAL	
VENDOR MAILING ADDRESS		
CITY - STATE - ZIP	POSTING OF PROPOSAL TABULATIONS Proposal tabulations with recommended awards will be posted for review by interested parties at the location where proposals were opened and will remain posted for a period of 72 hours. Failure to file a protest within the time prescribed in Section 120.53(5), Florida Statutes, shall constitute a waiver of proceedings under Chapter 120, Florida Statutes. Posting will be on or about AUGUST 24, 1990	
AREA CODE	TELEPHONE NUMBER	
	TOLL-FREE NUMBER	

I certify that this proposal is made without prior understanding, agreement, or connection with any corporation, firm, or person submitting a proposal for the same contractual services, and is in all respects true and without collusion or fraud. I agree to abide by all conditions of the proposal and certify that I am authorized to sign this proposal for the proposer and that the proposer is in compliance with all requirements of the Request for Proposal including but not limited to certification requirements in submitting a proposal to an agency for the State of Florida; the proposer offers and agrees that if the proposal is accepted, the proposer will convey all, assign or transfer to the State of Florida all rights, title and interest in and to all causes of action it may now or hereafter acquire under the Antitrust laws of the United States and the State of Florida for price fixing relating to the particular commodities or services purchased or acquired by the State of Florida. At the State's discretion such assignment shall be made and become effective at the time the purchasing agency tenders final payment to the proposer.

AUTHORIZED SIGNATURE (MANUAL)

AUTHORIZED SIGNATURE (TYPED) TITLE

GENERAL CONDITIONS

SEALED PROPOSALS: All proposal sheets and this original acknowledgement form must be enclosed and submitted in a sealed envelope. (DO NOT INCLUDE MORE THAN ONE PROPOSAL PER ENVELOPE.) The face of the envelope shall contain, in addition to the above address, the date and time of the proposal opening and the proposal number. Proposals opened not submitted on attached proposal price sheets when required shall be rejected. All proposals are subject to the conditions specified herein. Those which do not comply with these conditions are subject to rejection.

- EXECUTION OF PROPOSAL:** Proposal must contain a manual signature of authorized representative in the space provided above. Proposal must be typed or printed in ink. Use of erasable ink is not permitted. All corrections to prices made by proposer must be initialed. The company name and F.E.D. or social security number must appear on each price line on the proposal as required. If a vendor desires to do repetitive business with the State and a vendor number has not been assigned to your company, contact Department of General Services, Division of Purchasing, Room 613, Larson Bldg., Tallahassee, FL 32399-0937, 904-488-8440 immediately.
- NO PROPOSAL SUBMITTED:** If not submitting a proposal, respond by returning only the proposer acknowledgement form marking "NO PROPOSAL", and explain the reason in the space provided above. Failure to respond to a procurement solicitation without giving justifiable reasons for such failure, non-conformance to contract conditions, or other pertinent factors deemed reasonable and valid shall be cause for removal of the proposer's name from the proposal mailing list. NOTE: To qualify as a respondent, proposer must submit a "NO PROPOSAL", and it must be received no later than the stated proposal opening date and hour.
- PROPOSAL OPENING:** Shall be public, on the date, location and the time specified on the acknowledgement form. It is the proposer's responsibility to assure that his proposal is delivered at the proper time and place of the proposal opening. Proposals which for any reason are not so delivered, will not be considered. Offers by telegram or telephone are not acceptable. A proposal may not be altered after opening of the price proposal. NOTE: Proposal tabulations will be furnished upon written request with an enclosed, self-addressed stamped envelope and payment of a predetermined fee. Proposal tabulations will not be provided by telephone.
- PRICES, TERMS AND PAYMENT:** Firm prices shall be proposed and include all services rendered to the purchaser.
 - TAXES:** The State of Florida does not pay Federal Excise and Sales taxes on direct purchases of services. See tax exemption number on face of purchase order or agreement form. This exemption does not apply to purchases of services in the performance of contracts for the improvement of state-owned real property as defined in Chapter 122, Florida Statutes.
 - DISCOUNTS:** Cash discount for prompt payment shall not be considered in determining the lowest net cost for proposal evaluation purposes.
 - MISTAKES:** Proposers are expected to examine the conditions, scope of work, proposal price, extensions, and all instructions pertaining to the services involved. Failure to do so will be at proposer's risk.

- INVOICING AND PAYMENT:** The contractor shall be paid upon submission of properly certified invoices to the purchaser at the prices specified on the contract at the time the order is placed, after delivery and acceptance of goods, less deductions if any, as provided. Invoices shall contain the contract number, purchase order number and the contractor's Federal Employer Identification Number. An original and three (3) copies of the invoice shall be submitted. The final payment shall not be made until after the contract is complete unless the State has agreed otherwise. Invoices for fees or other compensation for services or expenses submitted for contractual services shall be submitted in detail sufficient for a proper audit and postaudit thereof and invoices for any travel expenses shall be submitted in accordance with the rules of or under those specified in Sections 112.061 and 287.058 F.S. Interest Penalties: Payment shall be made in accordance with Section 215.422, F.S., which states the contractor's rights and the State agency's responsibilities concerning interest penalties and time limits for payment of invoices. The Division of Purchasing shall review the conditions and circumstances surrounding non-payment and unless there is a bonafide dispute, the Division may in writing authorize the contract supplier to reject and return purchase orders from the agency until such time as the agency complies with the provisions of Section 215.422, F.S.
- ANNUAL APPROPRIATIONS:** The State of Florida's performance and obligation to pay under this contract is contingent upon an annual appropriation by the Legislature.
- CONFLICT OF INTEREST:** The award hereunder is subject to the provisions of Chapter 112, Florida Statutes. Proposers must disclose with their proposal the name of any officer, director or agent who is and an employee of the State of Florida, or any of its agencies. Further, all proposers must disclose the name of any State employee who owns, directly or indirectly, an interest of five percent (5%) or more in the proposer's firm or any of its branches, in accordance with Chapter 287, Florida Statutes, no person or firm receiving a contract that has not been procured pursuant to Section 287.057(2) or (3) to perform a feasibility study of the potential implementation of a subsequent contract, participating in the drafting or a request for proposal, or developing a program for future implementation shall be eligible to contract with the agency for any other contracts dealing with that specific subject matter; and proposers must disclose with their proposal any such conflict of interest.
- AWARDS:** As the best interest of the State may require, the right is reserved to reject any and all proposals or waive any minor irregularity or technicality in proposals received. Proposers are cautioned to make no assumptions unless their proposal has been evaluated as being responsive.
- INTERPRETATIONS/DISPUTES:** Any questions concerning conditions and specifications shall be directed in writing to this office for receipt no later than ten (10) days prior to the proposal opening. Inquiries must reference the date of proposal opening and proposal number. No interpretation shall be considered binding unless provided in writing by the State of Florida in response to requests in full compliance with this provision. Any actual or prospective proposer who disputes the reasonableness, necessity or completeness of the terms and conditions of the Request for

Proposal, proposal selection or contract award recommendation, shall file such protest in form of a petition in compliance with Rule 13A-1.006, Florida Administrative Code. Failure to file a protest within the time prescribed in Section 120.53(5), Florida Statutes, shall constitute a waiver of proceedings under Chapter 120, Florida Statutes.

8. **GOVERNMENTAL RESTRICTIONS:** In the event any governmental restrictions may be imposed which would necessitate alteration of the material quality of the services offered on this proposal prior to their completion, it shall be the responsibility of the successful proposer to notify the purchaser at once, indicating in his letter the specific regulation which required an alteration. The State reserves the right to accept any such alteration, including any price adjustments occasioned thereby, or to cancel the contract at no further expense to the State.
9. **DEFAULT:** Failure to perform according to this proposal and/or resulting contract shall be cause for your firm to be found in default in which event any and all reproduction costs may be charged against your firm. Any violations of these requirements may also result in:
 - a) Contractor's name being removed from the Division of Purchasing vendor mailing list.
 - b) All State agencies being advised not to do business with the contractor without written approval of the Division of Purchasing.
10. **LEGAL REQUIREMENTS:** Applicable provision of all Federal, State, county and local laws, and of all ordinances, rules, and regulations shall govern development, submission and evaluation of all proposals received in response hereto and shall govern any and all claims and disputes which may arise between persons submitting a proposal response hereto and the State of Florida, by and through its officers, employees and authorized representatives, or any other person, natural or otherwise, and lack of knowledge by any proposer shall not constitute a cognizable defense against the legal effect thereof.

11. **ADVERTISING:** In submitting a proposal, proposer agrees not to use the results therefrom as a part of any commercial advertising.
12. **ASSIGNMENT:** Any Contract or Purchase Order issued pursuant to this request for proposal and the monies which may become due hereunder are not assignable except with the prior written approval of the purchaser.
13. **LIABILITY:** On any contract resulting from this proposal the proposer shall hold and save the State of Florida, its officers, agents, and employees harmless against claims by third parties resulting from the contractor's breach of this contract or the contractor's negligence. This requirement does not apply to contracts between governmental agencies.
14. **FACILITIES:** The State reserves the right to inspect the proposer's facilities at any time with prior notice.
15. **CANCELLATION:** The State shall have the right of unilateral cancellation for refusal by the contractor to allow public access to all documents, papers, letters, or other material subject to the provisions of Chapter 119, Florida Statutes, and made or received by the contractor in conjunction with the contract.
16. **PUBLIC RECORDS:** Any material submitted in response to this Request for Proposal will become a public document pursuant to Section 119 07, F.S. This includes material which the responding proposer might consider to be confidential or a trade secret. Any claim of confidentiality is waived upon submission, effective after opening pursuant to Section 119 07, F.S.

NOTE:

ANY AND ALL SPECIAL CONDITIONS AND SPECIFICATIONS ATTACHED HERETO WHICH VARY FROM THESE GENERAL CONDITIONS SHALL HAVE PRECEDENCE.

ATTACHMENTS:

1. COVER SHEET, (GOLDENROD), PGS. 1 & 2
2. NOTICE/PUBLIC ENTITY FORM PUR: 7068, PGS. 3-5
3. MINORITY CERTIFICATION - PG. 6
4. ENTIRE CONTENTS OF RFP - PGS. 7-30

N O T I C E

Effective July 1, 1989, prior to entering into a contract in excess of the threshold amount for Category two (currently \$3,500) to provide goods or services to a public entity, a person shall file a sworn statement with the contracting officer of that public entity on Form PUR: 7068 (copy attached).

Bidders are required to complete this form to provide compliance with the law. **FORM MUST BE SIGNED, NOTARIZED, AND RETURNED WITH EACH BID.** Failure to follow these instructions shall result in rejection of bid.

SWORN STATEMENT UNDER SECTION 287.133(3)(u),
FLORIDA STATUTES, ON PUBLIC ENTITY CRIMES

THIS FORM MUST BE SIGNED IN THE PRESENCE OF A NOTARY PUBLIC OR OTHER OFFICER AUTHORIZED TO ADMINISTER OATHS.

1. This sworn statement is submitted with Bid, Proposal or Contract No. _____
for _____.
2. This sworn statement is submitted by _____
[name of entity submitting sworn statement]
whose business address is _____
_____ and
(if applicable) its Federal Employer Identification Number (FEIN) is _____.
(If the entity has no FEIN, include the Social Security Number of the individual signing this sworn statement: _____.)
3. My name is _____ and my relationship to the
[please print name of individual signing]
entity named above is _____.
4. I understand that a "public entity crime" as defined in Paragraph 287.133(1)(g), Florida Statutes, means a violation of any state or federal law by a person with respect to and directly related to the transaction of business with any public entity or with an agency or political subdivision of any other state or with the United States, including, but not limited to, any bid or contract for goods or services to be provided to any public entity or an agency or political subdivision of any other state or of the United States and involving antitrust, fraud, theft, bribery, collusion, racketeering, conspiracy, or material misrepresentation.
5. I understand that "convicted" or "conviction" as defined in Paragraph 287.133(1)(b), Florida Statutes, means a finding of guilt or a conviction of a public entity crime, with or without an adjudication of guilt, in any federal or state trial court of record relating to charges brought by indictment or information after July 1, 1989, as a result of a jury verdict, nonjury trial, or entry of a plea of guilty or nolo contendere.
6. I understand that an "affiliate" as defined in Paragraph 287.133(1)(a), Florida Statutes, means:
 1. A predecessor or successor of a person convicted of a public entity crime; or
 2. An entity under the control of any natural person who is active in the management of the entity and who has been convicted of a public entity crime. The term "affiliate" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in the management of an affiliate. The ownership by one person of shares constituting a controlling interest in another person, or a pooling of equipment or income among persons when not for fair market value under an arm's length agreement, shall be a prima facie case that one person controls another person. A person who knowingly enters into a joint venture with a person who has been convicted of a public entity crime in Florida during the preceding 36 months shall be considered an affiliate.
7. I understand that a "person" as defined in Paragraph 287.133(1)(e), Florida Statutes, means any natural person or entity organized under the laws of any state or of the United States with the legal power to enter into a binding contract and which bids or applies to bid on contracts for the provision of goods or services let by a public entity, or which otherwise transacts or applies to transact business with a public entity. The term "person" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in management of an entity.
8. Based on information and belief, the statement which I have marked below is true in relation to the entity submitting this sworn statement. [Please indicate which statement applies.]

_____ Neither the entity submitting this sworn statement, nor any officers, directors, executives, partners, shareholders, employees, members, or agents who are active in management of the entity, nor any affiliate of the entity have been charged with and convicted of a public entity crime subsequent to July 1, 1989.

_____ The entity submitting this sworn statement, or one or more of the officers, directors, executives, partners, shareholders, employees, members, or agents who are active in management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989, AND [Please indicate which additional statement applies.]

_____ There has been a proceeding concerning the conviction before a hearing officer of the State of Florida, Division of Administrative Hearings. The final order entered by the hearing officer did not place the person or affiliate on the convicted vendor list. [Please attach a copy of the final order.]

_____ The person or affiliate was placed on the convicted vendor list. There has been a subsequent proceeding before a hearing officer of the State of Florida, Division of Administrative Hearings. The final order entered by the hearing officer determined that it was in the public interest to remove the person or affiliate from the convicted vendor list. [Please attach a copy of the final order.]

_____ The person or affiliate has not been placed on the convicted vendor list. [Please describe any action taken by or pending with the Department of General Services.]

[signature]

Date: _____

STATE OF _____

COUNTY OF _____

PERSONALLY APPEARED BEFORE ME, the undersigned authority,

_____ who, after first being sworn by me, affixed his/her signature
[name of individual signing]

in the space provided above on this _____ day of _____, 19_____.

NOTARY PUBLIC

My commission expires:

STATE OF FLORIDA

DEPARTMENT OF INSURANCE AND TREASURER
TALLAHASSEE, FLORIDA

CERTIFICATION

PLEASE PROVIDE THE FOLLOWING INFORMATION FOR OUR RECORDS, IF APPLICABLE,
TO YOU OR YOUR COMPANY:

OWNERSHIP: (AT LEAST 51% OWNED OR CONTROLLED BY
MINORITY PERSONS - CHECK ONE ONLY.)

- BLACK AMERICANS
- HISPANIC AMERICANS
- ASIAN AMERICANS
- NATIVE AMERICANS
- NATIVE HAWAIIAN AMERICANS
- AMERICAN WOMEN
- PHYSICALLY DISABLED AMERICANS

NAME OF FIRM: _____

ADDRESS: _____

AUTHORIZED SIGNATURE: _____

Manual

Type Name/Title

RFP NO: _____

DATE: _____

REQUEST FOR PROPOSAL

PART I GENERAL INFORMATION

1-1 Purpose

The purpose of this request for proposal (RFP) is to provide information and guidelines for the submission of proposals to the Florida Department of Insurance (hereafter referred to as "the Department") by consulting firms for an examination of the structure and operations of the National Council on Compensation Insurance (NCCI).

This examination will be conducted under the examination authorities of the Florida Department of Insurance, the Maine Bureau of Insurance, the Nebraska Department of Insurance, and the Utah Department of Insurance. The examination is intended to address areas of concern to these states as well as other states with respect to the structure and operations of the NCCI. The National Association of Insurance Commissioners (NAIC) will be coordinating the activities of the four departments in administering the examination but is not a party to the contract with the consultants.

1-2 Issuing Office

The issuing office is the Florida Department of Insurance, Purchasing Section, Division of Administration, Room G-59, Larson Building, Tallahassee, Florida 32399-0300, 904/488-4984.

1-3 Contract Consideration

Due to the nature of the work to be performed, consideration will only be given to consultants with sufficiently qualified people in the areas of actuarial science, computer auditing, statistical analysis, financial and management consulting to undertake a detailed and comprehensive examination of a workers' compensation rating organization.

1-4 Acceptance

The Department reserves the right to accept or reject any or all proposals and to award the ensuing contract in the best interest of the State of Florida and the other participating states, as named above. Any material conflict of interest arising out of current or past work performed for the NCCI could cause the rejection of a proposal.

1-5 Developmental Costs

Neither the Department, nor the other participating departments, or the NAIC or any other state or agency of any other state is liable for any of the costs incurred by the respondent in preparing a proposal in response to this RFP.

1-6 Questions

Only questions in writing concerning this RFP will be received before July 13, 1990 by Robert Klein, Director of Research, NAIC, 120 West 12th

Street, Suite 1100, Kansas City, Missouri. A list of the questions received and written answers to those questions will then be distributed by First Class U.S. Mail to all recipients of this RFP by July 20, 1990. Questions received after July 13, 1990 will not be answered.

1-7 Agenda

Any significant change made in the RFP will be brought to the attention of those who have demonstrated interest in responding to the RFP and adequate time will be allowed for response.

1-8 Schedule

The following schedule will be strictly adhered to in all actions relative to this procurement.

- A. June 29, 1990: RFP issued.
- B. From June 29, 1990 to July 13, 1990, written questions will be received.
- C. All proposals are due by 3:00 p.m. on July 27, 1990 in the issuing office (see Part 1-15).
- D. From July 27, 1990, proposal evaluation will begin.
- E. A site visit at the offices of the NCCI on July 10, 1990 (see Part 1-17). The purpose of the site visit is to allow bidders to obtain information on the data systems and procedures of the NCCI.
- F. Oral presentation if required will be scheduled during the period August 21 to August 23. Since this will require coordination of evaluation committee members from four states and the NAIC, respondents should be prepared to attend on relatively short notice.
- G. Notice of the Department decision will be posted on August 24, 1990 in the issuing office (see Part 1-15).
- H. Following the evaluation negotiations and necessary concurrences between the Department and successful respondent, a contract award will occur.

1-9 Proposal Content and Signature

To facilitate an objective review, eleven (11) copies of the proposal will be required with a separately sealed cost proposal. All copies must be signed by a company official with power to bind the firm to its proposal for a sixty (60) day period. To be considered, all proposals must be completely responsive to the RFP.

1-10 Proposal Preparation

All respondents will provide a straightforward and concise description of their ability to meet RFP requirements (see Part IV). The

proposal must specify the approach to the development (i.e., computer programs, tables, reports, etc.) of the final product.

1-11 Prime Responsibilities

The selected respondent will be expected to assume responsibility for all services offered in his proposal. The selected respondent will be the sole point of contractual matters including payment of any and all charges resulting from the contract.

1-12 Project Control

Control of the project shall remain the total responsibility of the Department and the other participating departments.

1-13 Rules for Proposal

The signer of the proposal must declare that the only person, persons, company or parties interested in the proposals as principals, are named therein, that the proposal is made without collusion with any other person, persons, company or parties submitting a proposal, that it is in all respects fair and in good faith without collusion or fraud, and that the signer of the proposal has full authority to bind the principal.

1-14 Regulations

The selected firm or individual will be required to comply with all applicable State of Florida regulations and contract provisions. The ensuing contract shall contain such contractual provisions or conditions necessary to define a sound and complete agreement and to satisfy state regulations and statutory requirements of the Department.

1-15 Proposal Submission

The proposal must be submitted (per schedule in Section 1-8) to Ina Boykin, Purchasing Director, G-59 Larson Building, Tallahassee, Florida 32399-0300 telephone (904) 488-4984.

1-16 Proposal Timetable

The final report for the project may be completed on a section by section basis. The final report for Section III Practical Considerations in Implementing a Loss Cost System shall be submitted by November 15, 1990. The final reports for Sections I and II shall be submitted no later than May 15, 1991. If the respondent can complete reports sooner, then this should be noted in the proposal.

1-17 NCCI Site Visit

A site visit at the offices of the NCCI at 750 Park of Commerce Drive, Boca Raton, Florida, is scheduled for July 10, 1990, beginning at 9:00 a.m. The purpose of the site visit is to allow bidders to obtain information on the data systems and procedures of the NCCI. NCCI personnel will be available to answer questions at this meeting. Any other questions concerning the RFP should be submitted to Bob Klein in accordance with Part 1-6.

PART II INFORMATION REQUIRED FROM RESPONDENTS

Proposals must be submitted in the format below:

2-1 Organization and Credentials

Provide a listing showing all persons who will work on the project along with their experience and qualifications. Any work for the NCCI by any person who will be involved in this project over the past 5 years should be clearly noted and explained. Any potential conflict of interest arising out of current or past work performed for the NCCI by the respondent or any subcontractor should be clearly noted and explained. Also, provide an estimate of the number of hours per week that each person would be available. A separate listing should show those persons who would participate on a peer review basis as opposed to being active in the research or drafting of the reports. A separate section should show the computer hardware and systems capabilities that will be used in the project.

2-2 Respondent's Understanding of the Project and Workplan

Provide a precise rendering of the respondent's understanding of the project.

2-3 Subcontractors

Identification of any contemplated subcontractor(s) is required, with identification of personnel to be assigned, their qualifications, and experiences and specific details of how the subcontractor(s) will be used, the work products the subcontractor(s) will produce and the costs for these services.

2-4 Services of the Department, Other Participating Departments, the NAIC and the NCCI.

Respondents should indicate any data they might require from the NCCI or other sources as well as assistance anticipated from Department, other participating departments or the NAIC in acquiring such data.

2-5 Cost Proposals

A Cost Proposal attached to the eleven (11) copies of the proposal must be separately sealed and submitted to the Department utilizing the standard form attached to this RFP and in accordance with the provisions outlined in Part I of this RFP. A separate cost form should be submitted for each of the following parts of the project: Section I.A.; Section I.B.; Section II.A.; Section III; and under Section II.B. each of the following: 1a, 1b, 2a, 2b, 2c, 2d, 2e, 2f, 3a, 3b, 3c, 3d, 3e, 3f, 4a, 4b, 4c, 5a, 5b, 5c, 5d, 6a, 6b, 7a, 7b, 7c, 7d, 8a, 8b, and 8c. A separate cost form should show a consolidation for the entire project. Costs should be based on the hourly fees of required personnel clearly stated and the anticipated hourly involvement of such personnel.

2-6 Additional Information and Comments

Comments under this heading are encouraged and left to the discretion of the respondent. Material should be pertinent to the proposal but not otherwise required in the RFP.

PART III PROPOSAL REVIEW/CRITERIA FOR SELECTION

3-1 Submission

Proposals will be submitted initially on the most favorable terms from both technical and cost standpoints. The date and time of submission (see Part I, 1-8) will be strictly adhered to.

3-2 Proposals for Specific Parts of the Examination

The overwhelming preference is to award the contract to one entity for the entire project. The reason for this preference is the interrelationship between the various sections of the examination. Information or insight gained in one part of the examination could prove to be crucial to other areas of the examination. However, proposals to perform specific part(s) of the project will be accepted. The burden will be on the respondent to explain why and how the project can be performed by several providers and integrated into one final project.

3-3 Proposal Review

The proposals will be reviewed and necessary negotiations conducted by the Department, other participating departments and NAIC personnel. Oral presentations may be required to assist in the final selection of proposals.

3-4 Evaluation

Proposals will be evaluated and the respondent selected on the following criteria with a maximum possible total points of 100.

Weighting Factors for Evaluation of Proposals:

<u>Points</u>	<u>Weighting Criteria:</u>
15	A. The quality of the proposal submitted and the demonstrated understanding of the nature of the analysis and report required.
10	B. Time frames for completion of research and delivery of final reports.
20	C. Cost factors.
	D. The quality and adequacy of the team assembled, including computer hardware and system capabilities, to perform the underlying research and draft of the report(s). This involves consideration of the factors shown under D.(1), D.(2), and D(3). The total points

allowed for D. is 55 which is composed of 20 points for D.(1), 20 points for D.(2) and 15 points for D.(3).

- 20 (1) The experience and qualifications of the team to undertake the examination specified. The number of highly qualified persons who will be active in the research and drafting of the portions of the report relating to ratemaking and experience rating formula, as opposed to merely reading later drafts as a form of peer review. Any material conflict of interest arising out of current or past work performed for the NCCI.
- 20 (2) The number of hours per week that will be available from highly qualified persons, as well as from necessary support staff, and the computer hardware and system capabilities.
- 15 (3) The adequacy of peer review procedures. Any material conflict of interest arising out of current or past work performed for the NCCI.

100 Total Points

PART IV WORK PRODUCT REQUIRED

This examination stems from a recommendation by the NAIC's Workers' Compensation Advisory Organization Activities Working Group. The working group studied the issue of implementing a "loss cost" system in workers' compensation similar to the system being implemented in the other property-casualty lines. Under a loss cost system, advisory/rating organizations are prohibited from filing final rates but they are allowed to file "prospective lost costs" which include adjustments for development and trend.

In December of 1989, the NAIC adopted that working group's resolution which said that its present belief was that workers' compensation should not be treated differently from the other property-casualty lines with respect to permissible activities of advisory/rating organizations. However, some group members expressed concerns about the impact of a loss cost system on the marketplace as well as concerns about the performance of advisory/rating organizations within workers' compensation which would not be resolved by implementation of a loss cost system. Consequently, the group deferred recommendations on the specific details of the system to be implemented until the completion of two studies: 1) a staff economic analysis of the likely impact of a loss cost system on state workers' compensation markets; and 2) a comprehensive examination of the structure and operations of the National Council on Compensation Insurance (NCCI) conducted under the examination authority of the four states.

The purpose of this examination is to thoroughly evaluate the data collection and processing activities of the NCCI as well as certain aspects of its ratemaking activities. The examination also is intended to review the practical considerations with respect to the NCCI's operations involved in implementing a loss cost system. While the examination will be conducted under the authority of four states, it is intended to address issues of general concern to all state insurance regulators.

The examiners will be expected to fully document current NCCI procedures, evaluate the adequacy or appropriateness of those procedures, and where possible, present possible alternative approaches and the practical effects of those approaches. The examiners also will be expected to use the results of previous NCCI examination reports where possible to the extent that the results of those examinations can be verified.

The final product of the examination should be a comprehensive and detailed report that will provide insurance regulators with a good understanding of NCCI procedures as well as ideas on how those procedures might be improved. In addition, the report should identify the practical questions that would be associated with the NCCI's transition to loss costs and discuss how those areas might be handled. The report should enable insurance regulators, individually and collectively, to make specific recommendations on the features of the system that would be implemented as well as other improvements to the data collection and analysis services provided by the NCCI.

Section I. Data Collection and Data Quality

A. Description of NCCI's Data Collection and Data Handling Procedures

The consultant will be expected to fully document the NCCI's data systems by either verifying information produced by NCCI or creating documentation where necessary. The final work product will completely document the NCCI data systems from input documents to final data bases. As a general introduction to data collection, the consultant should include responses to the following:

- . What types of data does the NCCI collect?
- . What is the purpose for collecting each type of data?
- . How are the data obtained from insurers and processed into a data base?

For each statistical call, the following should be shown:

- . The fields that are entered on computer systems from the source document;
- . The edits performed on each field;
- . How errors are handled and how corrected fields are integrated into the data base.
- . Any modifications to the data from the source document;
- . A list of all data bases and fields within the data base that come from the statistical call.

Also, for each data base there should be provided a list of all fields, the source of each field, an indication of how long the data are maintained and a discussion of how the data base are used.

B. Evaluation of Data Collection and Data Quality

The consultant will be expected to evaluate NCCI data collection, data handling procedures and the quality of the NCCI data. The consultant should make suggestions for improvements in any of these areas. Part of this analysis should be accomplished by sampling actual transactions and testing computer programs within the NCCI. Answers to each of the following questions should be included in the final work product:

- (1) How accurate is the data base? Are adequate quality control procedures in place to ensure the accuracy of the data as they are reported by insurers and processed by the NCCI? How could these procedures be improved?
- (2) Does the NCCI reconcile data collected for ratemaking purposes with the data reported in insurers' annual statements? If so, how are these data reconciled and what is done when these data do not match? Are there additional reconciliation measures that could be beneficial?
- (3) Does the NCCI have adequate procedures to ensure that classification data are complete and accurate? Are additional checks of the data performed when unusual classification indications appear? Does the NCCI check to be sure that insurers report reimbursements by second injury funds, subrogation and funds associated with cases determined to be noncompensable?
- (4) What quality controls are used to ensure the accuracy of data collected under a detailed claim information call?
- (5) Are the data collected and maintained in such a way that the experience from a specific policy can always be traced? If not, how could this be accomplished? Are the data for risks in the residual markets maintained in such a way that the experience can be compiled separately for the residual market versus the voluntary market?
- (6) Is sufficient information collected and maintained to test and implement reasonable alternative ratemaking methodologies? If not, what enhancements could be made to support alternative methodologies and identify the underlying causes of rate increases?
- (7) Do the NCCI's data gathering procedures ensure that the data base is not distorted by schedule rating?
- (8) What kinds of data on insurer expenses are collected and how are they processed and maintained? What controls are in place to ensure that insurers' reporting of expenses is reasonable and accurate? Are there ways in which the reporting of expense data could be improved to make it more suitable for ratemaking? Is separate information on the cost of loss prevention services collected, and if not, could it be collected?

Section II. Ratemaking Procedures

A. Description of NCCI's Current Ratemaking Procedures

The work product must include a thorough and technically complete description of the procedures and formulas currently used by the NCCI in

producing manual rates and experience rating values. When more than one procedure is sometimes used (i.e., where the NCCI may base its rate change upon policy year incurred losses, with or without incurred but not reported losses (IBNR), or upon paid losses; or where they may average differing numbers of years, etc.), describe the different procedures and describe how the NCCI chooses among them. In areas, if any, where the NCCI will often deviate from their "normal" procedures, note whether these deviations are usually reasonable responses to unusual situations where "normal" procedures would be likely to produce inaccurate results. Describe the assumptions made by the NCCI in their procedures and describe the means used by the NCCI to verify these assumptions.

B. Evaluation of Ratemaking Methodologies

Note: Within the ratemaking methodology section, priorities of "A", "B", "C" or "D" are assigned to each question. The grading corresponds to the depth to which a topic is to be covered, with "A" topics being most important. Answers to "A" priority questions should be detailed and of such quality that they may be used to advance the "state of the art". Answers to "D" priority questions should be the highest quality answers that can be obtained at a moderate cost. As such, limitations to the responses to "D" priority questions are acceptable due to the time and cost that would be necessary to cover every possible issue in the topic area. Questions with "B" and "C" priorities should receive intermediate treatment.

Comments have also been made with regard to the extent of original research which is expected to be most appropriate. These comments are presented as an attempt to be helpful, but should be interpreted as guidelines only.

1. Premium and Loss Development Factors

While the selection of link ratios and the calculation of development factors is often considered a purely mechanical process, differences of 5-10 percent in the estimated ultimate losses for a recent policy or accident year are common between different loss development methods. In addition, differences of opinion in the selection of link ratios can occur within the same development format. Past experience has clearly shown that misestimations in this regard are only compounded by trending, because indicated trends are heavily influenced by the most recent point or two, which are those points most heavily distorted by excessive or inadequate loss development. In this context:

- (a) Evaluate the NCCI's premium and loss development techniques. Would the use of more years of data or of multistate data, with appropriate adjustments, produce superior results? Are there other techniques or improvements to current techniques that would be appropriate?

(Priority: "A". Past experience in this regard should be tabulated and reviewed. An attempt should be made to discern what differences might be appropriate for larger vs. smaller states.)

- (b) The NCCI uses different formats for loss development from state to state and from year to year. Paid losses through the 8th report may be used one time as a basis, the next time incurred losses excluding IBNR may be used, etc. The use of multiple techniques is common and considered good practice in many types of reserving applications. The results of different techniques, which normally differ, can be studied to gain insights relating to the underlying assumptions used with each technique. Evaluate the NCCI's procedures for reconciling the differences which occur between different development techniques and evaluate the effectiveness and likely accuracy of the criteria which they use to choose one format over another.

(Priority: "B". The nature and quality of NCCI analytical techniques and whether they are reasonably followed should be examined here. Original research should largely be confined to that which is relevant to answer question 1(a). It is not the intent of this question to focus on whether any sort of bias from state to state occurs, although it should be covered if an overt tendency becomes apparent.)

2. Expenses

There is some question as to whether the expense loadings filed by the NCCI are consistent with the actual experience of their member insurers. Several factors complicate this analysis including premium discounts, the interplay of stock versus non-stock discounts, the consideration of stock only expenses in some instances and not in others, plus the impact of expense constants and minimum premiums.

- (a) Does the current NCCI expense methodology tend to load more or less expenses in the overall rate level than are actually expended by insurers using stock discounts in NCCI states? If there are biases or inaccuracies, what is their source and their effect?

(Priority: "A". A detailed analysis of the NCCI's expense methodology for insurers using stock discounts should be performed.)

- (b) What would be the incremental cost of collecting allocated loss adjustment expense (ALAE) on a unit basis. Discuss the pro's and con's of having this level of detail available versus what is now available. Also, discuss whether it would be more cost efficient to collect this on a more limited survey basis, or only specific areas where problems may exist such as retrospectively rated risks and residual markets. (In these two situations, there is little economic motivation for an insurer to defend claims.)

(Priority: "A". We are aware that the NCCI has been presented with this question in the past, so it is likely that some degree of documentation may exist for the consultant to start with. Consider the costs to insurers as well as to the NCCI with this question.)

- (c) When a state's premiums and rates grow at approximately the same rate as is occurring on a national basis, it is reasonable to expect a proportional increase in the expense loading for the individual state. However, when a state's proposed rate increase considerably exceeds the national average, is it reasonable to assume that expenses increase proportionally for the state? Should large state rate increases be tempered because of less than proportional increases in expenses?

(Priority: "C". No individual research is required here. The response to this question should be well reasoned and offer, if possible, suggested changes to current methodologies.)

- (d) Discuss the advantages and disadvantages of using a budgeted approach to acquisition expenses versus basing these factors on actual expense experience.

(Priority: "C". No individual research is required here. The response to this question should be well reasoned and offer, if possible, suggested changes to current methodologies.)

- (e) Traditionally, mutual insurers utilized a non-stock discount and collected a higher premium than stock insurers. In return, however, mutual insurers following this plan would also return generous dividends which resulted in net premiums that were lower than for stock insurers. The workers compensation market has since evolved into a much more complex mechanism and the consultant should examine whether the original assumptions which supported the existence of dual expense discounts still exist. Are the higher rates collected by insurers utilizing non-stock discounts fully returned in the form of higher dividends than are paid by insurers utilizing stock discount tables? In addition, are lower expenses, if any, experienced by insurers utilizing non-stock discounts also returned in the form of higher dividends? (The analysis should be restricted to NCCI states as it relates to dividends, as a high portion of countrywide compensation dividends are paid in California, which is a non-NCCI state.)

(Priority: "B". It is presumed that the NCCI can provide expense data compilations sufficient to address this question. A degree of imprecision due to the effects of company groups would be acceptable. Basically, this question presumes that the consultant will design requests for compilations to be performed by the NCCI and that the consultant will report on the indications resulting from these compilations.)

- (f) Review premium discounts (stock and non-stock) and expense constants to determine whether the relative expense loadings are equitable for all sizes of risk. (Consideration of minimum premium size risks may be excluded here as they are the subject of a broader question under the "Miscellaneous" heading.)

(Priority: "D". The NCCI has studied these factors from time to time. Review this material and report on it.)

3. Trend

In most jurisdictions, losses have increased more quickly than wages and it is necessary to apply trend factors to losses in order to generate adequate rate level indications. Because these trend indications have often been quite large, there is some question of the NCCI trend factors even when past results on a national basis would seem to indicate that trend factors have not been excessive. In addition, the NCCI also appears to project past trends into the future without offset for any legislation attempting to mitigate the increase in workers compensation claims.

- (a) Are there any expected biases or errors present in the NCCI's general trending procedures? If so, discuss their impact.

(Priority: "A". This should be an in-depth and refined analysis of the procedure and techniques.)

- (b) Would more accurate trending be likely with a different model or with revisions to the current model?

(Priority: "B". This is an extension of question 3(a).)

- (c) Are adequate adjustments made to projections by the NCCI's trend model when significant legal or economic changes occur on a state or national level?

(Priority: "C". Traditional actuarial trending procedures presume that future loss trends will continue to be similar to past loss trends. This presumption loses validity, however, when recent legal or economic developments intervene. In response to this question, examine the extent to which the NCCI brings such events into consideration and whether this appears to be adequate.)

- (d) Contrast the current model, which puts all losses to a current benefit level, to a model which puts all past losses to the same "relative" value of prospective benefits. (In other words, if the prospective min/max benefit level and state AWW were \$100/\$300 and \$320, respectively, then no adjustment would be made to past losses if the past values were \$80/\$240 and \$256. This method would apply a steeper trend line to a lower historic loss level.)

(Priority: "D". Examine the two approaches from a theoretical point of view. No original research is expected.)

- (e) The NCCI determines the overall impact of all classification rate changes combined based on the three years of payroll used in the filing at that time. If the mix of business in a state changes over the years, this estimation of the effect of a past rate filing as it would relate to the current mix of classifications may be distorted. Estimate the likely magnitude of these distortions and discuss whether an improved procedure would be warranted.

(Priority: "D". It is presumed that the NCCI can produce data runs for a sampling of states and years so that the likely magnitude of any distortions can be examined. It would be expected that the consultant would provide the specifications for the NCCI to produce such data and that the consultant would review and comment on the results.)

- (f) The NCCI brings past losses to a current benefit level by multiplying the various law change factors estimated at about the time the law changes went into effect. Is this an accurate method?

(Priority: "D". Examine this from a theoretical point of view.)

4. Classification Ratemaking

There is a significant concern that current classification ratemaking procedures may be significantly less accurate than would be possible using more years of data and an improved methodology. There are often significant swings in class rate relativities from year to year when there is no reason to expect that underlying loss expectancies are changing so rapidly. An optimum ratemaking procedure should give the weight to state class experience that would be most likely to produce accurate estimates of future losses.

- (a) Study the NCCI's current scheme of credibilities and their practice of using three years of data as a sole indicator for most national pure premium indications and as a basic unit for determining pure premiums at the state level. (We recognize the implicit weight given to older years of state data where credibilities of less than 100% are used.) For different types of loss and different expected loss volumes, determine whether class rating accuracy could be improved through the use of more years of data, different credibilities, or both. In addition, determine whether superior results would be expected using maximum loss size limitations that vary as a function of the total expected losses by class, by state, with adjustments made to recognize the effects of these differing limitations.

(Priority: "A". While the NCCI would be expected to do the data compilation necessary to address this question, a thorough response will require a significant level of original research to be performed by the consultant. It is expected that the response to this question may involve more effort than that required to respond to any other ratemaking question.)

- (b) Could the NCCI's procedure for determining industry group relativities be enhanced by utilizing more years of data (with appropriate recognition of apparent trends)? How would this vary between large states and small states?

(Priority: "C". The NCCI would be expected to do the data compilation necessary to perform this analysis.)

- (c) In their classification ratemaking, the NCCI applies loss

development and benefit level adjustments to individual years of data, but applies a single trend factor to all three years of experience combined. Should the NCCI adjust losses to a current (or common) level by trending individual years separately rather than by applying an aggregate trend factor to all years combined?

(Priority: "D". It would be expected that this question would be approached from a theoretical point of view. If it was felt that a change would produce superior results, then the likely degree of improvement, plus any practical considerations, should be discussed.)

5. Determination of Rate Changes Due to Statutory Revisions

- (a) Review NCCI's procedures for determining expected loss changes due to changes in weekly benefits, waiting periods, escalation provisions and medical fee schedules to see if they would be expected to yield fair estimations.

(Priority: "A". A technically complete analysis of this question should be provided.)

- (b) Should the 1973 Standard Wage Distribution Table be updated?

(Priority: "C". The consultant should structure a test of indemnity losses to see if they are reasonably consistent with expectations from the 1973 table. If the NCCI has undertaken studies of this question, use them to the fullest extent possible.)

- (c) Discuss the manner and anticipated or observed effectiveness of the NCCI when presented with non-formula type law changes. Could NCCI's performance in this area be practicably improved?

(Priority: "C". Examine a sampling of recent situations where this has occurred and evaluate the NCCI's performance.)

- (d) Should different wage distribution tables be determined for major classification groupings, instead of for all occupational groups, so that differences in the job mix from state to state may be recognized?

(Priority: "D". The differences in average wages from state to state will be attributable in part to different mixes of industry as well as different overall wage levels. Without significant research, except to examine any studies which the NCCI may already have available, attempt to determine whether this is an area which warrants the extensive work which it would require to have multiple wage distribution tables.)

6. Alternate Exposure Bases

There has been significant discussion and controversy over total payroll as an exposure base for workers compensation. The controversy involving man-hours as an exposure base has largely

subsidized, but plans involving recognition of the wage rate(s) at which total payrolls are earned appear to offer the hope of more equitable rating. The consultant should largely restrict themselves to a study using data culled from previous studies, thereby avoiding the need to collect original data.

- (a) What degree of improvement could be expected from a rating system that recognized the wage rate (if available) in addition to total payroll?

(Priority: "A". The consultant should conduct a thorough review of the research which already exists relating to this question.)

- (b) Discuss the additional expenses that would be expected to result from the administration of a system utilizing this additional information.

(Priority: "B". A rating system that utilized both wage rates and total remuneration might require additional recordkeeping by employers, more time for insurer audits, and additional data elements for the NCCI and its member insurers. Estimate the magnitude of these additional costs.)

7. Experience Rating Formulas

The work product must include a thorough and technically complete description of the formulas currently used by the NCCI in their production of experience rating modifications. This should include a description of interstate and intrastate experience rating as well as a description of experience rating formulas both before and after NCCI's revised experience rating plan (RERP) filing. LRAP, schedule rating and miscellaneous state exceptions should be omitted.

- (a) Is the NCCI's RERP experience rating actuarially sound? Specifically, are there significant tendencies for the formulas to produce debits or credits such that it could reasonably be predicted that groupings of risk by any combination of classification, risk size or modification range would be likely to have excessive or inadequate rates? What changes could be made to lessen these deficiencies?

(Priority: "A". A thorough analysis of the study done by NCCI to develop RERP should be completed. Additional data should be requested, if necessary, to verify the action of RERP.)

- (b) To what extent, if any, would experience rating be expected to be more accurate if more than three years of data were used for experience rating? Specifically consider whether five years would be superior, as insurers report unit data through fifth report. Discuss additional costs, if any, that might be applicable from the use of five years of data versus three.

(Priority: "B". Data provided by the NCCI should be tested to determine if the addition of two more years of data would tend

to produce more accurate experience rating. If it would, it would be necessary to examine what additional costs would be incurred by the NCCI to use five years instead of three.)

- (c) What credits would be indicated for loss free risks that were less than the minimum size to be eligible for experience rating? To what extent would it be indicated and practicable to debit small risks for higher than expected losses?

(Priority: "B". The consultant should analyze experience runs produced by the NCCI according to specifications provided by the consultant. The consultant should evaluate whether it would be feasible to provide some degree of credits for small risks that had no losses or very low loss ratios if it could be done without endangering rate adequacy.)

- (d) Are the formulas used to calculate ELR's and "D" ratios sound? Does the NCCI method of introducing RERP tend to result in a revenue increase?

(Priority: "C". Examine current techniques to see if they are appropriate.)

8. Miscellaneous

- (a) Compare the expected loss and expense ratios of minimum premium insureds to those for all classes of insureds combined.

(Priority: "B". It would be expected that the NCCI would be able to generate the data that would be necessary to address this question. The consultant should analyze data runs produced by the NCCI according to the consultant's specifications.)

- (b) What recognition does NCCI give to additional premiums expected to be collected from surcharges imposed on policyholders in residual markets? As these markets increase or decrease, is this expected change in revenue recognized?

(Priority: "C". Examine recent filings made by the NCCI to answer this question. Examine filings where surcharge plans are introduced as well as filings where surcharges are in place to determine whether NCCI filing procedures adequately recognize this additional income.)

- (c) Does the NCCI ratemaking formula accurately account for any off-balance due to the experience rating plan? Does the NCCI adequately adjust expected loss ratios (ELR) and "D" ratios to maintain the off-balance at a reasonable level? What improvements could be made in the NCCI's procedures regarding the off-balance in the experience rating plan?

(Priority: "C". Examine NCCI procedures carefully to check for their apparent balance.)

Section III. Practical Considerations in Implementing a Loss Cost System

Under the system adopted by the NAIC for the other property-casualty lines, advisory organizations are allowed to do much of what they had done previously, short of filing final rates. Advisory organizations are allowed to collect historical loss information from insurers, adjust these data for development and trend, and distribute or file this "prospective" loss cost information with the commissioner. Advisory organizations also are allowed to develop and file supplementary rating information, rating manuals (excluding final rate pages) and policy forms and endorsements. Insurers are required to determine individually, their own expense and profit factors and file their final rates. Insurers' rate filings can reference, if necessary, the prospective loss cost and supplementary rating information filed by the advisory organization. This approach seeks to promote competition and maximize benefits to consumers by preserving efficiencies gained through the joint collection and analysis of loss information, while enforcing independence in the areas of expenses and profits which should be based on each insurer's specific methods of operation.

The examination should address the practical considerations involved in implementing a loss cost system on a national scale in workers compensation insurance. In other words, how should the NCCI's activities be modified to accommodate a loss cost system similar to that which is being implemented for the other lines? This question also encompasses how member insurers would be allowed to use NCCI information in making their own rate filings. To the extent possible, the consultant should use the system being developed for the other lines as a model but also should consider areas where workers' compensation may require different treatment. In this analysis, the consultant also will be expected to review how the NCCI and member insurers operate in states that currently have a loss cost system for workers' compensation.

The consultant's analysis should consider, but not be limited to, the following areas:

- . minimum premiums
- . rating plans
- . premium discount plans
- . schedule rating plans
- . expense constants
- . experience rating systems
- . policyholder dividend plans and practices
- . retrospective rating plans
- . anniversary date rating rules
- . other rate-related rules
- . distribution of expense data to insurers

In addition to these areas, the consultant should evaluate whether any changes

should be made to Part III of the Insurance Expense Exhibit and the approval of rate changes for policies already in effect or rate filings with retroactive effective dates in a loss cost environment.

The examination report should analyze the relevant issues with respect to these areas, as well as any other significant areas, and outline the different options that might be taken and their likely consequences. It should be assumed that the NCCI would continue to administer and make rates for the residual market.

NAIC

Examination of NCCI

Section I: Data Collection and Data Quality

Volume II: Description of Data Collection and Data Handling

May 15, 1991



Milliman & Robertson, Inc.

**ARTHUR
ANDERSEN**
ARTHUR ANDERSEN & CO., S.C.

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Volume II: Table of Contents

- 1) Description Of Data Collection And Data Handling
- 2) Glossary Of Terms
- 3) How To Use Statistical Call Data Documentation
- 4) Unit Report Overview Document
- 5) Calendar Year Call For Net Direct Written Workers Compensation Premium (Call #1)
- 6) Calendar Year Call For Compensation Experience By State (Call #2)
- 7) Calendar Year Call For Assigned Risk Compensation Experience (Call #2A)
- 8) Policy Year Call For Compensation Experience By State (Call #3)
- 9) Policy Year Call For Assigned Risk Compensation Experience (Call #3A)
- 10) Calendar-Accident Year Call For Compensation Experience By State (Call #5)
- 11) Calendar-Accident Year Call For Assigned Risk Compensation Experience (Call #5A)
- 12) Insurance Expense Exhibit (Call #6)
- 13) Call For Premium By Size Of Policy (Call #7)
- 14) Calendar Year Reconciliation Report (Call #8)
- 15) "F" Classification Calendar Year Call For Compensation Experience (Call #9)

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

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- 16) "F" Classification Policy Year Call For Compensation Experience (Call #11)
- 17) Calendar Year Expense Call (Call #14)
- 18) Semiannual Call For Compensation Experience (Call #17)
- 19) Loss Adjustment Expense Call On Countrywide Direct Compensation Business (Call #19)

Note: An appendix to this volume, containing detailed flow diagrams of systems and procedures, is included in a separate binder.

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Introduction:

The documentation in this binder contains information on statistical calls, systems and procedures at NCCI. The statistical call information is contained in the Data Documentation section. The systems and procedures are presented graphically in a series of flow diagrams and in written descriptions of NCCI's functional areas.

There are seven functional areas identified in this documentation. These functional groupings do not necessarily correspond to NCCI's formal organizational structure. The areas represent key operations performed by NCCI in producing rates and experience modification factors. The seven areas, together with their respective flow diagram cross-reference, are:

- o Overall Rate Level (F101).
- o Unit Card Data Conversion (U101).
- o Unit Card Data Administration (A101).
- o Class Ratemaking (C101).
- o Experience Rating (E101).
- o Policy Issue Capture System (PICS) (P101).
- o Detailed Claim Information (DCI) System (D101).

The Description of Data Collection and Data Handling section provides a graphical and written presentation of NCCI information flows. The written descriptions contain cross-references to the flowcharts using index numbers. These cross references appear in parentheses, as shown above, in the text and in the upper right-hand corner of the flow diagrams.

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

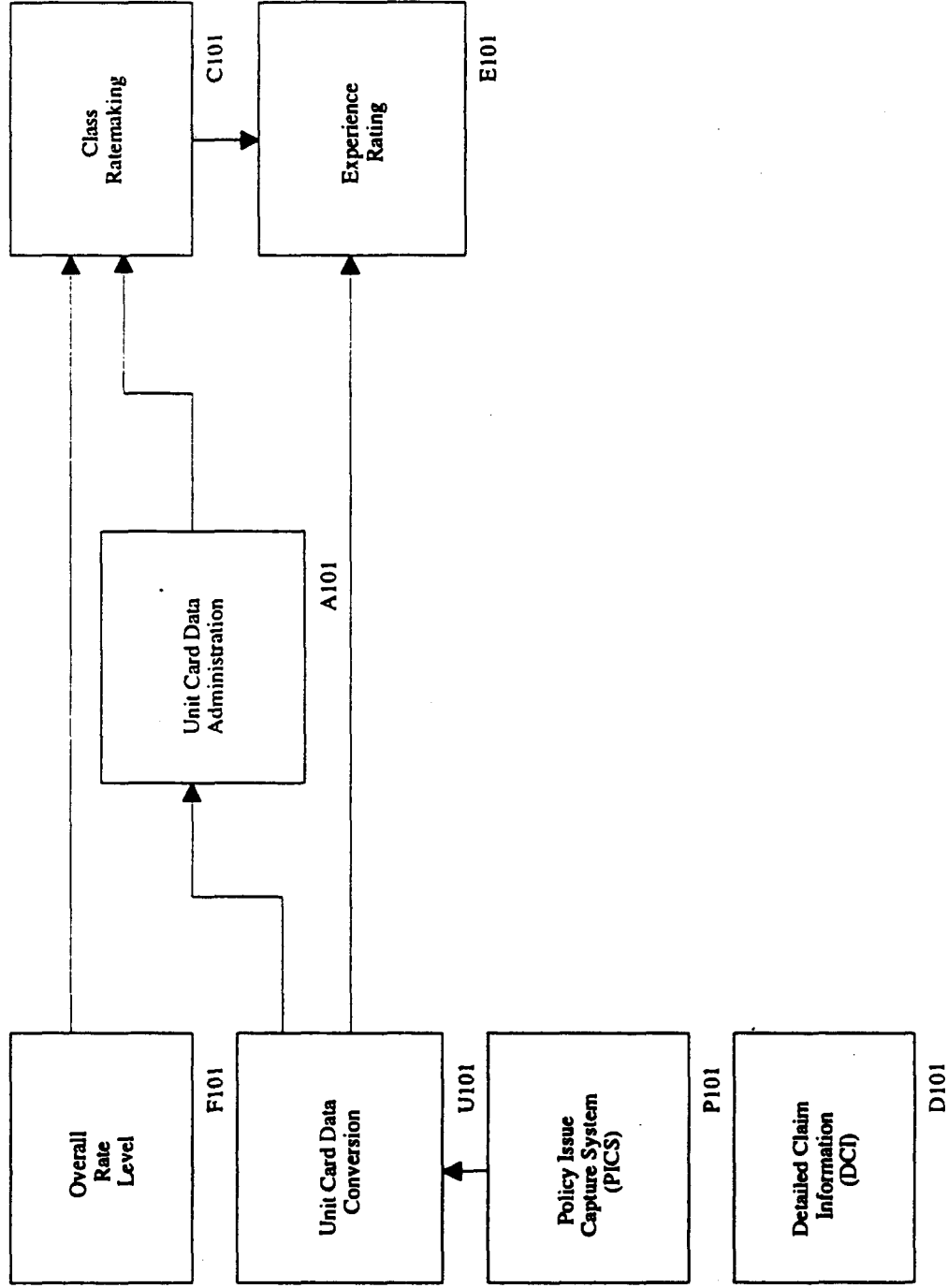
Introduction:

The Statistical Call Overview Documents provide a detailed description of the validation performed on unit report data and on data for fifteen financial calls. This documentation consists of an overview of the purpose and data elements collected in the call, a detailed description of the validation procedures for each element and the contents of key files containing data received on the call.

Only systems, procedures and data that are currently utilized at NCCI have been reviewed in detail. This documentation is limited to functions and data which directly affect the determination of workers compensation rates, experience ratings and detailed claim information. Systems under development are discussed in Volume I of this report.

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

NCCI Overview:



DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

NCCI Overview:

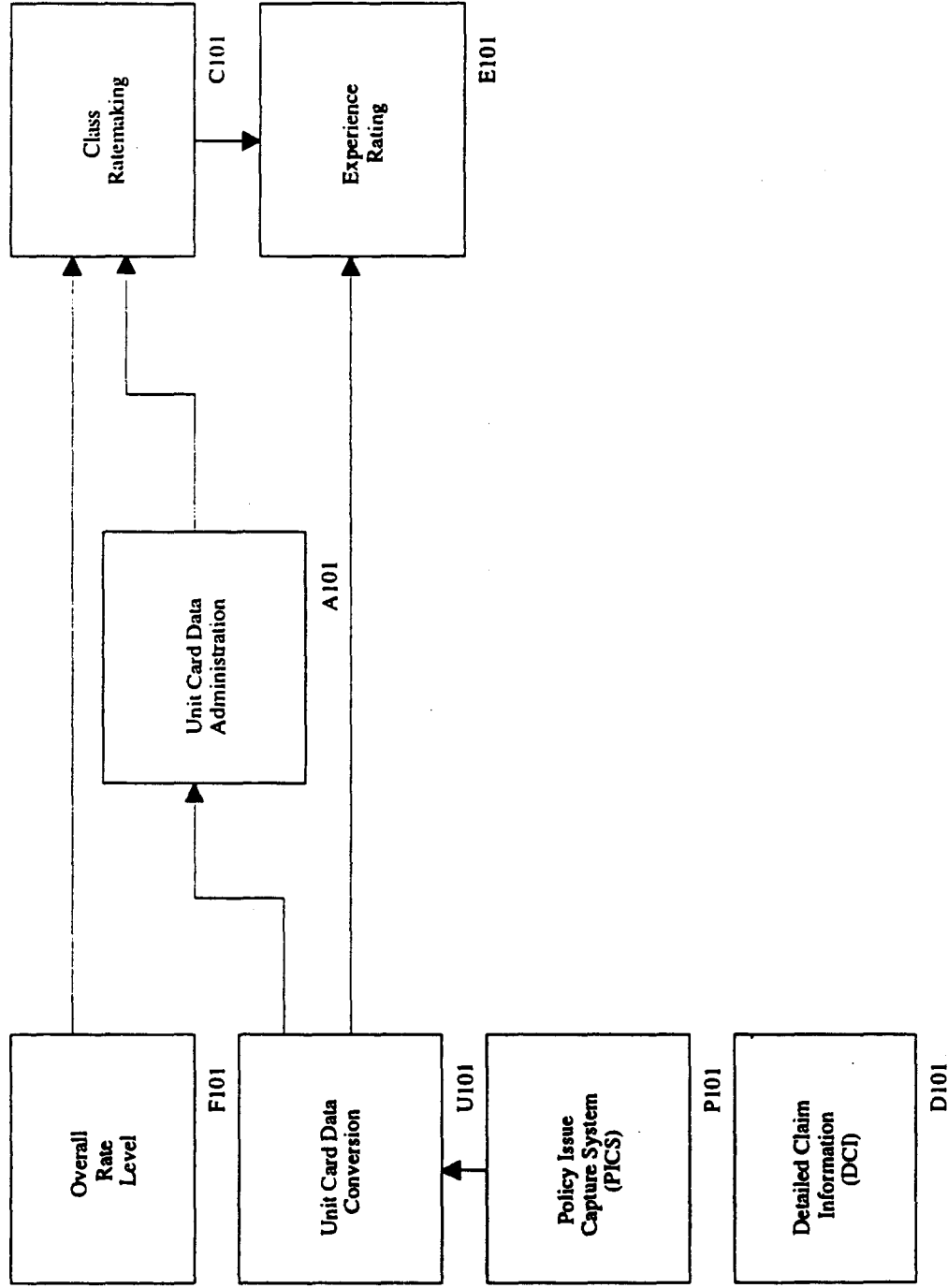
NCCI services the insurance industry by compiling data on workers compensation insurance policies and by developing premium rates and experience modifications for 33 states. NCCI collects premium, payroll, loss and other financial data on standardized reporting forms. This data is validated in a series of manual and automated processes which check accuracy and completeness. Ratemaking functions use the data to produce both overall premium rate levels and premium rates by payroll classification. The experience rating function produces modification factors for premiums based on an insured's historical loss experience compared to the experience of other insureds within the same classification. Additional information supporting these functions is provided by systems which track policy information and detailed claim information.

The processing of data and development of rates at NCCI is accomplished through a combination of manual and automated procedures. Manual procedures are performed at the home office in Boca Raton and in the eight field locations. Automated procedures are executed on both mainframe computers and microcomputers. Data is stored primarily on magnetic tape although some data is retained on-line using database technology.

Overall Rate Level (F101) collects aggregate financial information from carriers on standard forms referred to as financial calls. This data is combined with data from prior years and used to produce an overall rate recommendation for each state. The overall rate level is provided to Class Ratemaking and is included as part of the annual state rate filing.

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

NCCI Overview:



DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

NCCI Overview:

Unit Card Data Conversion (U101) collects detail payroll and loss data from carriers on a standard form referred to as a unit report under the Workers Compensation Statistical Plan (WCSP). Carriers are required to submit a unit report for each year of each policy. Unit reports are collected and maintained for up to five valuation years. All unit report data is sent to Data Administration for validation and correction. Unit report data for experience rated policies is also provided to Experience Rating.

Unit Card Data Administration (A101) receives and inputs all unit report data, sorts and extracts it by state, performs a series of automated and manual validations and corrections, and provides five years of accumulated data to Class Ratemaking.

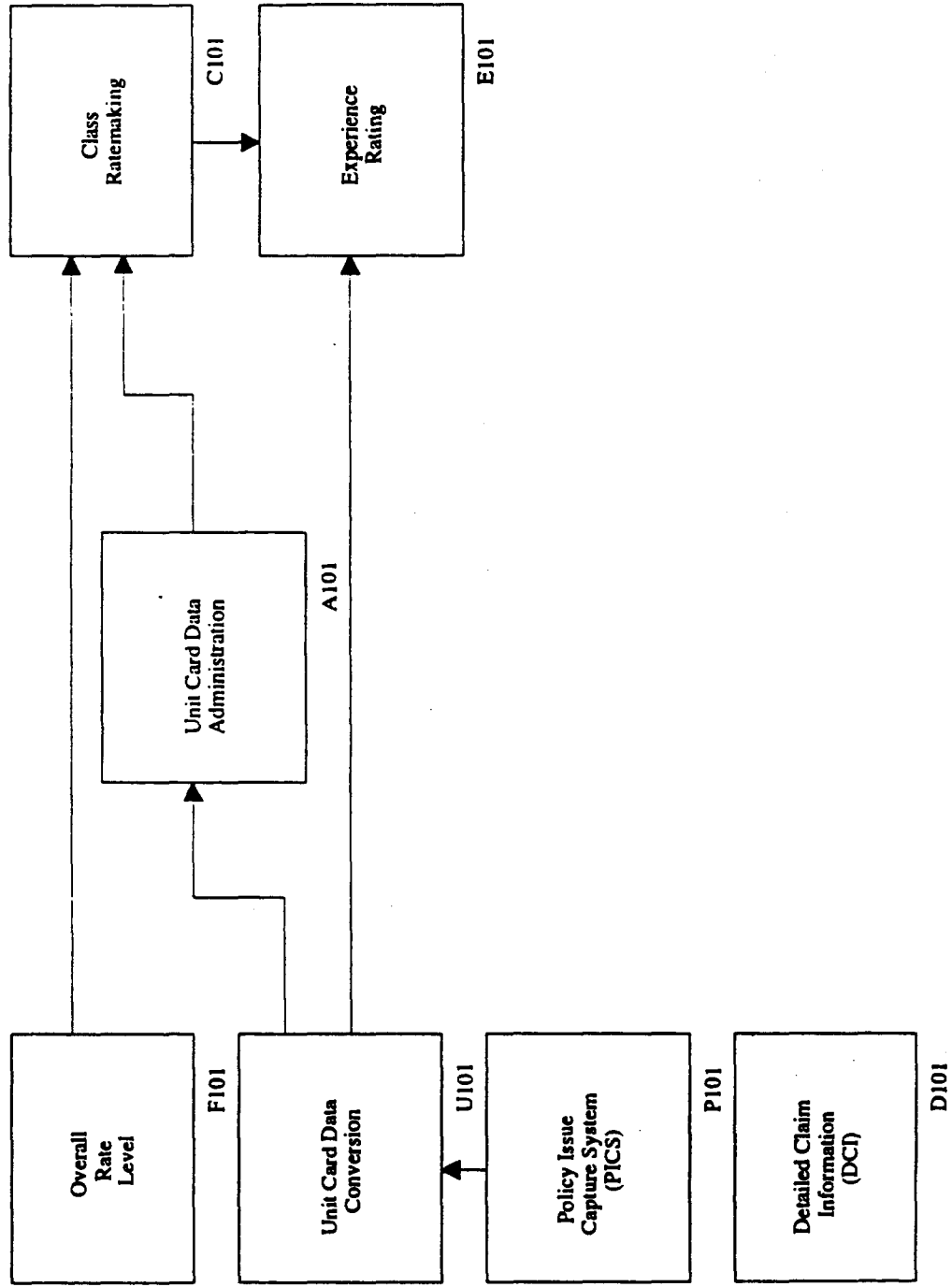
Class Ratemaking (C101) uses the overall rate level and payroll and loss data from unit reports to produce rates by payroll classification code for each state. These rates are included as part of the state rate filings. Class Ratemaking also calculates key ratios which are used by Experience Rating.

Experience Rating (E101) uses key ratios from Class Ratemaking and unit report payroll and loss data to produce experience modification factors (experience mods). These experience mods are sent to carriers and used to adjust an insured's premium.

Policy Issue Capture System (P101) collects workers compensation policy information from carriers. The information is used by both internal and external groups for research purposes.

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

NCCI Overview:



DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

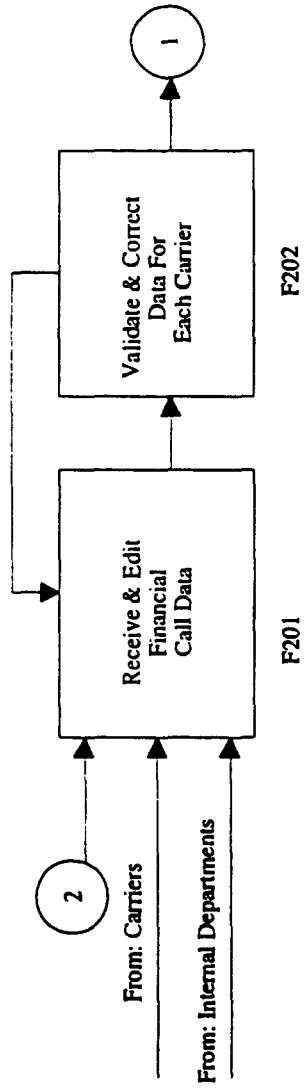
NCCI Overview:

Detailed Claim Information System (DI01) collects expanded detail loss and loss expense information from carriers on calls for detailed claim information. This information is used primarily for research and inquiry purposes to better understand changing workers compensation loss costs.



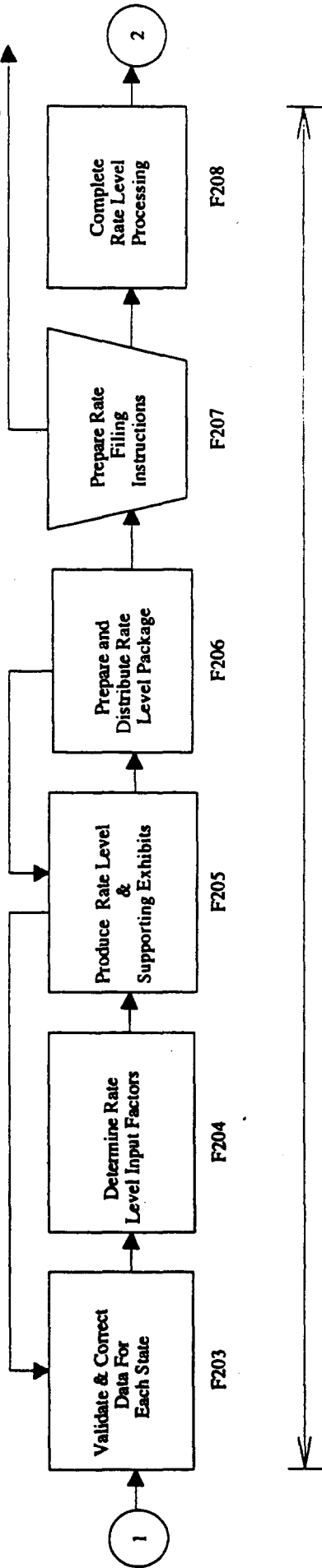
DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Overall Rate Level (E101):



Pre Rate Level Production Processing

To: Class Ratemaking



Rate Level Production Processing

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Overall Rate Level (F101):

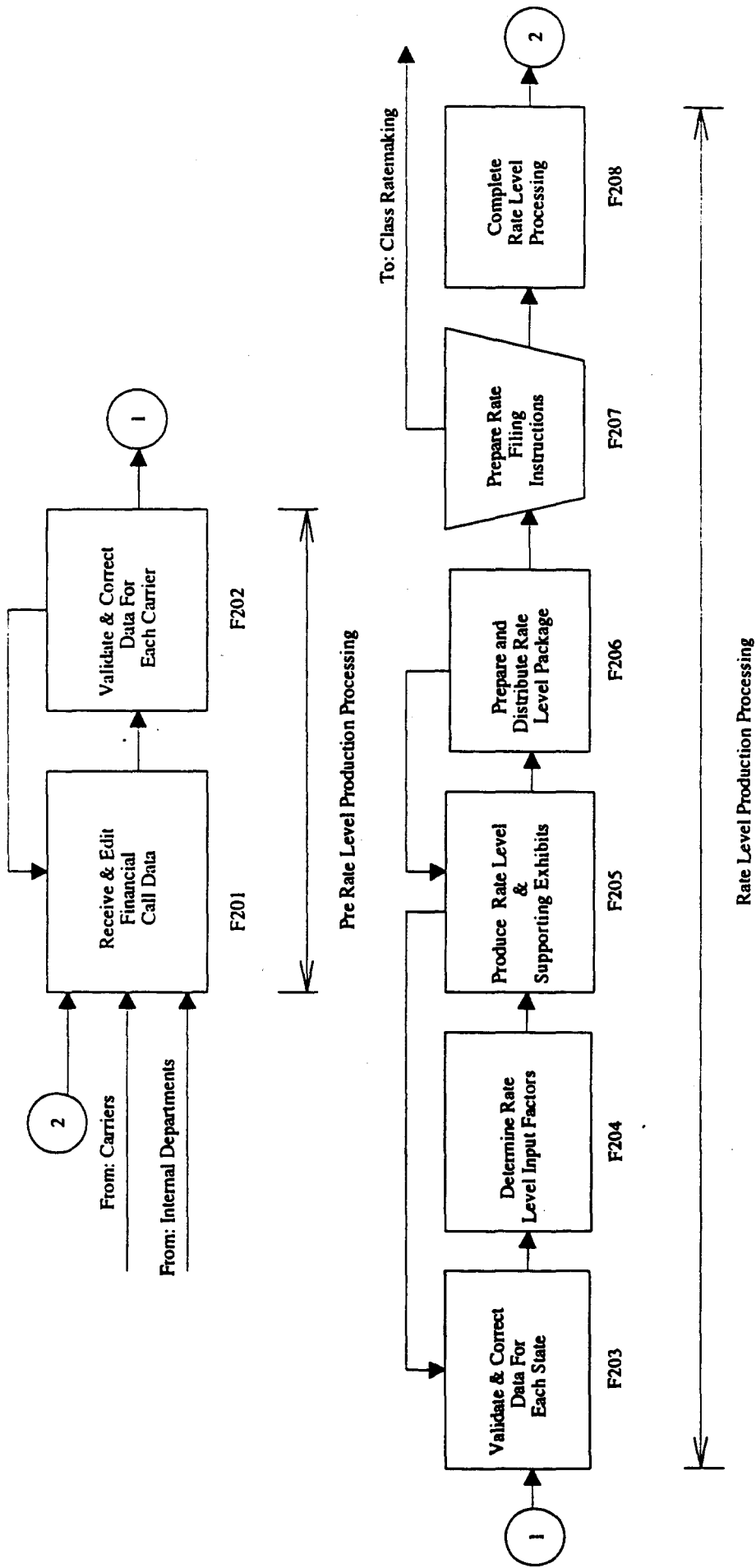
NCCI requests financial information from carriers on 22 annual financial calls and receives about 5,000 responses. The data from three of these financial calls is used to generate aggregate rate level indications. Data from other financial calls is used to reconcile the three calls to carrier financial data compiled by A.M. Best or the carrier, for expense analyses and for certain state specific calculations and regulatory reports.

The Overall Rate Level function encompasses the receipt and processing of the annual calls from the carriers to the generation of aggregate rate levels by state. Within the Overall Rate Level function, the Financial Data area controls the receipt of financial calls (F201) while the Aggregate Ratemaking area produces the overall rate levels (F201 to F208).

Early in the fourth quarter of each year, NCCI sends financial call requests to carriers for premium, loss and other experience that is required for the upcoming year's overall rate level determination. The Financial Data area receives the financial calls and related corrections during the first quarter of each year. Hardcopy financial call data is separated by call, logged in, visually reviewed for completeness and obvious errors, and sent to NCCI's outside data entry firm, Appalachian Computer Services (ACS), for data entry. Entered data is transmitted back to NCCI by modem. The data is subjected to basic system edits. Financial call data received on diskette (FCOD) is processed through a microcomputer application for validation prior to being uploaded to the mainframe.

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Overall Rate Level (F101):



DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Overall Rate Level (F101):

Data rejected at this point is either returned to the carrier for correction, or corrected internally and reprocessed by ACS. (F201)

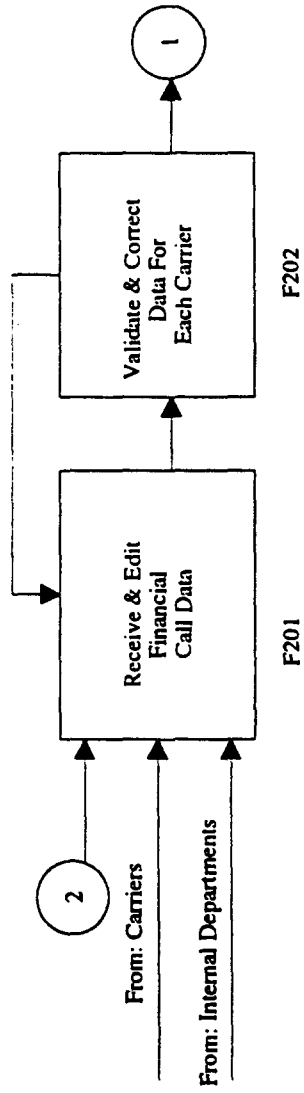
After initial edits are performed and corrections made, Aggregate Ratemaking runs several validation programs known as "Batch Validation". These programs perform reasonableness checks on accident year and policy year information, compare certain calls for consistency of similar data elements, compare certain fields to calculated equivalents and perform general data edits on an individual carrier basis. An NCCI employee reviews the reports generated and corresponds with the carriers to resolve any identified errors. If a correction applies to a state that is not yet in final rate level production, the corrections are routed through the Financial Data area and keypunched by ACS. If final rate level production has begun, corrections are forwarded to the Aggregate Ratemaking area for entry. (F202)

Aggregate Ratemaking begins the final rate level production process for a state by extracting the state's financial call data for the three most recent years and creating a state library file. A series of validation programs, known as "State Validation" programs, are applied to this file. This validation is similar to the batch validation noted above, however it includes analysis of loss and premium totals for the entire state. It also identifies unusual development within individual carrier data. Any corrections are entered into a correction file known as a "Corr" file. When the data passes these edits, additional validation programs, known as "Secondary Validations", are used to examine the statewide data and produce additional corrections. The secondary validation concentrates on analysis of loss development (F203).

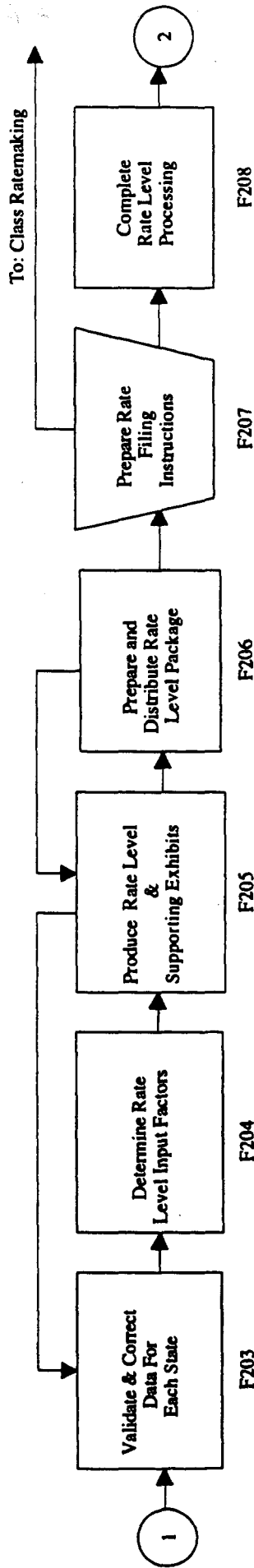


DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Overall Rate Level (F101):



Pre Rate Level Production Processing



To: Class Ratemaking



Rate Level Production Processing

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Overall Rate Level (F10D):

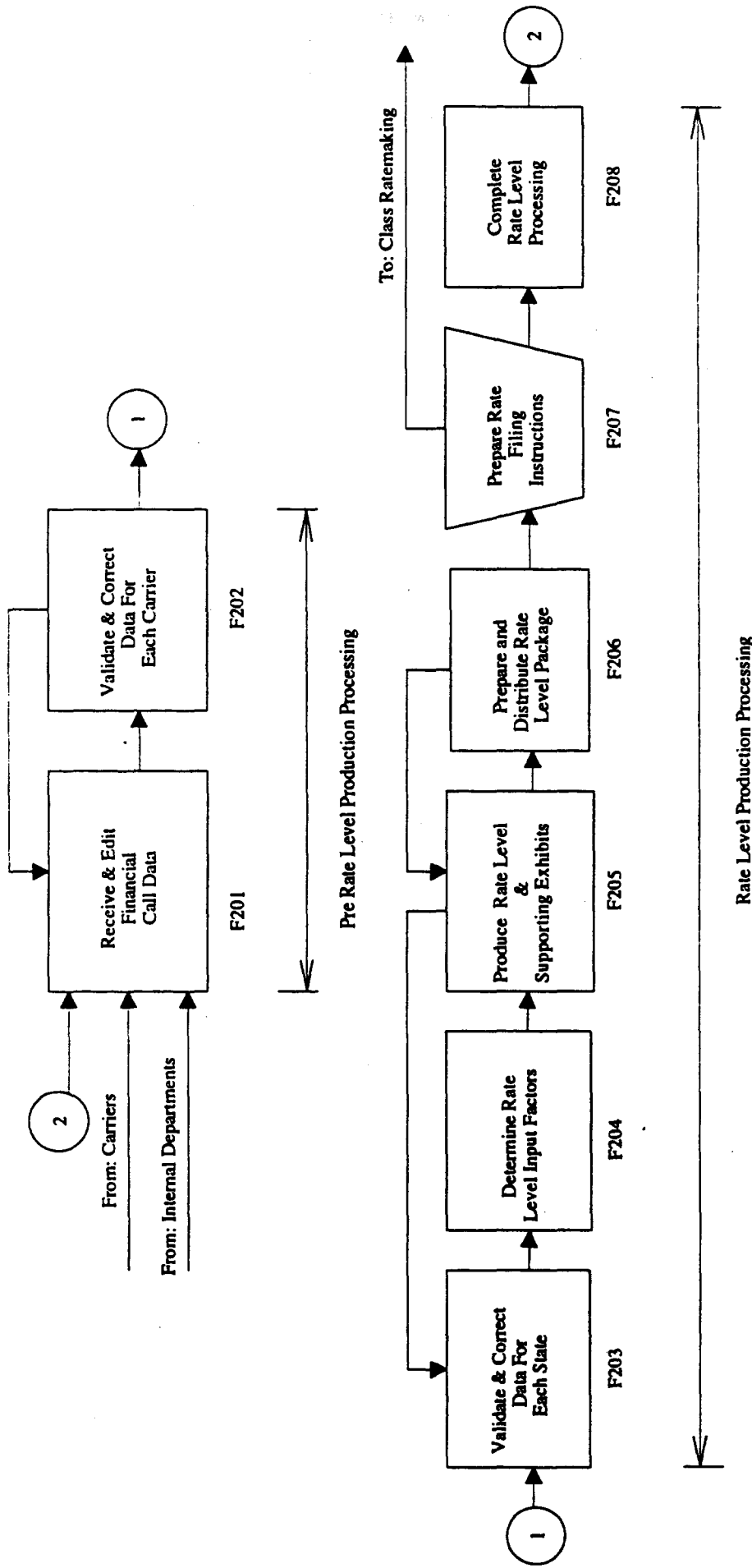
Production of overall rate levels begins in late April. Aggregate Ratemaking calculates a set of rate levels on a mainframe computer application using experience from the state library file, the latest correction file, and a set of rate level input parameters. Aggregate Ratemaking collects some of these input parameters from Class Ratemaking, the Actuarial Committee and the Benefit Evaluations department. The remaining input parameters are calculated using mainframe and microcomputer applications. These parameters address such issues as adjusting experience for changes in benefit levels. (F204)

The rate levels and supporting exhibits are reviewed for large or unusual changes. If any carrier data distorts overall experience, it is investigated and changes may be entered into the correction file. Additional supporting exhibits (e.g., without certain carrier experience) may be provided to aid investigation. Rate level indications are compared to prior year rate levels. (F205)

Once any unusual developments are explained or corrected, the rate levels are manually modified to account for new changes in benefits and proposed changes in expenses and/or assessments. The voluntary and assigned risk loss ratio exhibit, assigned risk subsidy and other special exhibits are also prepared.

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Overall Rate Level (F101):



DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Overall Rate Level (F101):

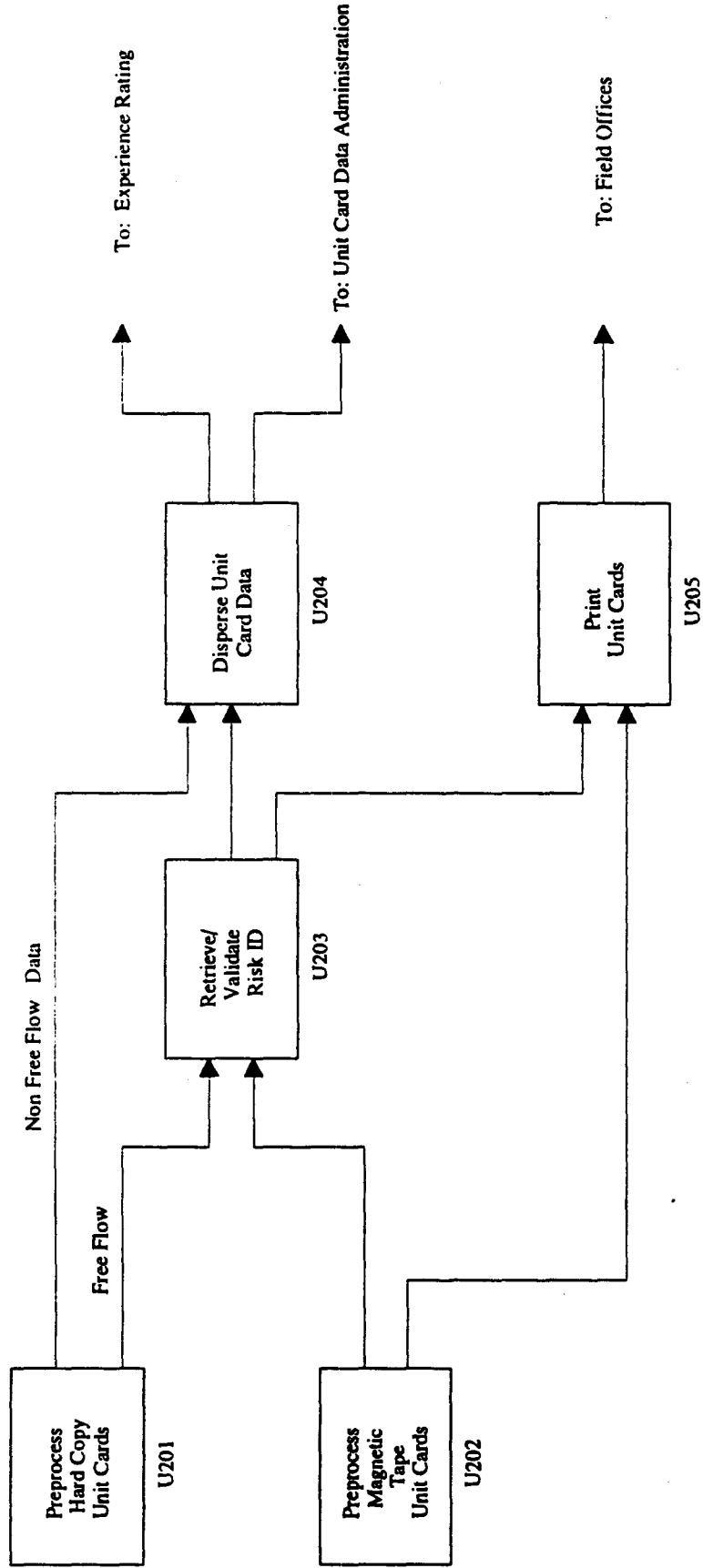
A package of rate levels and supporting exhibits is sent to the regional actuary for selection of the final rate level. (F206)

Rate levels calculated by using different loss development methodologies are compared and analyzed by the regional actuaries. Additional methodologies may be reviewed, such as rate level indications produced with experience which excludes specific carrier data that may be causing a distortion. The regional actuary selects the final rate level and presents the final rate level to the Rates Committee and Classification and Rating Committee for approval. The regional actuary then prepares and distributes filing instructions. Final rate levels in the rate filing package are reviewed by the Quality Control area.(F207)

After a rate filing is approved, data corrections are printed and keyed by ACS so that they will be incorporated into subsequent years' rate calculations. (F208)

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Unit Card Data Conversion (U10D):



DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Unit Card Data Conversion (U101):

NCCI receives detail payroll and loss data by payroll class from carriers in accordance with the Workers Compensation Statistical Plan (WCSP). Carriers submit approximately 250,000 unit reports per month; roughly 60% are submitted on magnetic tape and 40% are submitted on hard copy. Carriers are required to report annually for five years on each workers compensation policy which has open claims.

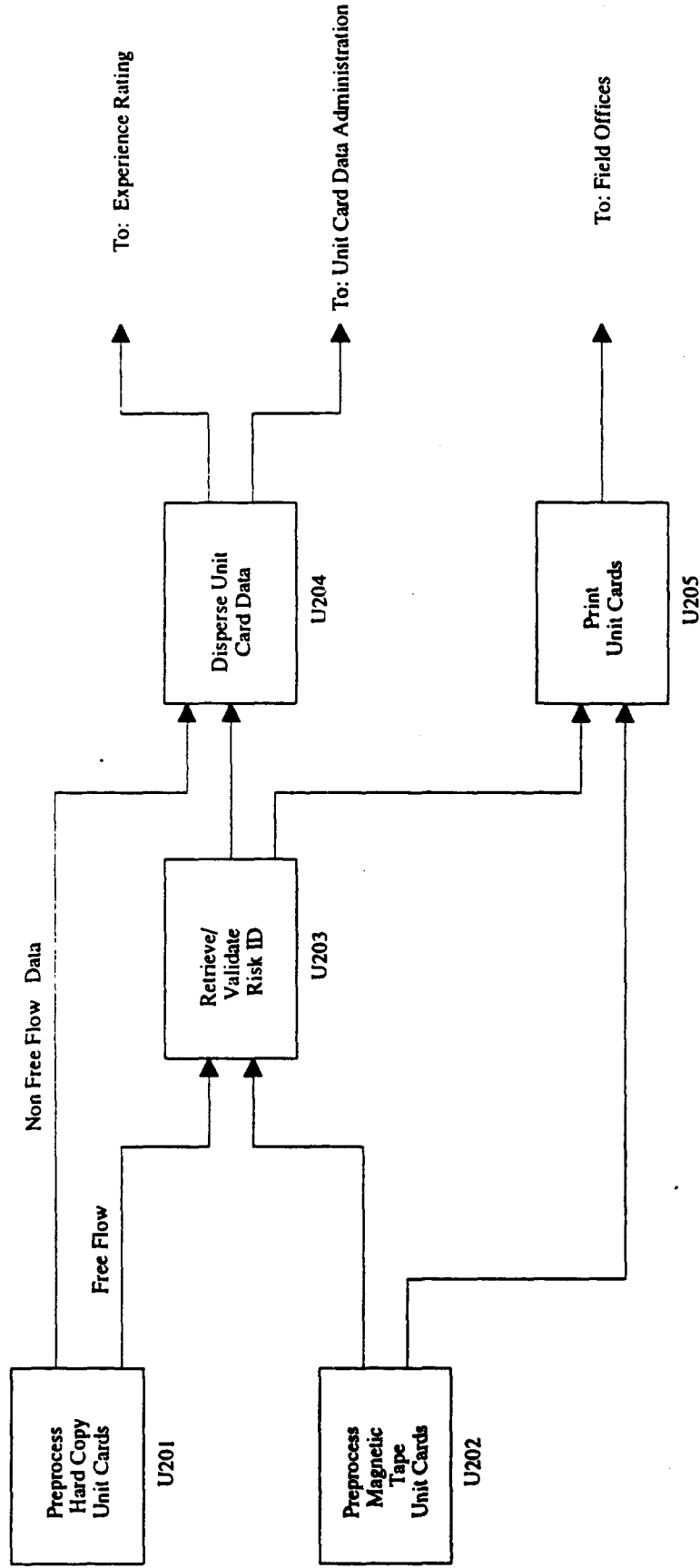
Unit Card Data Conversion receives and processes unit reports and delivers data files to Unit Card Data Administration and Experience Rating. (U101)

Hard copy unit reports are processed in Boca Raton. Preprocessing begins when Data Conversion sorts the unit reports into batches. The batches are microfilmed by an outside contractor (Leahy) and keypunched by ACS. The data is electronically transmitted via modem back to NCCI from ACS and is separated by NCCI's unit report application into unit reports (free flow data) and corrections (non free flow data). (U201)

Magnetic tape unit reports are also processed by the Data Conversion area. Initial processing of the magnetic tapes includes verification of standard format, generation of microfiche copies of individual unit reports and creation of files used to print hard copy unit reports. (U202)

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Unit Card Data Conversion (U10D):



DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Unit Card Data Conversion (U10D):

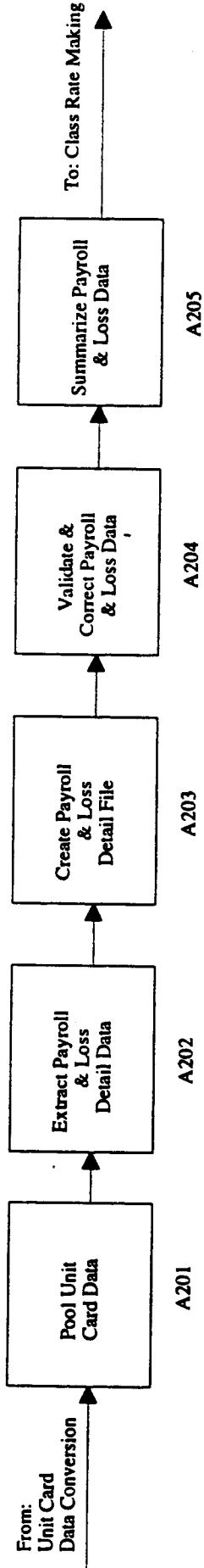
"Free flow" hard copy unit reports and all preprocessed magnetic tape unit reports are merged into one file. A program attempts to retrieve/validate the risk identification number (risk ID) on the unit report by comparing this file to a risk directory. The risk directory associates policy and insured information with a risk ID. Only unit reports for experience rated risks are assigned a risk ID. Approximately 45% of unit reports which have sufficient premium to be experience rated are successfully matched, 33% cannot be matched to either a risk ID or a risk name in the directory, and the rest are partial matches. (U203)

Successful matching to a risk ID and risk name causes the data to be dispersed to Experience Rating and Unit Card Data Administration. (U204) Free flow unit reports which are not matched to both a risk ID and a risk name are reported on a series of hard copy reports which are researched by the Indexing area of Data Administration. Unit reports which are manually identified (i.e., a risk ID is found) are updated on-line and released to both Experience Rating and Unit Card Data Administration. Final reports and hard copies of all printed unit reports are batched and sent to the field offices to be used as a reference. (U205) Unmatched unit reports are investigated in the field office. Any updates are noted on the report and sent back to Boca Raton for processing. Unit reports for new policies eligible for experience rating are assigned a risk ID by the field office.

At the end of each month, all batches of researched unit reports which have not been associated with a risk ID are sent to Unit Card Data Administration to complete the data which will be needed in Class Ratemaking. Data Administration and Experience Rating are responsible for ensuring completeness and accuracy of data they utilize.(U201)

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Unit Card Data Administration (A101):



DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Unit Card Data Administration (A101):

Unit Card Data Administration receives all payroll and loss data from Unit Card Data Conversion, extracts it by state, performs several validation tests and corrects the data for use by Class Ratemaking. (A101)

On a daily basis, the data provided from Data Conversion is captured and stored on magnetic tape. These tapes are called day pools. Each week, day pools are combined to form week pool tapes. Every four weeks, month pools are created. (A201)

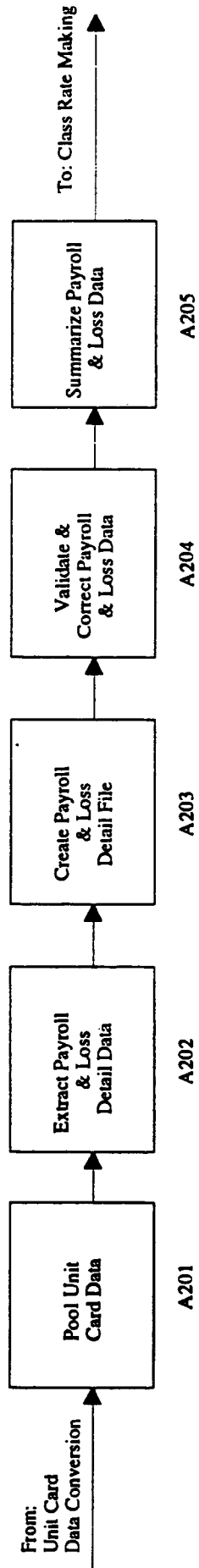
Six to eight months prior to the rate filing date for a given state, five policy years of payroll and loss data are extracted from month pools. A state payroll and loss detail file (P/L file) is created from this data. The output totals are compared to prior year totals for reasonableness. A system generated report identifies exact duplicate records which are purged. (A202, A203)

Validation of the P/L file involves several steps which may occur more than once. Logical, relational and reasonableness tests are performed.

System generated listings of potential duplicate records are produced and manually reviewed. The "State Validation" program is run to identify potential errors. The Class Payroll Fluctuation report is used to identify unreasonable fluctuations in payroll, while the WCSP Reasonableness Test is used to identify unreasonable fluctuations in losses. Carriers may be contacted to obtain missing information and/or explanations of data irregularities. (A204)

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Unit Card Data Administration (A10D):



DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

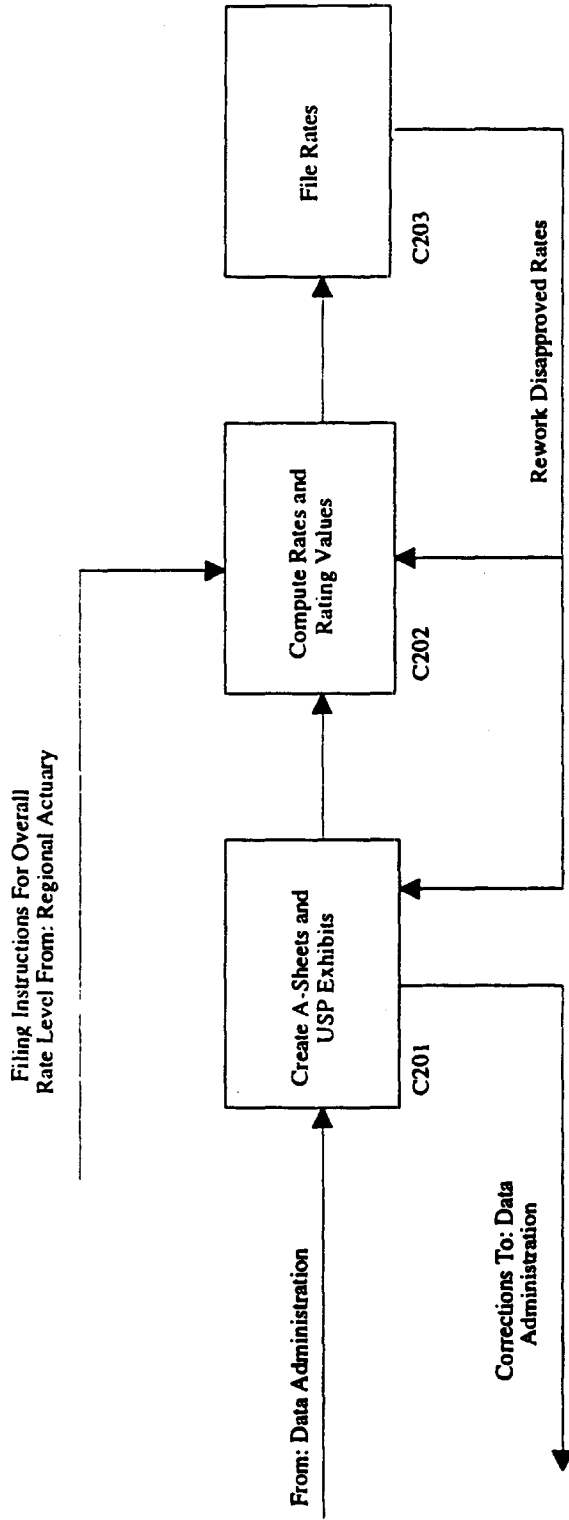
Unit Card Data Administration (A101):

The correction process for P/L file data is heavily reliant on manual reviews of system generated reports. Corrections are applied to the data through an on-line data entry system or by filling out correction sheets which are sent to ACS for data entry and transferred via modem to the NCCI system. Validation and correction are iterative processes in which the data flow and sequence of programs is dictated by the Data Administration area, based on the type and number of errors encountered. Validation and correction programs are executed on request throughout this process.(A204)

Validated payroll and loss data for a state is summarized by class code and segmented into industry groups. Industry groups identify particular types of risks. The three industry groups are manufacturing, contracting and all others. Payroll and loss data is also summarized after individual and catastrophe loss limitations have been applied to the loss amounts. This summarized information is provided to the Pure Premium area of Class Ratemaking. (A205)

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Class Ratemaking (C101):



DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Class Ratemaking (C101):

Class Ratemaking receives payroll and loss data summarized by class code from Unit Card Data Administration and filing instructions from the regional actuaries. These inputs are used to distribute the proposed overall rate level change across both industry groups and payroll classification codes. The resulting rates, referred to as manual rates if they include expenses, profit and contingencies, and load and loss costs if they do not, are presented as premium per hundred dollars of payroll. (C101)

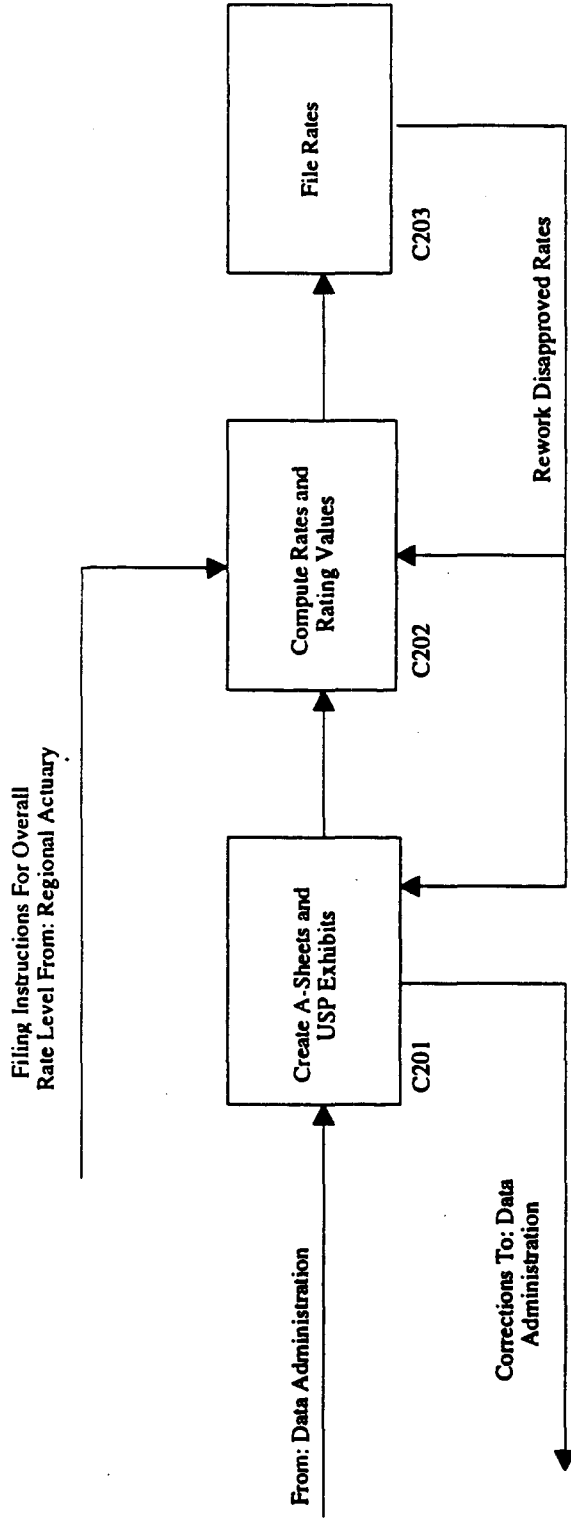
The Pure Premium area uses the summarized P/L file created and validated by Data Administration. The data is reviewed manually for reasonableness using statistical analysis programs. The reviews investigate payroll fluctuations, loss development, aggregate losses in excess of a maximum amount and premium development. Any necessary changes to the P/L file are sent to Unit Card Data Administration for correction through ACS.

The Pure Premium area derives various input factors including development factors and industry group differentials using a spreadsheet application on a microcomputer. Various exhibits are produced for ratemaking and other purposes.

The final step in the Pure Premium area is the production of A-sheets. A-sheets document the calculation of formula pure premium, which is the calculated loss per unit of payroll for each class code. The Quality Control function reviews the processing through preliminary A-sheets. (C201)

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Class Ratemaking (C10):



DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Class Ratemaking (C10D):

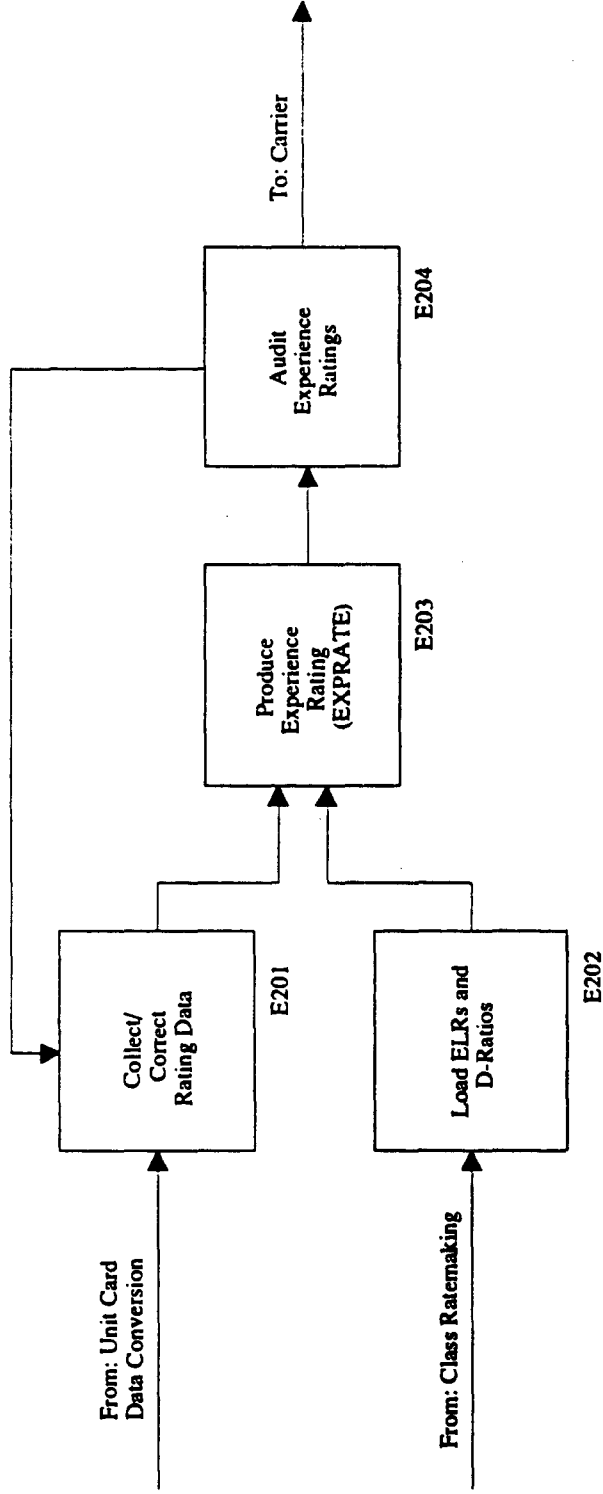
The Rates area uses the regional actuary's filing instructions, P/L data and results from A-sheet processing to produce Rate Factor Cards. The A-sheet data and Rate Factor cards are inputs to an automated procedure which computes the class rates and experience rating values. Individual class rate adjustments and sample rate calculations are performed manually. Any adjustments for specific requirements by state and/or class are input to the rates file.

From this file, the rate filing pages are produced. Miscellaneous exhibits and appendices are also produced to document the interim steps taken to arrive at the final rates. During this step, expected loss rate factors and D-ratio factors are also produced for transmittal to Experience Rating after the filing is approved. (C202)

The final filing is reviewed by Quality Control and the regional actuaries. Any necessary changes can be entered into the final rates file. The rates are filed with the state upon final Quality Control review and regional actuary approval. (C203)

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Experience Rating (E101):



DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Experience Rating (E101):

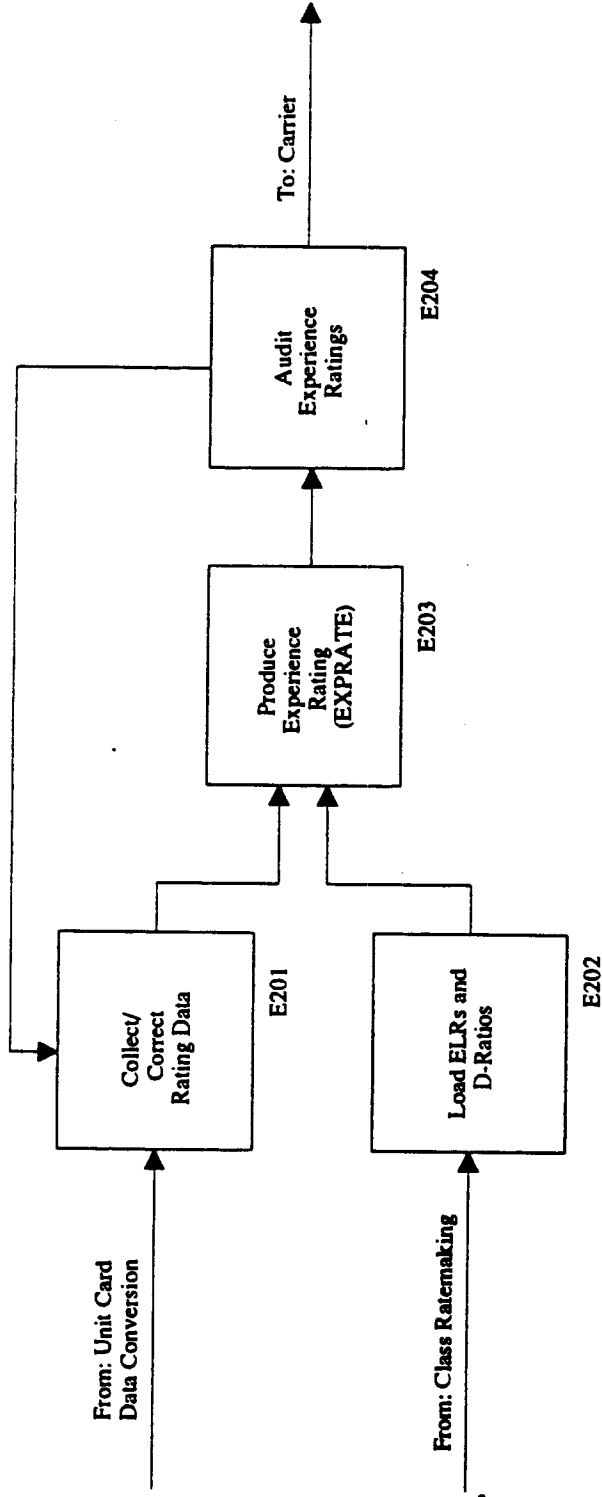
Experience modification factors (experience mods) allow carriers to adjust policy premiums based on an insured's historical loss experience. Experience mods are calculated for each insured meeting state set premium thresholds by comparing individual loss experience to classification averages. Experience Rating receives payroll, premium and loss information from Unit Card Data Conversion, and approved rating values from Class Ratemaking. Experience mods are provided to insurance carriers.

Unit card data is forwarded to Experience Rating if the insured's policy premium meets experience rating threshold amounts which are defined for each state. Currently, this threshold ranges from \$1,750 to \$5,000. An experience mod will be produced for an insured only if it meets this threshold over a three year period. If the insured meets a second threshold, usually twice the minimum, for a one or two year period, it will also be considered eligible for experience rating.

Experience Rating collects and corrects rating data received from Unit Card Data Conversion. This task begins when newly received unit card data is merged with older data to make up three years of experience data. Payroll and loss information is checked for completeness by a series of automated and manual processes. If three years of data does not exist, exception procedures are used to obtain missing information or to produce the rating with less than three years of data. Previously missing or corrected unit cards are processed through Unit Card Data Conversion and forwarded to Experience Rating and to Unit Card Data Administration as appropriate. (E201)

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Experience Rating (E10D):



DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

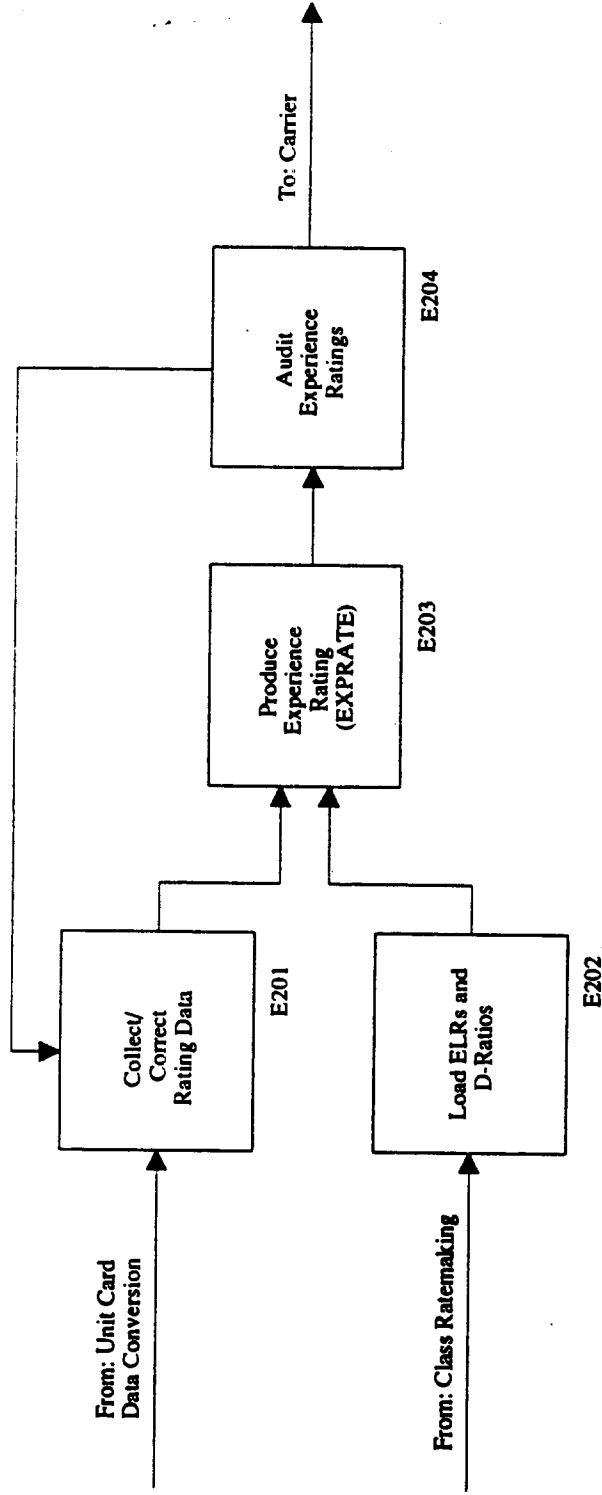
Experience Rating (E101):

Experience Rating loads the Expected Loss Rate (ELR) factors and D-ratios for each class in each state into the experience rating system. Class Ratemaking produces these factors during its rate calculations. The ELR factor specifies the amount of expected losses by payroll classification for each \$100 of payroll. D-Ratios specify what portion of expected losses are anticipated to be below a specified dollar amount. For states in which class rates have not been finalized, current information will be used to calculate preliminary experience mods until final rates are approved. (E202)

The experience rating production system consists of several automated steps to further validate data and produce experience ratings. Automated procedures validate payroll data and loss data. The validation process generates a valid rating data file and a rejected rating data file. Valid rating data is further separated into single state insureds (intrastate) and multi-state insureds (interstate) files. The valid rating files are processed through calculation programs which produce rating sheets for each insured. Rating sheets list all payroll and loss data, ELRs, and D-ratios used in producing the experience modification factor, which is also listed. Rejected rating data is reviewed, corrected and reprocessed. (E203)

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Experience Rating (E10D):



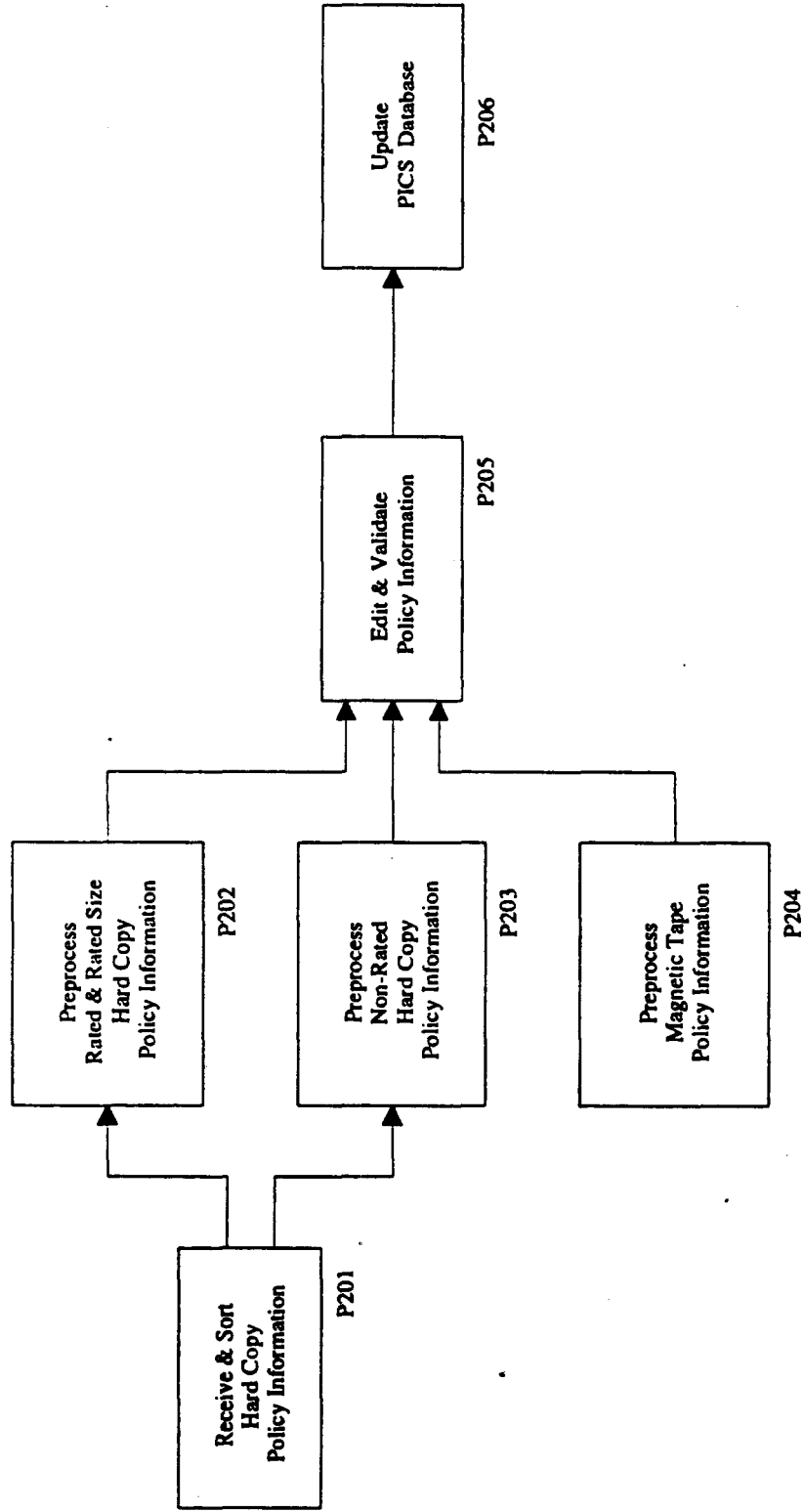
DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Experience Rating (E101):

The field offices audit experience rating sheets produced by the system. Field office personnel compare payroll, loss and experience mods to prior year information, look for duplicate data and perform general reasonableness reviews. Rating sheets requiring corrections are marked and sent back through ACS or corrected on-line. Unit Card Data Conversion receives and processes correction data and then forwards it to Experience Rating and Data Administration, as appropriate. Valid preliminary rating sheets are sent to the carriers until new finalized rating sheets can be produced. NCCI sends valid final rating sheets to the appropriate carriers so that affected premiums can be adjusted. (E204)

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Policy Issue Capture System (PICS) (P101)



DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Policy Issue Capture System (PICS) (P101):

Policy information is sent to NCCI by the carriers in either hardcopy format or on magnetic tape. Currently, about 39% of policies, based on premiums, are sent on hardcopy. NCCI field office personnel receive and separate hardcopy policy information into rated and non-rated groups based on the experience rating premium threshold. Policy information is retained for experience rated policies, assigned risk policies, policies in merit rating states and policies in states subscribing to NCCI's Proof of Coverage (POC) service. Policies within \$500 of the state's experience rating threshold are also retained (see Experience Rating). (P201)

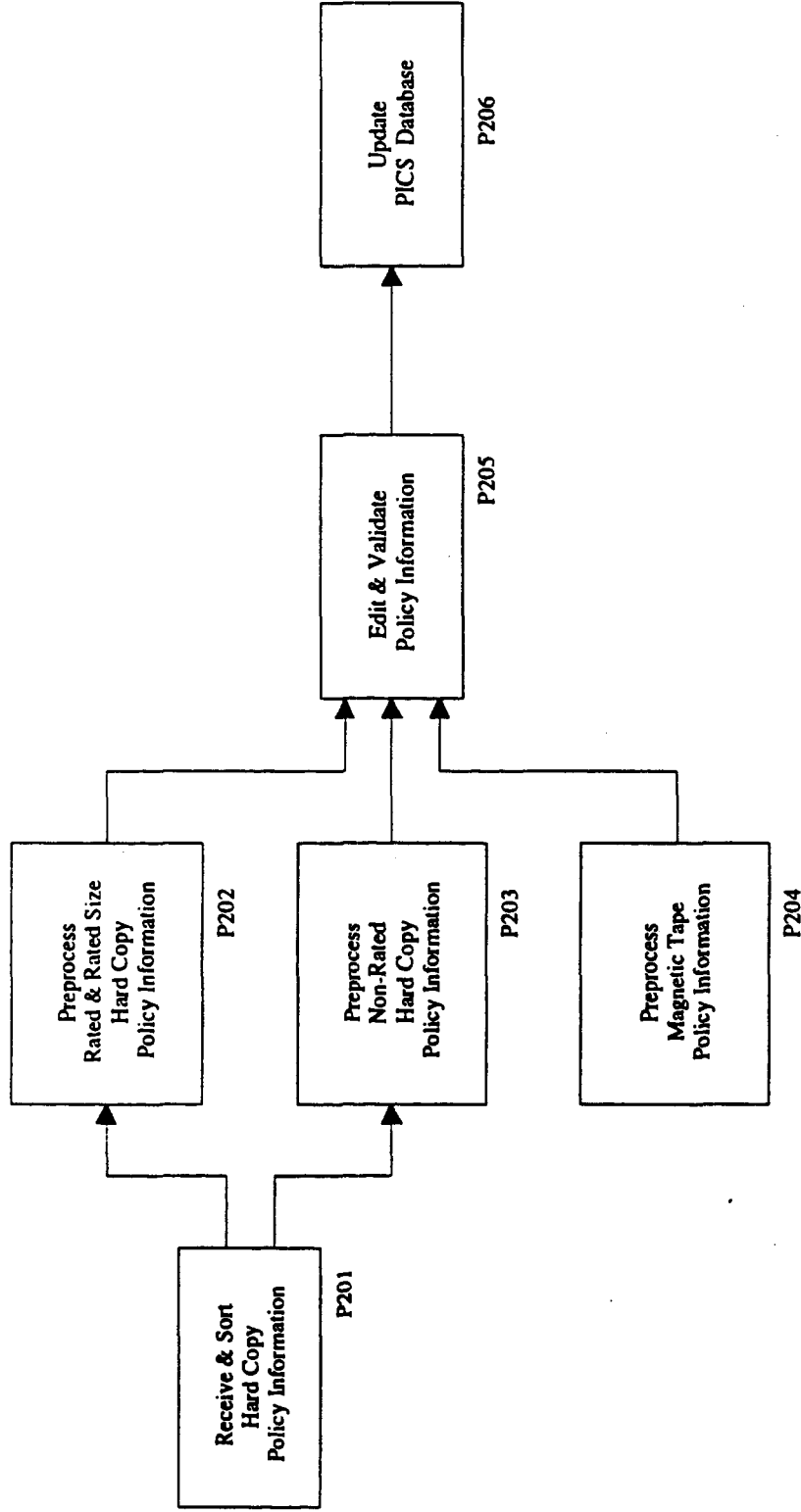
Field office personnel enter rated and rated size hardcopy policy information through a series of on-line screens. Data entered through these screens is validated before being posted to the PICS database. (P202)

The field office sends qualifying non-rated hardcopy policies to ACS for data entry. ACS transmits keyed data to NCCI in Boca Raton through an electronic data transfer. PICS programs receive non-rated hardcopy policy information and reformat it for additional processing. (P203)

NCCI receives and preprocesses magnetic tape policy information into a temporary database after deleting from the files policies which do not qualify for retention. The insured's risk name and address are modified where necessary to conform to a standard format. (204)

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Policy Information Capture System (PICS) (P101):



DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Policy Information Capture System (PICS) (P101):

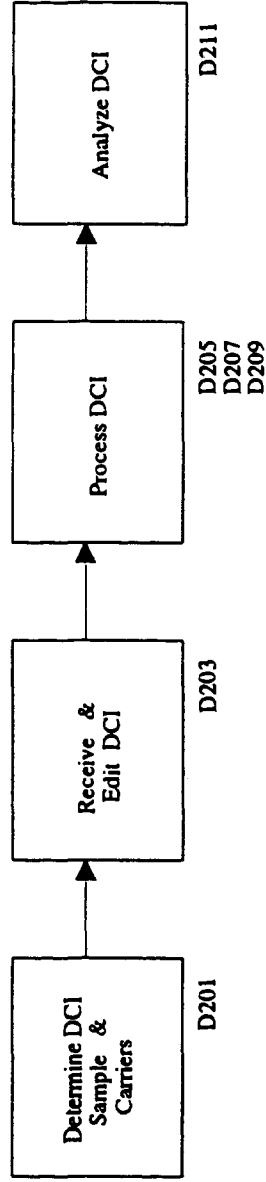
The PICS system edits and validates both magnetic tape and ACS keyed policies through a series of batch modules. (P205) The policy system application updates the PICS database with valid policy information. (P206) Rejected policies appear on a series of error reports and must be corrected by NCCI personnel or through carrier resubmission of data before being incorporated into the database.

The policy information database serves as a source for carrier information, risk IDs, proof of coverage (POC) information and general policy information. It is accessed by several areas including Unit Card Data Conversion, Experience Rating and POC subscribers. There are currently approximately 6 million policies in the PICS database. This number is currently growing at a rate of approximately 125,000 per month.

It is our understanding that NCCI intends to capture information for all policies.

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Detailed Claim Information (DCI) System (D101):



DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Detailed Claim Information (DCI) System (D101):

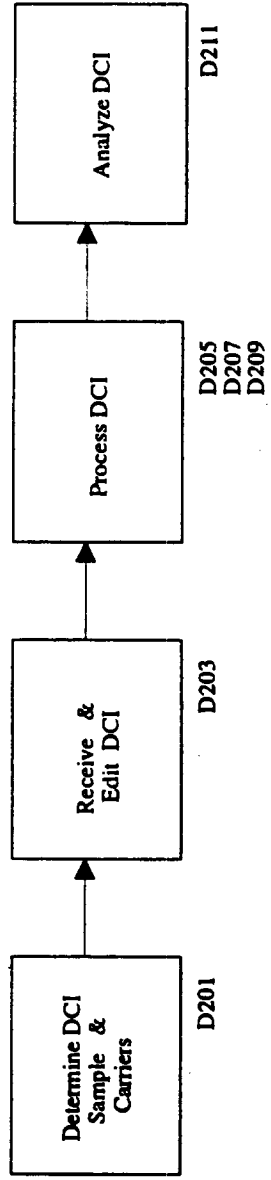
The Detailed Claim Information System is used by NCCI to understand the components of changing workers compensation loss costs. It represents a sample of indemnity claims from a population of thirteen states. DCI is not integrated with the Experience Rating and Class Ratemaking systems. The data captured in DCI includes additional information concerning claimant data, indemnity benefits and payments, vocational rehabilitation benefits, medical benefits and claim administration details. NCCI processes approximately 10,000 DCI claim reports per month. The percentage received on magnetic tape varies from 10% to 30%.

Every three years, NCCI determines a sampling ratio with the objective of capturing a sample of between 1,000 and 1,500 permanent partial disability claims for each NCCI state. Carriers are subject to DCI reporting requirements in any DCI state where they write more than 0.1% of total premiums. These carriers must generate a random sample of all direct indemnity claims. The selected claim is first reported six months after the claim is filed and every twelve months thereafter until it is either closed or no longer includes indemnity compensation.(D201)

NCCI receives DCI information from the carriers throughout the year on a Call For Detailed Claim Information. Hard copy calls are keypunched by ACS and electronically returned to NCCI. Magnetic tape submissions are processed by NCCI data operations. The DCI system merges the ACS tape with the magnetic tape submissions and performs a series of logical and relational edits on the

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Detailed Claim Information (DCI) System (D101):



DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Detailed Claim Information (DCI) (D101):

data. If critical fields in the call are missing or incorrect, an error condition occurs which can only be corrected by carrier resubmission of the data. Less critical errors cause the system to generate a call for corrected detailed claim information which is sent to the carrier and returned to NCCI. The data is held in a suspense file until it is corrected. (D203)

DCI processing encompasses tracking calls for corrected detailed claim information and generating additional notices as necessary, generating and tracking calls for subsequent detailed claim information and creating the quarterly file used to produce DCI analyses. If a correction call is not received, then up to three additional notices will be sent. If the carrier does not respond, the data remains in the suspense file. Once a claim is established in the DCI system, NCCI generates a call for subsequent detailed claim information every twelve months and delivers it to the carrier sixty days prior to its due date. Calls for subsequent information will continue to be sent until either the carrier indicates that the case is no longer subject to DCI reporting or the claim reaches its ninth year. Quarterly, a file of all valid DCI information is extracted for use in analyzing the data. (D205, D207, D209)

The only regularly performed analysis of DCI data is a bi-annual report produced by NCCI actuarial personnel. Regional actuaries use DCI to answer specific inquiries from state insurance departments and for research purposes. DCI data is also used by Actuarial Information Services and the Benefits Division. (D211)

DATA COLLECTION AND DATA QUALITY

Glossary of Terms

ACS	Appalachian Computer Services. An offsite data entry organization used extensively by NCCI.
A-Rates	Classifications whose diversification of experience cannot warrant normal manual rating are "a"-rated. Estimated rates are obtained from NCCI or other licensed rating organizations until an inspection of the insured 's activities can be made.
A-Sheets (Pure Premium Exhibits)	For each classification, this exhibit contains payrolls, losses on a current level, credibilities for state and national partial pure premiums, as well as the following pure premiums (see pure premiums) by serious indemnity, non-serious indemnity and medical parts: <ol style="list-style-type: none">1) Indicated by Experience2) Present on Rate Level3) Underlying Present Rates4) Indicated by National Relativity5) Derived by Formula
Accident Year	The calendar year in which an accident or loss occurred. Also called Calendar-Accident Year.
Accident Year Call	A call for premium and loss experience information on an accident year basis.
Bulk Reserves	Those outstanding reserves for general case reserve inadequacy, supplemental case reserves, cases that may reopen, or other (non IBNR) reserves which are not associated to specific claims. (Reference: Financial Calls)
Calendar Year Call	A call for premium or loss experience for a specified calendar year.
Case Reserves	Those outstanding reserves established for specific known cases. (Reference: Financial Calls)

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"Corr" File	A temporary correction file used by the Aggregate Ratemaking production team to store financial call data corrections when determination of a state's rate level is in progress.
Credibility	A weight, ranging from 0 to 1, assigned to a certain body of data. NCCI applies credibility in its trend methodology, its classification ratemaking methodology, and its experience rating formulas.
Credibility Complement	Unity less credibility.
Critical Value	The amount of indemnity losses determining whether a permanent partial claim is classified as major or minor. If the indemnity portion is greater the critical value, then the injury type is major permanent partial. If the indemnity portion is less than the critical value, then the injury type is minor permanent partial.
"D"-Ratios	Represents the average ratio of expected primary losses to total expected losses for a given classification.
"D"-Ratio Factor	Used in the "D"-ratio formula, these factors are calculated for application to serious, non-serious, and medical pure premiums by taking the ratio of primary losses to total serious, non-serious, and medical losses, respectively.
"D"-Ratio Formula	Equal to $[(\text{Serious "D" factor} \times \text{serious pure premium}) + (\text{Non-serious "D" factor} \times \text{Non-serious pure premium}) + (\text{Medical "D" factor} \times \text{medical pure premium})] / \text{Total Pure Premium}$. "D"-ratios are limited to plus or minus .1 from the last approved rate's "D"-ratios. "D"-ratios cannot be less than .25; nor can they exceed .90.
Data Request Form	Describes the policy periods to be used in the upcoming state experience filing. Also denotes critical values, current self-rating point (to limit NC-235 losses), current master and the Phase I Volume checks.

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Detailed Claim Information	Information on an individual workers compensation claim basis which provides detail on the components of loss costs.
Development Factor	Ratio of losses (premium) at a given age divided by losses (premium) at a prior age.
Excess Loss Factors	Excess Loss Factors are percentages of standard earned premium paid by the policyholder in lieu of being charged for losses above a selected limit per accident. The charges vary by hazard group to reflect the differences in expected frequency and size of claim. Excess Loss Factors are only available through the Retrospective Rating Plan.
Expected Annual Trend	Estimated annual change in loss ratio due to differences in the rate at which payrolls and losses change over time.
Expected Losses	<ol style="list-style-type: none">1. In classification ratemaking: the class payroll in hundreds multiplied by the partial pure premium underlying the current rates (not the A-Sheet pure premiums). Used to calculate state credibility.2. In experience rating: the payroll in hundreds multiplied by the expected loss rate.
Expected Loss Rate Factor	Amount of expected losses for the classification per unit of exposure, which is generally \$100 of payroll.
Expected Loss Rate (ELR)	An ELR estimates average loss levels (losses per \$100 of payroll) of a classification for the experience period. The ELR factor is calculated for each hazard group and is applied to the manual rate for each classification. Applying ELR to payroll in hundreds results in the expected losses.
Experience Modification (Mod) Factor	A factor calculated from actual case experience (unit reports) used to adjust an insured's manual premiums up or down based on the policy's loss experience compared to average class experience.

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Experience Period For Ratemaking	The time interval from which the loss and premium data was extracted.
Experience Period For Trend	The time interval from which the indemnity (medical) loss ratio data was extracted.
Experience Rating	A mandatory form of individual risk rating which takes into consideration the loss experience of the particular insured (or "risk") as a credit or debit to the manual rate for the insured's classification. (Applies only to insureds meeting premium eligibility requirements.)
Experience Rating Eligibility Requirements	The minimum premium level that qualifies an insured for experience modification. The minimum premium required for experience rating eligibility is equal to the standard earned premium generated from ten average workers. The state average earned rate and the state average wage are used in determination of the eligibility requirements.
Experience Rating Plan	The base (mathematical) rules that specify how a workers compensation experience modification must be calculated in a given state.
Exposure	Measure of propensity to risk, which is generally the total dollar amount of payroll associated with a policy. (Another exposure is number of employee years for per capita classifications.)
Extended Term	A policy term that exceeds 12 months and 15 days. Unit reports are required for each 12 month period and portion there of.
Financial Call	A request for financial information from the carrier. This information is used to generate aggregate rate level indicators, reconcile reported data for expense analysis and for certain state specific calculations and regulatory reports.

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Financial Data	Policy year, calendar-accident year and calendar year are collected on an aggregate basis and are referred to as financial data because they can be reconciled to a company's annual statement.
Financial Data Adjustment Factor	The factor to adjust the financial data loss ratio used in the A-Sheets to the final Exhibit I loss ratio. The factor is used in the calculation of the Rate Level Adjustment Factor.
First Report	For the first Workers Compensation Statistical unit report (WCSP) filing; the first report contains policy year premiums (12 months) and claims valued as of the 18th month after the policy became effective.
First Report (Financial Call)	For the policy year, 24 months after the inception of the policy years (e.g., Policy Year 19XX at 12/31/19XX+1). For accident year, 12 months after the inception (e.g., Accident Year 19XX at 12/31/XX.)
Form R	Totals by industry group and policy period, showing payroll and premium at current manual rates. Part of the Workers Compensation Statistical Plan data.
Free Flow	Unit card data which can be processed without manual intervention through the experience rating system.
Frequency	Number of losses divided by exposures in a given period.
Incurred But Not Reported (IBNR)	IBNR refers to losses estimated for events which will result in a loss and eventually a claim but have not yet been reported to insurers or reinsurers. Financial data rate levels can be done including or excluding IBNR.
Indexing	The process of assigning a risk ID to a unit report.

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Injury Type	NCCI classifies injuries as one of the following: <ol style="list-style-type: none">1) death2) permanent total3) major permanent partial4) minor permanent partial5) temporary total6) medical only
Interstate Risk	Insured with payroll (exposure) in more than one state where interstate rating has been adopted.
Intrastate Risk	Insured with payroll (exposure) in one state.
Law Amendment Factor	Factor that adjusts losses for any changes in the law.
Leahy	Offsite microfilming services used by NCCI.
Loss Adjustment Expense	Includes the cost of investigating cases, representing the employer before claims adjudicating bodies, defending lawsuits and so forth. The allowance for loss adjustment expenses includes both allocated and unallocated expense since workers compensation losses exclude all loss adjustment expense except allocated loss adjustment for Coverage B (employers liability) claims which are reported as losses.
Loss Cost	The portion of workers compensation rates allocated for projected losses. Expenses and profits are not included in loss cost.
Loss Ratio	Losses divided by premium in a given period.
Manual Premium	Payroll, in hundreds, multiplied by the manual rate.
Manual Rate	The unit cost which is multiplied by the employer's payroll in hundreds to determine manual premium.

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Master-Final Pass Rate	The final computer printout listing class codes, run and effective date of rates, approved updated pure premiums by serious, non-serious, medical and total, approved rates, disease elements and "D" ratios. This printout of classification code rates and rating values is used as the base upon which the next proposed rate change is run.
Merit Rating	State mandated program to provide a factor for premium adjustment based on past loss experience of a risk. Merit rating differs from experience rating in that merit ratings are determined on the state level for policies with premiums below the Experience Rating threshold.
Midterm Cancellation	One party cancels the insurance contract after the effective, but before the expiration date.
Minimum Premium	The minimum price for writing a Workers Compensation policy based upon the following formula: $\text{Rate (including disease loading)} \times \text{Minimum Premium Multiplier} + \text{Expense Constant}$ (Note: This formula does not apply to per capita codes.)
Minimum Premium Multiplier	The minimum premium multiplier is a component of the minimum premium formula. It was originally calculated to reflect the state average annual worker's wage in hundreds ((average weekly earnings x 52)/100), but limited to 10 point annual increases. For example, the minimum premium multiplier in Alabama should be the average annual worker's wage in hundreds rounded to the nearest 5 ((294.79 x 52/100 = 150). The Alabama minimum premium multiplier is, however, subject to the maximum increase of 10. Since the May 1, 1986 minimum premium multiplier is 105, the June 1, 1987 minimum premium multiplier cannot increase to 150. It is limited to 115.
Mod	Experience modification.

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Monopolistic State	State where workers compensation coverage is written by a state fund with no competition from commercial carriers.
National Data Base	A compilation of the latest approved indicated A-Sheet experience for every state. It is used to derive the pure premiums indicated by the National Relativity.
NC-235 Report	Compilations of Workers Compensation Statistical Plan data which show payroll, earned and manual premiums, number of cases and indemnity and medical losses by injury type. For individual class NC-235's, losses from individual claims are limited to 20% of the self-rating point, and for multiple claims, are limited to 40% of the self-rating point. (Under RERP, the A-Sheet limitation point will no longer be called the self-rating point.)
NCCI	National Council on Compensation Insurance.
NCR	Offsite microfiche service used by NCCI.
Net Premium	Premium resulting from the application of premium discounts and retrospective adjustments to standard premium.
New Business	Policies newly written by an insurance carrier.
Non-free Flow	Unit card data which requires manual intervention to continue processing through the experience rating system.
Non-rated Risk	An insured risk which is not subject to experience modification of policy premium.
On-level Factor	Factor that adjusts premium (losses) to the current premium or law level.
On-level Losses	Losses from a prior period multiplied by the on-level factor to arrive at losses on the same base as those in the current period.

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On-level Premium	Premium from a prior period multiplied by the on-level factor to arrive at premium on the same base as those in the current period.
Outstanding (Excluding IBNR) Losses	In the financial calls, this definition is intended to capture case reserves and bulk reserves (see separate definitions of these two reserve components). For some carriers, this item will include case reserves only. (Reference: Financial Calls)
Payroll/Loss Detail (P/L Detail)	The individual class records taken from unit cards for a particular state and policy period. The class records are separated into exposure (usually payroll) and loss records.
Per Capita Classification	A classification which uses the number of workers rather than payroll as the exposure base. Private residence workers (servants, drivers) fall into this category. Per capita classification rates are rounded to a whole number and the minimum premium is usually the rate + expense constant.
PEMIP	Performance Evaluation Monetary Incentive Program or fining program used by NCCI to encourage timely and accurate submission of experience by carriers. Also known as MIP.
Permissible Loss Ratio	The target cost ratio excluding loss adjustment expense.
PICS	NCCI database of carrier policy information (Policy Issue Capture System).
Policy Effective Date	Policy's effective date of coverage. Also starts WCSP unit reporting cycle.
Policy Register	A record of key data (number, effective date, coverage states, etc.) for all policies maintained in a carrier's database.
Policy Year Call	A call for premium and loss information associated with accidents which occurred during the specified policy effective period.

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Policy Year Data	The premium and loss associated with policies with effective dates in a given calendar year period.
Premium	The amount paid for by an insured for coverage.
Primary Loss	The first \$5,000 of any loss greater than \$5,000 or the entire loss amount of any loss less than or equal to \$5,000. Under the previous Expense Rating Plan, the primary loss was determined on the basis of a different formula, the maximum being \$10,000. Primary losses are established to avoid unreasonable effects of very large losses on an insured's experience in the experience rating plan.
Profile System	NCCI system containing the last calculated experience rating and unit reports received since the last rating.
Proof of Coverage Card	Document sent to the state notifying it of an insured's workers compensation coverage.
Proof of Coverage State (POC)	States that use the NCCI database to verify workers compensation coverage.
Pure Premiums (A Sheets)	<ol style="list-style-type: none">1) Indicated by Experience - Workers Compensation Statistical Plan Experience from class NC-235's adjusted to current level of benefits, loss adjustment expense, trend and financial data, developed to an ultimate (by indemnity and medical portions) and divided by payroll in units of one hundred dollars.2) Underlying Present Rates - On A-Sheets, the pure premiums from the last rate revision, adjusted for the most recent off-balance of the Experience Rating Plan and any subsequent law changes since the last rate revision.3) Present on Rate Level - The A-Sheets underlying pure premiums adjusted to the level of the current financial data.

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4) Indicated by National Relativity - See Frank Hawayne's paper, "Use of National Experience Indications in Workers Compensation Classification Ratemaking." (PCAS, Vol. LXIV, p.74). Pure premiums reflect the countrywide experience as indicated by the latest available individual classification experience for all states for which NCCI compiles data.

5) Derived by formula:

(State credibility x indicated pure premium) +
(National credibility x pure premium indicated by
national relativity) + [(1 - state credibility - national
credibility) x pure premium on present rate level]

Pure Premium
Department

The actuarial department within the NCCI that calculates development factors, industry group differentials and cost ratios and produces certain exhibits for class ratemaking.

Pure Premiums
Underlying Rates

- 1) Present: These are the serious, non-serious and medical pure premiums underlying the rates currently in effect. They are obtained from the master and are used in the application to obtain pure premiums on the next set of A-Sheets.
- 2) Proposed: These are the serious, non-serious and medical pure premiums underlying the proposed rates, obtained by rate calculations. (Note: Not to be confused with A-Sheet Pure Premiums.)

Rate Filing

The annual request for workers compensation rate changes filed with each state.

Rate Level Adjustment
Factor (RLAF)

Allowed for any factors to be applied to a reviewed classification rate calculation: (RLAF x Test Correction Factor = Composite Factor) that are not applied elsewhere in a rate filing, as well as an adjustment of financial data.

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Rate Projection Period	This is the time period from the average accident date in the experience period for ratemaking to the average accident date for the policy year starting on the effective date stated in the rate filing.
Rated Risk	An insured which is subject to experience rating modification of policy premium.
Rated Size Policy	A policy which has premiums which exceed state threshold amounts for experience modification. Policies with premium within \$500 of this threshold are also included in this group.
Ratemaking	The actuarial process of setting premium rates for new and renewal policies. Ratemaking is performed annually on a state-by-state basis.
Ratio of Manual to Earned Premium	<ol style="list-style-type: none">1) The present ratio of manual premium to earned premium divided by the proposed ratio of manual premium to earned premium is applied in A-Sheets to obtain pure premiums underlying manual rates.2) The new (proposed) ratio of manual premium to earned premium (after any adjustments - e.g., revised eligibility) is applied in the rate calculation.
Reported Data	Carrier data that has been reported to a bureau on a unit report.
Risk ID	A unique number used by NCCI to identify a rated risk.
Risk Study	A printout of risk, payroll, earned and manual premium and indemnity and medical losses by premium size for stock and non-stock companies by industry group on a first report basis. Also contains list of risks with premium greater than \$99,999 by carrier and class code.
Revised Experience Rating Plan (RERP)	A modification to the experience rating plan introduced in 1989 using updated parameters to more accurately predict the loss experience of an eligible employer.

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SAWW	Statewide Average Weekly Wage.
SL2 Process	Current NCCI process of requesting late records that should be replaced by the URC turnaround process.
Schedule "Z" (Sched-Z)	A compilation of the raw unit plan experience by policy period and by class which underlies the A-Sheets. Losses are not limited in any way. The same data on NC-235's is available on Schedule Z.
Second, Thirds, Fourths, Fifths	Subsequent WCSP reports occurring 12, 24, 36 and 48 months after the first report for a policy.
Second Report, Third Report, Etc. (Financial Calls)	Premium and loss data evaluated 12 months, 24 months, etc. after the first report.
Self-Rating Point	<p>In experience rating, the self-rating point is the amount of expected losses necessary for a risk's own experience to solely determine its experience modification. (Under RERP, however, the concept of self-rating will no longer exist.) It is also used to limit the losses considered in experience rating to 10% and 20% of the self-rating point for single and multiple claims respectively. (Under RERP, losses for experience rating will be limited using the State Reference Point.)</p> <p>The self rating point is 25 times the serious average cost per case averaged with the previous self rating point.</p> <p>In the Pure Premium Exhibits (the A-Sheets) losses are limited to 20% and 40% of the self-rating point for single and multiple claims, respectively.</p>
Severity	Volume of losses divided by number of claims in a given period.
Standard Earned Premium	Manual premium after experience rating modification and expense constants.

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Standard Exclusions	Any classification code whose experience is not found on the A-Sheets (e.g., Federal classifications, Maritime classifications, "a"-rated classifications, Explosive classifications, Non-Ratable Element Codes). These codes are listed on the master as industry group "7".
Statistical Plan	The rules that govern how workers compensation statistics must be reported to the NCCI.
Subsequent Reports	All unit reports after the First Report.
Swing Limits	Swing limits are used to control the change in rates by classification. For example, a swing limit of 25% implies that Maximum Deviation = Effect of the final change in premium level by industry group plus or minus 25% rounded to the nearest 1%.
Target Cost Ratio (TCR)	Represents the percentage of each dollar of standard premium collected available for payment of benefits including loss adjustment expense.
Test Correction Factor (TCF)	Used to determine if the required change in manual premium level has been achieved. An iterative process continually tests the proposed rates including tentative TCF's until the required change is obtained. This process also adjusts for the effect of classes limited by the upper and lower swing.
Three-Year Fixed Rate Policy	Established to permit the underwriting of small size insureds at less Policy cost. An insured whose estimated premium is not over \$700 per year may be written for a period of three years at the manual rate, provided the risk is not eligible for the Experience Rating Plan on the effective date of the policy. This rate will not change unless there is an adjustment of outstanding policies in excess of 10% as a result of a law amendment.
Trend	Change in loss ratio due to differences in the rate at which payrolls and losses change over time.

DATA COLLECTION AND DATA QUALITY

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Turnaround Document	A Listing or Report sent from NCCI to the carrier and then returned to NCCI with the appropriate Carrier Responses.
Ultimate Cost	The total paid losses to date plus an estimate of all future costs required to close the claim.
Unit Card Routing (UCR)	Future system which will provide an on-line database to store all unit reports and to serve as a foundation for improvements to data validation, Experience Rating and Class Ratemaking.
Unit Reports	Standard reporting forms completed by carriers for each insured supplying information about payroll and premium by classification, and losses for individual claims. Unit Reports are received by NCCI and compiled for each state into the Workers Compensation Statistical Plan.
Unit Report Control (URC)	Future production system that will trigger requests for unit reports for experience rated policies, provide information necessary to assess fines against carriers for late unit report submission and provide information on overall performance in delivering unit reports on time.
Unit Record Card	Report of premiums and/or claims to the state workers compensation body or rating bureau.
Unreported Data	Carrier data that has not been reported to NCCI on a unit report.
Validation	Procedures, either automated, manual or both, which check data for reasonableness, accuracy or other similar parameters.
Valuation Date	The point at which the cost of claims to date are estimated. (See First Report, Second Report, etc.)
Workers Compensation Statistical Plan (WCSP)	The reporting method by which NCCI compiles its payroll, premium and loss information through unit card summarization. The WCSP used to be referred to as the Unit Statistical Plan (USP).

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

How to Use Statistical Call Data Documentation

This binder provides a description of the validations performed to the data received on unit reports and the fifteen financial calls listed in the table of contents. These sixteen statistical calls were documented with extensive assistance from NCCI personnel. For each statistical call, the documentation includes:

- o An Overview which provides:
 - Description of the unit report or financial call
 - Description of production files/databases
 - Description of error handling
 - Description of modifications to data

- o An example of the Unit Report or an example of the financial call and filing instructions from the Reporting Guidebook for the Annual Calls for Experience.

In addition, supplemental detail is included for the following statistical calls:

- o Unit Report
- o Calendar Year Call for Net Written Workers Compensation Premium (Call #1)
- o Calendar Year Call for Compensation Experience by State (Call #2)
- o Policy Year Call for Compensation Experience by State (Call #3)
- o Calendar-Accident Year Call for Compensation Experience by State (Call #5)
- o Insurance Expense Exhibit (Call #6)
- o Calendar Year Reconciliation Report by State (Call #8)

The following supplemental information is provided for these calls:

- o Description of Data Collection and Data Handling:
 - A listing of each element on the source document
 - An indication of whether the element is captured in NCCI computer files
 - Description of validation performed

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

How to Use Statistical Call Data Documentation

- o Detailed descriptions of NCCI computer files containing statistical call information:
 - File Type (VSAM, Sequential, PDS, IDMS)
 - Device Type (Disk, Tape)
 - Retention Period
 - Element Description
 - Element Attribute (Alpha, Numeric)
 - Element Length
 - Source

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Statistical Call Overview Document

DESCRIPTION OF UNIT REPORT:

The unit report is a statistical document submitted by the carriers for reporting workers compensation statistical plan (WCSP) data to NCCI. It includes exposure, premium and loss data by state at a payroll classification code level.

WCSP data is submitted to NCCI on unit reports for every workers compensation policy written. The first report for a policy is due at NCCI twenty months after the policy effective date. This allows six months of loss development after the policy expiration date and two months for carriers to complete preparation. Carriers are required to submit follow-up reports each year, up to four additional reports for any policy that has open claims. These follow-up reports are known as "subsequents" or individually as second, third, fourth and fifth reports.

WCSP data is used by NCCI to determine rate distribution by payroll classification in producing class rates and to evaluate the relative experience of each insured in producing experience modification factors (Experience Mods).

FILES/DATABASES:

Payroll & Loss (P/L) Detail File:

This file serves as the central repository for detailed WCSP data used for class ratemaking. This file contains five years of WCSP data. There is a separate P/L file for each state for which NCCI prepares rates.

Compress File:

This file contains payroll and loss data for each experience rated insured for the most recent three policy years. The data contained on this file represents the most recent valuation achieved by combining first and subsequent reports.

NC-235 Limited Summary File:

This file contains unit report information summarized by class and used for class ratemaking. This data is obtained by summarizing detail WCSP data in the P/L Detail File after it has been validated.

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Statistical Call Overview Document

DESCRIPTION OF ERROR HANDLING:

The unit report data is validated visually using system generated reports as the data is processed through Data Administration. Clerks manually review these reports for reasonableness of fluctuations from one year to the next, identification of missing unit reports, data entry and carrier reporting errors.

Errors are resolved through the application of standard procedures. In some cases the carriers are sent correspondence letters to resolve errors/questionable data identified during the validation process. The carriers respond to NCCI's request either by verifying the questioned information is correct as reported or by submitting a correction unit report ("C-report"). These reports are validated upon receipt. If the carrier does not reply, the data may be eliminated from the file.

MODIFICATIONS TO DATA:

WCSP data may be modified by NCCI during validation and through resubmission/corrections provided by the carriers.

As the result of insufficient experience for rate filing purposes, class codes may be reassigned by the system according to the state master file. Class codes would be reassigned because of a lack of experience being reported for a given class code, and/or a class code being discontinued.

Modifications to the unit report data may result from loss limitations being applied for single and multiple claims. The maximum allowable loss amounts are limited by state. A single claim will be limited to 20% of the A-sheet loss limitation value, while multiple, or "catastrophe" claims are limited in total to 40% of the A-sheet loss limitation value. This process is performed by the system with no manual intervention.

Injury types may be reassigned by the system if particular reassignment criteria have been met. A new injury type will be reassigned automatically based upon these conditions. For example, if a particular unit report is reported with an injury type of five and the indemnity amount equals zero, the injury type will automatically be reassigned to six.

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Statistical Call Overview Document

NCCI eliminates or corrects data identified during its validation process based on standard rules. These rules address elimination of duplicates, data reported outside of WCSP guidelines, data entry errors and other obvious errors.

On occasion, a carrier may have to report a revision to previously submitted information. Changes in payroll, manual rate or premium are reported on an "Exposure Correction Card" and changes in loss information are reported on a "Loss Correction Card".

All revised data is requested to be submitted on subsequent reports or correction reports. When production deadlines require a more timely response, telephone responses are accepted with the stipulation that a correction unit report will also be submitted.

When Unit Report Control (URC) becomes a production application, unit reports will be processed and some file validations performed upon receipt. All unit reports will go through a matching process whereby subsequent reports that do not have a corresponding first report will be rejected and the carrier notified of the processing error.

**NAIC Examination of NCCI
Description of Data Collection and Data Handling
Statistical Call Data Documentation**

Unit Report:

Data Element	Captured?	Description of Validation
1. Report Number	Yes	<p>A. Checked for missing or invalid report numbers. Valid values are between 1 and 5, excluding 0 reports. (Visual review of hard copy input)</p> <p>B. As of 05/01/91, the URC process will replace the manual review via the Reject Facsimile process. If this field is missing or invalid, the unit report will be rejected from the system, and returned to the carrier for correction. The unit report will also be rejected if received prior to loss valuation date.</p>
2. Policy Number	Yes	<p>A. Checked for missing policy numbers. The policy number is a number assigned by the carrier to a policy. (Visual review of hard copy input)</p> <p>B. As of 05/01/91, the URC process will replace the manual review via the Reject Facsimile process. If this field is missing, the unit report will be rejected from the system and returned to the carrier for correction.</p> <p>C. For experience rated unit reports using PICS, the name on the policy is checked against the name shown on the rating by the Field Offices. (Visual review of an on-line inquiry screen)</p>
3. State Name	No	
4. State Code	Yes	<p>A. Checked for missing or invalid state codes. The state code is a two digit numeric code assigned by NCCI that uniquely identifies a state on the unit report. (Visual review of hard copy input)</p> <p>B. As of 05/01/91, the URC process will replace the manual review via the Reject Facsimile process. If this field is missing or invalid, the unit report will be rejected from the system, and returned to the carrier for correction.</p>
5. Carrier Name	No	

NAIC Examination of NCCI
 Description of Data Collection and Data Handling
 Statistical Call Data Documentation

Unit Report:

Data Element	Captured?	Description of Validation
6. Carrier Code	Yes	<p>A. Checked for missing or invalid carrier codes. The carrier code is a unique five digit numeric code assigned by NCCI to each member or subscriber company. (Visual review of hard copy input)</p> <p>B. As of 05/01/91, the URC process will replace the manual review via the Reject Facsimile process. If this field is missing or invalid, the unit report will be rejected from the system and returned to the carrier for correction.</p> <p>C. For experience rated unit reports: - Checked to determine if subsequent unit reports belong to the State fund carrier codes: 1) 19909-Arizona 2) 20020-Montana 3) 19933-Utah</p>

NAIC Examination of NCCI
 Description of Data Collection and Data Handling
 Statistical Call Data Documentation

Unit Report:

Data Element	Captured?	Description of Validation
<p>7. Effective Date</p>	<p>Yes</p>	<p>A. Checked for missing or invalid effective dates. (Visual review of hard copy input)</p> <p>The effective date is the date (MM/DD/YY) upon which the policy becomes operational. Formatted YY/MM/DD on magnetic tape.</p> <p>B. As of 05/01/91, the URC process will replace the manual review via the Reject Facsimile process. If this field is missing, the unit report will be rejected from the system and returned to the carrier for correction.</p> <p>C. For experienced rated unit reports using PICS, the effective date on the policy is checked against the effective date shown on the rating by the Field Offices. (Visual review of an on-line inquiry screen)</p> <p>If the effective date on the policy does not reconcile to the effective date shown on the rating, the effective date is extended or short-termed. The effective date is extended by adding three months to the normal expiration date. The effective date is short-termed if the rating effective date is greater than fifteen months. (Manual process performed on-line)</p> <p>D. For experienced rated unit reports:</p> <ul style="list-style-type: none"> - Checked to determine if consecutive policy periods are overlapping in excess of one day. (Visual review of a system generated report) - Checked to determine if the maximum experience rated WCSP data is not greater than three years and nine months old. (Visual review of a system generated report) - Checked to determine that the experience rating has a full term 1st report between twenty-seven and thirty-eight months older than the rating effective date. (Visual review of a system generated report)
<p>8. Term</p>	<p>No</p>	

NAIC Examination of NCCI
Description of Data Collection and Data Handling

Statistical Call Data Documentation

Unit Report:

Data Element	Captured?	Description of Validation
9. Expiration Date	Yes	<p>A. Checked for missing or invalid expiration dates. (Visual review of hard copy input)</p> <p>The expiration date is the date (MM/DD/YY) upon which the policy ends. Formatted YY/MM/DD on magnetic tape.</p>
10. Condition	Yes	None
11. Number of Claims Previously Reported	Yes	<p>A. Reasonableness of unusual aggregate increases and/or decreases between previously reported information and current information is reviewed. (Visual review of a system generated report)</p>
12. Accident Date or Revised Number of Claims	Yes	None
13. Previously Reported Class Code	Yes	<p>A. Reasonableness of unusual aggregate increases and/or decreases between previously reported information and current information is reviewed. (Visual review of a system generated report)</p> <p>B. Validates reassigned class codes, those class codes which have been discontinued or combined due to insufficient experience for rate filing purposes. (Visual review of a system generated report)</p> <p>C. Class codes, which contain losses but no exposure, are reviewed. (Visual review of a system generated report)</p>
14. Previously Reported Injury Type	Yes	<p>A. Reasonableness of unusual aggregate increases and/or decreases between previously reported information and current information is reviewed. (Visual review of a system generated report)</p>

NAIC Examination of NCCI
 Description of Data Collection and Data Handling
 Statistical Call Data Documentation

Unit Report:

Data Element	Captured?	Description of Validation
15. Previously Reported Incurred Losses Indemnity	Yes	<p>A. Claims with combined indemnity and medical amounts greater than \$500,000 are reviewed for 5 years. An additional review takes place when investigating maximum aggregates (cap on indemnity amount by state). (Visual review of a system generated report)</p> <p>B. Reasonableness of unusual aggregate increases and/or decreases between previously reported information and current information is reviewed. (Visual review of a system generated report)</p> <p>C. Reasonableness of reported amount is validated against a critical values table.</p> <p>An error code flags all unreasonable amounts on a report which is reviewed. (Visual review of a system generated report)</p>
16. Previously Reported Incurred Losses Medical	Yes	<p>A. Claims with combined indemnity and medical amounts greater than \$500,000 are reviewed for 5 years. (Visual review of a system generated report)</p> <p>B. Reasonableness of unusual aggregate increases and/or decreases between previously reported information and current information is reviewed. (Visual review of a system generated review)</p>
17. Previously Reported Open or Closed	Yes	None
18. Previously Reported Loss Coverage	Yes	None

NAIC Examination of NCCI
 Description of Data Collection and Data Handling
 Statistical Call Data Documentation

Unit Report:

Data Element	Captured?	Description of Validation
19. Previously Reported Cat. Number	Yes	A. Reviewed to determine if total catastrophic loss amounts are greater than their limitation value. (Visual review of a system generated report) B. Limits the total catastrophic loss amounts to 40% of adjusted A-Sheet Limitation Value. (Visual review of a system generated report) C. Checked for negative values and keypunch errors. (Visual review of a system generated report)
20. Previously Reported Class Code	Yes	A. Reasonableness of unusual aggregate increases and/or decreases between previously reported information and current information is reviewed. (Visual review of a system generated report) B. Validation of reassigned class codes, those class codes which have been discontinued or combined due to insufficient experience for rate filing purposes. (Visual review of a system generated report) C. Class codes, which contain losses but no exposure, are reviewed. (Visual review of a system generated report)
21. Revised Injury Type	Yes	A. Reasonableness of unusual aggregate increases and/or decreases between previously reported information and current information is reviewed. (Visual review of a system generated report)

NAIC Examination of NCCI
Description of Data Collection and Data Handling
Statistical Call Data Documentation

Unit Report:

Data Element	Captured?	Description of Validation
22. Revised Incurred Losses Indemnity	Yes	<p>A. Claims with combined indemnity and medical amounts greater than \$500,000 are reviewed for 5 years. An additional review takes place when investigating maximum aggregates (cap on indemnity amount by state). (Visual review of a system generated report)</p> <p>B. Reasonableness of unusual increases and/or decreases between previously reported information and current information is reviewed. (Visual review of a system generated report)</p> <p>C. Reasonableness of reported amount is validated against a critical values table. An error code flags all unreasonable amounts on a report which is reviewed. (Visual review of a system generated report)</p> <p>D. For experience rated unit reports: - Reviewed for duplicate and/or credit loss records. - Checked to determine the presence of catastrophic claims. - Checked to determine whether credit records exist. - Checked to determine losses without payroll. (Visual review of system generated reports)</p>
23. Revised Incurred Losses Medical	Yes	<p>A. Claims with combined indemnity and medical amounts greater than \$500,000 are reviewed for 5 years. (Visual review of a system generated report)</p> <p>B. Reasonableness of unusual aggregate increases and/or decreases between previously reported information and current information is reviewed. (Visual review of a system generated report)</p> <p>C. For experience rated unit reports: - Reviewed for duplicate and/or credit loss records. - Checked to determine the presence of catastrophic claims. - Checked to determine whether credit records exist. - Checked to determine losses without payroll. (Visual review of system generated reports)</p>
24. Revised Open or Closed	Yes	None

NAIC Examination of NCCI
Description of Data Collection and Data Handling
Statistical Call Data Documentation

Unit Report:

Data Element	Captured?	Description of Validation
25. Revised Loss Coverage	Yes	None
26. Revised Cat. Number	Yes	<p>A. Reviewed to determine if total catastrophic loss amounts are greater than their limitation value. (Visual review of a system generated report)</p> <p>B. Limits the total catastrophic loss amounts to 40% of adjusted A-Sheet Limitation Value. (Visual review of a system generated report)</p> <p>C. Checked for negatively submitted values and keypunch errors. (Visual review of a system generated report)</p>
27. Exposure Coverage	Yes	None
28. Class Code	Yes	<p>A. Payroll and loss summary records for which the class code does not appear on state master are reviewed. (Visual review of a system generated report)</p> <p>B. Validates reassigned class codes, those class codes which have been discontinued or combined due to insufficient experience for rate filing purposes. (Visual review of a system generated report)</p> <p>C. Class codes, which contain losses but no exposure, are reviewed. (Visual review of a system generated report)</p> <p>D. Checked for coal mine, per capita class codes and that there are no class code changes except for class codes 8810, 7380 and 8742 for experienced rated unit reports. (Visual review of a system generated report)</p>

NAIC Examination of NCCI
Description of Data Collection and Data Handling

Statistical Call Data Documentation

Unit Report:

Data Element	Captured?	Description of Validation
29. Exposure	Yes	<p>A. Duplicate payroll and loss records are offset and validated. (Visual review of a system generated report)</p> <p>B. Class codes with unusual aggregate payroll fluctuations are investigated and/or explained. (Visual review of a system generated report)</p> <p>C. Three years of payroll data is traced to identify missing large risks. (Visual review of a system generated report)</p> <p>D. For experience rated unit reports: - Reviewed to determine whether the change in the payroll levels for the two most recent years exceeds 50%. - Reviewed for duplicate and/or credit payroll records. - Checked to determine the presence of catastrophic claims. - Checked to determine whether credit records exist. (Visual review of system generated reports)</p>
30. Manual Rate	Yes	<p>A. Calculated rate is reviewed for keypunching errors. (Visual review of a system generated report)</p> <p style="text-align: center;">The formula for calculating the manual rate is: $\frac{\text{premium amount} \times 100}{\text{payroll amount}} = \text{manual rate}$</p>
31. Premium	Yes	<p>A. Checked for keypunching errors. (Visual review of a system generated report and hard copy input)</p> <p>B. For experience rated unit reports: - Validated to determine whether subject premium meets or exceeds state eligibility requirements for experience rating. - Reviewed to determine whether changes in premium levels for the two most recent years exceeds 50%. (Visual review of system generated reports)</p>
32. Claim Number	Yes	None
33. Accident Date or Number of Claims	Yes	None

NAIC Examination of NCCI
Description of Data Collection and Data Handling
Statistical Call Data Documentation

Unit Report:

Data Element	Captured?	Description of Validation
34. Class Code	Yes	<p>A. Payroll and loss summary records for which the class code does not appear on state master are reviewed. (Visual review of a system generated report)</p> <p>B. Validates reassigned class codes, those class codes which have been discontinued or combined due to insufficient experience for rate filing purposes. (Visual review of a system generated report)</p> <p>C. Class codes, which contain losses but no exposure, are reviewed. (Visual review of a system generated report)</p>
35. Injury Type	Yes	A. Reasonableness of unusual aggregate increases and/or decreases between previously reported information and current information is reviewed. (Visual review of a system generated report)
36. Incurred Losses Indemnity	Yes	<p>A. Claims with combined indemnity and medical amounts greater than \$500,000 are reviewed for 5 years. An additional review takes place when investigating maximum aggregates (cap on indemnity amount by state). (Visual review of a system generated report)</p> <p>B. Reasonableness of unusual aggregate increases and/or decreases between previously reported information and current information is reviewed. (Visual review of a system generated report)</p> <p>C. Reasonableness of reported amount is validated against a critical values table.</p> <p>An error code flags all unreasonable amounts on a report which is reviewed. (Visual review of a system generated report)</p>
37. Incurred Losses Medical	Yes	<p>A. Claims with combined indemnity and medical amounts greater than \$500,000 are reviewed for 5 years. (Visual review of a system generated report)</p> <p>B. Reasonableness of unusual aggregate increases and/or decreases between previously reported information and current information is reviewed. (Visual review of a system generated report)</p>
38. Open/Closed Indicator	Yes	None

NAIC Examination of NCCI
Description of Data Collection and Data Handling
Statistical Call Data Documentation

Unit Report:

Data Element	Captured?	Description of Validation
39. Loss Coverage	Yes	None
40. Cat Number	Yes	<p>A. Reviewed to determine if total catastrophic loss amounts are greater than their limitation value. (Visual review of a system generated report)</p> <p>B. Limits the total catastrophic loss amounts to 40% of adjusted A-Sheet Limitation Value. (Visual review of a system generated report)</p> <p>C. Checked for negatively submitted values and keypunch errors. (Visual review of a system generated report)</p>
41. Risk Name	Yes	A. Experience rated unit reports are checked for missing or invalid risk names by the Field Offices. (Visual review of a system generated report)
42. Risk ID Number	Yes	A. Experience rated unit reports are checked for missing or invalid risk ID numbers by the Field Offices. (Visual review of a hard copy input)
43. Policy Name	Yes	A. The name on the policy is checked against the name shown on the rating for experience rated unit reports by the field offices using PICS. (Visual review of an on-line inquiry screen)
44. Experience Mod	Yes	<p>A. For experience rated unit reports:</p> <ul style="list-style-type: none"> - Checked to determine if modifier increases or decreases are within +/- 25% of last year's modifier. (Visual review of a system generated report) - Checked to determine if modifier is greater than 2.00 or less than 0.50. (Visual review of a system generated report)

NAIC EXAMINATION OF NCCI
FILE DEFINITION - PAYROLL & LOSS (P/L) DETAIL FILE

DESCRIPTION AND USE:

PAYROLL AND LOSS (P/L) DETAIL FILE.

THIS FILE SERVES AS THE CENTRAL REPOSITORY FOR DETAILED WCSP
DATA USED FOR CLASS RATEMAKING. THIS FILE CONTAINS FIVE YEARS
OF WCSP DATA. THERE IS A SEPARATE P/L FILE FOR EACH STATE FOR
WHICH NCCI PREPARES RATES.

FILE TYPE : SEQUENTIAL (V=VSAM, S=Sequential, P=PI=IDMS)
DEVICE TYPE : TAPE (D=Disk, T=Tape)
RETENTION : 10 YEARS

ELEMENT DESCRIPTION	ELEMENT ATTRIBUTE	ELEMENT LENGTH	SOURCE
REPORT NUMBER	ALPHA	2	UNIT REPORT
EFFECTIVE DATE	ALPHA	6	UNIT REPORT
STATE CODE	ALPHA	2	UNIT REPORT
CARRIER CODE	NUMERIC	5	UNIT REPORT
SERIAL NUMBER	NUMERIC	6	UNIT REPORT
GOVERNING CLASS CODE MOD	NUMERIC	4	UNIT REPORT
RISK ID	ALPHA	9	UNIT REPORT
CATASTOPHE CODE	ALPHA	2	UNIT REPORT
TRANSACTION CODE	ALPHA	1	UNIT REPORT
INJURY TYPE	NUMERIC	1	UNIT REPORT
CASES	NUMERIC	7	UNIT REPORT
PAYROLL INDEMNITY AMOUNT	NUMERIC	13	UNIT REPORT
PREMIUM MEDICAL AMOUNT	NUMERIC	11	UNIT REPORT
SPECIAL CASE CODE	NUMERIC	1	UNIT REPORT
ASSIGNED RISK INDICATOR	ALPHA	1	UNIT REPORT
ADMINISTRATION NUMBER	ALPHA	21	UNIT REPORT
POLICY NUMBER	ALPHA	18	UNIT REPORT
CORRECTION CODE INDICATOR	ALPHA	1	UNIT REPORT
POLICY EXPIRATION DATE	ALPHA	6	UNIT REPORT
POLICY CONDITION CODE	ALPHA	9	UNIT REPORT
FIXED RATE INDICATOR	ALPHA	1	UNIT REPORT
RATING EFFECTIVE DATE	ALPHA	6	UNIT REPORT
REPORT NUMBER	ALPHA	2	UNIT REPORT
TOTAL LOSS CASES	ALPHA	6	UNIT REPORT
ACCIDENT DATE	ALPHA	6	UNIT REPORT
REPORTED INJURY CODE	ALPHA	1	UNIT REPORT
LOSS STATUS	ALPHA	1	UNIT REPORT
LOSS COVERAGE	ALPHA	2	UNIT REPORT
CLAIM NUMBER	ALPHA	20	UNIT REPORT

NAIC EXAMINATION OF NCCI
FILE DEFINITION - EXPERIENCE RATING COMPRESS FILE

DESCRIPTION AND USE:

EXPERIENCE RATING COMPRESS FILE

THIS FILE CONTAINS PAYROLL AND LOSS DATA FOR EACH EXPERIENCE RATED RISK FOR THE MOST RECENT THREE POLICY YEARS. THE DATA CONTAINED ON THIS FILE REPRESENTS THE MOST RECENT THREE POLICY YEARS AND THE MOST RECENT VALUATION ACHIEVED BY COMBINING FIRST AND SUBSEQUENT REPORTS.

FILE TYPE : SEQUENTIAL (V=VSAM, S=Sequential, P=PDS, I=IDMS)

DEVICE TYPE : TAPE (D=Disk, T=Tape)

RETENTION : 10 YEARS

ELEMENT DESCRIPTION	ELEMENT ATTRIBUTE	ELEMENT LENGTH	SOURCE
RISK ID	ALPHA	10	UNIT REPORT
EXPECTED LOSS RATIO FACTORS	NUMERIC	4	UNIT REPORT
FIRM ID	ALPHA	10	UNIT REPORT
POLICY NUMBER	ALPHA	18	UNIT REPORT
POLICY DATE	ALPHA	6	UNIT REPORT
POLICY EFFECTIVE DATE	ALPHA	6	UNIT REPORT
STATE CODE	ALPHA	2	UNIT REPORT
REPORT NUMBER	NUMERIC	1	UNIT REPORT
CARRIER CODE	ALPHA	5	UNIT REPORT
SERIAL NUMBER	ALPHA	6	UNIT REPORT
EXPERIENCE MOD	ALPHA	3	UNIT REPORT
CLASS CODE	ALPHA	4	UNIT REPORT
TRANSACTION CODE	ALPHA	1	UNIT REPORT
SPECIAL CASE INDICATOR	ALPHA	1	UNIT REPORT
D-RATIO	NUMERIC	4	UNIT REPORT
PAYROLL AMOUNT	NUMERIC	9	UNIT REPORT
PREMIUM AMOUNT	NUMERIC	7	UNIT REPORT
EXPIRATION DATE	ALPHA	6	UNIT REPORT
BATCH NUMBER	ALPHA	4	UNIT REPORT
MAGTAPE INDICATOR	ALPHA	1	UNIT REPORT
SOURCE TAG	ALPHA	1	UNIT REPORT
INJURY TYPE	ALPHA	1	UNIT REPORT
CASE CODE	ALPHA	4	UNIT REPORT
INDEMNITY AMOUNT	NUMERIC	9	UNIT REPORT
MEDICAL AMOUNT	NUMERIC	7	UNIT REPORT
CLAIM NUMBER	ALPHA	20	UNIT REPORT
ACCIDENT DATE	ALPHA	6	UNIT REPORT
PAYMENT TOTAL	NUMERIC	9	UNIT REPORT
INDEMNITY TOTAL	NUMERIC	7	UNIT REPORT
MEDICAL TOTAL	NUMERIC	8	UNIT REPORT
RECORD COUNT	ALPHA	6	UNIT REPORT

NAIC EXAMINATOR OF NCCI
 FILE DEFINITION - NC-235 SUMMARY RATEMAKING FILE

DESCRIPTION AND USE:

NC-235 SUMMARY RATEMAKING FILE.

THIS FILE CONTAINS UNIT REPORT INFORMATION SUMMARIZED BY CLASS AND USED FOR CLASS RATEMAKING. THIS DATA IS OBTAINED BY SUMMARIZING DETAIL WCSP DATA IN THE P/L DETAIL FILE AFTER IT HAS BEEN VALIDATED.

FILE TYPE : SEQUENTIAL (V=VSAM, S=Sequential, P=PDS, I=IDMS)
 DEVICE TYPE : TAPE (D=Disk, T=Tape)
 RETENTION : 10 YEARS

ELEMENT DESCRIPTION	ELEMENT ATTRIBUTE	ELEMENT LENGTH	SOURCE
EFFECTIVE DATE	ALPHA	4	UNIT REPORT
EXPOSURE DATE	ALPHA	4	UNIT REPORT
STATE CODE	ALPHA	2	UNIT REPORT
REPORT NUMBER	ALPHA	1	UNIT REPORT
FEDERAL CODE	ALPHA	1	UNIT REPORT
INJURY GROUP CODE	NUMERIC	1	UNIT REPORT
CASES	NUMERIC	7	UNIT REPORT
PAID INDEMNITY	NUMERIC	13	UNIT REPORT
PAID MEDICAL	ALPHA	11	UNIT REPORT
CLASS CODE	ALPHA	4	UNIT REPORT
TRANSACTION INJURY TYPE	ALPHA	1	UNIT REPORT
UNMOD PREMIUM AMOUNT	NUMERIC	13	UNIT REPORT
PREMIUM CURRENT RATE	NUMERIC	13	UNIT REPORT
REASSIGNED CLASS CODE	ALPHA	4	UNIT REPORT

NAIC Examination of NCCI
Description of Data Collection and Data Handling

Statistical Call Data Documentation

Example Of A Unit Report :

REPORT	POLICY NUMBER	STATE	STATE NO	CARRIER	CARRIER NO	REVISED CARD SERIAL NO	ADM FILE NO							
EFFECTIVE DATE	TERM	EXPIRATION DATE		INURED										
COND	01	02	03	04	05	06	07	08	OTHER	ORIG CARD SERIAL NO				
CLAIM NUMBER OR NUMBER OF CLAIMS PREVIOUSLY REPORTED	ACCIDENT DATE OR REVISED NUMBER OF CLAIMS	CLASS CODE	N	PREVIOUSLY REPORTED*					REVISED*					
				INCURRED LOSSES		LOSS COV	CAT NO	INCURRED LOSSES		LOSS COV	CAT NO			
		INDemnITY		MEDICAL								INDemnITY		MEDICAL
				TOTAL			TOTAL							
DO NOT USE	PREVIOUSLY REPORTED				REVISED				*INDICATE INDIVIDUAL ITEMS WHERE THERE HAS BEEN A CHANGE IN ANY OF THE DATA PREVIOUSLY REPORTED. ALL "TOTALS" MUST INCLUDE ALL ITEMS INCLUDING THOSE THAT REMAIN UNCHANGED.					
	RR	RR	NO	OR	TYPE	RR	RR	NO	OR	TYPE	RR	RR	NO	OR

LOSS CARD FORM 18-10

1	POLICY NUMBER	STATE	STATE NO	CARRIER	CARRIER NO	CARD SERIAL NO	ADM FILE NO					
EFFECTIVE DATE	TERM	EXPIRATION DATE		INURED								
COND	01	02	03	04	05	06	07	08	OTHER			
EXP COV	CLASS CODE	EXPOSURE	RATURAL RATE	PREMIUM	CLASS NUMBER	ACCIDENT DATE OR NO OF CLAIMS	CLASS CODE	N	INCURRED LOSSES		LOSS COV	CAT NO
									INDemnITY				MEDICAL
A - TOTAL SUBJECT PREMIUM												
B - EXPERIENCE MODIFICATION												
C - TOTAL MODIFIED PREMIUM (A) X (B)												
D												
E												
F												
G												
R O T	STD		E E E		E E E							
	OTHER		E E E		E E E							
	EXP		PREMIUM DISCOUNT		E E E							
EXPENSE CONSTANT				TOTALS				E E E E E				
DO NOT USE	PREM SIZE	INDUSTRY GROUP	TYPE	INDUSTRY SCHED	KEYPURCH					FORM 17-10		VERSION 0

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Statistical Call Overview Document

STATISTICAL CALL NAME:

Calendar Year Call For Net Written Workers Compensation Premium (Call #1)

DESCRIPTION OF CALL:

This call contains dollar amounts for net direct written workers compensation premium detailed by state and type of workers compensation premium (Workers Compensation, USL&HW, Excess, & National Defense) for the specified calendar year. All members of NCCI and reinsurance pools managed by NCCI are required to submit this information annually.

The Calendar Year Call for Net Direct Workers Compensation is used as the base for NCCI's assessment process and as the base for the calculation of participation ratios used for distribution of the reinsurance pool's quarterly operating results to the pool membership.

FILES/DATABASES:

Premium Call Production File:

This file serves as the central repository for Call #1 data. This file contains all data received from the carriers.

DESCRIPTION OF ERROR HANDLING:

All submissions to NCCI require a copy of the carrier's annual statement Page 8 and individual states' Page 14s. Each Page 14 is manually compared to each amount entered on Call #1 for all individual states and the total on Call #1 is compared to the direct written premium amount on Page 8. When differences are detected, the carrier is contacted for correction to the call and a revision is submitted for processing. The NCCI makes no adjustments to any data submitted by the carrier.

After the manual comparison of the Page 8 and Page 14 data to the premium call, the report is batched with other financial calls and sent to NCCI's off-site data entry service (ACS). The entered information is transmitted from ACS to NCCI's Operations

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Statistical Call Overview Document

Department where CFOPWJ01 Edit and Balance Program is run. The Premium Call Production File is the repository for all processed data and allows a further edit on potential cross-foot errors on premium. One of the captured fields is the Carrier Code. Before the information is transmitted back to NCCI from ACS, it is edited against ACS's master carrier list for validity. If the carrier code is not a valid number, it is rejected and returned to NCCI for correction. If the carrier code passes their process, it is again verified when the Edit and Balance Program is run against the NCCI Carrier Master. This double checks the code for transpositions.

The Edit and Balance Program generates a hard copy print out of the keyed data and flags any problem with the data. Cross-foot errors can be corrected through a supplemental form which, after the carrier is notified of the "arithmetic" error, is sent to ACS for keypunching of corrected data. Carrier codes can be valid numbers but applied to the wrong premium call. One of the other edits performed is to manually compare the name translated from the carrier code printout to the actual premium call. If the carrier code is not correct, NCCI will correct the number on the correction form sent to ACS for data entry.

MODIFICATIONS TO DATA:

No modifications are made by NCCI personnel. If modifications are necessary, the carrier will be requested to resubmit the premium call.

**NAIC Examination of NCCI
Description of Data Collection and Data Handling**

Statistical Call Data Documentation

Statistical Call Name: Calendar Year Call For Net Written Workers Compensation Premium (NCCI Call #1)

Data Element	Captured?	Description of Validation
1. Carrier Name	No	
2. State Name	No	
3. State Code	Yes	A. Checked against the individual premium call after ACS keypunching. (Visual review of hard copy input and system generated report)
4. Workers' Compensation Premium (Column A)	Yes	A. Checked against the individual premium call after ACS keypunching. (Visual review of hard copy input and system generated report)
5. USL & HW Premium (Column B)	Yes	A. Checked against the individual premium call after ACS keypunching. (Visual review of hard copy input and system generated report)
6. Excess Workers' Compensation Premium (Column C)	Yes	A. Checked against the individual premium call after ACS keypunching. (Visual review of hard copy input and system generated report)
7. National Defense Plans Premium (Column D)	Yes	A. Checked against the individual premium call after ACS keypunching. (Visual review of hard copy input and system generated report)
8. Total (Column E) (Sum of Column A-D)	Yes	A. Checked against the individual state's Page 14 data for each line on the premium call after ACS keypunching. (Visual review of hard copy input and system generated report)
9. Line 49 (Total)	Yes	A. Checked against the individual premium call after ACS keypunching. System recalculates the call data to ensure the call was added correctly. (Visual review of hard copy input and system generated report)

NAIC Examination of NCCI
 Description of Data Collection and Data Handling
 Statistical Call Data Documentation

Statistical Call Name: Calendar Year Call For Net Written Workers Compensation Premium (NCCI Call #1)

Data Element	Captured?	Description of Validation
10. Carrier Code	Yes	A. Checked against the Carrier Master file for reasonableness and validity. Associated carrier name is printed and reviewed. (Visual review of a system generated report)
11. Carrier Status	Yes	A. System captures the data indicating if the carrier is a stock, mutual, reciprocal or state fund. This code is manually applied by NCCI personnel. B. Data input is validated against the Carrier Master file for reasonableness and reviewed. (Visual review of a system generated report)

NAIC EXAMINATION OF NCCI
 FILE DEFINITION - PREMIUM CALL PRODUCTION FILE

DATE:20APR91

DESCRIPTION AND USE:

PREMIUM CALL PRODUCTION FILE

USED AS A REPOSITORY OF CALENDAR YEAR CALL FOR NET WRITTEN WORKERS'
 COMPENSATION PREMIUM (CALL #1). THIS FILE CONTAINS ALL DATA
 RECEIVED FROM THE CARRIERS.

FILE TYPE : SEQUENTIAL (V=VSAM, S=Sequential, P=PDS, I=IDMS)
 DEVICE TYPE : TAPE (D=Disk, T=Tape)
 RETENTION : 10 YEARS

ELEMENT DESCRIPTION	ELEMENT ATTRIBUTE	ELEMENT LENGTH	SOURCE
CARRIER NAME	ALPHA	60	NOT CAPTURED
CARRIER CODE	APLHA	5	NET PREMIUM FINANCIAL CALL #1
CARRIER TYPE INDICATOR	APLHA	2	CALCULATED
STATE CODE	APLHA	2	NET PREMIUM FINANCIAL CALL #1
SUBSCRIBER INDICATOR	APLHA	1	CALCULATED
PREMIUM RATIO	NUMERIC	11	NET PREMIUM FINANCIAL CALL #1
PREMIUM AMOUNT	NUMERIC	11	NET PREMIUM FINANCIAL CALL #1
USL & HW PREMIUM	NUMERIC	11	NET PREMIUM FINANCIAL CALL #1
EXCESS WORKERS' COMP. PREMIUM	NUMERIC	11	NET PREMIUM FINANCIAL CALL #1
NATIONAL DEFENSE PLANS PREMIUM	NUMERIC	11	NET PREMIUM FINANCIAL CALL #1
TOTAL PREMIUM	NUMERIC	13	NET PREMIUM FINANCIAL CALL #1

CALL FOR EXPERIENCE #1
CALL FOR NET DIRECT WRITTEN PREMIUM

Background and Purpose of the Report

The Call for Net Direct Written Premium is due at NCCI on or before March 1 of the year following the calendar year experience being collected. As an example, the 1990 Call For Net Direct Written Premium is due at NCCI on or before March 1, 1991.

For each Annual Call Year, the most recent calendar year data must be reported on a state basis. Calendar Year transactions are those that occur during a specific year. As a result, calendar year 1990 data will include policy activity transactions occurring during 1990 from 1-1-90 through 12-31-90.

This Call is used by NCCI to provide the premium information necessary for NCCI Assessments and Reinsurance Pool participation for the following:

- National Workers Compensation Reinsurance Pool
- Michigan Workers Compensation Reinsurance Pool
- New Mexico Workers Compensation Reinsurance Pool

The data contained on this also provides the basis for the market share calculations used with the performance evaluation Monetary Incentive Program and the Early Reporting Program. Data collected in the Call For Net Direct Written Premium includes net direct written premium as reported on the carrier's Annual Statement. This data is split between Workers Compensation, USL&HW, Excess Workers Compensation and National Defense. The Workers Compensation total excludes the other three types of coverage, but does include Coal Mine experience.

The data reported on this call should include the experience developed under all deductible policies. This experience should be reported on a net basis as reported on Page 14 of the Annual Statements.

Instructions for Completion of the Report

Column A—The required premiums are defined as Workers Compensation and Employers Liability Direct Premiums charged, including policy and membership fees, less return premiums and premiums on policies not taken which are returned to policyholders, excluding all Reinsurance Assumed and without deducting any Reinsurance Ceded and excluding premiums for Longshore and Harbor Workers' Act (USL&HW), Excess Workers Compensation, and National Defense Plans.

Note: Coal Mine premiums are included in this column.

Column B—Due to the variations in procedures in establishing the applicable premium writing's bases, special information is required. This column should be completed showing only those premiums written under the U.S. Longshore and Harbor Workers' Act (USL&HW) using the same basis as required for Column A.

Column C—As in Column B, special information is required and this column should be completed showing only those premiums written for Excess Workers Compensation using the same basis as required for Column A.

Excess insurance is insurance written over the retention of a qualified self-insurer. Excess premiums and losses are those required to be omitted in NCCI's Calls for financial data, and itemized in the Calendar Year Reconciliation Call.

Column D—As in Columns B and C, special information is required and this column should be completed showing only those premiums written under Special National Defense Comprehensive Rating or Special National Defense Premium Discount Plans using the same basis as required for Column A.

Column E—Provides for the balancing of the report. The totals of each line from Columns A, B, C, and D as entered in Column E will reconcile to the net direct written by state you are required to report on Page 14 of your Annual Statement.

Report premiums in all columns in whole dollars only.

Group Reporting—Group reporting of premiums by member companies will be permitted. The group report should indicate the group name that will then be used for all NCCI assessments and Reinsurance Pool participation. A listing of all companies included in a group report must be furnished with the report.

In submitting this report, all columns are to be completed. If your company did not write any workers compensation premiums, please indicate "NONE" on Line 49, as applicable. The completed report must be dated and signed by an authorized representative.

The Line 49 total in Column E must agree with Page 8, Part 2B, Column 1, Line 16 which indicates workers compensation direct premiums written and IT IS REQUIRED THAT A COPY OF PAGE 8 OF YOUR FILED ANNUAL STATEMENT BE SUBMITTED WITH THIS REPORT. If this is a Group report, your Page 8 Annual Statement submissions must agree with your Line 49, Column E report total.

IT IS ALSO REQUIRED THAT A COPY OF PAGE 14 OF YOUR FILED ANNUAL STATEMENT FOR EACH STATE IN WHICH THEY WERE FILED BE SUBMITTED WITH THIS REPORT. If this is a group report, your annual

statement's Page 14 must agree with Column E for each state.

The submission of this completed report will provide the premium information necessary for NCCI assessments and Reinsurance Pool participation for the following:

National Council on Compensation Insurance
National Workers Compensation Reinsurance Pool
Michigan Workers' Compensation Placement Facility
New Mexico Workers Compensation Reinsurance Pool

Two copies of the reporting form will be provided in the package of forms sent to carriers in October of each year. One copy is to be filed with NCCI and the other copy is for your records.

All questions on this Call should be directed to the Residual Market Accounting Department at (407) 997-4309.

Please note that the due date for reporting this data is on or before March 1 of each year.

Please mail this Call to:

National Council on Compensation Insurance
750 Park of Commerce Drive
Boca Raton, FL 33487

ATTENTION: RESIDUAL MARKET ACCOUNTING

NATIONAL COUNCIL ON COMPENSATION INSURANCE
Reporting Guidebook for the Annual Calls for Experience

Effective January 1, 1990

NATIONAL COUNCIL ON COMPENSATION INSURANCE
REPORT OF NET DIRECT WRITTEN WORKERS COMPENSATION PREMIUMS

NAME OF CARRIER _____ 9 T

ADDRESS _____ CITY & STATE _____ A

IMPORTANT: Please read instructions before completing. 2 6 S

7-8	18-11	12	(A) 13-24	(B) 25-36	(C) 37-46	(D) 49-60	(E) 61-73
Line	State	Code	Workers Compensation	USL&HW	Excess Workers Compensation	National Defense Plans	Total
							Cols. (A thru D)
01	Alabama	01					
02	Alaska	54					
03	Arizona	02					
04	Arkansas	03					
05	California	04					
06	Colorado	05					
07	Connecticut	06					
08	District of Columbia	08					
09	Florida	09					
10	Georgia	10					
11	Hawaii	52					
12	Idaho	11					
13	Illinois	12					
14	Indiana	13					

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 REPORT OF NET DIRECT WRITTEN WORKERS COMPENSATION PREMIUMS

NAME OF CARRIER

7-8 Line	10-11 Code	12 .	(A) 13-24 Workers Compensation	(B) 25-36 USLAHW	(C) 37-48 Excess Workers Compensation	(D) 49-60 National Defense Plans	(E) 61-73 Total Cols. (A thru D)
15	Iowa	14					
16	Kansas	15					
17	Kentucky	16					
18	Louisiana	17					
19	Maine	18					
20	Maryland	19					
21	Massachusetts	20					
22	Michigan	21					
23	Minnesota	22					
24	Mississippi	23					
25	Missouri	24					
26	Montana	25					
27	Nebraska	26					

NATIONAL COUNCIL ON COMPENSATION INSURANCE
Reporting Guidebook for the Annual Calls for Experience

Effective January 1, 1990

Part IV
 Page 1:7

Original Printin

NATIONAL COUNCIL ON COMPENSATION INSURANCE
REPORT OF NET DIRECT WRITTEN WORKERS COMPENSATION PREMIUMS

NAME OF CARRIER _____

7-6 Line	10-11 State	12 Code	(A) 19-24 Workers Compensation	(B) 25-36 USL&HW	(C) 37-48 Excess Workers Compensation	(D) 49-60 National Defense Plans	(E) 61-73 Total Cols. (A thru D)
28	New Hampshire	28					
29	New Jersey	29					
30	New Mexico	30					
31	New York	31					
32	North Carolina	32					
33	Oklahoma	35					
34	Oregon	36					
35	Rhode Island	38					
36	South Carolina	39					
37	South Dakota	40					
38	Tennessee	41					
39	Texas	42					
40	Utah	43					
41	Vermont	44					
42	Virginia	45					

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 Reporting Guidebook for the Annual Calls for Experience

Effective January 1, 1990

Part IV
 Page 1:9

Original Printing

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 REPORT OF NET DIRECT WRITTEN WORKERS COMPENSATION PREMIUMS

NAME OF CARRIER _____

7-9 Line	10-11 State	12 Code	(A) 13-24 Workers Compensation	(B) 25-36 USL&HW	(C) 37-48 Excess Workers Compensation	(D) 49-60 National Defense Plans	(E) 61-73 Total Cols. (A thru D)
43	Wisconsin	48					
45	Line 1 thru 43 Total	98					
46	Delaware	07					
47	Pennsylvania	37					
48	All Other	80					
49	GRAND TOTAL	99					

Annual Statement, Page 8, Part 2B, Column 1, Line 16 workers compensation direct premium

written \$ _____ (See circular)

DATE _____ SIGNATURE _____ TITLE _____

PRINT NAME _____ TEL NO. _____

*For Council use only

TRANSMITTAL LETTER

1. CALL: CALENDAR YEAR CALL FOR NET DIRECT WORKERS COMPENSATION PREMIUMS WRITTEN

2. DUE DATE: MARCH 1 of each year.

3. CARRIER NAME _____

4. CARRIER CODE

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5. FILING AS: GROUP INDIVIDUAL COMPANY

6. If filing as a group, list individual carrier names:

7. SUBMISSION:

A. Complete Call: Original Resubmission

B. Page 8 Annual Statement: Included Not Included

C. If Page 8 not included, date it will be filed _____

D. Page 14(s) Annual Statement: Included Not Included

E. If Page 14(s) not included, date expected to be filed _____

F. No Experience to Report: (Does not eliminate required submission of Page 8.)

G. Reasons _____

MAIL CALL AND TRANSMITTAL LETTER TO:
NATIONAL COUNCIL ON COMPENSATION INSURANCE
750 PARK OF COMMERCE DRIVE
BOCA RATON, FL 33487
ATTN: RESIDUAL MARKET ACCOUNTING

NCCI USE ONLY
Date Received

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Statistical Call Overview Document

STATISTICAL CALL NAME:

Calendar Year Call For Compensation Experience By State (Call #2)

DESCRIPTION OF CALL:

This call contains dollar amounts for workers compensation Standard Earned Premium at NCCI DSR level, Standard Earned Premium at Company level, Net Earned Premium, and Total Incurred Losses for the specified calendar year. Each NCCI member carrier is required to submit this information for each state in which they operate. Some states require all carriers writing workers compensation policies to submit financial calls.

The Calendar Year Call for Compensation Experience is used to reconcile workers compensation experience data reported in the Policy Year Call and the Calendar-Accident Year Call to the carrier's annual statement.

FILES/DATABASES:

Calendar Year Call Production File:

This file serves as the central repository for Calendar Year Call data. This file contains all data received from the carriers as well as corrections applied to this data. Corrections to the file are made via ACS for data entry of revised reports with electronic transfer of the data to NCCI for incorporation into the production file.

Calendar Year Call SAS Dataset:

Actuarial analysis and reporting programs are executed using the data in this file.

There is one SAS dataset for each state for which the NCCI produces rates. The dataset contains data only for the specified state. This file is created through an extraction from the Calendar Year Call production file. Revised reports which are obtained after this extraction are entered into the SAS dataset and marked internally as revised records. When rate levels are completed for the state, these records are printed and sent to ACS for data entry and incorporation into the production file.

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Statistical Call Overview Document

DESCRIPTION OF ERROR HANDLING:

Calendar Year data is validated in a two step process. An initial validation using automated reports is performed when the data is received from the carrier. A final validation of the data is performed as one of the steps in producing a state's rate level to ensure that no errors have been overlooked.

Carriers are sent written correspondence letters to resolve any errors identified during the initial validation. As revised reports are received, they are checked for accuracy. If correct, the revised reports are sent to ACS for processing or entered into the SAS dataset if the affected data is already being used for rate level production.

During the final validation, newly discovered and outstanding errors are handled in a slightly different manner. Carriers are contacted by phone for a response. Revised reports are submitted by facsimile transmission or some form of overnight delivery. NCCI may enter corrections based on the phone conversation and in anticipation of carrier submitted revisions.

MODIFICATIONS TO DATA:

Revised reports are processed as they are received. Any data containing errors which remain unresolved at the time of a state's rate level production will be removed from the dataset if resolution of the remaining errors is not possible within the framework of the rate level production schedule.

All revised data is requested to be submitted on revised reports or via written correspondence. When production deadlines require an immediate response, telephone responses are accepted with the stipulation that a written confirmation of the changes also be submitted.

**NAIC Examination of NCCI
Description of Data Collection and Data Handling**

Statistical Call Data Documentation

Statistical Call Name: Calendar Year Call For Compensation Experience By State (NCCI Call #2)

Data Element	Captured?	Description of Validation
1. Carrier Name	No	
2. Carrier Code	Yes	A. Validated against NCCI carrier membership list. (Visual review of hard copy input)
3. Call Year	Yes	A. Checked for consistency with data submitted on call. (Visual review of a system generated report and hard copy input)
4. Submitted By	No	
5. Title	No	
6. Telephone Number	No	
7. Date Submitted	No	
8. Serial Number	No	
9. State Code	Yes	<p>A. Checked via reconciliation of Net Earned Premium and Total Incurred Losses to the Insurance Expense Exhibit. If wrong state, data will not match.</p> <p>B. Checked via reconciliation of Standard Earned Premium at NCCI DSR level, Standard Earned Premium at Company level, Net Earned Premium, and Incurred Losses to line S on the Calendar - Accident Year call and line T of the Policy Year call. If wrong state, data will not match.</p>
10. Standard Earned Premium at NCCI DSR Level	Yes	A. Total line checked against the sum of all states.
11. Standard Earned Premium at Company Level	Yes	A. Total line checked against the sum of all states.
12. Net Earned Premium	Yes	<p>A. Validated via reconciliation to Insurance Expense Exhibit.</p> <p>B. Total line checked against the sum of all states.</p>

NAIC Examination of NCCI
 Description of Data Collection and Data Handling
 Statistical Call Data Documentation

Statistical Call Name: Calendar Year Call For Compensation Experience By State (NCCI Call #2)

Data Element	Captured?	Description of Validation
13. Total Incurred Losses	Yes	A. Validated via reconciliation to Insurance Expense Exhibit. B. Total line checked against the sum of all states.

NAIC EXAMINATOR OF NCCI
FILE DEFINITION - CALENDAR YEAR PRODUCTION FILE

DESCRIPTION AND USE:

CALENDAR YEAR PRODUCTION FILE.

USED AS REPOSITORY OF CALENDAR YEAR DATA FOR FINANCIAL CALLS
AREA BY DATA PROCESSING.

FILE TYPE : SEQUENTIAL (V=VSAM, S=Sequential, P=PDS, I=IDMS)
 DEVICE TYPE : TAPE (D=Disk, T=Tape)
 RETENTION : 10 YEARS

ELEMENT DESCRIPTION	ELEMENT ATTRIBUTE	ELEMENT LENGTH	SOURCE
CALENDAR TYPE	ALPHA	1	CALCULATED
STATE	ALPHA	2	CALENDAR YEAR FINANCIAL CALL
CARRIER	ALPHA	5	CALENDAR YEAR FINANCIAL CALL
STANDARD PREMIUM CREDIT INDICATOR	ALPHA	1	CALCULATED
STANDARD PREMIUM	NUMERIC	10	CALENDAR YEAR FINANCIAL CALL
NET PREMIUM CREDIT INDICATOR	ALPHA	1	CALCULATED
NET PREMIUM	NUMERIC	10	CALENDAR YEAR FINANCIAL CALL
INCURRED LOSS CREDIT INDICATOR	ALPHA	1	CALCULATED
INCURRED LOSS	NUMERIC	10	CALENDAR YEAR FINANCIAL CALL
CARRIER NAME	ALPHA	32	NOT CAPTURED
COMPANY PREMIUM INDICATOR	ALPHA	1	CALCULATED
COMPANY PREMIUM	NUMERIC	10	CALENDAR YEAR FINANCIAL CALL
BATCH NUMBER	ALPHA	2	CALCULATED

NAIC EXAMINATION OF NCCI
FILE DEFINITION - CALENDAR YEAR FROZEN FILE

DESCRIPTION AND USE:

CALENDAR YEAR CALL DATA BY STATE.

USED IN RECONCILING ANNUAL STATEMENT TO FINANCIAL DATA AND IN
SUPPORTING DOCUMENTS FOR RATE FILINGS.

FILE TYPE : PDS, SAS DATA SET (V=VSAM, S=Sequential, P=PDS, I=IDMS)
 DEVICE TYPE : DISK (D=Disk, T=Tape)
 RETENTION : 10 YEARS

ELEMENT DESCRIPTION	ELEMENT ATTRIBUTE	ELEMENT LENGTH	SOURCE
NCCI CARRIER CODE	ALPHA	5	CALENDAR YEAR FINANCIAL CALL
COMPANY PREMIUM	NUMERIC	8	CALENDAR YEAR FINANCIAL CALL
INCURRED LOSSES	NUMERIC	8	CALENDAR YEAR FINANCIAL CALL
NET PREMIUM	NUMERIC	8	CALENDAR YEAR FINANCIAL CALL
ORIGINAL VS. CORRECTED DATA FLAG	ALPHA	1	CALCULATED
DSR STANDARD PREMIUM	NUMERIC	8	CALENDAR YEAR FINANCIAL CALL

CALL FOR EXPERIENCE #2
CALENDAR YEAR CALL

Background and Purpose of the Report

The Calendar Year Call is due at NCCI on or before March 15 of the year following the calendar year experience being collected. As an example, the Calendar Year 1990 Call is due at NCCI on or before March 15, 1991.

This Call is one of five standard annual calls for experience subject to the Performance Evaluation Monetary Incentive Program (PEMIP).

For each Annual Call Year, the most recent calendar year data must be reported on a state basis. Calendar year transactions, both premiums and losses, are those occurring during a specific year. Calendar Year 1990 will be comprised of all the transactions which occur during 1990, from 1/1/90 through 12/31/90. As a result, calendar year data will include policy activity, both premium and claim, originating in prior years. Any activity on these policies, such as endorsements and claim payments, would be reported to the Calendar Year during which the transaction occurred.

The Calendar Year Call formerly had a 50% weight in the Actuarial ratemaking formula; however, much of this emphasis has been replaced by the Calendar-Accident Year Call. Currently, the primary use of this call is as a validation to the Policy Year and Calendar-Accident Year Calls. It is also used internally to analyze countrywide results and trends. Results of the Calendar Year Call are distributed to NCCI Members and Subscribers.

Data collected in the Calendar Year Call includes earned premiums and incurred losses on a state basis. Calendar Year earned premiums are separated between Standard at NCCI DSR Level, Standard at Company Level and Net Earned. The incurred losses include indemnity and medical benefits, along with IBNR.

The data reported in this call should *exclude* experience developed under large deductible policies (deductible amount over \$100,000 per claim or per accident).

The Calendar Year Reconciliation Report (Call #8) has been revised to add lines to reconcile premium and losses to Page 14 of the Annual Statement due to the exclusion of the large deductible policies.

Filing Requirements

Calendar Year Call for Compensation Experience by State—Calendar Year Basis—due March 15 of the following year

In accordance with the approved statistical program, you are hereby requested to file with NCCI on or before March 15 of each year your compensation experience for the previous Calendar Year.

This Call is included in PEMIP (Performance Evaluation Monetary Incentive Program) and will be subject to assessments for late and/or inaccurate reporting. Details of PEMIP are updated annually in January of each year.

Questions regarding reporting requirements on completion of the Calls should be directed to Aggregate Ratemaking at (407) 997-4395.

A. GENERAL INSTRUCTIONS

1. Group Report

Carrier name and five-digit code must be shown on reporting forms. If this is a group reporting, each carrier writing compensation must be listed individually on the form. With respect to affiliated carriers, it will be appreciated if you will follow the same method of reporting for this Calendar Year Call (individual company basis or group basis) as was followed in compliance with our Semi-Annual Call for the first six months of the prior year issued. If this is not convenient, please advise us that you have changed procedure.

2. Standard Earned Premiums at NCCI Designated Statistical Reporting Level

Standard earned premiums shall be the entire earned premium for the state resulting from standard rating procedures after the application of:

1. Experience rating plan adjustments (NOTE: Except for Michigan experience, experience rating plan adjustments must reflect only NCCI published modification factors.)*
2. Expense Constants (These are the Expense Constants published by NCCI or an independent bureau. For Voluntary Business in pure premium states, expense constants at NCCI DSR level are 0.)
3. Loss Constants (These are the Loss Constants published by NCCI or an independent bureau. For Voluntary Business in pure premium states, loss constants at NCCI DSR level are 0.)

but prior to the application of:

1. Deviations from NCCI Designated Statistical Reporting rates or pure premiums**
2. Deviations from published NCCI experience rating plan modification factors (except Michigan)*
3. Retrospective rating plan adjustments
4. Other individual risk rating plan adjustments*** (e.g., Schedule Rating)
5. Premium discounts
6. Expense modification program adjustments
7. Payment of policyholder dividends
8. Premium credits for small deductible coverage *

* Carriers must report their Standard Earned Premium at NCCI's experience rating plan level for all states except Michigan. If carriers use their own experience rating plan in Michigan, they may report their Standard Earned Premium at their own experience rating plan level.

- ** Rates: Arkansas, Connecticut, Georgia, Illinois, Indiana, New Mexico, Rhode Island, Vermont
Pure Premiums: Kentucky, Louisiana (policies effective 4/1/89 and subsequent), Oregon, Michigan, Maryland
- *** Note that premium adjustments resulting from the application of individual risk rating plans other than experience rating must be excluded from both Standard Earned Premium at Company Level and Standard Earned Premium at NCCI Designated Statistical Reporting Level.

3. Standard Earned Premium at Company Level

The earned premium on all risks after the application of:

1. Deviations from NCCI Designated Statistical Reporting rates or pure premiums*
2. Experience rating plan adjustments (NOTE: Except for Michigan experience, experience rating plan adjustments must reflect only NCCI published modification factors.)**
3. Expense Constants (Carrier charged expense constants)
4. Loss Constants (Carrier charged loss constants) but prior to the application of:
 1. Deviations from published NCCI experience rating plan modification factors (Except Michigan)**
 2. Retrospective rating plan adjustments
 3. Other individual risk rating plan adjustments*** (e.g., Schedule Rating)
 4. Premium discounts
 5. Expense modification program adjustments
 6. Payment of policyholder dividends
7. Premium credits for small deductible coverage

For every state Standard Earned Premium at DSR Level is reported, Standard Earned Premium at Company Level must be reported as well.

- * Rates: Arkansas, Georgia, Illinois, Indiana, Rhode Island, Vermont
Pure Premiums: Connecticut (policies effective 1/1/90 and subsequent), Kentucky, Louisiana (policies effective 4/1/89 and subsequent), Maryland, Michigan, New Mexico (policies effective 1/1/90 and subsequent), Oregon
- ** Carriers must report their Standard Earned Premium at NCCI's experience rating plan level for all states except Michigan. If carriers use their own experience rating plan in Michigan, they may report their Standard Earned Premium at their own experience rating plan level.

- *** Note that premium adjustments resulting from the application of individual risk rating plans other than experience rating must be excluded from both Standard Earned Premium at Company Level and Standard Earned Premium at NCCI Designated Statistical Reporting Level.

4. Carriers Writing in Competitive Rating States

Arkansas, Connecticut, Georgia, Illinois, Indiana, Kentucky, Louisiana, Maryland, Michigan, New Mexico, Oregon, Rhode Island and Vermont. Carriers must enter the standard earned premium figures at NCCI Designated Statistical Reporting Level and at Company Level in the appropriate columns on the form. Please reference the enclosed circular titled "Annual Update on Designated Statistical Reporting Levels."

5. Carriers Writing at Deviations from NCCI Rates in Administered Pricing States

For State Funds and other carriers writing at deviations from Bureau Rates in non-competitive rating states, the standard earned premiums must be adjusted to Bureau rate level and must be reported in the column labeled "STD Earned Premium at NCCI Designated Stat. Reporting Level." The standard earned premiums at the carrier rate level must be reported in the column labeled "STD Earned Premium at Company Level."

Carriers that do not deviate from NCCI rates must enter their standard earned premium in the column labeled "STD Earned Premium at NCCI Designated Stat. Reporting Level" and must enter the same figure in the column labeled "STD Earned Premium at Company Level."

Also note that where premium credits have been granted in connection with the Transition Program of Payroll Limitation rules, both reported Standard Earned Premium figures shall be reduced by such credits.

6. Net Earned Premium

Net earned premiums shall be the actual earned premium on all risks prior to the payment of policyholder dividends; but after application of any retrospective rating premium adjustments, after the application of premium discounts in accordance with Manual Rules, after the expense modification program, after any deviations or "write-offs" from Bureau rates or pure premiums, and after the effect of any schedule rating premium adjustments.

7. Incurred Losses

Losses reported by state should include compensation and medical incurred during this calendar year period. For further details on the inclusion or exclusion of certain losses and/or reserves, please refer to the specific instructions below.

CALL FOR EXPERIENCE #2A
ASSIGNED RISK CALENDAR YEAR CALL

Background and Purpose of the Report

The Calendar Year Call for Assigned Risk Compensation Experience by State is due at NCCI on March 15 of the current year for the previous calendar year.

This call is one of the annual calls for experience subject to the Performance Evaluation Monetary Incentive Program (PEMIP).

For each Annual Year Call, the most recent calendar year assigned risk data must be reported on a state basis. Data collected on this Call includes earned premiums and incurred losses. The calendar year assigned risk premiums are separated into Standard premium at NCCI DSR Level and Net premium. As there are no company deviations or competitive ratings, assigned risk standard premium at company level is not applicable.

The net earned premium is used to reconcile the Call to page 14 of the company's Annual Statement. The calendar year incurred losses represent the sum of indemnity and medical benefits, including IBNR reserves.

The intent of this Call is to use the collected data in ratemaking to develop Assigned Risk experience separately and will also be used along with the Calendar Year Call to develop "voluntary business only" experience. Thus, it is essential that the methodology for determining the premium and losses reported in this Call be consistent with the procedures used for reporting the experience on page 14 of the annual statement. The data on this Call must also be consistent with the assigned risk data in the Calendar Year Call (Call #2).

The data reported in this call should *exclude* experience ★ developed under large deductible policies (deductible amount over \$100,000 per claim or per accident).

The Calendar Year Reconciliation Report (Call #8) has been ★ revised to add lines to reconcile premium and losses to Page 14 of the Annual Statement due to the exclusion of the large deductible policies.

Filing Requirements

Calendar Year Call for Assigned Risk Compensation Experience by State—Calendar Year Basis—Due March 15 of each year

In accordance with the approved statistical program, you are hereby requested to file with NCCI on or before March 15 of each year your Assigned Risk compensation experience for the preceding Calendar Year.

This Call is included in PEMIP (Performance Evaluation Monetary Incentive Program) and would normally be subject to assessments for late and/or inaccurate reporting. Details of PEMIP are updated annually in January of each year and when released in January 1990, will contain more details pertaining to the three Assigned Risk Only Calls.

Please note: the eventual intent of this Call is for use in ratemaking. This Call will be used on its own to develop Assigned Risk experience and also will be used along with the standard Calendar Year Call to develop "voluntary business only" experience. For this reason, it is essential that the premium and losses reported on this Call reconciles with the Assigned Risk data included on Page 14 of the annual statement. The data submitted on this Call should also be consistent with the Assigned Risk experience reported on the standard Calendar Year Call.

Questions regarding reporting requirements on completion of the Calls should be directed to Aggregate Ratemaking at (407) 997-4395.

A. GENERAL INSTRUCTIONS

1. Group Report

Carrier name and five-digit code must be shown on reporting forms. If this is a group reporting, each carrier writing compensation must be listed individually on the form. With respect to affiliated carriers, it will be appreciated if you will follow the same method of reporting for the Assigned Risk Calendar Year Call (individual company basis or group basis) as was followed in compliance with our Semi-Annual Call for the first six months of the current year issued in October. If this is not convenient, please advise us that you have changed procedure.

2. Standard Earned Premiums at NCCI Designated Statistical Reporting Level

Standard earned premiums shall be the entire earned premium for the state resulting from standard rating procedures after the application of:

1. Assigned Risk rating programs, surcharges, etc.
2. Experience rating plan adjustments (NOTE: Except for Michigan experience, experience rating plan adjustments must reflect only NCCI published modification factors.)*
3. Expense Constants (These are the Expense Constants published by NCCI or an independent bureau.)
4. Loss Constants (These are the Loss Constants published by NCCI or an independent bureau.)

but prior to the application of:

1. Deviations from published NCCI experience rating plan modification factors (except Michigan)*
2. Retrospective rating plan adjustments

3. Premium discounts
4. Expense modification program adjustments
5. Payment of policyholder dividends
- ★ 6. Premium credits for small deductible coverage

- Carriers must report their Standard Earned Premium at NCCI's experience rating plan level for all states except Michigan. If carriers use their own experience rating plan in Michigan, they may report their Standard Earned Premium at their own experience rating plan level.

3. Standard Earned Premium at Company Level

Not Applicable to Assigned Risk Calendar Year Call.

4. Carriers Writing in Competitive Rating States

Not Applicable to Assigned Risk Calendar Year Call.

5. Carriers Writing at Deviations from NCCI Rates in Administered Pricing States

Not Applicable to Assigned Risk Calendar Year Call.

6. Net Earned Premium

Net earned premiums shall be the actual earned premium on all risks prior to the payment of policyholder dividends; but after application of any retrospective rating premium adjustments, after the application of premium discounts in accordance with Manual Rules, after the expense modification program.

7. Incurred Losses

Losses reported by state should include compensation and medical incurred during this calendar year period. For further details on the inclusion or exclusion of certain losses and/or reserves please refer to the specific instructions below.

8. Rounding Procedure and Reporting of Credits

Please report amounts of premiums and losses in whole dollars only. Count fifty cents and over as an extra dollar, and reject the cents if less than fifty. Please show negative amounts enclosed within parentheses so that they may be handled properly in punching and tabulating operations.

9. Total Experience

Kindly show the totals of all amounts reported on the last line of sheet 2 captioned "All States."

10. Signature Requirement

The person responsible for the completion and accuracy of this Call should sign and date the reporting form.

11. Full Submission

Report should include ALL States where company has data to report. Resubmission or correction must also include all states, not just revised states.

B. SPECIFIC INSTRUCTIONS

1. "F" Classifications

Experience of the "F" Classifications for policies effective January 1, 1974, and thereafter, MUST BE EXCLUDED.

2. Coal Mine Experience

Underground Coal Mine experience MUST BE EXCLUDED in all states except Pennsylvania and Virginia. In Pennsylvania and Virginia ALL Coal Mine experience MUST BE EXCLUDED.

3. Excess Policies

Experience on excess policies MUST BE EXCLUDED.

4. National Defense Projects

Experience on National Defense Projects written under either the old Comprehensive Rating Plan or the new National Defense Projects Rating Plan MUST BE EXCLUDED. Experience incurred on a Defense Base should be included unless written under the National Defense Projects Rating Plan.

5. Reinsurance

No deductions shall be made from premiums and losses for or on account of reinsurance ceded. Premiums and losses arising from reinsurance received by the reporting company shall be excluded from the experience. Experience reported should be DIRECT BUSINESS ONLY.

6. Experience Incurred Under Occupational Disease Act

Experience incurred under any Occupational Disease Act which is separate and distinct from the Compensation Act for the state shall be combined with the traumatic experience under the State Compensation Act, and the total of such combined experience shall be reported.

7. IBNR

Losses reported by state should include an appropriate reserve for incurred but not reported cases.

8. Reopened Cases

Include an appropriate loss reserve for reopened cases.

8. Rounding Procedure and Reporting of Credits

Please report amounts of premiums and losses in whole dollars only. Count fifty cents and over as an extra dollar, and reject the cents if less than fifty. Please show negative amounts enclosed within parentheses so that they may be handled properly in punching and tabulating operations.

9. Total Experience

Kindly show the totals of all amounts reported on the last line of sheet 2 captioned "All States."

10. Signature Requirement

The person responsible for the completion and accuracy of this Call should sign and date the reporting form.

11. Full Submission

Report should include ALL states in which company has data to report. Resubmission or correction must also include all states, not just revised states.

B. SPECIFIC INSTRUCTIONS

1. "F" Classifications

Experience of the "F" Classifications for policies effective January 1, 1974, and thereafter, MUST BE EXCLUDED.

2. Coal Mine Experience

Underground coal mine experience MUST BE EXCLUDED in all states except Pennsylvania and Virginia. In Pennsylvania and Virginia ALL coal mine experience (surface and underground) MUST BE EXCLUDED.

3. Excess Policies

Experience on excess policies MUST BE EXCLUDED.

4. National Defense Projects

Experience on National Defense Projects written under either the old Comprehensive Rating Plan or the new National Defense Projects Rating Plan MUST BE EXCLUDED. Experience incurred on a Defense Base should be included unless written under the National Defense Projects Rating Plan.

5. Reinsurance

No deductions shall be made from premiums and losses for or on account of reinsurance ceded. Premiums and losses arising from reinsurance received by the reporting company shall be excluded from the experience. Experience reported should be DIRECT BUSINESS ONLY.

6. Assigned Risk

Experience for assigned risk policies must be INCLUDED. Assigned risk policies must be reported at the level of approved assigned risk rates.

7. Experience Incurred Under Occupational Disease Act

Experience incurred under any Occupational Disease Act that is separate and distinct from the Compensation Act for the state shall be combined with the traumatic experience under the State Compensation Act; and the total of such combined experience shall be reported.

8. IBNR

Losses reported by state should include an appropriate reserve for incurred but not reported cases.

9. Reopened Cases

Include an appropriate loss reserve for reopened cases.

10. Reserves for Specific Contingencies

Include medical and other loss reserves to meet specific contingencies.

11. Other Voluntary Reserves

Exclude voluntary reserves other than those mentioned above.

12. Expenses

Exclude all expenses, either allocated or unallocated, except allocated Coverage B loss adjustment expense.

13. Assessments and Special Compensation Funds

The inclusion of assessments and other compensation special funds as incurred losses in the Calendar Year data follow the same instructions that apply in reporting of experience under NCCI's Workers Compensation Unit Statistical Plan Manual. Specifically, where the compensation law states that, in connection with certain types of injury a specified amount shall be paid into special funds (e.g., a Second Injury Fund), and that such amounts are in addition to the compensation payable to the injured worker or his dependents, then the combined total amount shall be reported as incurred indemnity losses. Examples are: (1) payments in no-dependent death claims, and (2) a specified percentage of the permanent partial award. However, any special payments to the states

assessed on total premium writings, total losses paid or incurred, or total indemnity losses paid or incurred instead of on a per claim basis shall not be reported as losses to the rating bureau. In other words, special funds or assessments are reported as incurred losses only when the assessment is levied on certain types of injuries.

A list of specific assessments and other compensation special funds for each state and the proper treatment for including these assessments in calendar year submissions is attached.

★ 14. Small Deductible Programs

In states in which small deductible programs apply, losses are to be reported on a gross basis inclusive of the employer paid loss amount.

15. Pennsylvania Calendar Year Experience

The calendar year experience for the state of Pennsylvania should be reconcilable with Schedule W-Section II (a) of the Pennsylvania Annual Statement.

16. Taxes and Assessments in Kentucky

Taxes and assessments on premiums earned in Kentucky on or after January 1, 1977 MUST BE EXCLUDED.

17. Oregon Assessments

Assessments on premiums written or earned in Oregon on or after July 1, 1982 must be excluded. This is pursuant to the requirements of OAR 436-51-025 and 51-030(2) contained in WCD Administrative Order 8-1982.

Please note the date for reporting this data is on or before March 15 of the year following the valuation year. It is urged that every effort be made to comply with this reporting date as a delay in receiving this data will seriously hamper NCCI in its preparation of rate revisions. Please mail this Call to:

National Council on Compensation Insurance
750 Park of Commerce Drive
Boca Raton, Florida 33487

ATTENTION: FINANCIAL DATA

9. Reserves for Specific Contingencies

Include medical and other loss reserves to meet specific contingencies.

10. Other Voluntary Reserves

Exclude voluntary reserves other than those mentioned above.

11. Expenses

Exclude all expenses, either allocated or unallocated, except allocated Coverage B loss adjustment expense.

12. Assessments and Special Compensation Funds

The inclusion of assessments and other compensation special funds as incurred losses in the Calendar Year data follow the same instructions that apply in reporting of experience under the National Council Workers Compensation Unit Statistical Plan Manual. Specifically, where the compensation law states that, in connection with certain types of injury a specified amount shall be paid into special funds (e.g., a Second Injury Fund), and that such amounts are in addition to the compensation payable to the injured worker or his dependents, then the combined total amount shall be reported as incurred indemnity losses. Examples are: (1) payments in no-dependent death claims, and (2) a specified percentage of the permanent partial award.

However, any special payments to the states assessed on total premium writings, total losses paid or incurred, or total indemnity losses paid or incurred instead of on a per claim basis shall not be reported as losses to the rating bureau. In other words, special funds or assessments are reported as incurred losses only when the assessment is levied on certain types of injuries.

A list of specific assessments and other compensation special funds for each state and the proper treatment for including these assessments in calendar year submissions is attached.

13. Small Deductible Programs ★

In states in which small deductible programs apply, losses are to be reported on a gross basis inclusive of the employer paid loss amount.

Please note that the date for reporting this data is on or before March 15 of each year. It is urged that every effort be made to comply with this reporting date as a delay in receiving this data will seriously hamper the National Council in its preparation of rate revisions. Please mail this Call to:

National Council on Compensation Insurance
750 Park of Commerce Drive
Boca Raton, Florida 33487

ATTENTION: FINANCIAL DATA

CALENDAR YEAR CALL FOR COMPENSATION EXPERIENCE BY STATE
 CALENDAR YEAR BASIS

Page 1

CARRIER* _____ CARRIER CODE
 SUBMITTED BY _____ TITLE _____
 TELEPHONE NO. _____ DATE SUBMITTED _____

State	EARNED PREMIUMS			
	Standard at NCCI Designated Statistical Reporting Level (1)	Standard at Company Level (2)	Net (3)	Incurred Losses (4)
AL 01				
AK 54				
AZ 02				
AR 03				
CA 04				
CO 05				
CT 06				
DE 07				
DC 08				
FL 09				
GA 10				
HI 52				
ID 11				
IL 12				
IN 13				
IA 14				
KS 15				
KY 16				
LA 17				
ME 18				
MD 19				
MA 20				
MI 21				

* If this is a group report, list all carrier names or carrier codes
 for which any experience is reported.

SHOW AMOUNTS IN DOLLARS ONLY

CALENDAR YEAR CALL FOR COMPENSATION EXPERIENCE BY STATE
 CALENDAR YEAR BASIS

Page 2

CARRIER* _____ CARRIER CODE
 SUBMITTED BY _____ TITLE _____
 TELEPHONE NO. _____ DATE SUBMITTED _____

		EARNED PREMIUMS			
State		Standard at NCCI Designated Statistical Reporting Level (1)	Standard at Company Level (2)	Net (3)	Incurred Losses (4)
MS	23				
MO	24				
MT	25				
NE	26				
NH	28				
NJ	29				
NM	30				
NY	31				
NC	32				
OK	35				
OR	36				
PA	37				
RI	38				
SC	39				
SD	40				
TN	41				
TX	42				
UT	43				
VT	44				
VA	45				
WI	48				
All Other	99				
TOTAL	00				

SHOW AMOUNTS IN DOLLARS ONLY

TRANSMITTAL LETTER

1. CALL: CALENDAR YEAR CALL FOR COMPENSATION EXPERIENCE BY STATE

2. DUE DATE: March 15 of the year following valuation

3. CARRIER NAME _____

4. CARRIER CODE

--	--	--	--	--

5. FILING AS: GROUP INDIVIDUAL COMPANY

6. If filing as a group, list individual carrier names or carrier codes:

7. SUBMISSION TYPE:

Original

Correction

Voluntary Resubmission

MAIL CALL AND TRANSMITTAL LETTER TO:

NATIONAL COUNCIL ON COMPENSATION INSURANCE

750 PARK OF COMMERCE DRIVE

BOCA RATON, FL 33487

ATTN: FINANCIAL DATA

NCCI USE ONLY
Date Received

Receipt Mailed

**NATIONAL COUNCIL ON COMPENSATION INSURANCE
RECEIPT OF CALL NOTIFICATION**

8. CALL: CALENDAR YEAR CALL FOR COMPENSATION EXPERIENCE BY STATE

9. DUE DATE: March 15 of the year following valuation

10. DATE RECEIVED AT NCCI _____ BY _____

11. MAIL RECEIPT TO: (Indicate specific individual)

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Statistical Call Overview Document

STATISTICAL CALL NAME:

Calendar Year Call For Assigned Risk Compensation Experience (Call #2A)

DESCRIPTION OF CALL:

This call contains dollar amounts for workers compensation Standard Earned Premium at NCCI DSR level, Net Earned Premium, and Total Incurred Losses for the specified calendar year. Each NCCI member carrier is required to submit this information for each state in which they operate. Some states require all carriers writing workers compensation policies to submit financial calls.

The Calendar Year Call for Assigned Risk Compensation Experience is used to reconcile assigned risk workers compensation experience data reported in the Policy Year Assigned Risk Call to that reported in Calendar-Accident Year Assigned Risk Call.

NCCI first distributed the Calendar Year Assigned Risk Call in 1990. The data is validated, but not yet used to calculate rates. NCCI requires financial call data to be submitted for at least three years before it is used to calculate rates.

FILES/DATABASES:

Calendar Year Call Assigned Risk Production File:

This file serves as the central repository for Calendar Year Assigned Risk Call data. This file contains all data received from the carriers as well as corrections applied to this data. Corrections to the file are made via ACS for data entry of revised reports with electronic transfer of the data to NCCI for incorporation into the production file.

Calendar Year Call Assigned Risk SAS Dataset:

Actuarial analysis and reporting programs are executed using the data in this file.

There is one SAS dataset for each state for which the NCCI produces rates. The dataset contains data only for the specified state. This file is created through an extraction from the Calendar Year Call Assigned Risk production file. Revised reports which are obtained after this extraction are entered into the SAS dataset and marked internally as

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Statistical Call Overview Document

revised records. When rate levels are completed for the state, these records are printed and sent to ACS for data entry and incorporation into the production file.

DESCRIPTION OF ERROR HANDLING:

Calendar Year Assigned Risk data is validated in a two step process. An initial validation using automated reports is performed when the data is received from the carrier. A final validation of the data is performed as one of the steps in producing a state's rate level to ensure that no errors have been overlooked.

Carriers are sent written correspondence letters to resolve any errors identified during the initial validation. As revised reports are received, they are checked for accuracy. If correct, the revised reports are sent to ACS for processing or entered into the SAS dataset if the affected data is already being used for rate level production.

During the final validation, newly discovered and outstanding errors are handled in a slightly different manner. Carriers are contacted by phone for a response. Revised reports are submitted by facsimile transmission or some form of overnight delivery. NCCI may enter corrections based on the phone conversation in anticipation of carrier submitted revisions.

MODIFICATIONS TO DATA:

Revised reports are processed as they are received. Any data containing errors which remain unresolved at the time of a state's rate level production will be removed from the dataset if resolution of the remaining errors is not possible within the framework of the rate level production schedule.

All revised data is requested to be submitted on revised reports or via written correspondence. When production deadlines require an immediate response, telephone responses are accepted with the stipulation that a written confirmation of the changes also be submitted.

CALL FOR EXPERIENCE #2A
ASSIGNED RISK CALENDAR YEAR CALL

Background and Purpose of the Report

The Calendar Year Call for Assigned Risk Compensation Experience by State is due at NCCI on March 15 of the current year for the previous calendar year.

This call is one of the annual calls for experience subject to the Performance Evaluation Monetary Incentive Program (PEMIP).

For each Annual Year Call, the most recent calendar year assigned risk data must be reported on a state basis. Data collected on this Call includes earned premiums and incurred losses. The calendar year assigned risk premiums are separated into Standard premium at NCCI DSR Level and Net premium. As there are no company deviations or competitive ratings, assigned risk standard premium at company level is not applicable.

The net earned premium is used to reconcile the Call to page 14 of the company's Annual Statement. The calendar year incurred losses represent the sum of indemnity and medical benefits, including IBNR reserves.

The intent of this Call is to use the collected data in ratemaking to develop Assigned Risk experience separately and will also be used along with the Calendar Year Call to develop "voluntary business only" experience. Thus, it is essential that the methodology for determining the premium and losses reported in this Call be consistent with the procedures used for reporting the experience on page 14 of the annual statement. The data on this Call must also be consistent with the assigned risk data in the Calendar Year Call (Call #2).

Filing Requirements

Calendar Year Call for Assigned Risk Compensation Experience by State—Calendar Year Basis—Due March 15 of each year

In accordance with the approved statistical program, you are hereby requested to file with NCCI on or before March 15 of each year your Assigned Risk compensation experience for the preceding Calendar Year.

This Call is included in PEMIP (Performance Evaluation Monetary Incentive Program) and would normally be subject to assessments for late and/or inaccurate reporting. Details of PEMIP are updated annually in January of each year and when released in January 1990, will contain more details pertaining to the three Assigned Risk Only Calls.

Please note: the eventual intent of this Call is for use in ratemaking. This Call will be used on its own to develop Assigned Risk experience and also will be used along with the standard Calendar Year Call to develop "voluntary business only" experience. For this reason, it is essential that the premium and losses reported on this Call reconciles with the Assigned Risk data included on Page 14 of the annual statement. The data submitted on this Call should also be consistent with the Assigned Risk experience reported on the standard Calendar Year Call.

Questions regarding reporting requirements on completion of the Calls should be directed to Aggregate Ratemaking at (407) 997-4395.

A. GENERAL INSTRUCTIONS

1. Group Report

Carrier name and five-digit code must be shown on reporting forms. If this is a group reporting, each carrier writing compensation must be listed individually on the form. With respect to affiliated carriers, it will be appreciated if you will follow the same method of reporting for the Assigned Risk Calendar Year Call (individual company basis or group basis) as was followed in compliance with our Semi-Annual Call for the first six months of the current year issued in October. If this is not convenient, please advise us that you have changed procedure.

2. Standard Earned Premiums at NCCI Designated Statistical Reporting Level

Standard earned premiums shall be the entire earned premium for the state resulting from standard rating procedures after the application of:

1. Assigned Risk rating programs, surcharges, etc.
2. Experience rating plan adjustments (NOTE: Except for Michigan experience, experience rating plan adjustments must reflect only NCCI published modification factors.)*
3. Expense Constants (These are the Expense Constants published by NCCI or an independent bureau.)
4. Loss Constants (These are the Loss Constants published by NCCI or an independent bureau.)

but prior to the application of:

1. Deviations from published NCCI experience rating plan modification factors (except Michigan)*
2. Retrospective rating plan adjustments

3. Premium discounts
4. Expense modification program adjustments
5. Maine small business premium discount
6. Payment of policyholder dividends
7. Premium credits for deductible coverage

• Carriers must report their Standard Earned Premium at NCCI's experience rating plan level for all states except Michigan. If carriers use their own experience rating plan in Michigan, they may report their Standard Earned Premium at their own experience rating plan level.

3. Standard Earned Premium at Company Level

Not Applicable to Assigned Risk Calendar Year Call.

4. Carriers Writing in Competitive Rating States

Not Applicable to Assigned Risk Calendar Year Call.

5. Carriers Writing at Deviations from NCCI Rates in Administered Pricing States

Not Applicable to Assigned Risk Calendar Year Call.

6. Net Earned Premium

Net earned premiums shall be the actual earned premium on all risks prior to the payment of policyholder dividends; but after application of any retrospective rating premium adjustments, after the application of premium discounts in accordance with Manual Rules, after the expense modification program.

7. Incurred Losses

Losses reported by state should include compensation and medical incurred during this calendar year period. For further details on the inclusion or exclusion of certain losses and/or reserves please refer to the specific instructions below.

8. Rounding Procedure and Reporting of Credits

Please report amounts of premiums and losses in whole dollars only. Count fifty cents and over as an extra dollar, and reject the cents if less than fifty. Please show negative amounts enclosed within parentheses so that they may be handled properly in punching and tabulating operations.

9. Total Experience

Kindly show the totals of all amounts reported on the last line of sheet 2 captioned "All States."

10. Signature Requirement

The person responsible for the completion and accuracy of this Call should sign and date the reporting form.

11. Full Submission

Report should include ALL States where company has data to report. Resubmission or correction must also include all states, not just revised states.

B. SPECIFIC INSTRUCTIONS

1. "F" Classifications

Experience of the "F" Classifications for policies effective January 1, 1974, and thereafter, MUST BE EXCLUDED.

2. Coal Mine Experience

Underground Coal Mine experience MUST BE EXCLUDED in all states except Pennsylvania and Virginia. In Pennsylvania and Virginia ALL Coal Mine experience MUST BE EXCLUDED.

3. Excess Policies

Experience on excess policies MUST BE EXCLUDED.

4. National Defense Projects

Experience on National Defense Projects written under either the old Comprehensive Rating Plan or the new National Defense Projects Rating Plan MUST BE EXCLUDED. Experience incurred on a Defense Base should be included unless written under the National Defense Projects Rating Plan.

5. Reinsurance

No deductions shall be made from premiums and losses for or on account of reinsurance ceded. Premiums and losses arising from reinsurance received by the reporting company shall be excluded from the experience. Experience reported should be DIRECT BUSINESS ONLY.

6. Experience Incurred Under Occupational Disease Act

Experience incurred under any Occupational Disease Act which is separate and distinct from the Compensation Act for the state shall be combined with the traumatic experience under the State Compensation Act, and the total of such combined experience shall be reported.

7. IBNR

Losses reported by state should include an appropriate reserve for incurred but not reported cases.

8. Reopened Cases

Include an appropriate loss reserve for reopened cases.

9. Reserves for Specific Contingencies

Include medical and other loss reserves to meet specific contingencies.

10. Other Voluntary Reserves

Exclude voluntary reserves other than those mentioned above.

11. Expenses

Exclude all expenses, either allocated or unallocated, except allocated Coverage B loss adjustment expense.

12. Assessments and Special Compensation Funds

The inclusion of assessments and other compensation special funds as incurred losses in the Calendar Year data follow the same instructions that apply in reporting of experience under the National Council Workers Compensation Unit Statistical Plan Manual. Specifically, where the compensation law states that, in connection with **certain types of injury** a specified amount shall be paid into special funds (e.g., a Second Injury Fund), and that such amounts are in addition to the compensation payable to the injured worker or his dependents, then the combined total amount shall be reported as incurred indemnity losses. Examples are: (1) payments in no-dependent death claims, and (2) a specified percentage of the permanent partial award.

However, any special payments to the states assessed on total premium writings, total losses paid or incurred, or total indemnity losses paid or incurred instead of on a per claim basis shall not be reported as losses to the rating bureau. In other words, special funds or assessments are reported as incurred losses only when the assessment is levied on certain types of injuries.

A list of specific assessments and other compensation special funds for each state and the proper treatment for including these assessments in calendar year submissions is attached.

13. Claims Deductible Programs

In states in which deductible programs apply, losses are to be reported on a gross basis inclusive of the employer paid loss amount.

Please note that the date for reporting this data is on or before March 15 of each year. It is urged that every effort be made to comply with this reporting date as a delay in receiving this data will seriously hamper the National Council in its preparation of rate revisions. Please mail this Call to:

National Council on Compensation Insurance
750 Park of Commerce Drive
Boca Raton, Florida 33487

ATTENTION: FINANCIAL DATA

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 Page 1
 CALENDAR YEAR CALL FOR ASSIGNED RISK COMPENSATION EXPERIENCE BY STATE
 CALENDAR YEAR BASIS

CARRIER* _____ CARRIER CODE

SUBMITTED BY _____ TITLE _____

TELEPHONE NO. _____ DATE SUBMITTED _____

EARNED PREMIUMS				
State	Standard at NCCI Designated Statistical Reporting Level (1)	Standard at Company Level (2)	Net (3)	Incurred Losses (4)
AL	01			
AK	54			
AZ	02			
AR	03			
CA	04			
CO	05			
CT	06			
DE	07			
DC	08			
FL	09			
GA	10			
HI	52			
ID	11			
IL	12			
IN	13			
IA	14			
KS	15			
KY	16			
LA	17			
ME	18			
MD	19			
MA	20			
MI	21			

* If this is a group report, list all carrier names or carrier codes for which any experience is reported.

SHOW AMOUNTS IN DOLLARS ONLY

NATIONAL COUNCIL ON COMPENSATION INSURANCE Page 2
CALENDAR YEAR CALL FOR ASSIGNED RISK COMPENSATION EXPERIENCE BY STATE
CALENDAR YEAR BASIS

CARRIER* _____ CARRIER CODE

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 SUBMITTED BY _____ TITLE _____
 TELEPHONE NO. _____ DATE SUBMITTED _____

EARNED PREMIUMS				
State	Standard at NCCI Designated Statistical Reporting Level (1)	Standard at Company Level (2)	Net (3)	Incurred Losses (4)
MS	23			
MO	24			
MT	25			
NE	26			
NH	28			
NJ	29			
NM	30			
NY	31			
NC	32			
OK	35			
OR	36			
PA	37			
RI	38			
SC	39			
SD	40			
TN	41			
TX	42			
UT	43			
VT	44			
VA	45			
WI	48			
All Other	99			
TOTAL	00			

SHOW AMOUNTS IN DOLLARS ONLY

TRANSMITTAL LETTER

1. CALL: CALENDAR YEAR CALL FOR ASSIGNED RISK COMPENSATION EXPERIENCE BY STATE

2. DUE DATE: March 15 of the following year

3. CARRIER NAME _____ 4. CARRIER CODE _____

5. FILING AS: GROUP INDIVIDUAL COMPANY

6. If filing as a group, list individual carrier names or carrier codes:

7. SUBMISSION TYPE:

Original

Correction

Voluntary Resubmission

MAIL CALL AND TRANSMITTAL LETTER TO:

NATIONAL COUNCIL ON COMPENSATION INSURANCE

750 PARK OF COMMERCE DRIVE

BOCA RATON, FL 33487

ATTN.: FINANCIAL DATA

NCCI USE ONLY
Date Received

Receipt Mailed

NATIONAL COUNCIL ON COMPENSATION INSURANCE
RECEIPT OF CALL NOTIFICATION

8. CALL: CALENDAR YEAR CALL FOR ASSIGNED RISK COMPENSATION EXPERIENCE BY STATE

9. DUE DATE: March 15 of the following year

10. DATE RECEIVED AT NCCI _____ BY _____

11. MAIL RECEIPT TO: (Indicate specific individual)

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Statistical Call Overview Document

STATISTICAL CALL NAME:

Policy Year Call For Compensation Experience (Call #3)

DESCRIPTION OF CALL:

This call contains dollar amounts for workers compensation Standard Earned Premium at NCCI DSR level, Standard Earned Premium at Company level, Net Earned Premium, and Total Incurred Losses by Policy Year for each state NCCI produces rate levels. The Total Incurred Losses are broken down to Paid, Outstanding excluding IBNR, and IBNR on page 1. Each of these components is further broken down into its indemnity and medical components and reported along with the Indemnity Claim Count on page 2. In addition, Indemnity and Medical Outstanding excluding IBNR are separated into case and bulk reserves on page 3. Each NCCI member carrier is required to submit this information for each state in which they operate. Some states require all carriers writing workers compensation policies to submit financial calls.

The Policy Year Call for Compensation Experience is used in conjunction with the Calendar-Accident Year Call to determine rate adequacy for the states in which the NCCI produces rate levels.

FILES/DATABASES:

Policy Year Call Production File:

This file serves as the central repository for Policy Year Call data. This file contains all data received from the carriers as well as corrections applied to this data. Corrections to the file are made via ACS for data entry of revised reports with electronic transfer of the data to NCCI for incorporation into the production file.

Policy Year Call SAS Dataset:

Actuarial analysis and reporting programs are executed using the data in this file.

There is one SAS dataset for each state for which the NCCI produces rates. The dataset contains data only for the specified state. This file is created through an extraction from the Policy Year Call production file. Revised reports which are obtained after this

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Statistical Call Overview Document

extraction are entered into the SAS dataset and marked internally as revised records. When rate levels are completed for the state, these records are printed and sent to ACS for data entry and incorporation into the production file.

DESCRIPTION OF ERROR HANDLING:

Policy Year data is validated in a two step process. An initial validation using automated reports is performed when the data is received from the carrier. A final validation of the data is performed as one of the steps in producing a state's rate level to ensure that no errors have been overlooked.

Carriers are sent written correspondence letters to resolve any errors identified during the initial validation. As revised reports are received, they are checked for accuracy. If correct, the revised reports are sent to ACS for processing or entered into the SAS dataset if the affected data is already being used for rate level production.

During the final validation, newly discovered and outstanding errors are handled in a slightly different manner. Carriers are contacted by phone for a response. Revised reports are submitted by facsimile transmission or some form of overnight delivery. NCCI may enter corrections based on the phone conversation in anticipation of carrier submitted revisions.

MODIFICATIONS TO DATA:

Revised reports are processed as they are received. Any data containing errors which remain unresolved at the time of a state's rate level production will be removed from the dataset if resolution of the remaining errors is not possible within the framework of the rate level production schedule.

All revised data is requested to be submitted on revised reports or via written correspondence. When production deadlines require an immediate response, telephone responses are accepted with the stipulation that a written confirmation of the changes also be submitted.

NAIC Examination of NCCI
 Description of Data Collection and Data Handling
 Statistical Call Data Documentation

Statistical Call Name: Policy Year Call For Compensation Experience By State (NCCI Call #3)

Data Element	Captured?	Description of Validation
1. Carrier Name	No	
2. Carrier Code	Yes	A. Validated against NCCI carrier membership list. (Visual review of a hard copy input)
3. State Name	No	
4. State Code	Yes	A. Checked against state name on call. (Visual review of a hard copy input)
5. Call Year	Yes	A. Checked for consistency with data submitted on call. (Visual review of a system generated report and hard copy input)
6. Submitted By	No	
7. Title	No	
8. Telephone Number	No	
9. Date Submitted	No	
10. Serial Number	No	

NAIC Examination of NCCI
 Description of Data Collection and Data Handling
 Statistical Call Data Documentation

Statistical Call Name: Policy Year Call For Compensation Experience By State (NCCI Call #3)

Data Element	Captured?	Description of Validation
11. Standard Earned Premium at NCCI DSR Level	Yes	<p>A. Ratio of Policy Year Accumulated Standard Earned Premium at NCCI DSR level to Policy Year Accumulated Standard Earned Premium at Company level is compared to expected ratios calculated from individual carrier's filings and carrier correspondence.</p> <p>B. Ratio of data from the current year's call to that of the previous year's call is checked for reasonableness for individual Policy Years.</p> <p>C. Line R is checked against the total of lines A through M.</p> <p>D. Line S from the current year's call is checked against line R from the previous year's call.</p> <p>E. Line T is checked against the total of line R - line S.</p> <p>F. Lines A through M are checked for negative entries.</p> <p>G. Line T is checked against Calendar Year Standard Earned Premium at NCCI DSR level from the Calendar Year Call for Compensation Experience by State (NCCI Call #2).</p> <p>H. Checks latest Policy Year against line T to ensure Calendar Year experience is split among all Policy Years.</p>

NAIC Examination of NCCI
 Description of Data Collection and Data Handling
 Statistical Call Data Documentation

Statistical Call Name: Policy Year Call For Compensation Experience By State (NCCI Call #3)

Data Element	Captured?	Description of Validation
12. Standard Earned Premium at Company Level	Yes	<p>A. Ratio of Standard Earned Premium at Company Level to Net Earned Premium for Individual Policy Years is checked for reasonableness.</p> <p>B. Line R is checked against the total of lines A through M.</p> <p>C. Line S from the current year's call is checked against line R from the previous year's call.</p> <p>D. Line T is checked against the total of line R - line S.</p> <p>E. Lines A through M are checked for negative entries.</p> <p>F. Line T is checked against Calendar Year Standard Earned Premium at Company level from the Calendar Year Call for Compensation Experience by State (NCCI Call #2).</p> <p>G. Check latest Policy Year against line T to ensure Calendar Year experience is split among all Policy Years.</p>

NAIC Examination of NCCI
 Description of Data Collection and Data Handling
 Statistical Call Data Documentation

Statistical Call Name: Policy Year Call For Compensation Experience By State (NCCI Call #3)

Data Element	Captured?	Description of Validation
13. Net Earned Premium	Yes	A. Ratio of data from the current year's call to that of the previous year's call is checked for reasonableness for individual Policy Years. B. Line R is checked against the total of lines A through M. C. Line S from the current year's call is checked against line R from the previous year's call. D. Line T is checked against the total of line R - line S. E. Lines A through M are checked for negative entries. G. Line T is checked against Calendar Year Net Earned Premium from the Calendar Year Call for Compensation Experience by State (NCCI Call #2). H. Check latest Policy Year against line T to ensure Calendar Year experience is split among all Policy Years.
14. Total Paid Losses	Yes	A. Total Paid Losses are checked against the sum of Indemnity Paid Losses and Medical Paid Losses. B. Line R is checked against the total of lines A through M. C. Line S from the current year's call is checked against line R from the previous year's call. D. Line T is checked against the total of line R - line S. E. Lines A through M are checked for negative entries.

NAIC Examination of NCCI
Description of Data Collection and Data Handling

Statistical Call Data Documentation

Statistical Call Name: Policy Year Call For Compensation Experience By State (NCCI Call #3)

Data Element	Captured?	Description of Validation
15. Total Outstanding Excluding IBMR Losses	Yes	<p>A. Total Outstanding Excluding IBMR Losses are checked against the sum of Indemnity Outstanding Excluding IBMR Losses and Medical Outstanding Excluding IBMR Losses.</p> <p>B. Line R is checked against the total of lines A through M.</p> <p>C. Line S from the current year's call is checked against line R from the previous year's call.</p> <p>D. Line T is checked against the total of line R - line S.</p> <p>E. Lines A through M are checked for negative entries.</p>
16. Total IBMR Losses	Yes	<p>A. Total IBMR Losses are checked against the sum of Indemnity IBMR Losses and Medical IBMR Losses.</p> <p>B. Line R is checked against the total of lines A through M.</p> <p>C. Line S from the current year's call is checked against line R from the previous year's call.</p> <p>D. Line T is checked against the total of line R - line S.</p> <p>E. Lines A through M are checked for negative entries.</p>

NAIC Examination of NCCI
 Description of Data Collection and Data Handling
 Statistical Call Data Documentation

Statistical Call Name: Policy Year Call For Compensation Experience By State (NCCI Call #3)

Data Element	Captured?	Description of Validation
17. Total Incurred Losses	Yes	<p>A. Total Incurred Losses are checked against the sum of Total Paid Losses, Total Outstanding Excluding IBNR Losses, and Total IBNR Losses.</p> <p>B. Ratio of data from the current year's call to that of the previous year's call is checked for reasonableness for individual Policy Years.</p> <p>C. Line R is checked against the total of lines A through M.</p> <p>D. Line S from the current year's call is checked against line R from the previous year's call.</p> <p>E. Line T is checked against the total of line R - Line S.</p> <p>F. Lines A through M are checked for negative entries.</p> <p>G. Line T is checked against Incurred Losses from Calendar Year Call for Compensation Experience by State (NCCI Call #2)</p> <p>H. Check Latest Policy Year against line T to ensure Calendar Year experience is split among all Policy Years.</p> <p>I. Check for Total Incurred Losses with no corresponding Standard Earned Premium at NCCI DSR level.</p>
18. Indemnity Claim Count	Yes	<p>A. Check for Indemnity Paid Losses and/or Indemnity Outstanding Excluding IBNR Losses with no corresponding Indemnity Claim Count for individual Policy Years.</p> <p>B. Check for Indemnity Claim Count with no corresponding Indemnity Paid Losses or Indemnity Outstanding Excluding IBNR Losses for individual Policy Years.</p>

NAIC Examination of NCCI
 Description of Data Collection and Data Handling
 Statistical Call Data Documentation

Statistical Call Name: Policy Year Call For Compensation Experience By State (NCCI Call #3)

Data Element	Captured?	Description of Validation
19. Indemnity Paid Losses	Yes	<p>A. Each individual Policy Year's data is checked against the corresponding Accident Year data to ensure consistency of reporting between the two calls.</p> <p>B. Ratio of sum of Indemnity Paid Losses, Indemnity Outstanding Excluding IBMR Losses, and Indemnity IBMR Losses from the current year's call compared to the same sum from the previous year's call for individual Policy Years.</p> <p>C. Line R is checked against the total of lines A through M.</p> <p>D. Line S from the current year's call is checked against line R from the previous year's call.</p> <p>E. Line T is checked against the total of line R - line S.</p> <p>F. Lines A through M are checked for negative entries.</p>
20. Medical Paid Losses	Yes	<p>A. Each individual Policy Year's data is checked against the corresponding Accident Year data to ensure consistency of reporting between the two calls.</p> <p>B. Ratio of sum of Medical Paid Losses, Medical Outstanding Excluding IBMR Losses, and Medical IBMR Losses from the current year's call compared to the same sum from the previous year's call for individual Policy Years.</p> <p>C. Line R is checked against the total of lines A through M.</p> <p>D. Line S from the current year's call is checked against line R from the previous year's call.</p> <p>E. Line T is checked against the total of line R - line S.</p> <p>F. Lines A through M are checked for negative entries.</p>

NAIC Examination of NCCI
 Description of Data Collection and Data Handling
 Statistical Call Data Documentation

Statistical Call Name: Policy Year Call For Compensation Experience By State (NCCI Call #3)

Data Element	Captured?	Description of Validation
21. Indemnity Outstanding Excluding IBNR Losses	Yes	<p>A. Each individual Policy Year's data is checked against the corresponding Accident Year data to ensure consistency of reporting between the two calls.</p> <p>B. Indemnity Outstanding Excluding IBNR Losses Checked against the sum of Indemnity Outstanding Excluding IBNR - Case Losses and Indemnity Outstanding Excluding IBNR - Bulk Losses.</p> <p>C. Ratio of sum of Indemnity Paid Losses, Indemnity Outstanding Excluding IBNR Losses, and Indemnity IBNR Losses from the current year's call compared to the same sum from the previous year's call for individual Policy Years.</p> <p>D. Line R is checked against the total of lines A through M.</p> <p>E. Line S from the current year's call is checked against Line R from the previous year's call.</p> <p>F. Line T is checked against the total of line R - Line S.</p> <p>G. Lines A through N are checked for negative entries.</p>

NAIC Examination of NCCI
Description of Data Collection and Data Handling

Statistical Call Data Documentation

Statistical Call Name: Policy Year Call For Compensation Experience By State (NCCI Call #3)

Data Element	Captured?	Description of Validation
22. Medical Outstanding Excluding IBNR Losses	Yes	<p>A. Each individual Policy Year's data is checked against the corresponding Accident Year data to ensure consistency of reporting between the two calls.</p> <p>B. Medical Outstanding Excluding IBNR Losses Checked against the sum of Medical Outstanding Excluding IBNR - Case Losses and Medical Outstanding Excluding IBNR - Bulk Losses.</p> <p>C. Ratio of sum of Medical Paid Losses, Medical Outstanding Excluding IBNR Losses, and Medical IBNR Losses from the current year's call is compared to the same sum from the previous year's call for individual Policy Years.</p> <p>D. Line R is checked against the total of lines A through M.</p> <p>E. Line S from the current year's call is checked against line R from the previous year's call.</p> <p>F. Line T is checked against the total of line R - line S.</p> <p>G. Lines A through M are checked for negative entries.</p>

NAIC Examination of NCCI
Description of Data Collection and Data Handling

Statistical Call Data Documentation

Statistical Call Name: Policy Year Call For Compensation Experience By State (NCCI Call #3)

Data Element	Captured?	Description of Validation
23. Indemnity IBMR Losses	Yes	<p>A. Each individual Policy Year's data is checked against the corresponding Accident Year data to ensure consistency of reporting between the two calls.</p> <p>B. Ratio of sum of Indemnity Paid Losses, Indemnity Outstanding Excluding IBMR Losses, and Indemnity IBMR Losses from the current year's call compared to the same sum from the previous year's call for individual Policy Years.</p> <p>C. Line R is checked against the total of lines A through M.</p> <p>D. Line S from the current year's call is checked against line R from the previous year's call.</p> <p>E. Line T is checked against the total of line R - line S.</p> <p>F. Lines A through M are checked for negative entries.</p>
24. Medical IBMR Losses	Yes	<p>A. Each individual Policy Year's data is checked against the corresponding Accident Year data to ensure consistency of reporting between the two calls.</p> <p>B. Ratio of sum of Medical Paid Losses, Medical Outstanding Excluding IBMR Losses, and Medical IBMR Losses from the current year's call compared to the same sum from the previous year's call for individual Policy Years.</p> <p>C. Line R is checked against the total of lines A through M.</p> <p>D. Line S from the current year's call is checked against line R from the previous year's call.</p> <p>E. Line T is checked against the total of line R - line S.</p> <p>F. Lines A through M are checked for negative entries.</p>

NAIC Examination of NCCI
Description of Data Collection and Data Handling

Statistical Call Data Documentation

Statistical Call Name: Policy Year Call For Compensation Experience By State (NCCI Call #3)

Data Element	Captured?	Description of Validation
25. Indemnity Outstanding Excluding IBNR - Case	Yes	<p>A. Line R is checked against the total of lines A through M.</p> <p>B. Line S from the current year's call is checked against line R from the previous year's call.</p> <p>C. Line T is checked against the total of line R - line S.</p> <p>D. Lines A through M are checked for negative entries.</p>
26. Indemnity Outstanding Excluding IBNR - Bulk	Yes	<p>A. Line R is checked against the total of lines A through M.</p> <p>B. Line S from the current year's call is checked against line R from the previous year's call.</p> <p>C. Line T is checked against the total of line R - line S.</p> <p>D. Lines A through M are checked for negative entries.</p>
27. Medical Outstanding Excluding IBNR - Case	Yes	<p>A. Line R is checked against the total of lines A through M.</p> <p>B. Line S from the current year's call is checked against line R from the previous year's call.</p> <p>C. Line T is checked against the total of line R - line S.</p> <p>D. Lines A through M are checked for negative entries.</p>
28. Medical Outstanding Excluding IBNR - Bulk	Yes	<p>A. Line R is checked against the total of lines A through M.</p> <p>B. Line S from the current year's call is checked against line R from the previous year's call.</p> <p>C. Line T is checked against the total of line R - line S.</p> <p>D. Lines A through M are checked for negative entries.</p>
29. Question A	Yes	<p>A. Checked for missing response.</p>

NAIC Examination of NCCI
 Description of Data Collection and Data Handling
 Statistical Call Data Documentation

Statistical Call Name: Policy Year Call For Compensation Experience By State (NCCI Call #3)

Data Element	Captured?	Description of Validation
30. Question B	Yes	A. Checked for missing response if answer to question A is no. B. Checked for unnecessary response if answer to question A is yes.
31. Question C	Yes	A. Checked for missing response if answer to question B is estimated. B. Checked for unnecessary response if answer to question B is actual or response to question A is yes.
32. Questionnaire item #1	No	
33. Questionnaire item #2	No	
34. Questionnaire item #3	No	
35. Questionnaire item #4	No	
36. Questionnaire item #5	No	
37. Questionnaire item #6	No	
38. Oklahoma questionnaire item #1	No	
39. Oklahoma questionnaire item #2	No	
40. Oklahoma questionnaire item #3	No	

NAIC EXAMINATOR OF NCCI
FILE DEFINITION - POLICY YEAR CALL PRODUCTION FILE

DESCRIPTION AND USE:

POLICY YEAR CALL PRODUCTION FILE

THIS FILE SERVES AS THE CENTRAL REPOSITORY FOR POLICY YEAR CALL
DATA.

FILE TYPE : SEQUENTIAL (V=VSAM, S=Sequential, P=PDS, I=IMS)
 DEVICE TYPE : TAPE (D=Disk, T=Tape)
 RETENTION : 10 YEARS

ELEMENT DESCRIPTION	ELEMENT ATTRIBUTE	ELEMENT LENGTH	SOURCE
BATCH NUMBER	ALPHA	8	CALCULATED
CARRIER CODE	APLHA	5	POLICY YEAR FINANCIAL CALL #1
CARRIER NAME	APLHA	32	NOT CAPTURED
STATE CODE	APLHA	2	POLICY YEAR FINANCIAL CALL #1
CALL YEAR	APLHA	1	POLICY YEAR FINANCIAL CALL #1
EVALUATION YEAR	ALPHA	2	POLICY YEAR FINANCIAL CALL #1
STANDARD PREMIUM AT DSR	NUMERIC	11	POLICY YEAR FINANCIAL CALL #1
NET PREMIUM	NUMERIC	11	POLICY YEAR FINANCIAL CALL #1
INDEMNITY CLAIM	NUMERIC	11	POLICY YEAR FINANCIAL CALL #1
INDEMNITY PAID	NUMERIC	11	POLICY YEAR FINANCIAL CALL #1
INDEMNITY OUTSTANDING	NUMERIC	11	POLICY YEAR FINANCIAL CALL #1
MEDICAL PAID	NUMERIC	11	POLICY YEAR FINANCIAL CALL #1
MEDICAL OUTSTANDING	NUMERIC	11	POLICY YEAR FINANCIAL CALL #1
INCURRED PAID	NUMERIC	11	POLICY YEAR FINANCIAL CALL #1
INCURRED OUTSTANDING	NUMERIC	11	POLICY YEAR FINANCIAL CALL #1
IBNR TOTAL	NUMERIC	11	POLICY YEAR FINANCIAL CALL #1
INCURRED TOTAL	NUMERIC	11	POLICY YEAR FINANCIAL CALL #1
INDEMNITY IBNR	NUMERIC	11	POLICY YEAR FINANCIAL CALL #1
MEDICAL IBNR	NUMERIC	11	POLICY YEAR FINANCIAL CALL #1
STANDARD COMPANY PREMIUM	NUMERIC	11	POLICY YEAR FINANCIAL CALL #1
INDEMNITY CASE	NUMERIC	11	POLICY YEAR FINANCIAL CALL #1
INDEMNITY BULK	NUMERIC	11	POLICY YEAR FINANCIAL CALL #1
MEDICAL CASE	NUMERIC	11	POLICY YEAR FINANCIAL CALL #1
MEDICAL BULK	NUMERIC	11	POLICY YEAR FINANCIAL CALL #1
QUESTION A INDICATOR	ALPHA	1	POLICY YEAR FINANCIAL CALL #1
QUESTION B INDICATOR	ALPHA	1	POLICY YEAR FINANCIAL CALL #1
QUESTION C INDICATOR	ALPHA	1	POLICY YEAR FINANCIAL CALL #1

NAIC EXAMINATION OF NCCI
FILE DEFINITION - POLICY YEAR CALL SAS DATASET

DESCRIPTION AND USE:

POLICY YEAR CALL SAS DATASET CONTAINS POLICY YEAR INFORMATION
FOR SPECIFIC STATES. THIS FILE IS CREATED THROUGH AN EXTRACTION
FROM THE POLICY YEAR CALL PRODUCTION FILE.

FILE TYPE : PDS, SAS DATA SET (V=VSAM, S=Sequential, P=PDS, I=IDMS)
 DEVICE TYPE : DISK (D=Disk, T=Tape)
 RETENTION : 10 YEARS

ELEMENT DESCRIPTION	ELEMENT ATTRIBUTE	ELEMENT LENGTH	SOURCE
CARRIER CODE	ALPHA	5	POLICY YEAR FINANCIAL CALL
INCURRED INDEMNITY CLAIM COUNT	NUMERIC	8	POLICY YEAR FINANCIAL CALL
COMPANY STANDARD PREMIUM	NUMERIC	8	POLICY YEAR FINANCIAL CALL
STANDARD EARNED PREMIUM AT DSR	NUMERIC	8	POLICY YEAR FINANCIAL CALL
IBNR	NUMERIC	8	POLICY YEAR FINANCIAL CALL
INCURRED LOSSES INCL. IBNR	NUMERIC	8	POLICY YEAR FINANCIAL CALL
INDEMNITY IBNR	NUMERIC	8	POLICY YEAR FINANCIAL CALL
INDEMNITY PAID	NUMERIC	8	POLICY YEAR FINANCIAL CALL
MEDICAL BULK	NUMERIC	8	POLICY YEAR FINANCIAL CALL
MEDICAL CASE	NUMERIC	8	POLICY YEAR FINANCIAL CALL
MEDICAL IBNR	NUMERIC	8	POLICY YEAR FINANCIAL CALL
MEDICAL PAID	NUMERIC	8	POLICY YEAR FINANCIAL CALL
NET PREMIUM	NUMERIC	8	POLICY YEAR FINANCIAL CALL
OUTSTANDING EXCL. IBNR INDEMNITY BULK	NUMERIC	8	POLICY YEAR FINANCIAL CALL
OUTSTANDING EXCL. IBNR INDEMNITY CASE	NUMERIC	8	POLICY YEAR FINANCIAL CALL
OUTSTANDING EXCL. IBNR INDEMNITY	NUMERIC	8	POLICY YEAR FINANCIAL CALL
OUTSTANDING EXCL. IBNR MEDICAL BULK	NUMERIC	8	POLICY YEAR FINANCIAL CALL
OUTSTANDING EXCL. IBNR MEDICAL CASE	NUMERIC	8	POLICY YEAR FINANCIAL CALL
OUTSTANDING EXCL. IBNR MEDICAL	NUMERIC	8	POLICY YEAR FINANCIAL CALL
OUTSTANDING EXCL. IBNR	NUMERIC	8	POLICY YEAR FINANCIAL CALL
PAID	NUMERIC	8	POLICY YEAR FINANCIAL CALL
SERIAL NUMBER	ALPHA	10	CALCULATED

CALL FOR EXPERIENCE #3
POLICY YEAR CALL

Background and Purpose of the Report

The Policy Year Call is due at NCCI on or before March 15 of the year following the most recent Policy Year. As an example, the Policy Year Call valued as of 12/31/90 is due at NCCI on or before March 15, 1991.

This call is one of five standard annual calls for experience subject to the Performance Evaluation Monetary Incentive Program (PEMIP).

In the past for each Annual Call Year, the most recent eight (8) full years of individual policy years had been reported separately by state. Prior to the eight most recent full years, the total of all "Prior to" Policy Years were grouped together. However, effective with Calls valued as of December 31, 1987, this call retained the oldest data year. As an example, the Policy Year Call valued as of 12/31/87 should be retained in the 1978 and prior to data as well as requesting data for 1987. This phase-in retention will result in the collection of 15 full underwriting years of data with calls reported in 1994. The definition of Policy Year refers to a way of organizing financial data based upon policy effective date. As an example, Policy Year 1990 is comprised of all policies with effective dates initiating in 1990 from 1/1/90 to 12/31/90. Additionally, all claims developed for these policies are reported back to the policy effective year, irrespective of the year the claim arose.

Policy Year data matches premiums and losses from an identified collection of policies that provide a very stable base on which to structure premium level analysis. As a result, this call is given a 50% weight in the ratemaking formula and is used to test reserve adequacy and reserve level changes. Changes in the ratemaking formula are made based upon these tests to obtain a more accurate indication of rate level needed. Results of the Policy Year Call are distributed to NCCI Members and Subscribers.

Data collected in the Policy Year Call includes earned premium and incurred losses on a state basis. Policy Year Earned Premiums are separated between Standard at NCCI DSR Level, Standard at Company Level and Net Earned. Standard at DSR Level is prior to the effect of any individual company competitive pricing activity and is, therefore, used for ratemaking. Standard at Company Level is used to confirm the accuracy of the ratemaking premium given our records of individual company deviation filings. Net earned premium is used to reconcile the company's annual statement (page 14) to the information reported on the call. Policy Year incurred losses, include incurred indemnity claim count and indemnity and medical total for paid losses, outstanding losses excluding IBNR, cases and bulk reserves in the outstanding losses excluding IBNR and total incurred losses.

The data reported in this call should *exclude* experience developed under large deductible policies (deductible amount over \$100,000 per claim or per accident).

The Calendar Year Reconciliation Report (Call #8) has been revised to add lines to reconcile premium and losses to Page 14 of the Annual Statement due to the exclusion of the large deductible policies.

Filing Requirements

Policy Year Call for Compensation Experience by State Valued as of December 31 of each year—due March 15 of the following year

In accordance with the approved statistical program, you are hereby requested to file with NCCI on or before March 15 of each year, your compensation experience by policy year valued as of December 31 of the prior year.

This Call is included in PEMIP (Performance Evaluation Monetary Incentive Program) and will be subject to assessments for late and/or inaccurate reporting. Details of PEMIP are updated annually in January of each year. Since future Compensation Rate Levels will depend upon these figures, it is essential that this Call be reported on or before the required due date.

This Call continues the phased-in expansion of the Policy Year Call to ultimately collect 15 full underwriting years of data. This Policy Year Call to be reported in 1990 retains the oldest data year (1978) and includes the current year 1989, thus requiring the collection of a total of 11 full underwriting years of data to be reported in 1990. This phased-in retention will continue until 15 full underwriting years of data are collected.

Two copies of the reporting form for the required information are provided in the package of forms sent to carriers in October of each year. Since a separate form is required for each state, carriers are asked to reproduce these forms within their organizations.

Questions regarding reporting requirements on completion of the Calls should be directed to Aggregate Ratemaking at (407) 997-4395.

A. GENERAL INSTRUCTIONS

1. Group Report

Carrier name and five-digit code must be shown on the reporting form. If this is a group reporting, each carrier writing compensation must be listed individually on the reporting form. List only the names or carrier codes of those carriers having direct business during at least one of the policy years for which data is required in a given state. Carriers are requested to submit the Policy Year Call on the same basis (i.e., group report or individual company report) as the Calendar Year Call. This will facilitate reconciliation of carrier data.

2. State

List both the name of the state and the state code number on each state's reporting form. Only one state per reporting sheet is allowed.

3. Accumulated Standard Earned Premium at NCCI Designated Statistical Reporting Level

As in last year's Call, you are required to report the Accumulated Standard Earned Premium for each of the indicated policy years. Specifically, for any given policy year, you are to report the entire Standard Earned Premium since policy inception through December 31 for those policies becoming effective during the policy year being reported.

For each policy year indicated, the Accumulated Standard Earned Premium at NCCI Designated Statistical Reporting Level shall be the accumulated earned premium for that particular policy year resulting from standard rating procedures after the application of:

1. Experience rating plan adjustments (NOTE: Except for Michigan experience, experience rating plan adjustments must reflect only NCCI-published modification factors.)*
2. Expense Constants (These are the Expense Constants published by NCCI or an independent bureau. For Voluntary Business in pure premium states, Expense Constants at the NCCI DSR level are 0.)
3. Loss Constants (These are the Loss Constants published by NCCI or an independent bureau. For Voluntary Business in pure premium states, Loss Constants at the NCCI DSR level are 0.)

but prior to the application of:

1. Deviations from NCCI Designated Statistical Reporting rates or pure premiums**
2. Deviations from published NCCI experience rating plan modification factors (Except Michigan)*
3. Retrospective rating plan adjustments
4. Other individual risk rating plan adjustments*** (e.g., Schedule Rating)
5. Premium discounts
6. Expense modification program adjustments
7. Payment of policyholder dividends
8. Premium credits for small deductible coverage

For every policy year Standard Earned Premium at DSR Level is reported, Standard Earned Premium at Company Level must be reported as well.

* Carriers must report their Standard Earned Premium at NCCI's experience rating plan level for all states except Michigan. If carriers use their own experience rating plan in Michigan, they may report their Standard Earned Premium at their own experience rating plan level.

** Rates: Arkansas, Georgia, Illinois, Indiana, Rhode Island, Vermont

Pure Premiums: Connecticut (policies effective 1/1/90 and subsequent), Kentucky, Louisiana (policies effective 4/1/89 and subsequent), Maryland, Michigan, New Mexico (policies effective 1/1/90 and subsequent), Oregon

*** Note that premium adjustments resulting from the application of individual risk rating plans other than experience rating must be excluded from both Standard Earned Premium at Company Level and Standard Earned Premium at NCCI Designated Statistical Reporting Level.

4. Standard Earned Premium at Company Level

The earned premium on all risks after the application of:

1. Deviations from NCCI Designated Statistical Reporting rates or pure premiums*
2. Experience rating plan adjustments (NOTE: Except for Michigan experience, experience rating plan adjustments must reflect only NCCI-published modification factors)**
3. Expense Constants (Carrier charged Expense Constants)
4. Loss Constants (Carrier charged Loss Constants)

but prior to the application of:

1. Deviations from published NCCI experience rating plan modification factors (except Michigan)**
2. Retrospective rating plan adjustments
3. Other individual risk rating plan adjustments*** (e.g., Schedule Rating)
4. Premium discounts
5. Expense modification program adjustments
6. Payment of policyholder dividends
7. Premium credits for small deductible coverage

For every state Standard Earned Premium at DSR Level is reported, Standard Earned Premium at Company Level must be reported as well.

* Rates: Arkansas, Connecticut, Georgia, Illinois, Indiana, New Mexico, Rhode Island, Vermont
Pure Premiums: Kentucky, Louisiana (policies effective 4/1/89 and subsequent), Maryland, Michigan, Oregon

** Carriers must report their Standard Earned Premium at NCCI's experience rating plan level for all states except Michigan. If carriers use their own experience rating plan in Michigan, they may report their Standard Earned Premium at their own experience rating plan level.

*** Note that premium adjustments resulting from the application of individual risk rating plans other than experience rating must be excluded from both Standard Earned Premium at Company Level and Standard Earned Premium at NCCI Designated Statistical Reporting Level.

5. Carriers Writing in Competitive Rating States

For Arkansas, Connecticut, Georgia, Illinois, Indiana, Kentucky, Louisiana, Maryland, Michigan, New Mexico, Oregon, Rhode Island, and Vermont, carriers must enter the Standard Earned Premium figures at NCCI Designated Statistical Reporting Level and at Company Level in the appropriate columns on the form. Both columns must be filled in for these states. The Designated Statistical Reporting Levels are often split during the policy year for these states. Please reference the enclosed circular titled "Annual Update on Designated Statistical Reporting Levels."

6. Carriers Writing at Deviations from NCCI Rates in Administered Pricing States

For State Funds and other carriers writing at deviations from Bureau rates in non-competitive rating states, the Standard Earned Premiums must be adjusted to Bureau rate level and reported in the column labeled "Standard Earned Premium at NCCI Designated Stat. Reporting Level." The Standard Earned Premium at the carrier rate level must be reported in the column labeled "Standard Earned Premium at Company Level."

Note: For Oklahoma the DSR level for policies effective between November 1, 1985 and July 1, 1988 is the March 1, 1985 rates. Companies writing policies on a "Consent to Rate" basis should report as if they had an upward deviation of the March 1, 1985 rates. For further information, refer to Statistical Circular 87-17, dated May 1, 1987.

Carriers that do not deviate from NCCI rates must enter their Standard Earned Premium in the column labeled "Standard Earned Premium at NCCI Designated Stat. Reporting Level" and must enter the same figure in the column labeled "Standard Earned Premium at Company Level."

Also note that where premium credits have been granted in connection with the Transition Program of payroll limitation rules, both reported Standard Earned Premium figures shall be reduced by such credits.

7. Accumulated Net Earned Premium

As in last year's Call, you are required to report the accumulated net earned premium for each of the indicated policy years. Specifically, for any given policy year you are to report the entire net earned premium since policy inception through December 31 of each year for those policies becoming effective during the policy year being reported.

For each policy year indicated, the accumulated net earned premium shall be the accumulated actual

earned premium on all risks prior to the payment of policyholder dividends; but after application of any retrospective rating premium adjustments, after the application of premium discounts in accordance with Manual rules, after the expense modification program, after any deviations or "write-offs" from Bureau rates or pure premiums and after the effects of any schedule rating premium adjustments.

8. Accumulated Incurred Losses

As in previous Policy Year Calls, you are required to report accumulated total incurred losses (i.e., from date of inception through December 31 of each year). The Call further requires that accumulated total incurred losses be split into the following components: accumulated indemnity losses (separately for paid, Outstanding Excluding IBNR—Case and Bulk, and IBNR) and accumulated medical losses (separately for paid, Outstanding Excluding IBNR—Case and Bulk, and IBNR). The reporting of these components of incurred losses is mandatory for all carriers. Please note that for line T only, under Outstanding Excluding IBNR and IBNR, the calendar year change should be reported rather than the accumulated total.

The Outstanding Excluding IBNR category is designed to capture case reserves and bulk reserves. For the purposes of this Call, the following working definitions may be used by carriers:

Case Reserves—Those outstanding reserves established for specific known cases reported in an aggregate amount to reflect the total case reserve for the company.

Bulk Reserves—Those outstanding reserves for general case reserve inadequacy, supplemental case reserves, cases that may reopen, or other reserves not associated to specific claims.

The goal of this reporting is to clearly isolate case reserves without impacting the carrier methodology of reporting IBNR. Carriers should not alter the mix of data historically allocated to IBNR, since doing so would adversely impact the NCCI development of IBNR data.

For this reason, carriers having reported bulk reserves in IBNR should continue to do so. On the Outstanding Excluding IBNR Page 3 Reporting Form, these carriers should respond "Yes" to the question in Note A. In addition, carriers having no bulk reserves should also respond "Yes" to the question in Note A.

Those carriers reporting bulk reserves in the Outstanding Excluding IBNR category should respond "No" to the question in Note A of the Outstanding Excluding IBNR Page 3 Reporting Form. These carriers should have data reported in both the case reserves and bulk reserves.

The Case and Bulk Reserve Reporting Form accommodates carriers allocating this data on an **ACTUAL** basis as well as **ESTIMATED** basis. The reporting form contains a coding box to indicate the actual versus estimated method of allocation.

9. Incurred Indemnity Claim Count

The incurred indemnity claim count (i.e., the accumulated number of claims for which an indemnity payment has been made and/or an outstanding reserve exists) must be reported on a mandatory basis for policy years 1981 and subsequent. (Those carriers that are in a position to do so are requested to report the incurred indemnity claim count for as many policy years prior to 1981 as possible.) The indemnity claim count should exclude claims that start out with an indemnity reserve, but were resolved as medical only claims or closed without payment. Also, indemnity claim count should include claims that start out as medical only but were resolved as indemnity at future valuations. If indemnity claims are reopened, they should not be added to the claim count.

10. No Experience

State reports should not be submitted for any state in which the carrier(s) has (have) never had experience. In instances where for one or more, but not all, of the 1978-1989 Policy Years the carrier(s) failed to have experience in a given state, indicate "NO EXPERIENCE" across the appropriate Policy Year line(s) on that state.

11. Questionnaire

The questionnaire on pages 4 and 5 of the reporting form must be completed. Submit only one questionnaire per submission. A separate questionnaire per state is no longer required.

12. Complete Submission

A complete call submission per state must include all three pages (and the Oklahoma Questionnaire as appropriate). Page 3 must be completed for each state in which the carrier reports experience.

13. Signature Requirement

The name of the person responsible for the completion and accuracy of this Call is only required on the first state's reporting form and does not have to be repeated on each state's form.

14. States for which the Reporting of Policy Year Experience is Required

State	Code#	State	Code#
Alabama	01		
Alaska	54	Michigan	21
Arizona	02	Mississippi	23
Arkansas	03	Missouri	24
Colorado	05	Montana	25
Connecticut	06	Nebraska	26
Dist. of Columbia	08	New Hampshire	28
Florida	09	New Mexico	30
Georgia	10	North Carolina	32
Hawaii	52	Oklahoma	35
Idaho	11	Oregon	36
Illinois	12	Rhode Island	38
Indiana	13	South Carolina	39
Iowa	14	South Dakota	40
Kansas	15	Tennessee	41
Kentucky	16	Texas	42
Louisiana	17	Utah	43
Maine	18	Vermont	44
Maryland	19	Virginia	45
		Wisconsin	48

15. Rounding Procedure and Reporting of Credits

Please report amounts of premiums and losses in whole dollars only. Count fifty cents and over as an extra dollar, and reject the cents if less than fifty. Please show negative amounts enclosed within parentheses so that they may be handled properly in punching and tabulating operations.

B. SPECIFIC INSTRUCTIONS

1. "F" Classifications

Experience of the "F" Classifications for policies effective January 1, 1974 and thereafter **MUST BE EXCLUDED**.

2. Coal Mine Experience

Underground Coal Mine experience **MUST BE EXCLUDED** in all states except Virginia. In Virginia **ALL** Coal Mine experience **MUST BE EXCLUDED**.

3. Excess Policies

Experience on excess policies **MUST BE EXCLUDED**.

4. National Defense Projects

Experience on National Defense Projects written under either the old Comprehensive Rating Plan or the new National Defense Projects Rating Plan **MUST BE**

EXCLUDED. Experience incurred on a Defense Base should be included unless written under the National Defense Projects Rating Plan.

5. Reinsurance

No deductions shall be made from premiums and losses for or on account of reinsurance ceded. Premiums and losses arising from reinsurance received by the reporting company shall be excluded from the experience. Experience reported should be **DIRECT BUSINESS ONLY.**

6. Assigned Risk

Experience for assigned risk policies must be **INCLUDED.** Assigned risk policies must be reported at the level of approved assigned risk rates.

7. Experience Incurred Under Occupational Disease Act

Experience incurred under any Occupational Disease Act separate and distinct from the Compensation Act for the state shall be combined with the traumatic experience under the State Compensation Act, and the total of such combined experience shall be reported.

8. IBNR

Losses reported by state should include an appropriate reserve for incurred but not reported cases. The IBNR reserve must be reported separately for indemnity and medical.

Commencing with the Policy Year Call valued as of December 31, 1986, the Outstanding Excluding IBNR category has been further refined to capture case reserves and bulk reserves.

This reporting clearly isolates case reserves without impacting the carrier methodology of reporting IBNR. Carriers should not alter the mix of data historically allocated to IBNR, since doing so would adversely impact the NCCI development of IBNR data.

For this reason, carriers having reported bulk reserves in IBNR should continue to do so. On the Outstanding Excluding IBNR Page 3 Reporting Form, these carriers should respond "Yes" to the question in Note A.

9. Reopened Cases

Include an appropriate loss reserve for reopened cases.

10. Reserves for Specific Contingencies

Include medical and other loss reserves to meet specific contingencies.

11. Other Voluntary Reserves

Exclude voluntary reserves other than those mentioned above.

12. Expenses

Exclude all expenses, allocated or unallocated, except allocated Coverage B loss adjustment expense.

13. Assessments and Special Compensation Funds

The inclusion of assessments and other compensation special funds as incurred losses in this Policy Year Call follow the same instructions that apply in reporting of experience under NCCI's Workers Compensation Unit Statistical Plan Manual. Specifically, when the compensation law states that, in connection with a certain type of injury, a specified amount shall be paid into special funds (e.g., a Second Injury Fund), and that such amounts are in addition to the compensation payable to the injured worker or his dependents, then the combined total amount shall be reported as incurred indemnity losses. Examples are: (1) payments in no-dependent death claims, and (2) a specified percentage of the permanent partial award. However, any special payments to the states assessed on total premium writings, total losses paid or incurred, or total indemnity losses paid or incurred instead of on a per-claim basis shall not be reported as losses to the rating bureau. In other words, special funds or assessments are reported as incurred losses only when the assessment is levied on certain types of injuries.

A list of specific assessments and other compensation special funds for each state and the proper treatment for including these assessments in this Call is attached.

14. Small Deductible Programs *

In states in which small deductible programs apply, losses are to be reported on a gross basis inclusive of the employer paid loss amount.

15. Taxes and Assessments in Kentucky

Taxes and Assessments on premiums earned in Kentucky on or after January 1, 1977 **MUST BE EXCLUDED.**

16. Oregon Assessments

Assessments on premiums written or earned in Oregon on or after July 1, 1982 must be excluded. This is pursuant to the requirements of OAR 436-51-025 and 51-030(2) contained in WCD Administrative Order 8-1982.

17. Oklahoma Statistical Reporting Requirements

To ensure the accurate calculation of Standard Earned Premium at NCCI Designated Statistical Reporting Level, the March 1, 1985 rates must be the DSR for policies effective between March 1, 1985 and July 1, 1988. For those policies written on a consent-to-rate basis, premium developed will have to be adjusted downward to attain the March 1, 1985 rate level.

Enclosed is the Oklahoma Questionnaire. The intent of this questionnaire will be to identify carriers writing on a consent-to-rate basis, and to what extent this basis was used. Also, questionnaire responses will assist us in verifying the inclusion of policyholder refunds and provide a ratemaking data quality check. For further information, refer to Statistical Circular 87-17 dated May 1, 1987.

Please note that the date for reporting this data is on or before March 15 of each year. It is urged that every effort be made to comply with this reporting date, as a delay in receiving this data will seriously hamper NCCI in its preparation of rate revisions. Please mail this Call to:

National Council on Compensation Insurance
750 Park of Commerce Drive
Boca Raton, Florida 33487
ATTENTION: FINANCIAL DATA

NATIONAL COUNCIL ON COMPENSATION INSURANCE
Reporting Guidebook for the Annual Calls for Experience

Effective January 1, 1990

Part IV
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Page 1

NATIONAL COUNCIL ON COMPENSATION INSURANCE
POLICY YEAR CALL FOR COMPENSATION EXPERIENCE BY STATE VALUED AS OF DECEMBER 31 OF EACH YEAR

CARRIER(S)* _____ CARRIER CODE NUMBER _____

STATE NAME _____ STATE CODE NUMBER _____

SUBMITTED BY _____ TITLE _____ TELEPHONE NO. _____ DATE SUBMITTED _____

Policy Year	Standard AI NCCI Designated Stat. Reporting Level (1)	Policy Year Accumulated Earned Premium Standard AI Company Level (2)	Net (3)	Paid (9) + (10) (4)	Accumulated Policy Year Incurred Losses — Total Outstanding Excluding IBNR (11) + (12) (5)	IBNR (13) + (14) (6)	Incurring Losses Including IBNR (4) + (5) + (6) (7)
A. Prior to 1978							
B. 1978							
C. 1979							
D. 1980							
E. 1981							
F. 1982							
G. 1983							
H. 1984							
I. 1985							
J. 1986							
K. 1987							
L. 1988							
M. 1989							
N. 1990							
O. 1991							
P. 1992							
Q. 1993							
R. Total To Current Year							
S. Total To Last Year							
T. Current Calendar Year Experience (R-S)							

* If this is a group report, list all carrier names or carrier codes for which any experience is reported

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 POLICY YEAR CALL FOR COMPENSATION EXPERIENCE BY STATE VALUED AS OF DECEMBER 31 OF EACH YEAR

CARRIER(S) _____ CARRIER CODE NUMBER _____

STATE NAME _____ STATE CODE NUMBER _____

ACCUMULATED POLICY YEAR INCURRED LOSSES

Policy Year	Incurred Indemnity Claim Count (8)	Paid		Outstanding Excluding IBNR		IBNR	
		Indemnity (9)	Medical (10)	Indemnity (11)	Medical (12)	Indemnity (13)	Medical (14)
A. Prior to 1978							
B. 1978							
C. 1979							
D. 1980							
E. 1981							
F. 1982							
G. 1983							
H. 1984							
I. 1985							
J. 1986							
K. 1987							
L. 1988							
M. 1989							
N. 1990							
O. 1991							
P. 1992							
Q. 1993							
R. Total to Current Year							
S. Total to Less Year							
T. Current Calendar Year Experience (R-S)							

POLICY YEAR CALL FOR COMPENSATION EXPERIENCE
BY STATE VALUED AS OF DECEMBER 31 OF EACH YEAR

CARRIER(S) _____ CARRIER CODE NUMBER _____

STATE NAME _____ STATE CODE NUMBER _____

Policy Year	Outstanding Excluding IBNR Indemnity		Outstanding Excluding IBNR Medical	
	Case (15)	Bulk (16)	Case (17)	Bulk (18)
A. Prior to 1978				
B. 1978				
C. 1979				
D. 1980				
E. 1981				
F. 1982				
G. 1983				
H. 1984				
I. 1985				
J. 1986				
K. 1987				
L. 1988				
M. 1989				
N. 1990				
O. 1991				
P. 1992				
Q. 1993				
R. Total to Current Year				
S. Total to Last Year				
T. Current Calendar Year Experience (R-S)				

NOTE:

A. Does your company currently report all bulk reserves for indemnity and medical under the IBNR columns on page 2? Indicate by placing an "X" in the appropriate space below.

___ No ___ Yes

If "No," data should be reported in Columns 15 through 18. If "Yes," Columns 15 through 18 should be left blank.

B. If your company currently reports any bulk reserves for indemnity and medical under the outstanding excluding IBNR columns of page 2 then,

- Columns 15 + 16 on this page must equal Column 11 on page 2.
- Columns 17 + 18 on this page must equal Column 12 on page 2.

Please indicate if the amounts shown on this page are actual or estimated by placing an "x" in the appropriate space provided below.

___ Actual ___ Estimated

C. If you have provided estimated amounts, will your company be able to provide NCCI with actual amounts in subsequent reports?

___ No ___ Yes

POLICY YEAR CALL QUESTIONNAIRE

Page 4

CARRIER NAME _____ CARRIER CODE

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1. Does Line R from the previous call correspond to that reported on Line S from the current call? Yes No. If no, please explain why for every state.

2. Does Line T agree with the Calendar Year Call submitted by your company for all states? Yes No. If no, please reconcile every state.

3. If a credit appears in Columns (1) through (5), (7) through (12), or (15) through (18) on Lines () through () most current five years, please explain why for every state.

POLICY YEAR CALL QUESTIONNAIRE

Page 5

CARRIER NAME _____

CARRIER CODE

--	--	--	--	--	--

4. Does your company have any schedule rating plan in effect? Yes No. If yes, list the states in which you schedule rate.

5. Does your company deviate from NCCI rates? Yes No. If yes,

a. List states in which you deviate.

b. Has the premium in Column (1) been adjusted to NCCI DSR level in all states?

**POLICY YEAR CALL FOR COMPENSATION EXPERIENCE BY STATE VALUED
 AS OF DECEMBER 31 OF EACH YEAR**

Oklahoma Questionnaire

CARRIER NAME _____

CARRIER CODE

--	--	--	--	--

Question	Responses	
	Yes	No
1. Are all Oklahoma policies effective November 1, 1985 and subsequent written on a consent-to-rate basis?	<input type="checkbox"/>	<input type="checkbox"/>
2. Are any Oklahoma policies effective November 1, 1985 and subsequent written on a consent-to-rate basis?	<input type="checkbox"/>	<input type="checkbox"/>
3. If any or all of your Oklahoma policies have been written on a consent-to-rate basis, has the DSR Level Standard Premium (Page 1, Column 1, Lines I, J, K, L, M) been correctly adjusted back to the level of March 1, 1985 rates?	<input type="checkbox"/>	<input type="checkbox"/>

TRANSMITTAL LETTER

1. CALL: POLICY YEAR CALL FOR COMPENSATION EXPERIENCE BY STATE VALUED AS OF DECEMBER 31 OF EACH YEAR

2. DUE DATE: March 15 of the following year

3. CARRIER NAME _____

4. CARRIER CODE

--	--	--	--	--	--	--	--

5. FILING AS: GROUP INDIVIDUAL COMPANY

6. If filing as a group, list individual carrier names or carrier codes:

7. SUBMISSION TYPE:

Original

Correction

Voluntary Resubmission

8. SUBMISSION CONTENT:

Full

Partial and Not Final

Partial and Final

9. Number of states included _____

10. Number of pages _____

MAIL CALL AND TRANSMITTAL LETTER TO:

NATIONAL COUNCIL ON COMPENSATION INSURANCE

750 PARK OF COMMERCE DRIVE

BOCA RATON, FL 33487

ATTN.: FINANCIAL DATA

NCCI USE ONLY
Date Received

Receipt Mailed

NATIONAL COUNCIL ON COMPENSATION INSURANCE
RECEIPT OF CALL NOTIFICATION

11. CALL: POLICY YEAR CALL FOR COMPENSATION EXPERIENCE BY STATE VALUED AS OF DECEMBER 31 OF EACH YEAR

12. DUE DATE: March 15 of the following year

13. DATE RECEIVED AT NCCI _____ BY _____

14. MAIL RECEIPT TO: (Indicate specific individual)

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Statistical Call Overview Document

STATISTICAL CALL NAME:

Policy Year Call For Assigned Risk Compensation Experience (Call #3A)

DESCRIPTION OF CALL:

This call contains dollar amounts for workers compensation Standard Earned Premium at NCCI DSR level, Standard Earned Premium at Company level, Net Earned Premium, and Total Incurred Losses by Policy Year for each state in which NCCI produces rate levels. The Total Incurred Losses are broken down into Paid, Outstanding excluding IBNR, and IBNR on page 1. Each of these components is further broken down into its indemnity and medical components and reported along with the Indemnity Claim Count on page 2. In addition, Indemnity and Medical Outstanding excluding IBNR are separated into case and bulk reserves on page 3. Each NCCI assigned risk servicing carrier is required to submit this information for each state in which they operate. Some states require all carriers writing workers compensation policies to submit financial calls.

The Assigned Risk Policy Year Call data is used in conjunction with the Assigned Risk Calendar-Accident Year Call data to determine assigned risk and/or voluntary business rate adequacy for the states in which NCCI produces rate levels. Voluntary business is derived by subtracting the assigned risk data from the statewide data.

NCCI first distributed the Policy Year Assigned Risk Call in 1990. The data is validated, but not yet used to calculate rates. NCCI requires financial call data to be submitted for at least three years before it is used to calculate rates.

FILES/DATABASES:

Policy Year Call Assigned Risk Production File:

This file serves as the central repository for Policy Year Call Assigned Risk data. This file contains all data received from the carriers as well as corrections applied to this data. Corrections to the file are made via ACS for data entry of revised reports with electronic transfer of the data to NCCI for incorporation into the production file.

Policy Year Call Assigned Risk SAS Dataset:

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Statistical Call Overview Document

Actuarial analysis and reporting programs are executed using the data in this file.

There is one SAS dataset for each state for which NCCI produces rates and has assigned risk business. In some states, frequently those with state funds, there is no assigned risk business. In this case the state fund serves as the assigned risk insurer.

The dataset contains data only for the specified state. This file is created through an extraction from the Policy Year Call Assigned Risk production file. Revised reports which are obtained after this extraction are entered into the SAS dataset and marked internally as revised records. When rate levels are completed for the state, these records are printed and sent to ACS for data entry and incorporation into the production file.

DESCRIPTION OF ERROR HANDLING:

Policy Year Assigned Risk data is validated in a two step process. An initial validation using automated reports is performed when the data is received from the carrier. A final validation of the data is performed as one of the steps in producing a state's rate level to ensure that no errors have been overlooked.

Carriers are sent written correspondence letters to resolve any errors identified during the initial validation. As revised reports are received, they are checked for accuracy. If correct, the revised reports are sent to ACS for processing or entered into the SAS dataset if the affected data is already being used for rate level production.

During the final validation, newly discovered and outstanding errors are handled in a slightly different manner. Carriers are contacted by phone for a response. Revised reports are submitted by facsimile transmission or some form of overnight delivery. NCCI may enter corrections based on the phone conversation in anticipation of carrier submitted revisions.

MODIFICATIONS TO DATA:

Revised reports are processed as they are received. Any data containing errors which remain unresolved at the time of a state's rate level production will be removed from

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Statistical Call Overview Document

the dataset if resolution of the remaining errors is not possible within the framework of the rate level production schedule.

All revised data is requested to be submitted on revised reports or via written correspondence. When production deadlines require an immediate response, telephone responses are accepted with the stipulation that a written confirmation of the changes also be submitted.

CALL FOR EXPERIENCE #3—A
POLICY YEAR CALL FOR ASSIGNED RISK POLICY YEAR CALL
BY STATE

Background and Purpose of the Report

The Policy Year Call for Assigned Risk Compensation Experience by state is due at NCCI on March 15 of the current year for the previous policy year.

This call is one of the annual calls for experience subject to the Performance Evaluation Monetary Incentive Program (PEMIP).

The intent of this call is for use in ratemaking to develop assigned risk experience separately and also will be used along with the standard Policy Year Call (Call #3) to develop "voluntary business only" experience. Therefore, it is essential that the methodology for determining the premium and losses reported in this call be consistent with the procedures used for reporting the experience on page 14 of the annual statement. The data submitted on this call should also be consistent with the assigned risk experience included in the Policy Year Call (Call #3).

Filing Requirements

Policy Year Call for Assigned Risk Compensation Experience by State Valued as of December 31 of each year—Due March 15 of the following year

In accordance with the approved statistical program you are hereby requested to file with NCCI on or before March 15 of each year your assigned risk compensation experience by policy year valued as of December 31 of the prior year.

This call is included in PEMIP (Performance Evaluation Monetary Incentive Program) and would normally be subject to assessments for late and/or inaccurate reporting. Details of PEMIP are updated annually in January of each year and when released in January 1990, will contain more details pertaining to the Assigned Risk Only Calls. Since 1990 compensation rate levels will depend upon these figures, it is essential that this call be reported on or before the required due date.

This Call follows the phased-in expansion of the Policy Year Call to ultimately collect 15 full underwriting years of data. This Assigned Risk Policy Year Call to be reported in 1990 retains the oldest data year (1978) and includes the current year 1989, thus requiring the collection of a total of 11 full underwriting years of data to be reported in 1990. This phased-in retention will continue until 15 full underwriting years of data are collected.

Please note: the eventual intent of this Call is for use in ratemaking. This Call will be used on its own to develop Assigned Risk experience and also will be used along with the standard Policy Year Call to develop "voluntary business only" experience. For this reason, it is essential that the premium and losses reported on this Call reconcile with the Assigned Risk data included on Page 14 of the annual statement. The data submitted on this Call should also be consistent with the Assigned Risk experience reported on the standard Policy Year Call.

Attached are two copies of the reporting form for the required information. Since a separate form is required for each state, carriers are asked to reproduce these forms within their organizations.

Questions regarding reporting requirements on completion of the Calls should be directed to Aggregate Ratemaking at 407-997-4395.

A. GENERAL INSTRUCTIONS

1. Group Report

Carrier name and five-digit code must be shown on the reporting form. If this is a group reporting, each carrier writing compensation must be listed individually on the reporting form. List only the names or carrier codes of those carriers having direct Assigned Risk business during at least one of the policy years for which data is required in a given state. Carriers are requested to submit the Assigned Risk Policy Year Call on the same basis (i.e., group report or individual company report) as the Assigned Risk Calendar Year Call. This will facilitate reconciliation of carrier data.

2. State

List both the name of the state and the state code number on each state's reporting form. Only one state per reporting sheet is allowed.

3. Accumulated Standard Earned Premium at NCCI Designated Statistical Reporting Level

You are asked to report the Accumulated Standard Earned Premium for each of the indicated policy years. Specifically, for any given policy year you are to report the entire Standard Earned Premium since policy inception through December 31, 1988 for those policies becoming effective during the policy year being reported.

For each policy year indicated, the Accumulated Standard Earned Premium at NCCI Designated Statistical Reporting Level shall be the accumulated earned premium for that particular policy year resulting from standard rating procedures after the application of:

1. Assigned Risk rating programs, surcharges etc.
2. Experience rating plan adjustments (NOTE: Except for Michigan experience, experience rating plan adjustments must reflect only NCCI-published modification factors.)*
3. Expense Constants (These are the Expense Constants published by NCCI or an independent bureau.)
4. Loss Constants (These are the Loss Constants published by NCCI or an independent bureau.)

but prior to the application of:

1. Deviations from published NCCI experience rating plan modification factors (except Michigan)*
2. Maine small business premium discount
3. Retrospective rating plan adjustments
4. Premium discounts
5. Expense modification program adjustments
6. Payment of policyholder dividends
7. Premium credits for deductible coverage

* Carriers must report their Standard Earned Premium at NCCI's experience rating plan level for all states except Michigan. If carriers use their own experience rating plan in Michigan, they may report their Standard Earned Premium at their own experience rating plan level.

4. **Standard Earned Premium at Company Level**
Not Applicable to Assigned Risk Policy Year Call.
5. **Carriers Writing in Competitive Rating States**
Not Applicable to Assigned Risk Policy Year Call.
6. **Carriers Writing at Deviations from NCCI Rates in Administered Pricing States**
Not Applicable to Assigned Risk Policy Year Call.
7. **Accumulated Net Earned Premium**

As in last year's Policy Year Call, you are required to report the accumulated net earned premium for each of the indicated policy years. Specifically, for any given policy year you are to report the entire net earned premium since policy inception through December 31, 1989 for those policies becoming effective during the policy year being reported.

For each policy year indicated, the accumulated net earned premium shall be the accumulated actual earned premium on all risks prior to the payment of policyholder dividends; but after application of any retrospective rating premium adjustments, after the application of premium discounts in accordance with Manual rules, after the expense modification program and after the effects of any schedule rating premium adjustments.

8. **Accumulated Incurred Losses**

As in previous Policy Year Calls, you are required to report accumulated total incurred losses (i.e., from date

of inception through December 31). The Call further requires that accumulated total incurred losses be split into the following components: accumulated indemnity losses (separately for Paid, Outstanding Excluding IBNR—Case and Bulk, and IBNR) and accumulated medical losses (separately for Paid, Outstanding Excluding IBNR—Case and Bulk, and IBNR). The reporting of these components of incurred losses is mandatory for all carriers. Please note that for line T only, under Outstanding Excluding IBNR and IBNR, the calendar year change should be reported rather than the accumulated total.

The Outstanding Excluding IBNR category is designed to capture case reserves and bulk reserves. For the purposes of this Call, the following working definitions may be used by carriers:

Case Reserves—Those outstanding reserves established for specific known cases reported in an aggregate amount to reflect the total case reserve for the company.

Bulk Reserves—Those outstanding reserves for general case reserve inadequacy, supplemental case reserves, cases that may reopen, or other reserves not associated to specific claims.

The goal of this reporting is to clearly isolate case reserves without impacting the carrier methodology of reporting IBNR. Carriers should not alter the mix of data historically allocated to IBNR, since doing so would adversely impact the NCCI development of IBNR data.

For this reason, carriers who have reported bulk reserves in IBNR should continue to do so. On the Outstanding Excluding IBNR Page 3 Reporting Form, these carriers should respond "Yes" to the question in Note A.

Those carriers reporting bulk reserves in the Outstanding Excluding IBNR category should respond "No" to the question in Note A of the Outstanding Excluding IBNR Page 3 Reporting Form. These carriers should have data reported in both the case reserves and bulk reserves.

The Case and Bulk Reserve Reporting Form accommodates carriers allocating this data on an ACTUAL basis as well as ESTIMATED basis. The reporting form contains a coding box to indicate the actual versus estimated method of allocation.

9. **Incurred Indemnity Claim Count**

The incurred indemnity claim count (i.e., the accumulated number of claims for which an indemnity payment has been made and/or an outstanding reserve exists) must be reported on a mandatory basis for policy years 1981 and subsequent. (Those carriers in a position to do so are requested to report the incurred

indemnity claim count for as many policy years prior to 1981 as possible.) The indemnity claim count should exclude claims that start out with an indemnity reserve, but are resolved as medical only claims or closed without payment. Also, indemnity claim count should include claims that start out as medical only but are resolved as indemnity at future evaluations. If indemnity claims are reopened, they should not be added to the claim counts.

10. No Experience

State reports should not be submitted for any state in which the carrier(s) has (have) never had experience. In instances in which for one or more, but not all, of the 1978-1989 policy years the carrier(s) failed to have experience in a given state, indicate "NO EXPERIENCE" across the appropriate Policy Year line(s) on that state.

11. Questionnaire

The questionnaire on pages 4 and 5 of the reporting form must be completed. Submit only one questionnaire per submission. A separate questionnaire per state is no longer required.

12. Complete Submission

A complete call submission per state must include all three pages (and the Oklahoma Questionnaire as appropriate). Page 3 must be completed for each state in which the carrier reports experience.

13. Signature Requirement

The name of the person responsible for the completion and accuracy of this Call is only required on the first state's reporting form and does not have to be repeated on each state's form.

14. States for Which the Reporting of Assigned Risk Policy Year Experience is Required

State	Code #	State	Code #	State	Code #
Alabama	01	Iowa	14	North Carolina	32
Alaska	54	Kansas	15	Oregon	36
Arizona	02	Kentucky	16	Rhode Island	38
Arkansas	03	Louisiana	17	South Carolina	39
Connecticut	06	Maine	18	South Dakota	40
Dist. of Columbia	06	Michigan	21	Tennessee	41
Florida	09	Mississippi	21	Texas	42
Georgia	10	Missouri	24	Vermont	44
Hawaii	52	Nebraska	26	Virginia	45
Illinois	12	New Hampshire	28	Wisconsin	48
Indiana	13	New Mexico	30		

15. Rounding Procedure and Reporting of Credits

Please report amounts of premiums and losses in whole dollars only. Count fifty cents and over as an extra dollar, and reject the cents if less than fifty. Please show negative amounts enclosed within parentheses so that they may be handled properly in punching and tabulating operations.

B. SPECIFIC INSTRUCTIONS

1. "F" Classifications

Experience of the "F" Classifications for policies effective January 1, 1974 and thereafter **MUST BE EXCLUDED**.

2. Coal Mine Experience

Underground Coal Mine experience **MUST BE EXCLUDED** in all states except Virginia. In Virginia **ALL** Coal Mine experience **MUST BE EXCLUDED**.

3. Excess Policies

Experience on excess policies **MUST BE EXCLUDED**.

4. National Defense Projects

Experience on National Defense Projects written under either the old Comprehensive Rating Plan or the new National Defense Projects Rating Plan **MUST BE EXCLUDED**. Experience incurred on a Defense Base should be included unless written under the National Defense Projects Rating Plan.

5. Reinsurance

No deductions shall be made from premiums and losses for or on account of reinsurance ceded. Premiums and losses arising from reinsurance received by the reporting company shall be excluded from the experience. Experience reported should be **DIRECT BUSINESS ONLY**.

6. Experience Incurred Under Occupational Disease Act

Experience incurred under any Occupational Disease Act which is separate and distinct from the Compensation Act for the state shall be combined with the traumatic experience under the State Compensation Act, and the total of such combined experience shall be reported.

7. IBNR

Losses reported by state should include an appropriate reserve for incurred but not reported cases. The IBNR reserve must be reported separately for indemnity and medical.

The Outstanding Excluding IBNR category is further refined to capture case reserves and bulk reserve

This reporting clearly isolates case reserves without impacting the carrier methodology of reporting IBNR.

Effective January 1, 1990

Carriers should not alter the mix of data historically allocated to IBNR, since doing so would adversely impact the NCCI development of IBNR data.

For this reason, carriers having reported bulk reserves in IBNR should continue to do so. On the Outstanding Excluding IBNR Page 3 Reporting Form, these carriers should respond "Yes" to the question in Note A.

8. Reopened Cases

Include an appropriate loss reserve for reopened cases.

9. Reserves for Specific Contingencies

Include medical and other loss reserves to meet specific contingencies.

10. Other Voluntary Reserves

Exclude voluntary reserves other than those mentioned above.

11. Expenses

Exclude all expenses, allocated or unallocated, except allocated Coverage B loss adjustment expense.

12. Assessments and Special Compensation Funds

The inclusion of assessments and other compensation special funds as incurred losses in this Policy Year Call follow the same instructions that apply in reporting of experience under NCCI's Workers Compensation Unit Statistical Plan Manual. Specifically, where the compensation law states that, in connection with a certain type of injury, a specified amount shall be paid into special funds (e.g., a Second Injury Fund),

and that such amounts are in addition to the compensation payable to the injured worker or his dependents, then the combined total amount shall be reported as incurred indemnity losses. Examples are: (1) payments in no-dependent death claims, and (2) a specified percentage of the permanent partial award. However, any special payments to the states assessed on total premium writings, total losses paid or incurred, or total indemnity losses paid or incurred instead of on a per-claim basis shall not be reported as losses to the rating bureau. In other words, special funds or assessments are reported as incurred losses only when the assessment is levied on certain types of injuries.

A list of specific assessments and other compensation special funds for each state and the proper treatment for including these assessments in this Call is attached.

13. Claims Deductible Programs

In states in which claim deductible programs apply, losses are to be reported on a gross basis inclusive of the employer paid loss amount.

Please note that the date for reporting this data is on or before March 15 of each year. It is urged that every effort be made to comply with this reporting date, as a delay in receiving this data will seriously hamper NCCI in its preparation of rate revisions. Please mail this Call to:

National Council on Compensation Insurance
750 Park of Commerce Drive
Boca Raton, Florida 33487

ATTENTION: FINANCIAL DATA

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 Reporting Guidebook for the Annual Calls for Experience

Effective January 1, 1990

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Page 1

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 POLICY YEAR CALL FOR ASSIGNED RISK COMPENSATION EXPERIENCE BY STATE VALUED AS OF DECEMBER 31 OF EACH YEAR
 CARRIER(S)* _____ CARRIER CODE NUMBER _____

STATE NAME _____ STATE CODE NUMBER _____

Policy Year	SUBMITTED BY		Standard AI NCCI Designated Stat. Reporting Level (1)	POLICY YEAR ACCUMULATED EARNED PREMIUM		Net (3)	Paid (9) + (10) (4)	ACCUMULATED POLICY YEAR INCURRED LOSSES - Total				
	Standard AI Company Level (2)	TITLE		TELEPHONE NO.	DATE SUBMITTED			Outstanding Excluding IBNR (11) + (12) (5)	IBNR (13) + (14) (6)	Incurred Losses Including IBNR (4) + (5) + (6) (7)		
A. Prior to 1978												
B. 1978												
C. 1979												
D. 1980												
E. 1981												
F. 1982												
G. 1983												
H. 1984												
I. 1985												
J. 1986												
K. 1987												
L. 1988												
M. 1989												
N. 1990												
O. 1991												
P. 1992												
Q. 1993												
R. Total To Current Year												
S. Total To Last Year												
T. Current Calendar Year Experience (R-S)												

* If this is a group report, list all carrier names or carrier codes for any experience reported.

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Page 2

NATIONAL COUNCIL ON COMPENSATION INSURANCE
POLICY YEAR CALL FOR ASSIGNED RISK COMPENSATION EXPERIENCE BY STATE VALUED AS OF DECEMBER 31 OF EACH YEAR

CARRIER(S) _____ CARRIER CODE NUMBER _____
STATE NAME _____ STATE CODE NUMBER _____

Policy Year	ACCUMULATED POLICY YEAR INCURRED LOSSES				Outstanding Excluding IBNR				IBNR	
	Incurred Indemnity Claim Count (6)	Paid		Indemnity (11)		Medical (12)		Indemnity (13)	Medical (14)	
		Incurred Indemnity (8)	Medical (10)	Indemnity (9)	Medical (11)	Medical (12)	Medical (12)	Indemnity (13)	Medical (14)	
A. Prior to 1978										
B. 1978										
C. 1979										
D. 1980										
E. 1981										
F. 1982										
G. 1983										
H. 1984										
I. 1985										
J. 1986										
K. 1987										
L. 1988										
M. 1989										
N. 1990										
O. 1991										
P. 1992										
Q. 1993										
R. Total to Current Year										
S. Total to Last Year										
T. Current Calendar Year Experience (R-S)										

NATIONAL COUNCIL ON COMPENSATION INSURANCE
POLICY YEAR CALL FOR ASSIGNED RISK COMPENSATION EXPERIENCE
BY STATE VALUED AS OF DECEMBER 31 OF EACH YEAR

CARRIER(S) _____ CARRIER CODE NUMBER _____

STATE NAME _____ STATE CODE NUMBER _____

Policy Year	Outstanding Excluding IBNR Indemnity		Outstanding Excluding IBNR Medical	
	Case (15)	Bulk (16)	Case (17)	Bulk (18)
A. Prior to 1978				
B. 1978				
C. 1979				
D. 1980				
E. 1981				
F. 1982				
G. 1983				
H. 1984				
I. 1985				
J. 1986				
K. 1987				
L. 1988				
M. 1989				
N. 1990				
O. 1991				
P. 1992				
Q. 1993				
R. Total to Current Year				
S. Total to Last Year				
T. Current Calendar Year Experience (R-S)				

NOTE:

A. Does your company currently report all bulk reserves for indemnity and medical under the IBNR columns on page 2? Indicate by placing an "X" in the appropriate space below.

___ No ___ Yes

If "No," data should be reported in Columns 15 through 18. If "Yes," Columns 15 through 18 should be left blank.

B. If your company currently reports any bulk reserves for indemnity and medical under the outstanding excluding IBNR columns of page 2 then,

1. Columns 15 + 16 on this page must equal Column 11 on page 2.

2. Columns 17 + 18 on this page must equal Column 12 on page 2.

Please indicate if the amounts shown on this page are actual or estimated by placing an "x" in the appropriate space provided below.

___ Actual ___ Estimated

C. If you have provided estimated amounts, will your company be able to provide NCCI with actual amounts in subsequent reports?

___ No ___ Yes

Page 4

NATIONAL COUNCIL ON COMPENSATION INSURANCE
ASSIGNED RISK POLICY YEAR CALL QUESTIONNAIRE

CARRIER NAME _____

CARRIER CODE

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1. Does Line R from the previous call correspond to that reported on Line S from the current call? Yes No. If no, please explain why for every state.

N/A

2. Does Line T agree with the previous year's Assigned Risk Calendar Year Call submitted by your company for all states? Yes No. If no, please reconcile every state.

3. If a credit appears in Columns (1) through (5), (7) through (12), or (15) through (18) on Lines E through M, please explain why for every state.

NATIONAL COUNCIL ON COMPENSATION INSURANCE
ASSIGNED RISK POLICY YEAR CALL QUESTIONNAIRE

CARRIER NAME _____

CARRIER CODE

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4. Does your company have any schedule rating plan in effect for Assigned Risk Business? Yes No. If yes, list the states in which you schedule rate.

TRANSMITTAL LETTER

1. CALL: POLICY YEAR CALL FOR ASSIGNED RISK COMPENSATION EXPERIENCE BY STATE VALUED AS OF DECEMBER 31 OF EACH YEAR
2. DUE DATE: March 15 of the following year
3. CARRIER NAME _____ 4. CARRIER CODE _____
5. FILING AS: GROUP INDIVIDUAL COMPANY
6. If filing as a group, list individual carrier names or carrier codes:

7. SUBMISSION TYPE:
 Original Correction Voluntary Resubmission
8. SUBMISSION CONTENT:
 Full Partial and Not Final Partial and Final
9. Number of states included _____ 10. Number of pages _____

MAIL CALL AND TRANSMITTAL LETTER TO:

NATIONAL COUNCIL ON COMPENSATION INSURANCE

750 PARK OF COMMERCE DRIVE

BOCA RATON, FL 33487

ATTN.: FINANCIAL DATA

NCCI USE ONLY
Date Received _____

Receipt Mailed _____

NATIONAL COUNCIL ON COMPENSATION INSURANCE
RECEIPT OF CALL NOTIFICATION

11. CALL: POLICY YEAR CALL FOR ASSIGNED RISK COMPENSATION EXPERIENCE BY STATE VALUED AS OF DECEMBER 31 OF EACH YEAR
12. DUE DATE: March 15 of the following year
13. DATE RECEIVED AT NCCI _____ BY _____
14. MAIL RECEIPT TO: (Indicate specific individual)

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Statistical Call Overview Document

STATISTICAL CALL NAME:

Calendar-Accident Year Call For Compensation Experience (Call #5)

DESCRIPTION OF CALL:

This call contains dollar amounts for workers compensation Standard Earned Premium at NCCI DSR level, Standard Earned Premium at Company level, Net Earned Premium, and Total Incurred Losses by Calendar-Accident Year for each state in which NCCI produces rate levels. The Total Incurred Losses are broken down to Paid, Outstanding excluding IBNR, and IBNR on page 1. Each of these components is further broken down into its indemnity and medical components reported along with the Indemnity Claim Count on page 2. In addition, Indemnity and Medical Outstanding excluding IBNR are separated into case and bulk reserves on page 3. Each NCCI member carrier is required to submit this information for each state in which they operate. Some states require all carriers writing workers compensation policies to submit financial calls.

The Calendar-Accident Year Call for Compensation Experience is used in conjunction with the Policy Year Call to determine rate adequacy for the states in which NCCI produces rate levels.

FILES/DATABASES:

Calendar-Accident Year Call Production File:

This file serves as the central repository for Calendar-Accident Year Call data. This file contains all data received from the carriers as well as corrections applied to this data. Corrections to the file are made via ACS data entry of revised reports with electronic transfer of the data to NCCI for incorporation into the production file.

Calendar-Accident Year Call SAS Dataset:

Actuarial analysis and reporting programs are executed using the data in this file.

There is one SAS dataset for each state for which the NCCI produces rates. The dataset contains data only for the specified state. This file is created through an extraction from the Calendar-Accident Year Call production file. Revised reports which are obtained

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Statistical Call Overview Document

after this extraction are entered into the SAS dataset and marked internally as revised records. When rate levels are completed for the state, these records are printed and sent to ACS for data entry and incorporation into the production file.

DESCRIPTION OF ERROR HANDLING:

Calendar-Accident Year data is validated in a two step process. An initial validation using automated reports is performed when the data is received from the carrier. A final validation of the data is performed as one of the steps in producing a state's rate level to ensure that no errors have been overlooked.

Carriers are sent written correspondence letters to resolve any errors identified during the initial validation. As revised reports are received, they are checked for accuracy. If correct, the revised reports are sent to ACS for processing or entered into the SAS dataset if the affected data is already being used for rate level production.

During the final validation, newly discovered and outstanding errors are handled in a slightly different manner. Carriers are contacted by phone for a response. Revised reports are submitted by facsimile transmission or some form of overnight delivery. NCCI may enter corrections based on the phone conversation in anticipation of carrier submitted revisions.

MODIFICATIONS TO DATA:

Revised reports are processed as they are received. Any data containing errors which remain unresolved at the time of a state's rate level production will be removed from the dataset. Data is removed only if resolution of the remaining errors is not possible within the framework of the rate level production schedule.

All revised data is requested to be submitted on revised reports or via written correspondence. When production deadlines require an immediate response, telephone responses are accepted with the stipulation that a written confirmation of the changes also be submitted.

NAIC Examination of NCCI
 Description of Data Collection and Data Handling
 Statistical Call Data Documentation

Statistical Call Name: Calendar - Accident Year Call For Compensation Experience By State (NCCI Call #5)

Data Element	Captured?	Description of Validation
1. Carrier Name	No	
2. Carrier Code	Yes	A. Validated against NCCI carrier membership list. (Visual review of hard copy input)
3. State Name	No	
4. State Code	Yes	A. Checked against the state name on the call. (Visual review of hard copy input)
5. Call Year	Yes	A. Checked for consistency with data submitted on call. (Visual review of a system generated report and hard copy input)
6. Submitted By	No	
7. Title	No	
8. Telephone Number	No	
9. Date Submitted	No	
10. Serial Number	No	
11. Calendar Year Standard Earned Premium at NCCI DSR Level	Yes	<p>A. Data from the current year's call is compared to that of the previous year's call to ensure that it has not changed from one valuation year to the next for individual Calendar Years.</p> <p>B. Latest Calendar Year (i.e., 1990 for data valued as of 12/31/90) is checked against Calendar Year Standard Earned Premium at NCCI DSR level from the Calendar Year Call for Compensation Experience by State (NCCI Call #2).</p>

NAIC Examination of NCCI
 Description of Data Collection and Data Handling
 Statistical Call Data Documentation

Statistical Call Name: Calendar - Accident Year Call for Compensation Experience By State (NCCI Call #5)

	Captured?	Description of Validation
12. Calendar Year Standard Earned Premium at Company Level	Yes	<p>A. Data from the current year's call is compared to that of the previous year's call to ensure that it has not changed from one valuation year to the next for individual Calendar Years.</p> <p>B. Latest Calendar Year (i.e., 1990 for data valued as of 12/31/90) is checked against Calendar Year Standard Earned Premium at Company Level from the Calendar Year Call for Compensation Experience by State (NCCI Call #2).</p>
13. Calendar Year Net Earned Premium	Yes	<p>A. Data from the current year's call is compared to that of the previous year's call to ensure that it has not changed from one valuation to the next for individual Calendar Years.</p> <p>B. Latest Calendar Year (i.e., 1990 for data valued as of 12/31/90) is checked against Calendar Year Net Earned Premium from the Calendar Year Call for Compensation Experience by State (NCCI Call #2).</p>
14. Total Paid Losses	Yes	<p>A. Total Paid Losses are checked against the sum of Indemnity Paid Losses and Medical Paid Losses.</p> <p>B. Line Q is checked against the total of lines A through M.</p> <p>C. Line R from the current year's call is checked against line Q from the previous year's call.</p> <p>D. Line S is checked against the total of line Q - Line R.</p> <p>E. Lines A through M are checked for negative entries.</p>

NAIC Examination of NCCI
 Description of Data Collection and Data Handling
 Statistical Call Data Documentation

Statistical Call Name: Calendar - Accident Year Call For Compensation Experience By State (NCCI Call #5)

Data Element	Captured?	Description of Validation
15. Total Outstanding Excluding IBNR Losses	Yes	A. Total Outstanding Excluding IBNR Losses are checked against the sum of Indemnity Outstanding Excluding IBNR Losses and Medical Outstanding Excluding IBNR Losses. B. Line Q is checked against the total of lines A through M. C. Line R from the current year's call is checked against line Q from the previous year's call. D. Line S is checked against the total of line Q - line R. E. Lines A through M are checked for negative entries.
16. Total IBNR Losses	Yes	A. Total IBNR Losses are checked against the sum of Indemnity IBNR Losses and Medical IBNR Losses. B. Line Q is checked against the total of lines A through M. C. Line R from the current year's call is checked against line Q from the previous year's call. D. Line S is checked against the total of line Q - line R. E. Lines A through M are checked for negative entries.

NAIC Examination of NCCI
 Description of Data Collection and Data Handling
 Statistical Call Data Documentation

Statistical Call Name: Calendar - Accident Year Call For Compensation Experience By State (NCCI Call #5)

Data Element	Captured?	Description of Validation
17. Total Incurred Losses	Yes	<p>A. Total Incurred Losses are checked against the sum of Total Paid Losses, Total Outstanding Excluding IBNR Losses, and Total IBNR Losses.</p> <p>B. Ratio of data from the current year's call to that of the previous year's call is checked for reasonableness for individual Accident Years.</p> <p>C. Line Q is checked against the total of lines A through M.</p> <p>D. Line R from the current year's call is checked against line Q from the previous year's call.</p> <p>E. Line S is checked against the total of line Q - Line R.</p> <p>F. Lines A through M are checked for negative entries.</p> <p>G. Line S is checked against Incurred Losses from Calendar Year Call for Compensation Experience by State (NCCI Call #2)</p> <p>H. Check latest Accident Year against line S to ensure Calendar Year experience is split among all Accident Years.</p> <p>I. Check for Total Incurred Losses with no corresponding Standard Earned Premium at NCCI DSR level for the latest Calendar - Accident Year (i.e., 1990 for data valued as of 12/31/90).</p>
18. Indemnity Claim Count	Yes	<p>A. Check for Indemnity Paid Losses and/or Indemnity Outstanding Excluding IBNR Losses with no corresponding Indemnity Claim Count for individual Accident Years.</p> <p>B. Check for Indemnity Claim Count with no corresponding Indemnity Paid Losses or Indemnity Outstanding Losses for individual Accident Years.</p>

NAIC Examination of NCCI
 Description of Data Collection and Data Handling
 Statistical Call Data Documentation

Statistical Call Name: Calendar - Accident Year Call For Compensation Experience By State (NCCI Call #5)

Data Element	Captured?	Description of Validation
19. Indemnity Paid Losses	Yes	<p>A. Each individual Accident Year's data is checked against the corresponding Policy Years' data to ensure consistency of reporting between the two calls.</p> <p>B. Ratio of sum of Indemnity Paid Losses, Indemnity Outstanding Excluding IBNR Losses, and Indemnity IBNR Losses from the current Year's call are compared to the same sum from the previous year's call for individual Accident Years.</p> <p>C. Line Q is checked against the total of lines A through M.</p> <p>D. Line R from the current year's call is checked against line Q from the previous year's call.</p> <p>E. Line S is checked against the total of line Q - line R.</p> <p>F. Lines A through M are checked for negative entries.</p>
20. Medical Paid Losses	Yes	<p>A. Each individual Accident Year's data is checked against the corresponding Policy Years' data to ensure consistency of reporting between the two calls.</p> <p>B. Ratio of sum of Medical Paid Losses, Medical Outstanding Excluding IBNR Losses, and Medical IBNR Losses from the current year's call compared to the same sum from the previous year's call for individual Accident Years.</p> <p>C. Line Q is checked against the total of lines A through M.</p> <p>D. Line R from the current year's call is checked against line Q from the previous year's call.</p> <p>E. Line S is checked against the total of line Q - line R.</p> <p>F. Lines A through M are checked for negative entries.</p>

NAIC Examination of NCCI
 Description of Data Collection and Data Handling
 Statistical Call Data Documentation

Statistical Call Name: Calendar - Accident Year Call For Compensation Experience By State (NCCI Call #5)

Data Element	Captured?	Description of Validation
21. Indemnity Outstanding Excluding IBNR Losses	Yes	<p>A. Each individual Accident Year's data is checked against the corresponding Policy Years' data to ensure consistency of reporting between the two calls.</p> <p>B. Indemnity Outstanding Excluding IBNR Losses is Checked against the sum of Indemnity Outstanding Excluding IBNR - Case Losses and Indemnity Outstanding Excluding IBNR - Bulk Losses.</p> <p>C. Ratio of sum of Indemnity Paid Losses, Indemnity Outstanding Excluding IBNR Losses, and Indemnity IBNR Losses from the current year's call are compared to the same sum from the previous year's call for individual Accident Years.</p> <p>D. Line Q is checked against the total of lines A through M.</p> <p>E. Line R from the current year's call is checked against line Q from the previous year's call.</p> <p>F. Line S is checked against the total of line Q - Line R.</p> <p>G. Lines A through M are checked for negative entries.</p>

NAIC Examination of NCCI
Description of Data Collection and Data Handling

Statistical Call Data Documentation

Statistical Call Name: Calendar - Accident Year Call For Compensation Experience By State (NCCI Call #5)

Data Element	Captured?	Description of Validation
22. Medical Outstanding Excluding IBNR Losses	Yes	<p>A. Each individual Accident Year's data is checked against the corresponding Policy Years' data to ensure consistency of reporting between the two calls.</p> <p>B. Medical Outstanding Excluding IBNR Losses is checked against the sum of Medical Outstanding Excluding IBNR - Case Losses and Medical Outstanding Excluding IBNR - Bulk Losses.</p> <p>C. Ratio of sum of Medical Paid Losses, Medical Outstanding Excluding IBNR Losses, and Medical IBNR Losses from the current year's call are compared to the same sum from the previous year's call for individual Accident Years.</p> <p>D. Line Q is checked against the total of lines A through M.</p> <p>E. Line R from the current year's call is checked against line Q from the previous year's call.</p> <p>F. Line S is checked against the total of line Q - line R.</p> <p>G. Lines A through M are checked for negative entries.</p>

NAIC Examination of NCCI
 Description of Data Collection and Data Handling
 Statistical Call Data Documentation

Statistical Call Name: Calendar - Accident Year Call for Compensation Experience By State (NCCI Call #5)

Data Element	Captured?	Description of Validation
23. Indemnity IBNR Losses	Yes	<p>A. Each individual Accident Year's data is checked against the corresponding Policy Years' data to ensure consistency of reporting between the two calls.</p> <p>B. Ratio of sum of Indemnity Paid Losses, Indemnity Outstanding Excluding IBNR Losses, and Indemnity IBNR Losses from the current year's call are compared to the same sum from the previous year's call for individual Accident Years.</p> <p>C. Line Q checked is against the total of lines A through M.</p> <p>D. Line R from the current year's call is checked against line Q from the previous year's call.</p> <p>E. Line S is checked against the total of line Q - line R.</p> <p>F. Lines A through M are checked for negative entries.</p>
24. Medical IBNR Losses	Yes	<p>A. Each individual Accident Year's data is checked against the corresponding Policy Years' data to ensure consistency of reporting between the two calls.</p> <p>B. Ratio of sum of Medical Paid Losses, Medical Outstanding Excluding IBNR Losses, and Medical IBNR Losses from the current year's call are compared to the same sum from the previous year's call for individual Accident Years.</p> <p>C. Line Q is checked against the total of lines A through M.</p> <p>D. Line R from the current year's call is checked against line Q from the previous year's call.</p> <p>E. Line S is checked against the total of line Q - line R.</p> <p>F. Lines A through M are checked for negative entries.</p>

NAIC Examination of NCCI
 Description of Data Collection and Data Handling
 Statistical Call Data Documentation

Statistical Call Name: Calendar - Accident Year Call For Compensation Experience By State (NCCI Call #5)

Data Element	Captured?	Description of Validation
25. Indemnity Outstanding Excluding IBNR - Case	Yes	A. Line Q is checked against the total of lines A through M. B. Line R from the current year's call is checked against line Q from the previous year's call. C. Line S is checked against the total of line Q - line R. D. Lines A through M are checked for negative entries.
26. Indemnity Outstanding Excluding IBNR - Bulk	Yes	A. Line Q is checked against the total of lines A through M. B. Line R from the current year's call is checked against line Q from the previous year's call. C. Line S is checked against the total of line Q - line R. D. Lines A through M are checked for negative entries.
27. Medical Outstanding Excluding IBNR - Case	Yes	A. Line Q is checked against the total of lines A through M. B. Line R from the current year's call is checked against line Q from the previous year's call. C. Line S is checked against the total of line Q - line R. D. Lines A through M are checked for negative entries.
28. Medical Outstanding Excluding IBNR - Bulk	Yes	A. Line Q is checked against the total of lines A through M. B. Line R from the current year's call is checked against line Q from the previous year's call. C. Line S is checked against the total of line Q - line R. D. Lines A through M are checked for negative entries.
29. Question A	Yes	A. Checked for missing response.

NAIC Examination of NCCI
 Description of Data Collection and Data Handling
 Statistical Call Data Documentation

Statistical Call Name: Calendar - Accident Year Call For Compensation Experience By State (NCCI Call #5)

Data Element	Captured?	Description of Validation
30. Question B	Yes	A. Checked for missing response if answer to question A is no. B. Checked for unnecessary response if answer to question A is yes.
31. Question C	Yes	A. Checked for missing response if answer to question B is estimated. B. Checked for unnecessary response if answer to question B is actual or response to question A is yes.
32. Questionnaire item #1	No	
33. Questionnaire item #2	No	
34. Questionnaire item #3	No	

NAIC EXAMINATOR OF NCCI
 FILE DEFINITION - CALENDAR-ACCIDENT YEAR PRODUCTION FILE

DESCRIPTION AND USE:

CALENDAR-ACCIDENT YEAR CALL PRODUCTION FILE

THIS FILE SERVES AS THE CENTRAL REPOSITORY FOR CALENDAR-ACCIDENT
 YEAR CALL DATA.

FILE TYPE : SEQUENTIAL (V=VSAM, S=Sequential, P=PDS, I=IDMS)
 DEVICE TYPE : TAPE (D=Disk, T=Tape)
 RETENTION : 10 YEARS

ELEMENT DESCRIPTION	ELEMENT ATTRIBUTE	ELEMENT LENGTH	SOURCE
BATCH NUMBER	ALPHA	8	CALCULATED
CARRIER CODE	APLHA	5	CALENDAR-ACCIDENT CALL #5
STATE CODE	APLHA	2	CALENDAR-ACCIDENT CALL #5
CALL YEAR	APLHA	1	CALENDAR-ACCIDENT CALL #5
CLAIM COUNT	NUMERIC	7	CALENDAR-ACCIDENT CALL #5
EXPERIENCE YEAR	ALPHA	2	CALENDAR-ACCIDENT CALL #5
STANDARD PREMIUM AT DSR	NUMERIC	12	CALENDAR-ACCIDENT CALL #5
NET EARNED PREMIUM	NUMERIC	12	CALENDAR-ACCIDENT CALL #5
INDEMNITY PAID LOSSES	NUMERIC	12	CALENDAR-ACCIDENT CALL #5
INDEMNITY LOSS RESERVES	NUMERIC	12	CALENDAR-ACCIDENT CALL #5
TOTAL PAID LOSSES	NUMERIC	12	CALENDAR-ACCIDENT CALL #5
TOTAL PAID LOSS RESERVES	NUMERIC	12	CALENDAR-ACCIDENT CALL #5
IBNR	NUMERIC	12	CALENDAR-ACCIDENT CALL #5
TOTAL INCURRED LOSSES	NUMERIC	12	CALENDAR-ACCIDENT CALL #5
INDEMNITY IBNR	NUMERIC	12	CALENDAR-ACCIDENT CALL #5
MEDICAL IBNR	NUMERIC	12	CALENDAR-ACCIDENT CALL #5
STANDARD COMPANY PREMIUM	NUMERIC	12	CALENDAR-ACCIDENT CALL #5
INDEMNITY EXCL. IBNR CASE	NUMERIC	11	CALENDAR-ACCIDENT CALL #5
INDEMNITY EXCL. IBNR BULK	NUMERIC	11	CALENDAR-ACCIDENT CALL #5
MEDICAL EXCL. IBNR CASE	NUMERIC	11	CALENDAR-ACCIDENT CALL #5
MEDICAL EXCL. IBNR BULK	NUMERIC	11	CALENDAR-ACCIDENT CALL #5
QUESTION A	ALPHA	1	CALENDAR-ACCIDENT CALL #5
QUESTION B	ALPHA	1	CALENDAR-ACCIDENT CALL #5
QUESTION C	ALPHA	1	CALENDAR-ACCIDENT CALL #5

NAIC EXAMINATION OF NCCI
FILE DEFINITION - CALENDAR ACCIDENT YEAR SAS DATASET

DESCRIPTION AND USE:

CALENDAR-ACCIDENT YEAR SAS DATASET CONTAINS CALENDAR-ACCIDENT YEAR INFORMATION FOR SPECIFIC STATES. THIS FILE IS CREATED THROUGH AN EXTRACTION FROM THE CALENDAR-ACCIDENT YEAR CALL PRODUCTION FILE.

FILE TYPE : PDS, SAS DATA SET (V=VSAM, S=Sequential, P=PDS, I=IDMS)
 DEVICE TYPE : DISK (D=Disk, T=Tape)
 RETENTION : 10 YEARS

ELEMENT DESCRIPTION	ELEMENT ATTRIBUTE	ELEMENT LENGTH	SOURCE
CARRIER CODE	ALPHA	5	CALENDAR-ACCIDENT YEAR FINANCIAL CALL
YEAR	ALPHA	2	CALENDAR-ACCIDENT YEAR FINANCIAL CALL
INCURRED INDEMNITY CLAIM COUNT	NUMERIC	8	CALENDAR-ACCIDENT YEAR FINANCIAL CALL
COMPANY STANDARD PREMIUM	NUMERIC	8	CALENDAR-ACCIDENT YEAR FINANCIAL CALL
STANDARD EARNED PREMIUM AT DSR	NUMERIC	8	CALENDAR-ACCIDENT YEAR FINANCIAL CALL
IBNR	NUMERIC	8	CALENDAR-ACCIDENT YEAR FINANCIAL CALL
INCURRED LOSSES INCL. IBNR	NUMERIC	8	CALENDAR-ACCIDENT YEAR FINANCIAL CALL
INDEMNITY IBNR	NUMERIC	8	CALENDAR-ACCIDENT YEAR FINANCIAL CALL
INDEMNITY PAID	NUMERIC	8	CALENDAR-ACCIDENT YEAR FINANCIAL CALL
MEDICAL BULK	NUMERIC	8	CALENDAR-ACCIDENT YEAR FINANCIAL CALL
MEDICAL CASE	NUMERIC	8	CALENDAR-ACCIDENT YEAR FINANCIAL CALL
MEDICAL IBNR	NUMERIC	8	CALENDAR-ACCIDENT YEAR FINANCIAL CALL
MEDICAL PAID	NUMERIC	8	CALENDAR-ACCIDENT YEAR FINANCIAL CALL
NET PREMIUM	NUMERIC	8	CALENDAR-ACCIDENT YEAR FINANCIAL CALL
OUTSTANDING EXCL. IBNR INDEMNITY BULK	NUMERIC	8	CALENDAR-ACCIDENT YEAR FINANCIAL CALL
OUTSTANDING EXCL. IBNR INDEMNITY CASE	NUMERIC	8	CALENDAR-ACCIDENT YEAR FINANCIAL CALL
OUTSTANDING EXCL. IBNR INDEMNITY	NUMERIC	8	CALENDAR-ACCIDENT YEAR FINANCIAL CALL
OUTSTANDING EXCL. IBNR MEDICAL BULK	NUMERIC	8	CALENDAR-ACCIDENT YEAR FINANCIAL CALL
OUTSTANDING EXCL. IBNR MEDICAL CASE	NUMERIC	8	CALENDAR-ACCIDENT YEAR FINANCIAL CALL
OUTSTANDING EXCL. IBNR MEDICAL	NUMERIC	8	CALENDAR-ACCIDENT YEAR FINANCIAL CALL
OUTSTANDING EXCL. IBNR	NUMERIC	8	CALENDAR-ACCIDENT YEAR FINANCIAL CALL
PAID	NUMERIC	8	CALENDAR-ACCIDENT YEAR FINANCIAL CALL
SERIAL NUMBER	ALPHA	10	CALCULATED

CALL FOR EXPERIENCE #5 CALENDAR/ACCIDENT YEAR CALL

Background and Purpose of the Report

The Calendar/Accident Year Call is due at NCCI or before April 1 of the Year following the most recent Calendar/Accident Year being collected. As an example, Calendar/Accident Year experience valued as of 12-31-90 is due at NCCI on or before April 1, 1991.

This call is one of the five standard annual calls for experience subject to the Performance Evaluation Monetary Incentive Program (PEMIP).

In the past for each annual call year, the most recent eight (8) years of individual Calendar/Accident Years must be reported separately by state. Prior to the eight (8) most recent years, the total of all "prior to" Calendar/Accident Years are grouped together. However, effective with Calls valued as of December 31, 1987, the Call will retain the oldest data year. As an example, the Calendar Accident Call valued as of 12-31-87 will retain the 1979 and prior to data as well as requesting data for 1987. This phased-in retention will result in the collection of 15 full underwriting years of data being reported beginning in 1994. The definition of Calendar/Accident Year refers to the way the financial data reported on the call is organized. The term "Calendar" pertains to premium being reported according to specific transaction dates. The term "accident" pertains to losses being reported by the date the loss occurred. For example, Calendar/Accident Year 1990 includes premium transactions occurring in 1990 along with claims with accident days occurring in 1990.

Calendar/Accident Call results have recently been interrelated into the NCCI Actuarial Ratemaking Process, replacing the Calendar Year Call since it is just as responsive yet more stable. This call is currently given a 50% weight in the ratemaking formula and is used similarly to the Policy Year to test reserve adequacy and changes. Calendar/Accident Year data is also used to examine frequency patterns that assist in explaining changes in rate level needs. Industry Accident Year development data is provided to NCCI Members and Subscribers to assist in the preparation of Florida Form F (Excess Profits Test). Results of the Calendar/Accident Year Call are distributed to Members and Subscribers via circular each year.

The data collected in the Calendar/Accident Year Call includes earned premiums and incurred losses on a state basis. Calendar Year Earned Premiums are separated between Standard At NCCI DSR Level, Standard At Company Level and Net Earned. Accident Year incurred losses include incurred indemnity claim count and indemnity and medical totals for paid losses, outstanding losses excluding IBNR, case and bulk reserves in the outstanding losses excluding IBNR and total incurred losses.

The data reported in this call should *exclude* experience ★ developed under large deductible policies (deductible amount over \$100,000 per claim or per accident).

The Calendar Year Reconciliation Report (Call #8) has ★ been revised to add lines to reconcile premium and losses to Page 14 of the Annual Statement due to the exclusion of the large deductible policies.

Filing Requirements

Calendar-Accident Year Call for Compensation Experience by State Valued as of December 31 of each year—Due April 1 of the following year

In accordance with the approved statistical program you are hereby requested to file with the National Council on Compensation Insurance on or before April 1 of each year your calendar-accident year experience by state valued as of December 31 of the prior year.

This Call is included in PEMIP (Performance Evaluation Monetary Incentive Program) and will be subject to assessments for late and/or inaccurate reporting. Details of PEMIP are updated annually in January of each year.

Since current Compensation Rate Levels will depend upon these figures, it is essential that this Call be reported on or before the required due date.

This Call continues the phased-in expansion of the Calendar-Accident Year Call to ultimately collect 15 full underwriting years of data. This Calendar-Accident Year Call to be reported in 1990 retains the oldest data year (1979) and includes the current year 1989, thus requiring the collection of a total of 11 full underwriting years of individual data to be reported in 1990. This phased-in retention will continue until 15 full underwriting years are collected.

This Call continues the methodology of last year's Calendar-Accident Year Call in that it only requires the most recent five years of calendar year premium. Do not report Columns 1, 2, and 3 as shaded on the form for Lines A through G. As the older years of calendar year premium are not a critical part of the ratemaking process, the reporting of calendar year premium is limited to the most recent five years to simplify the reporting process.

To facilitate this reporting requirement, the totals on Lines Q, R and S for Columns 1, 2, and 3 are no longer required.

There is no change in the procedure for calculating the totals for the calendar-accident year losses (Columns 4 through 18).

Two copies of the reporting form are provided in the package of forms sent to carriers in October of each year. Since a separate form is required for each state, carriers are asked to reproduce these forms within their organizations.

Questions regarding reporting requirements on completion of the Calls should be directed to Aggregate Ratemaking at (407) 997-4395.

A. GENERAL INSTRUCTIONS

1. Group Report

Carrier name and five-digit code must be shown on each reporting form. If this is a group reporting, each carrier writing compensation must be listed individually on the reporting form. Carriers are requested to submit the Calendar-Accident Year Call on the same basis (i.e., group report or individual company report) as the Calendar Year Call. This will facilitate reconciliation of carrier data.

2. State

List both the name of the state and the state code number on each state's reporting form. Only one state per reporting sheet is allowed.

3. Calendar Year Standard Earned Premium at NCCI Designated Statistical Reporting Level

The Standard Earned Premium to be reported is the Calendar Year Standard Earned Premium as reported on the Calendar Year Call. This premium shall be the entire earned premium for the state resulting from standard rating procedures after the application of:

1. Experience rating plan adjustments (NOTE: Except for Michigan experience, experience rating plan adjustments must reflect only NCCI published modification factors.)*
2. Expense Constants (These are the Expense Constants published by NCCI or an independent bureau. For Voluntary Business in pure premium states, Expense Constants at the NCCI DSR level are 0.)
3. Loss Constants (These are the Loss Constants published by NCCI or an independent bureau. For Voluntary Business in pure premium states, Loss Constants at the NCCI DSR level are 0.)

but prior to the application of:

1. Deviations from NCCI Designated Statistical Reporting rates or pure premiums**
2. Deviations from published NCCI experience rating plan modification factors (except Michigan)*
3. Retrospective rating plan adjustments
4. Other individual risk rating plan adjustments*** (e.g., Schedule Rating)
5. Premium discounts
6. Expense modification program adjustments
7. Payment of policyholder dividends
8. Premium credits for small deductible coverage

* Carriers must report their Standard Earned Premium at NCCI's experience rating plan level for all states except Michigan. If carriers use their own experience rating plan in Michigan, they may report their Standard Earned Premium at their own experience rating plan level.

** Rates: Arkansas, Georgia, Illinois, Indiana, Rhode Island, Vermont
Pure Premiums: Connecticut (policies effective 1/1/90 and subsequent), Kentucky, Louisiana (policies

effective 4/1/89 and subsequent), Maryland, Michigan, New Mexico (policies effective 1/1/90 and subsequent), Oregon

*** Note that premium adjustments resulting from the application of individual risk rating plans other than experience rating must be excluded from both Standard Earned Premium at Company Level and Standard Earned Premium at NCCI DSR Level.

4. Standard Earned Premium At Company Level

The earned premium on all risks after the application of:

1. Deviations from NCCI Designated Statistical Reporting rates or pure premiums.*
2. Experience rating plan adjustments (NOTE: Except for Michigan experience, experience rating plan adjustments must reflect only NCCI published modification factors.)**
3. Expense Constants (Carrier charged Expense Constants)
4. Loss Constants (Carrier charged Loss Constants)

but prior to the application of:

1. Deviations from published NCCI experience rating plan modification factors (except Michigan)**
2. Retrospective rating plan adjustments
3. Other individual risk rating plan adjustments*** (e.g., Schedule Rating)
4. Premium discounts
5. Expense modification program adjustments
6. Payment of policyholder dividends
7. Premium credits for small deductible coverage

For every accident year Standard Earned Premium at DSR Level is reported, Standard Earned Premium at Company Level must be reported as well.

* Rates: Arkansas, Connecticut, Georgia, Illinois, Indiana, New Mexico, Rhode Island, Vermont
Pure Premiums: Kentucky, Louisiana (policies effective 4/1/89 and subsequent), Maryland, Michigan, Oregon

** Carriers must report their Standard Earned Premium at NCCI's experience rating plan level for all states except Michigan. If carriers use their own experience rating plan in Michigan, they may report their Standard Earned Premium at their own experience rating plan level.

*** Note that premium adjustments resulting from the application of individual risk rating plans other than experience rating must be excluded from both Standard Earned Premium at Company Level and Standard Earned Premium at NCCI Designated Statistical Reporting Level.

5. Carriers Writing in Competitive Rating States

For Arkansas, Connecticut, Georgia, Illinois, Indiana, Kentucky, Louisiana, Maryland, Michigan, New Mexico, Oregon, Rhode Island and Vermont, carriers must enter the Standard Earned Premium figures at NCCI

Designated Statistical Reporting Level and at Company Level in the appropriate columns on the form. Please reference the enclosed circular titled "Annual Update on Designated Statistical Reporting Levels."

5. Carriers Writing at Deviations from NCCI Rates in Administered Pricing States

For State Funds and other carriers writing at deviations from Bureau rates in non-competitive rating states, the Standard Earned Premiums must be adjusted to Bureau rate level and reported in the column labeled "Standard Earned Premium at NCCI Designated Stat. Reporting Level." The Standard Earned Premium at the carrier rate level must be reported in the column labeled "Standard Earned Premium at Company Level."

NOTE: For Oklahoma the DSR level for policies effective between November 1, 1985 and July 1, 1988 is the March 1, 1985 rates. Companies writing policies on a "Consent to Rate" basis should report as if they had an upward deviation of the March 1, 1985 rates. For further information, refer to Statistical Circular 87-17, dated May 1, 1987.

Carriers that do not deviate from NCCI rates must enter their Standard Earned Premium in the column labeled "Standard Earned Premium at NCCI Designated Stat. Reporting Level" and must enter the same figure in the column labeled "Standard Earned Premium at Company Level."

Also note that where premium credits have been granted in connection with the Transition Program of payroll limitation rules, both reported Standard Earned Premium figures shall be reduced by such credits.

7. Calendar Year Net Earned Premium

Net earned premiums shall be the actual earned premium on all risks prior to the payment of policyholder dividends; but after application of any retrospective rating premium adjustments, after the application of premium discounts in accordance with Manual Rules, after the expense modification program, after any deviations or "write-offs" from Bureau rates or pure premiums, and after the effect of any schedule rating premium adjustments.

8. Accident Year Accumulated Incurred Losses

As in previous Calendar-Accident Year Calls, you are required to report accumulated total incurred losses (i.e., from date of accident through December 31, of the current year) for each of the indicated accident years. If, for some reason, you are unable to report

accumulated paid and outstanding losses for one or more of the indicated accident years, no experience should be reported for that year. (For example, if paid losses have only been accumulated by accident year since January 1, 1990, while the amounts paid prior to this date cannot be separately identified by accident year, then no experience should be reported for 1989 and prior accident years. In this situation, the accumulated experience of all years prior to 1990 should be reported on Line A of the Call.)

Reconciliation of this Call to calendar year data will be possible if complete accident year data is being submitted on this year's Call and had been submitted on last year's Call. Line S (calendar year figures) will not reconcile unless losses for all accident years are included in both the "as-of" totals (Lines Q and R). If your company does not include directly the losses for all accident years shown on the Call, making use of the Policy Year Call will make it possible to report, on an aggregate basis, the losses for all accident years prior to those shown individually. Using the Policy Year Call for the corresponding year, use Line R to obtain the total for all accident years. Subtracting from this total the figures for the accident years shown individually will produce the "all prior accident year losses" to be included on the Accident Year Call. When this procedure is followed for this Call and for last year's Call, a restatement of figures from last year's Call will be necessary and the reconciliation will be possible. Carriers are urged to take every step to provide complete accident year information for as many accident years as possible. If it is not possible for your company to report the last nine accident years individually and your company uses the above procedure to calculate the "prior to" figures, then cross out the preprinted "prior to" year and write in the appropriate year.

For Line A, a continuing problem exists for any carrier unable to split its accumulated losses for any year into the six indemnity and medical components noted above. Since Line A is an accumulation of all prior years' experience, this line's components will not add correctly if even one year cannot be split. On this year's Call, Line A contains data for all years prior to the current year.

A carrier should take either of two steps to resolve this problem:

- a. Always use this method if you report Line A on the Policy Year Call and Lines B to L on the Calendar-Accident Year Call with the correct indemnity and medical split for all components. Line R on the Policy Year Call is your total experience valued as of the previous year. From this, subtract Lines B to L on the Calendar-Accident Year Call. The difference should be entered as Line A on the Calendar-Accident Year Call.

Effective January 1, 1990

- b. If you cannot use step 1 above, use either of the following methods:

Method 2a

Delete those years that cannot be split from your reported Line A experience. The remainder will be your base of experience. For example, if 1976 and earlier cannot be split, calculate the total experience for only years 1977 and 1978. Next, add to your base experience all the changes in indemnity, medical and total experience during 1990 for all accident years prior to 1979.

Method 2b

Keep all of the experience for years prior to 1979 on Line A and estimate the indemnity and medical components that add to your total components for Line A. For future reports the actual split experience should be added onto this base of experience.

Case and Bulk Reserve Reporting

This Call further requires that accumulated total incurred losses be split into the following components: accumulated indemnity losses (separately for paid, Outstanding Excluding IBNR—Case and Bulk, and IBNR) and accumulated medical losses (separately for paid, Outstanding Excluding IBNR—Case and Bulk, and IBNR).

The Outstanding Excluding IBNR category is designed to capture case reserves and bulk reserves. For the purposes of the Call, the following working definitions may be used by carriers:

Case Reserves—Those outstanding reserves established for specific known cases reported in an aggregate amount to reflect the total case reserve for the company.

Bulk Reserves—Those outstanding reserves for general case reserve inadequacy, supplemental case reserves, cases that may reopen, or other reserves not associated to specific claims.

The goal of this reporting is to clearly isolate case reserves without impacting the carrier methodology of reporting IBNR. Carriers should not alter the mix of data historically allocated to IBNR, since doing so would adversely impact the NCCI development of IBNR data.

For this reason, carriers reporting bulk reserves in IBNR should continue to do so. On the Outstanding Excluding IBNR Page 3 Reporting Form, these carriers should respond "Yes" to the question in Note A. In addition, carriers having no bulk reserves should also respond "Yes" to the question in Note A.

Those carriers reporting bulk reserves in the Outstanding Excluding IBNR should respond "No" to the question in Note A of the Outstanding Excluding IBNR Page 3 Report Form. These carriers should have data reported in both the case reserves and bulk reserves.

The Case and Bulk Reserve Reporting Form accommodates carriers allocating this data on an ACTUAL basis as well as ESTIMATED basis. The reporting form contains a coding box to indicate the actual vs. estimated method of allocation.

9. Incurred Indemnity Claim Count

The incurred indemnity claim count (i.e., the accumulated number of claims for which an indemnity payment has been made and/or an outstanding reserve exists) must be reported on a mandatory basis for accident years 1980 and subsequent. (Those carriers in a position to do so are requested to report the incurred indemnity claim count for as many accident years prior to 1980 as possible.) The indemnity claim count should exclude claims starting out with an indemnity reserve, but were resolved as medical only claims or closed without payment. Also, indemnity claim count should include claims starting out as medical only, but are resolved as indemnity at future evaluations. If indemnity claims are reopened, they should not be added to the claim counts.

10. Total Experience

Show the totals of all amounts reported on the line captioned "Total to current year."

11. No Experience

State reports should not be submitted for any state in which the carrier(s) has (have) never had experience. In instances in which one or more, but not all, of the 1979-1990 Accident Years the carrier(s) failed to have experience in a given state, indicate "NO EXPERIENCE" across the appropriate Accident Year line(s) on that state.

12. Signature Requirement

The name of the person responsible for the completion and accuracy of this Call is only required on the first state's reporting form and does not have to be repeated on each state's form.

13. States for Which the Reporting of Calendar-Accident Year Experience Is Required:

State	Code No.	State	Code No.
Alabama	01	Colorado	05
Alaska	54	Connecticut	06
Arizona	02	Dist. of Columbia	08
Arkansas	03	Florida	09

State	Code No.	State	Code No.
Georgia	10	Nebraska	26
Hawaii	52	New Hampshire	28
Idaho	11	New Mexico	30
Illinois	12	North Carolina	32
Indiana	13	Oklahoma	35
Iowa	14	Oregon	36
Kansas	15	Rhode Island	38
Kentucky	16	South Carolina	39
Louisiana	17	South Dakota	40
Maine	18	Tennessee	41
Maryland	19	Texas	42
Michigan	21	Utah	43
Mississippi	23	Vermont	44
Missouri	24	Virginia	45
Montana	25	Wisconsin	48

14. Rounding Procedure and Reporting of Credits

Please report amounts of premiums and losses in whole dollars only. Count fifty cents and over as an extra dollar, and reject the cents if less than fifty. Please show negative amounts enclosed within parentheses so that they may be handled properly in punching and tabulating operations.

15. Questionnaire

The questionnaire must be completed. Submit only one questionnaire per submission. A separate questionnaire per state is no longer required.

16. Complete Submission

A complete call submission per state must include all three pages. Page 3 must be completed for each state in which the carrier reports experience.

B. SPECIFIC INSTRUCTIONS

1. "F" Classifications

Experience of the "F" Classification for policies effective January 1, 1974 and thereafter, MUST BE EXCLUDED.

2. Coal Mine Experience

Underground Coal Mine experience MUST BE EXCLUDED in all states except Virginia. In Virginia ALL Coal Mine experience (surface and underground) MUST BE EXCLUDED.

3. Excess Policies

Experience on excess policies MUST BE EXCLUDED.

4. National Defense Projects

Experience on National Defense Projects written under either the old Comprehensive Rating Plan or the new National Defense Projects Rating Plan MUST BE EXCLUDED. Experience incurred on a Defense Base should be included unless written under the National Defense Projects Rating Plan.

5. Reinsurance

No deductions shall be made from premiums and losses for or on account of reinsurance ceded. Premiums and losses arising from reinsurance received by the reporting company shall be excluded from the experience. Experience reported should be DIRECT BUSINESS ONLY.

6. Assigned Risk

Experience for assigned risk policies must be INCLUDED. Assigned risk policies must be reported at the level of approved assigned risk rates.

7. Experience Incurred Under Occupational Disease Act

Experience incurred under any Occupational Disease Act separate and distinct from the Compensation Act for the state shall be combined with the traumatic experience under the State Compensation Act, and the total for such combined experience shall be reported.

8. IBNR

Losses reported by state should include an appropriate reserve for incurred but not reported cases. The IBNR reserve must be reported separately for indemnity and medical.

Commencing with Calendar-Accident Year Call valued as of December 31, 1986, the Outstanding Excluding IBNR category has been further refined to capture case reserves and bulk reserves.

This reporting isolates case reserves without impacting the carrier methodology of reporting IBNR. Carriers should not alter the mix of data historically allocated to IBNR, since doing so would adversely impact the NCCI development of IBNR data.

For this reason, carriers having reported bulk reserves in IBNR should continue to do so. On the Outstanding Excluding IBNR Page 3 Reporting Form, these carriers should respond "Yes" to the question in Note A.

9. Reopened Cases

Include an appropriate loss reserve for reopened cases.

10. Reserves for Specific Contingencies

Include medical and other loss reserves to meet specific contingencies.

11. Other Voluntary Reserves

Exclude voluntary reserves other than those mentioned above.

12. Expenses

Exclude all expenses, allocated or unallocated, except allocated Coverage B loss adjustment expense.

13. Assessments and Special Compensation Funds

The inclusion of assessments and other compensation special funds as incurred losses in this Calendar-Accident Year Call data follow the same instructions that apply in reporting of experience under NCCI's Workers Compensation Unit Statistical Plan Manual. Specifically, where the compensation law states that in connection with **certain types of injury** a specified amount shall be paid into special funds (e.g., a Second Injury Fund), and that such amounts are in addition to the compensation payable to the injured worker or his dependents, then the combined total amount shall be reported as incurred indemnity losses. Examples are: (1) payments in no-dependent death claims, and (2) a specified percentage of the permanent partial award. However, any special payments to the states that are assessed on total premium writings, total losses paid or incurred, or total indemnity losses paid or incurred instead of on a per-claim basis shall not be reported as losses to the rating bureau. In other words, special funds or assessments are reported as incurred losses only when the assessment is levied on certain types of injuries.

A list of specific assessments and other compensation special funds for each state and the proper treatment for including these assessments in this Call is attached.

★ 14. Small Deductible Programs

In states in which small deductible programs apply, losses are to be reported on a gross basis inclusive of the employer paid loss amount.

15. Taxes and Assessments in Kentucky

Taxes and Assessments on premiums earned in Kentucky on or after January 1, 1977 **MUST BE EXCLUDED.**

16. Oregon Assessments

Assessments on premiums written or earned in Oregon on or after July 1, 1982 must be excluded. This is pursuant to the requirements of OAR 436-51-025 and 51-030(2) contained in WCD Administrative Order 8-1982.

Please note that the date for reporting this data is on or before April 1 of each year. Please mail this Call to:

National Council on Compensation Insurance
750 Park of Commerce Drive
Boca Raton, Florida 33487

ATTENTION: FINANCIAL DATA

NATIONAL COUNCIL ON COMPENSATION INSURANCE
Reporting Guidebook for the Annual Calls for Experience

Effective January 1, 1990

Part IV
Page 5:7

Original Printing

Page 1

NATIONAL COUNCIL ON COMPENSATION INSURANCE

CALENDAR-ACCIDENT YEAR CALL FOR COMPENSATION EXPERIENCE BY STATE VALUED AS OF DECEMBER 31 OF EACH YEAR
CARRIER(S)*

CARRIER CODE NUMBER

STATE CODE NUMBER

STATE NAME

SUBMITTED BY _____ TITLE _____ TELEPHONE NO _____ DATE SUBMITTED _____

Year	Calendar Year Earned Premium			Accumulated Accident Year Incurred Losses--Total			
	Standard AI NCCI Designated Stat. Reporting Level (1)	Standard At Company Level (2)	Net (3)				
	Standard At NCCI Designated Stat. Reporting Level (1)	Standard At Company Level (2)	Net (3)	Paid (9) + (10) (4)	Outstanding Excluding IBNR (11) + (12) (5)	IBNR (13) + (14) (6)	Incurring Losses Including IBNR (4) + (5) + (6) (7)
A. Prior to 1979							
B. 1979							
C. 1980							
D. 1981							
E. 1982							
F. 1983							
G. 1984							
H. 1985							
I. 1986							
J. 1987							
K. 1988							
L. 1989							
M. 1990							
N. 1991							
O. 1992							
P. 1993							
Q. Total to current year							
R. Total to last year							
S. Current Calendar Year (Q - R)							

* If this is a group report, list all carrier names or carrier codes for which any experience is reported.

NATIONAL COUNCIL ON COMPENSATION INSURANCE
Reporting Guidebook for the Annual Calls for Experience

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Page 2

NATIONAL COUNCIL ON COMPENSATION INSURANCE

CALENDAR-ACCIDENT YEAR CALL FOR COMPENSATION EXPERIENCE BY STATE VALUED AS OF DECEMBER 31 OF EACH YEAR

CARRIER(S) _____ CARRIER CODE NUMBER _____

STATE NAME _____ STATE CODE NUMBER _____

Year	Incurred Indemnity Claim Count (8)	Paid			ACCUMULATED ACCIDENT YEAR INCURRED LOSSES			IBNR	
		Indemnity (9)	Medical (10)	Outstanding Excluding IBNR	Indemnity (11)	Medical (12)	Indemnity (13)	Medical (14)	
A. Prior to 1979									
B. 1979									
C. 1980									
D. 1981									
E. 1982									
F. 1983									
G. 1984									
H. 1985									
I. 1986									
J. 1987									
K. 1988									
L. 1989									
M. 1990									
N. 1991									
O. 1992									
P. 1993									
Q. Total to current year									
R. Total to last year									
S. Current Calendar Year (Q - R)									

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 CALENDAR-ACCIDENT YEAR CALL FOR COMPENSATION EXPERIENCE BY STATE VALUED
 AS OF DECEMBER 31 OF EACH YEAR

CARRIER(S) _____ CARRIER CODE NUMBER _____

STATE NAME _____ STATE CODE NUMBER _____

Year	Outstanding Excluding IBNR Indemnity		Outstanding Excluding IBNR Medical	
	Case (15)	Bulk (16)	Case (17)	Bulk (18)
A. Prior to 1979				
B. 1979				
C. 1980				
D. 1981				
E. 1982				
F. 1983				
G. 1984				
H. 1985				
I. 1986				
J. 1987				
K. 1988				
L. 1989				
M. 1990				
N. 1991				
O. 1992				
P. 1993				
Q. Total to Current Year				
R. Total to Last Year				
S. Current Calendar Year (Q-R)				

NOTE:

A. Does your company currently report all bulk reserves for indemnity and medical under the IBNR columns on page 2? Indicate by placing an "X" in the appropriate space below.

___ No ___ Yes

If "No," data should be reported in Columns 15 through 18. If "Yes," Columns 15 through 18 should be left blank.

B. If your company currently reports any bulk reserves for indemnity and medical under the outstanding excluding IBNR columns of page 2 then:

1. Columns 15 + 16 on this page must equal Column 11 on page 2.
2. Columns 17 + 18 on this page must equal Column 12 on page 2.

Please indicate if the amounts shown on this page are actual or estimated by placing an "x" in the appropriate space provided below.

___ Actual ___ Estimated

C. If you have provided estimated amounts, will your company be able to provide NCCI with actual amounts in subsequent reports?

___ No ___ Yes

NATIONAL COUNCIL ON COMPENSATION INSURANCE
CALENDAR-ACCIDENT YEAR CALL QUESTIONNAIRE

CARRIER NAME _____ CARRIER CODE

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1. For accumulated accident year losses (columns 4 through 18), does Line Q from the previous call correspond to the Line R of the current call? Yes No. If no, please explain why for every state.

2. For accumulated accident year losses (columns 4 through 18), does Line S agree with the Current Year's Calendar Year Call submitted by your company for all states? Yes No. If no, please reconcile every state.

3. Does the premium in Columns (1), (2) and (3) of the current year correspond to that reported on the Calendar Year Call? Yes No. If no, please reconcile every state.

4. If a credit appears in any of the Columns (4), (5), (7) through (12) or (15) through (18) on Lines D through the current years line, please explain why for every state.

TRANSMITTAL LETTER

1. CALL: CALENDAR-ACCIDENT YEAR CALL FOR COMPENSATION EXPERIENCE BY STATE VALUED AS OF DECEMBER 31 OF EACH YEAR.

2. DUE DATE: April 15 of the following year.

3. CARRIER NAME _____ 4. CARRIER CODE

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5. FILING AS: GROUP INDIVIDUAL COMPANY

6. If filing as a group, list individual carrier names or carrier codes:

7. SUBMISSION TYPE:

Original Correction Voluntary Resubmission

8. SUBMISSION CONTENT:

Full Partial and Not Final Partial and Final

9. Number of states included _____

10. Number of pages _____

MAIL CALL AND TRANSMITTAL LETTER TO:

NATIONAL COUNCIL ON COMPENSATION INSURANCE

750 PARK OF COMMERCE DRIVE

BOCA RATON, FL 33487

ATTN: FINANCIAL DATA

NCCI USE ONLY
Date Received

Receipt Mailed

NATIONAL COUNCIL ON COMPENSATION INSURANCE
RECEIPT OF CALL NOTIFICATION

8. CALL: CALENDAR-ACCIDENT YEAR CALL FOR COMPENSATION EXPERIENCE BY STATE VALUED AS OF DECEMBER 31 OF EACH YEAR.

9. DUE DATE: April 15 of the following year.

10. DATE RECEIVED AT NCCI _____ BY _____

11. MAIL RECEIPT TO: (Indicate specific individual)

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Statistical Call Overview Document

STATISTICAL CALL NAME:

Calendar-Accident Year Call For Assigned Risk Compensation Experience (Call #5A)

DESCRIPTION OF CALL:

This call contains dollar amounts for workers compensation Standard Earned Premium at NCCI DSR level, Net Earned Premium, and Total Incurred Losses by Calendar-Accident Year for each state in which NCCI produces rate levels. The Total Incurred Losses are broken down into Paid, Outstanding excluding IBNR, and IBNR on page 1. Each of these components is further broken down into its indemnity and medical components and reported along with the Indemnity Claim Count on page 2. In addition, Indemnity and Medical Outstanding excluding IBNR are separated into case and bulk reserves on page 3. Each NCCI assigned risk servicing carrier is required to submit this information in the states in which they operate and for which NCCI produces rate levels. Some states require all carriers writing workers compensation policies to submit financial calls.

The Assigned Risk Calendar-Accident Year Call data is used in conjunction with the Assigned Risk Policy Year Call data to determine assigned risk and/or voluntary business rate adequacy for the states in which NCCI produces rate levels. Voluntary business is derived by subtracting the assigned risk data from the statewide data.

NCCI first distributed the Calendar-Accident Year Assigned Risk Call in 1990. The data is validated, but not yet used to calculate rates. NCCI requires financial call data to be submitted for at least three years before it is used to calculate rates.

FILES/DATABASES:

Calendar-Accident Year Assigned Risk Call Production File:

This file serves as the central repository for Calendar-Accident Year Assigned Risk Call data. This file contains all data received from the carriers as well as corrections applied to this data. Corrections to the file are made via ACS for data entry of revised reports with electronic transfer of the data to NCCI for incorporation into the production file.

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Statistical Call Overview Document

Calendar-Accident Year Assigned Risk Call SAS Dataset:

Actuarial analysis and reporting programs are executed using the data in this file.

There is one SAS dataset for each state for which the NCCI produces rates and has assigned risk business. In some states, frequently those with state funds, there is no assigned risk business. In these cases the state fund serves as the assigned risk insurer.

The SAS dataset contains data only for the specified state. This file is created through an extraction from the Calendar-Accident Year Assigned Risk Call production file. Revised reports which are obtained after this extraction are entered into the SAS dataset and marked internally as revised records. When rate levels are completed for the state, these records are printed and sent to ACS for data entry and incorporation into the production file.

DESCRIPTION OF ERROR HANDLING:

Calendar-Accident Year Assigned Risk data is validated in a two step process. An initial validation using automated reports is performed when the data is received from the carrier. A final validation of the data is performed as one of the steps in producing a state's rate level to ensure that no errors have been overlooked.

Carriers are sent written correspondence letters to resolve any errors identified during the initial validation. As revised reports are received, they are checked for accuracy. If correct, the revised reports are sent to ACS for processing or entered into the SAS dataset if the affected data is already being used for rate level production.

During the final validation, newly discovered and outstanding errors are handled in a slightly different manner. Carriers are contacted by phone for a response. Revised reports are submitted by facsimile transmission or some form of overnight delivery. NCCI may enter corrections based on the phone conversation in anticipation of carrier submitted revisions.

MODIFICATIONS TO DATA:

Revised reports are processed as they are received. Any data containing errors which remain unresolved at the time of a state's rate level production will be removed from the

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Statistical Call Overview Document

dataset if resolution of the remaining errors is not possible within the framework of the rate level production schedule.

All revised data is requested to be submitted on revised reports or via written correspondence. When production deadlines require an immediate response, telephone responses are accepted with the stipulation that a written confirmation of the changes also be submitted.

CALL FOR EXPERIENCE #5—A
ASSIGNED RISK CALENDAR-ACCIDENT YEAR CALL

Background and Purpose of the Report

The Calendar-Accident Year Call for Assigned Risk Compensation Experience by State is due at NCCI on April 1 of the current year for assigned risk calendar-accident year experience for the previous year.

This call is one of the annual calls for experience subject to the Performance Evaluation Monetary Incentive Program (PEMIP).

This call follows the phased-in expansion of the Calendar-Accident Year Call to ultimately collect 15 full underwriting years of data. The Assigned Risk Calendar-Accident Year Call, to be reported in 1990, retains the oldest data year (1979) and includes the current year 1989. This requires the collection of 11 full underwriting years of individual data reportable in 1990. This phased-in retention will continue until 15 full underwriting years are collected. However, as this is the first year carriers will be required to report this data separately, carriers are asked to report as many prior years (back to 1979) as possible. Data validity is the key; therefore, only data for those years which can be collected accurately should be reported.

The intent of this call is for use in ratemaking to develop assigned risk experience and also will be used along with the standard Calendar-Accident Year Call (Call #5) to develop "voluntary business only" experience. Therefore, it is essential that the methodology for determining the premium and losses reported on this call be consistent with the procedures used for reporting the experience on page 14 of the annual statement. The data on this call should also be consistent with the assigned risk experience included in the standard Calendar-Accident Year Call (Call #5).

This call also follows the Calendar-Accident Year Call, as it only requires the most recent five years of calendar year premium. The reporting of calendar year premium is limited to the most recent five years to simplify reporting of this data. This includes discontinuation of the "totals" on lines Q, R, and S for columns 1, 2 and 3.

Filing Requirements

Calendar-Accident Year Call for Assigned Risk Compensation Experience by State Valued as of December 31 of each year—Due April 1 of the following year

In accordance with the approved statistical program you are hereby requested to file with NCCI on or before April 1 of each year your Assigned Risk calendar-accident year experience by state valued as of December 31 of the prior year.

This Call is included in PEMIP (Performance Evaluation Monetary Incentive Program) and would normally be subject to assessments for late and/or inaccurate reporting. Details of PEMIP are updated annually in January of each year and when released in January 1990, will contain more details pertaining to the Assigned Risk Only Calls.

Since 1990 Compensation Rate Levels will depend upon these figures, it is essential that this Call be reported on or before the required due date.

This Call follows the phased-in expansion of the Calendar-Accident Year Call to ultimately collect 15 full underwriting years of data. This Assigned Risk Calendar-Accident Year Call to be reported in 1990 retains the oldest data year (1979) and includes the current year 1989, thus requiring the collection of a total of 11 full underwriting years of individual data to be reported in 1990. This phased-in retention will continue until 15 full underwriting years are collected.

Please note: the eventual intent of this Call is for use in ratemaking. This Call will be used on its own to develop Assigned Risk experience and also will be used along with the standard Calendar-Accident Year Call to develop "voluntary business only" experience. For this reason, it is essential that the premium and losses reported on this Call reconcile with the Assigned Risk data included on Page 14 of the annual statement. The data submitted on this Call should also be consistent with the Assigned Risk experience reported on the standard Calendar-Accident Year Call.

This Call also follows the Calendar-Accident Year Call in that it only requires the most recent five years of calendar year premium. Do not report Columns 1, 2, and 3 as shaded on the form for Lines A through G. As the older years of calendar year premium are not a critical part of the ratemaking process, the reporting of calendar year premium is limited to the most recent five years to simplify the reporting process.

To facilitate this reporting requirement, the totals on Lines Q, R and S for Columns 1, 2, and 3 are no longer required.

Two copies of the reporting form are provided in the package of reporting forms sent to carriers in October of each year. Since a separate form is required for each state, carriers are asked to reproduce these forms within their organizations.

Questions regarding reporting requirements on completion of the Calls should be directed to Aggregate Ratemaking at 407-997-4395.

A. GENERAL INSTRUCTIONS

1. Group Report

Carrier name and five-digit code must be shown on each reporting form. If this is a group reporting, each carrier writing compensation must be listed individually on the reporting form. Carriers are requested to submit the Calendar-Accident Year Call on the same basis (i.e., group report or individual company report) as the Calendar Year Call. This will facilitate reconciliation of carrier data.

2. State

List both the name of the state and the state code number on each state's reporting form. Only one state per reporting sheet is allowed

3. Calendar Year Standard Earned Premium at NCCI Designated Statistical Reporting Level

The Standard Earned Premium to be reported is the Calendar Year Standard Earned Premium as reported on the Calendar Year Call. This premium shall be the entire earned premium for the state resulting from standard rating procedures after the application of:

1. Assigned Risk rating programs, surcharges, etc.
2. Experience rating plan adjustments (NOTE: Except for Michigan experience, experience rating plan adjustments must reflect only NCCI published modification factors.)*
3. Expense Constants (These are the Expense Constants published by the NCCI or an independent bureau.)
4. Loss Constants (These are the Loss Constants published by the NCCI or an independent bureau.)

but prior to the application of:

1. Deviations from published NCCI experience rating plan modification factors (except Michigan)*
2. Retrospective rating plan adjustments
3. Premium discounts
4. Expense modification program adjustments
5. Maine small business premium discount
6. Payment of policyholder dividends
7. Premium credits for deductible coverage

* Carriers must report their Standard Earned Premium at NCCI's experience rating plan level for all states except Michigan. If carriers use their own experience rating plan in Michigan, they may report their Standard Earned Premium at their own experience rating plan level.

4. Standard Earned Premium at Company Level

Not Applicable to Assigned Risk Calendar-Accident Year Call.

5. Carriers Writing in Competitive Rating States

Not Applicable to Assigned Risk Calendar-Accident Year Call.

6. Carriers Writing at Deviations from NCCI Rates in Administered Pricing States

Not Applicable to Assigned Risk Calendar-Accident Year Call.

7. Calendar Year Net Earned Premium

Net earned premiums shall be the actual earned premium on all risks prior to the payment of policyholder dividends, but after application of any retrospective rating premium adjustments, after the application of premium discounts in accordance with Manual Rules, after the expense modification program and after the effect of any schedule rating premium adjustments.

8. Accident Year Accumulated Incurred Losses

As in previous Calendar-Accident Year Calls, you are required to report accumulated total incurred losses (i.e., from date of accident through December 31, 1989) for each of the indicated accident years. If, for some reason, you are unable to report accumulated paid and outstanding losses for one or more of the indicated accident years, no experience should be reported for that year. (For example, if paid losses have only been accumulated by accident year since January 1, 1980 while the amounts paid prior to this date cannot be separately identified by accident year, then no experience should be reported for 1979 and prior accident years. In this situation, the accumulated experience of all years prior to 1980 should be reported on Line A of the Call.)

Reconciliation of this Call to calendar year data will be possible if complete accident year data is being submitted on this year's Call and had been submitted on last year's Call. Line S (calendar year figures) will not reconcile unless losses for all accident years are included in both the "as-of" totals (Lines Q and R). If your company does not include directly the losses for all accident years shown on the Call, making use of the Policy Year Call will make it possible to report, on an aggregate basis, the losses for all accident years prior to those shown individually. Using the Policy Year Call for the corresponding year, use Line R to obtain the total for all accident years. Subtracting from this total the figures for the accident years shown individually will produce the "all prior accident year losses" to be included on the Accident Year Call. When this procedure is followed for this Call and for last year's Call, a restatement of figures from last year's Call will be necessary and the reconciliation will be possible. Carriers are urged to take every step to provide complete accident year information for as many accident years as possible. If it is not possible for your company to report the last nine accident years individually and your company uses the above procedure to calculate the "prior to" figures, then cross out the preprinted "prior to" year and write in the appropriate year.

For Line A, a continuing problem exists for any carrier that for any year is unable to split its accumulated losses into the six indemnity and medical components noted above. Since Line A is an accumulation of all prior years' experience, this line's components will not add correctly if even one year cannot be split. On this year's Call, Line A contains data for all years prior to 1979.

A carrier should take either of two steps to resolve this problem:

- 1) Always use this method if you report Line A on the Assigned Risk Policy Year Call and Lines B to S on the Calendar-Accident Year Call with the correct indemnity and medical split for all components. Line R on the Policy Year Call is your total experience valued as of 12-31-89. From this, subtract Lines B to K on the Calendar-Accident Year Call. The difference should be entered as Line A on the Calendar-Accident Year Call.
- 2) If you cannot use step 1 above, use either of the following methods:

Method 2a

Delete those years that cannot be split from your reported Line A experience. The remainder will be your base of experience. For example, if 1976 and earlier cannot be split, calculate the total experience for only years 1977 and 1978. Next, add to your base experience all the changes in indemnity, medical and total experience during 1989 for all accident years prior to 1979.

Method 2b

Keep all of the experience for years prior to 1979 on Line A and estimate the indemnity and medical components that will add to your total components for Line A. For future reports the actual split experience should be added onto this base of experience.

Case and Bulk Reserve Reporting

This Call further requires that accumulated total incurred losses be split into the following components: accumulated indemnity losses (separately for Paid, Outstanding Excluding IBNR—Case and Bulk, and IBNR) and accumulated medical losses (separately for Paid, Outstanding Excluding IBNR—Case and Bulk, and IBNR).

The Outstanding Excluding IBNR category is designed to capture case reserves and bulk reserves. For the purposes of the Call, the following working definitions may be used by carriers:

Case Reserves—Those outstanding reserves established for specific known cases reported in an aggregate amount to reflect the total case reserve for the company.

Bulk Reserves—Those outstanding reserves for general case reserve inadequacy, supplemental case reserves, cases that may reopen, or other reserves not associated to specific claims.

The goal of this reporting is to clearly isolate case reserves without impacting the carrier methodology of reporting IBNR. Carriers should not alter the mix of data historically allocated to IBNR, since doing so would adversely impact the NCCI development of IBNR data.

For this reason, carriers who have reported bulk reserves in IBNR should continue to do so. On the Outstanding Excluding IBNR Page 3 Reporting Form, carriers should respond "Yes" to the question in Note A.

Those carriers reporting bulk reserves in the Outstanding Excluding IBNR should respond "No" to the question in Note A of the Outstanding Excluding IBNR Page 3 Report Form. These carriers should have data reported in both the case reserves and bulk reserves.

The Case and Bulk Reserve Reporting Form accommodates carriers allocating this data on an ACTUAL basis as well as ESTIMATED basis. The reporting form contains a coding box to indicate the actual vs. estimated method of allocation.

9. Incurred Indemnity Claim Count

The incurred indemnity claim count (i.e., the accumulated number of claims for which an indemnity payment has been made and/or an outstanding reserve exists) must be reported on a mandatory basis for accident years 1980 and subsequent. (Those carriers in a position to do so are requested to report the incurred indemnity claim count for as many accident years prior to 1980 as possible.) The indemnity claim count should exclude claims starting out with an indemnity reserve, but are resolved as medical only claims or closed without payment. Also, indemnity claim count should include claims that start out as medical only but are resolved as indemnity at future evaluations. If indemnity claims are reopened, they should not be added to the claim counts.

10. Total Experience

Show the totals of all amounts reported on the line captioned "Total to 12/31/89."

11. No Experience

State reports should not be submitted for any state in which the carrier(s) has (have) never had experience. In instances in which for one or more,

Effective January 1, 1990

but not all, of the 1979-1989 accident years the carrier(s) failed to have experience in a given state, indicate "NO EXPERIENCE" across the appropriate Accident Year line(s) on that state.

12. Signature Requirement

The name of the person responsible for the completion and accuracy of this Call is only required on the first state's reporting form and does not have to be repeated on each state's form.

13. States for Which the Reporting of Calendar-Accident Year Experience Is Required:

State	Code #	State	Code #	State	Code #
Alabama	01	Iowa	14	North Carolina	32
Alaska	54	Kansas	15	Oregon	36
Arizona	02	Kentucky	16	Rhode Island	38
Arkansas	03	Louisiana	17	South Carolina	39
Connecticut	06	Maine	18	South Dakota	40
Dist. of Columbia	08	Michigan	21	Tennessee	41
Florida	09	Mississippi	23	Texas	42
Georgia	10	Missouri	24	Vermont	44
Hawaii	52	Nebraska	26	Virginia	45
Illinois	12	New Hampshire	28	Wisconsin	48
Indiana	13	New Mexico	30		

14. Rounding Procedure and Reporting of Credits

Please report amounts of premiums and losses in whole dollars only. Count fifty cents and over as an extra dollar, and reject the cents if less than fifty. Please show negative amounts enclosed within parentheses so that they may be handled properly in punching and tabulating operations.

15. Questionnaire

The questionnaire must be completed. Submit only one questionnaire per submission. A separate questionnaire per state is no longer required.

16. Complete Submission

A complete call submission per state must include all three pages. Page 3 must be completed for each state in which the carrier reports experience.

B. SPECIFIC INSTRUCTIONS

1. "F" Classifications

Experience of the "F" Classification for policies effective January 1, 1974, and thereafter MUST BE EXCLUDED.

2. Coal Mine Experience

Underground Coal Mine experience MUST BE EXCLUDED in all states except Virginia. In Virginia ALL Coal Mine experience MUST BE EXCLUDED.

3. Excess Policies

Experience on excess policies MUST BE EXCLUDED.

4. National Defense Projects

Experience on National Defense Projects written under either the old Comprehensive Rating Plan or the new National Defense Projects Rating Plan MUST BE EXCLUDED. Experience incurred on a Defense Base should be included unless written under the National Defense Projects Rating Plan.

5. Reinsurance

No deductions shall be made from premiums and losses for or on account of reinsurance ceded. Premiums and losses arising from reinsurance received by the reporting company shall be excluded from the experience. Experience reported should be DIRECT BUSINESS ONLY.

6. Experience Incurred Under Occupational Disease Act

Experience incurred under any Occupational Disease Act separate and distinct from the Compensation Act for the state shall be combined with the traumatic experience under the State Compensation Act, and the total for such combined experience shall be reported.

7. IBNR

Losses reported by state should include an appropriate reserve for incurred but not reported cases. The IBNR reserve must be reported separately for indemnity and medical.

Commencing with Calendar-Accident Year Call valued as of December 31, 1986, the Outstanding Excluding IBNR category has been further refined to capture case reserves and bulk reserves.

This reporting isolates case reserves without impacting the carrier methodology of reporting IBNR. Carriers should not alter the mix of data historically allocated to IBNR, since doing so would adversely impact the NCCI development of IBNR data.

For this reason, carriers that have reported bulk reserves in IBNR should continue to do so. On the Outstanding Excluding IBNR Page 3 Reporting Form, these carriers should respond "Yes" to the question in Note A.

8. Reopened Cases

Include an appropriate loss reserve for reopened cases.

9. Reserves for Specific Contingencies

Include medical and other loss reserves to meet specific contingencies.

10. Other Voluntary Reserves

Exclude voluntary reserves other than those mentioned above.

11. Expenses

Exclude all expenses, allocated or unallocated, except allocated Coverage B loss adjustment expense.

12. Assessments and Special Compensation Funds

The inclusion of assessments and other compensation special funds as incurred losses in this Calendar-Accident Year Call data follow the same instructions that apply in reporting of experience under the National Council Workers Compensation Unit Statistical Plan Manual. Specifically, where the compensation law states that in connection with **certain types of injury** a specified amount shall be paid into special funds (e.g., a Second Injury Fund), and that such amounts are in addition to the compensation payable to the injured worker or his dependents, then the combined total amount shall be reported as incurred indemnity losses. Examples are: (1) payments in no-dependent death claims, and (2) a specified percentage of the permanent partial award. However, any special payments to the states that are assessed on total premium writings, total losses paid or incurred, or total indemnity losses paid or incurred instead of on a per-claim basis shall not be reported as losses to the

rating bureau. In other words, special funds or assessments are reported as incurred losses only when the assessment is levied on certain types of injuries.

A list of specific assessments and other compensation special funds for each state and the proper treatment for including these assessments in this Call is attached.

13. Claims Deductible Programs

In states in which claim deductible programs apply, losses are to be reported on a gross basis inclusive of the employer paid loss amount.

Please note that the date for reporting this data is on or before April 1, 1990. Please mail this Call to:

National Council on Compensation Insurance
750 Park of Commerce Drive
Boca Raton, Florida 33487

ATTENTION: FINANCIAL DATA

NATIONAL COUNCIL ON COMPENSATION INSURANCE
Reporting Guidebook for the Annual Calls for Experience

Effective January 1, 1990

Part IV
Page 5a:7

Original Printing

Page 1
NATIONAL COUNCIL ON COMPENSATION INSURANCE
CALENDAR-ACCIDENT YEAR CALL FOR ASSIGNED RISK COMPENSATION EXPERIENCE BY STATE VALUED AS OF DECEMBER 31 OF EACH YEAR
CARRIER(S)*
STATE NAME _____ CARRIER CODE NUMBER _____
STATE CODE NUMBER _____

Year	Standard At NCCI Designated Stat Reporting Level (1)		Calendar Year Earned Premium		Telephone No	DATE SUBMITTED	Accumulated Accident Year Incurred Losses		Total Incurred Losses Including IBNR (4) + (5) + (7)
	Standard At Company Level (2)	Net (3)	Paid (9) + (10) (4)	Outstanding Excluding IBNR (11) + (12) (5)			IBNR (13) + (14) (6)		
A Prior to 1979									
B 1979									
C 1980									
D 1981									
E 1982									
F 1983									
G 1984									
H 1985									
I 1986									
J 1987									
K 1988									
L 1989									
M 1990									
N 1991									
O 1992									
P 1993									
Q Total To Current Year									
H Total To Last Year									
S Current Calendar Year Experience (U-R)									

* If this is a group report, list all carrier names or carrier codes for any experience reported

NATIONAL COUNCIL ON COMPENSATION INSURANCE
CALENDAR-ACCIDENT YEAR CALL FOR ASSIGNED RISK COMPENSATION EXPERIENCE BY STATE VALUED AS OF DECEMBER 31 OF EACH YEAR

CARRIER(S) _____ CARRIER CODE NUMBER _____

STATE NAME _____ STATE CODE NUMBER _____

Year	ACCUMULATED ACCIDENT YEAR INCURRED LOSSES				Outstanding Excluding IBNR				IBNR	
	Incurred Indemnity Claim Count** (8)	Indemnity (9)	Medical (10)	Paid	Indemnity (11)	Medical (12)	Indemnity (13)	Medical (14)	Indemnity (13)	Medical (14)
A. Prior to 1979										
B. 1979										
C. 1980										
D. 1981										
E. 1982										
F. 1983										
G. 1984										
H. 1985										
I. 1986										
J. 1987										
K. 1988										
L. 1989										
M. 1990										
N. 1991										
O. 1992										
P. 1993										
Q. Total to Current Year										
R. Total to Last Year										
S. Current Calendar Year (Q-R)										

** Does the Incurred Indemnity Claim Count contain any cases which initially included an indemnity reserve, but were subsequently closed with medical payments only? If YES, enter "1" . If NO, enter "2"

NATIONAL COUNCIL ON COMPENSATION INSURANCE

CALENDAR-ACCIDENT YEAR CALL FOR ASSIGNED RISK COMPENSATION EXPERIENCE
BY STATE VALUED AS OF DECEMBER 31 OF EACH YEAR

CARRIER(S) _____ CARRIER CODE NUMBER _____

STATE NAME _____ STATE CODE NUMBER _____

Year	Outstanding Excluding IBNR Indemnity		Outstanding Excluding IBNR Medical	
	Case (15)	Bulk (16)	Case (17)	Bulk (18)
A. Prior to 1979				
B. 1979				
C. 1980				
D. 1981				
E. 1982				
F. 1983				
G. 1984				
H. 1985				
I. 1986				
J. 1987				
K. 1988				
L. 1989				
M. 1990				
N. 1991				
O. 1992				
P. 1993				
Q. Total to Current Year				
R. Total to Last Year				
S. Current Calendar Year (Q-R)				

NOTE:

A. Does your company currently report all bulk reserves for indemnity and medical under the IBNR columns on page 2? Indicate by placing an "X" in the appropriate space below.

___ No ___ Yes

If "No," data should be reported in Columns 15 through 18. If "Yes," Columns 15 through 18 should be left blank.

B. If your company currently reports any bulk reserves for indemnity and medical under the outstanding excluding IBNR columns of page 2 then,

1. Columns 15 + 16 on this page must equal Column 11 on page 2.

2. Columns 17 + 18 on this page must equal Column 12 on page 2.

Please indicate if the amounts shown on this page are actual or estimated by placing an "x" in the appropriate space provided below.

___ Actual ___ Estimated

C. If you have provided estimated amounts, will your company be able to provide NCCI with actual amounts in subsequent reports?

___ No ___ Yes

NATIONAL COUNCIL ON COMPENSATION INSURANCE
ASSIGNED RISK CALENDAR-ACCIDENT YEAR CALL QUESTIONNAIRE

CARRIER NAME _____ CARRIER CODE

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1. Does Line Q from the previous call correspond to the Line R from the current Call? Yes No. If no, please explain why for every state.

N/A

2. Does Line S agree with the current year Assigned Risk Calendar Year Call submitted by your company for all states? Yes No. If no, please reconcile every state.

3. Does the premium in Column (1) of Line L correspond to that reported in Column (1) of Line S? Yes No. If no, please reconcile every state.

4. If a credit appears in any of the Columns (4), (5), (7) through (12) or (15) through (18) on Lines D through L, please explain why for every state.

TRANSMITTAL LETTER

1. CALL: CALENDAR-ACCIDENT YEAR CALL FOR ASSIGNED RISK COMPENSATION EXPERIENCE BY STATE VALUED AS OF DECEMBER 31 OF EACH YEAR

2. DUE DATE: April 1 of the following year

3. CARRIER NAME _____ 4. CARRIER CODE

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5. FILING AS: GROUP INDIVIDUAL COMPANY

6. If filing as a group, list individual names or carrier codes:

7. SUBMISSION TYPE:

Original Correction Voluntary Resubmission

8. SUBMISSION CONTENT:

Full Partial and Not Final Partial and Final

9. Number of states included _____

10. Number of pages _____

MAIL CALL AND TRANSMITTAL LETTER TO:

NATIONAL COUNCIL ON COMPENSATION INSURANCE

750 PARK OF COMMERCE DRIVE

BOCA RATON, FL 33487

ATTN.: FINANCIAL DATA

NCCI USE ONLY
Date Received _____

Receipt Mailed _____

NATIONAL COUNCIL ON COMPENSATION INSURANCE
RECEIPT OF CALL NOTIFICATION

11. CALL: CALENDAR-ACCIDENT YEAR CALL FOR ASSIGNED RISK COMPENSATION EXPERIENCE BY STATE VALUED AS OF DECEMBER 31 OF EACH YEAR

12. DUE DATE: April 1 of the following year

13. DATE RECEIVED AT NCCI _____ BY _____

14. MAIL RECEIPT TO: (Indicate specific individual)

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Statistical Call Overview Document

STATISTICAL CALL NAME:

Insurance Expense Exhibit (Call #6)

DESCRIPTION OF CALL:

This call contains dollar amounts in thousands for all lines of business for premium, losses and expenses. Part II, column 16, Part III and Part IV contain the data relating directly to workers compensation business. NCCI captures only data concerning workers compensation insurance.

The Insurance Expense Exhibit provides the data to which the Calendar Year Call, "F" Classification Calendar Year Call and Underground Coal Mine Call are reconciled. The call is summarized by type of company and also used in various studies on company expenses.

FILES/DATABASES:

Insurance Expense Exhibit Production File:

This file serves as the central repository for Calendar Year Financial Call data. This file contains all data received from the carriers as well as corrections applied to this data. Corrections to the file are made via ACS for data entry of revised reports with electronic transfer of the data to NCCI for incorporation into the production file.

DESCRIPTION OF ERROR HANDLING:

The Insurance Expense Exhibit is validated using automated reports when the data is received from the carrier. The summarized data is then subjected to an additional validation. In this validation, unusual expenses from Part II and III are investigated to determine if a carrier has incorrectly reported its expenses.

The call is validated to make sure it is internally consistent and checked against data from AM Best to verify state premiums and losses reported in Part IV. Carriers are sent written correspondence to resolve any errors identified during the validation. As revised

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Statistical Call Overview Document

reports are received, they are checked for accuracy and then if correct are sent to ACS for processing.

MODIFICATIONS TO DATA:

Revised reports are processed as they are received. In extremely rare cases, carrier data may be removed due to errors.

All revised data is requested to be submitted on revised reports or via written correspondence. When production deadlines require an immediate response, telephone responses are excepted with the stipulation that a written confirmation of the changes also be submitted.

NAIC Examination of NCCI
Description of Data Collection and Data Handling

Statistical Call Data Documentation

Statistical Call Name: Insurance Expense Exhibit (NCCI Call #6)

Data Element		Captured?	Description of Validation
1.	Carrier Name	No	
2.	Carrier Code	No	A. The Insurance Expense Exhibit is not a call NCCI produces. There is no field for the NCCI carrier code on the call. NCCI uses the name given on the call and NCCI membership lists to assign the correct NCCI carrier codes to each call.
3.	Call Year	Yes	A. Checked for consistency with data submitted on call. (Visual review of a system generated report and hard copy input)
4.	Contact Person	No	
5.	Title	No	
6.	Part II column 16 line 1 - Net Premiums Written	Yes	None
7.	Part II column 16 line 2 - Net Premiums Earned	Yes	A. Checked against both Part IV column 1 line 86 and the sum of Part III column 1 lines 1 and 4 for consistency between parts.
8.	Part II column 16 line 3 - Net Losses Incurred	Yes	A. Checked against Part IV column 2 line 86 for consistency between parts.
9.	Part II column 16 line 4 - Loss Adjustment Expenses Incurred	Yes	A. Checked against Part III column 1 line 6 for consistency between parts.
10.	Part II column 16 line 5 - Commission and Brokerage Incurred	Yes	A. Checked against Part III column 1 line 7 for consistency between parts.
11.	Part II column 16 line 6 - Other Acquisition, Field Supervision, and Collection Expenses Incurred	Yes	A. Checked against Part III column 1 line 8 for consistency between parts.
12.	Part II column 16 line 7 - General Expenses Incurred	Yes	A. Checked against Part III column 1 line 9 for consistency between parts.

NAIC Examination of NCCI
Description of Data Collection and Data Handling
Statistical Call Data Documentation

Statistical Call Name: Insurance Expense Exhibit (NCCI Call #6)

	Data Element	Captured?	Description of Validation
13.	Part II column 16 line 8 - Taxes, Licenses, and Fees Incurred	Yes	A. Checked against Part III column 1 line 10 for consistency between parts.
14.	Part II column 16 line 9 - Total Expenses Incurred	Yes	A. Checked against Part III column 1 line 11 for consistency between parts. B. Checked against the sum of Part II lines 4 through 8.
15.	Part II column 16 line 10 - Net Investment Gain or (Loss) and Other Income	Yes	None
16.	Part II column 16 line 11 - Dividends to Policyholders	Yes	None
17.	Part II column 16 line 12 - Net Income Before federal and foreign Income Taxes	Yes	A. Checked against the sum of Part II lines 2 and 10 minus the sum of part II lines 3, 9, and 11.
18.	Part II column 16 line 13 - Direct Premiums Written	Yes	None
19.	Part II column 16 line 14 - Adjusted Direct Premiums Written	Yes	None
20.	Part II column 16 line 15 - Adjusted Direct Premiums Earned	Yes	None
21.	Part II column 16 line 16 - Adjusted Direct Losses Incurred	Yes	None
22.	Part II column 16 line 17 - Adjusted Direct Loss Adjustment Expenses Incurred	Yes	None
23.	Part II column 16 line 18 - Direct Commission And Brokerage Incurred	Yes	None

NAIC Examination of NCCI
Description of Data Collection and Data Handling

Statistical Call Data Documentation

Statistical Call Name: Insurance Expense Exhibit (NCCI Call #6)

	Data Element	Captured?	Description of Validation
24.	Part II column 16 line 19 - Adjusted Direct Commission and Brokerage Incurred	Yes	None
25.	Part III column 1 line 1 - Net Earned Premiums - Regular Business Excluding War Projects	Yes	None
26.	Part III column 1 line 2 - Adjustment for Premium Discounts and Retrospective Rating - Regular Business Excluding War Projects	Yes	None
27.	Part III column 1 line 3 - Net Earned Premiums - Standard Basis - Regular Business Excluding War Projects	Yes	A. Checked against the sum of Part III column 1 lines 1 and 2.
28.	Part III column 1 line 4 - Net Earned Premiums - War Projects	Yes	None
29.	Part III column 1 line 5 - Net Earned Premiums - Standard Basis - Total Business	Yes	A. Checked against the sum of Part III column 1 lines 3 and 4.
30.	Part III column 1 line 6 - Loss Adjustment Expenses	Yes	A. Checked against Part II column 16 line 4 for consistency between parts.
31.	Part III column 1 line 7 - Commission and Brokerage	Yes	A. Checked against Part II column 16 line 5 for consistency between parts.
32.	Part III column 1 line 8 - Other Acquisition, Field Supervision and Collection Expenses	Yes	A. Checked against Part II column 16 line 6 for consistency between parts.
33.	Part III column 1 line 9 - General Expenses	Yes	A. Checked against Part II column 16 line 7 for consistency between parts.

NAIC Examination of NCCI
 Description of Data Collection and Data Handling
 Statistical Call Data Documentation

Statistical Call Name: Insurance Expense Exhibit (NCCI Call #6)

Data Element	Captured?	Description of Validation
34. Part III column 1 line 10 - Taxes, Licenses, and Fees	Yes	A. Checked against Part II column 16 line 8 for consistency between parts.
35. Part III column 1 line 11 - Total Expenses Excluding Federal and Foreign Income Taxes	Yes	A. Checked against Part II column 16 line 8 for consistency between parts.
36. Part III column 1 line 12 - Effect of Expense Graduation	Yes	None
37. Part III column 1 line 13 - Total of Part III lines 12 and 13	Yes	A. Checked against the sum of Part III lines 11 and 12.
38. Part IV column 1 - State Code	Yes	None
39. Part IV column 2 - Earned Premium - Direct Business	Yes	<p>A. Individual state data compared to annual statement page 14 data as compiled by AM Best.</p> <p>B. Part IV column 1 line 81 checked against the sum of Part IV column 1 lines 01 through 80.</p> <p>C. Part IV column 1 line 84 checked against the sum of Part IV column 1 lines 81 and 82 minus Part IV line 83.</p> <p>D. Checked against both Part II column 16 line 2 and the sum of Part III column 1 lines 1 and 4 for consistency between parts.</p>

NAIC Examination of NCCI
 Description of Data Collection and Data Handling
 Statistical Call Data Documentation

Statistical Call Name: Insurance Expense Exhibit (NCCI Call #6)

Data Element	Captured?	Description of Validation
40. Part IV column 3 - Incurred Losses - Direct Business	Yes	<p>A. Individual state data compared to annual statement page 14 data as compiled by AH Best.</p> <p>B. Part IV column 2 line 81 checked against the sum of Part IV column 1 lines 01 through 80.</p> <p>C. Part IV column 2 line 84 checked against the sum of Part IV column 1 lines 81 and 82 minus Part IV line 83.</p> <p>D. Checked against Part II column 16 line 3 for consistency between parts.</p>

NAIC EXAMINATION OF NCCI
FILE DEFINITION - INSURANCE EXPENSE EXHIBIT PRODUCTION FILE

DESCRIPTION AND USE:

INSURANCE EXPENSE EXHIBIT PRODUCTION FILE

THIS FILE SERVES AS THE CENTRAL REPOSITORY FOR INSURANCE EXPENSE
EXHIBIT DATA.

FILE TYPE : SEQUENTIAL (V=VSAM, S=Sequential, P=PDS, I=IDMS)
 DEVICE TYPE : TAPE (D=Disk, T=Tape)
 RETENTION : 10 YEARS

ELEMENT DESCRIPTION	ELEMENT ATTRIBUTE	ELEMENT LENGTH	SOURCE
CALL YEAR	ALPHA	2	IEE FINANCIAL CALL #6
CARRIER CODE	ALPHA	5	ASSIGNED
NET PREMIUMS WRITTEN	NUMERIC	11	IEE FINANCIAL CALL #6
NET PREMIUMS EARNED	NUMERIC	11	IEE FINANCIAL CALL #6
NET LOSSES INCURRED	NUMERIC	11	IEE FINANCIAL CALL #6
LOSS ADJ. EXPENSES INCURRED	NUMERIC	11	IEE FINANCIAL CALL #6
COMMISSION & BROKERAGE INCURRED	NUMERIC	11	IEE FINANCIAL CALL #6
OTHER ACQ., FIELD SUP & COLL. EXP INC.	NUMERIC	11	IEE FINANCIAL CALL #6
GENERAL EXPENSES INCURRED	NUMERIC	11	IEE FINANCIAL CALL #6
TAXES, LICENSES, & FEES INCURRED	NUMERIC	11	IEE FINANCIAL CALL #6
TOTAL EXPENSES INCURRED	NUMERIC	11	IEE FINANCIAL CALL #6
NET INVESTMENT GAIN OR LOSS	NUMERIC	11	IEE FINANCIAL CALL #6
DIRECT PREMIUMS WRITTEN	NUMERIC	11	IEE FINANCIAL CALL #6
ADJUSTED DIRECT PREMIUMS WRITTEN	NUMERIC	11	IEE FINANCIAL CALL #6
ADJUSTED DIRECT PREMIUMS EARNED	NUMERIC	11	IEE FINANCIAL CALL #6
ADJUSTED DIRECT LOSSES INCURRED	NUMERIC	11	IEE FINANCIAL CALL #6
ADJUSTED DIRECT LOSS ADJ. EXPENSE INC.	NUMERIC	11	IEE FINANCIAL CALL #6
DIRECT COMMISSION & BROKERAGE INC.	NUMERIC	11	IEE FINANCIAL CALL #6
ADJ. DIRECT COMMISSION & BROKERAGE INC.	NUMERIC	11	IEE FINANCIAL CALL #6
NET EARNED PREMIUMS WRITTEN - REGULAR BUSINESS EXCLUDING WAR PROJECTS	NUMERIC	11	IEE FINANCIAL CALL #6
ADJ. FOR PREMIUM DISCOUNTS AND RETRO. RATING-REG. BUSINESS EXCL WAR PROJECTS	NUMERIC	11	IEE FINANCIAL CALL #6
NET EARNED PREMIUM - STANDARD BASIS REG. BUSINESS EXCLUDING WAR PROJECTS	NUMERIC	11	IEE FINANCIAL CALL #6
NET EARNED PREMIUMS - WAR PROJECTS	NUMERIC	11	IEE FINANCIAL CALL #6
NET EARNED PREMIUMS-STD.BASIS/TOT. BUS.	NUMERIC	11	IEE FINANCIAL CALL #6
LOSS ADJUSTMENT EXPENSES	NUMERIC	11	IEE FINANCIAL CALL #6
COMMISSION & BROKERAGE	NUMERIC	11	IEE FINANCIAL CALL #6
OTHER ACQ., FIELD SUP. AND COLL. EXP.	NUMERIC	11	IEE FINANCIAL CALL #6
GENERAL EXPENSES	NUMERIC	11	IEE FINANCIAL CALL #6
TAXES, LICENSES, AND FEES	NUMERIC	11	IEE FINANCIAL CALL #6
TOTAL EXPENSES EXCL.FED. AND FOREIGN INCOME TAXES	NUMERIC	11	IEE FINANCIAL CALL #6
EFFECT OF EXPENSE GRADUATION	NUMERIC	11	IEE FINANCIAL CALL #6
TOTAL OF PART III LINES 12 & 13	NUMERIC	11	IEE FINANCIAL CALL #6
STATE CODE	NUMERIC	11	IEE FINANCIAL CALL #6
EARNED PREMIUM DIRECT BUSINESS	NUMERIC	11	IEE FINANCIAL CALL #6
INCURRED LOSSES DIRECT BUSINESS	NUMERIC	11	IEE FINANCIAL CALL #6

**CALL FOR EXPERIENCE #6
INSURANCE EXPENSE EXHIBIT**

Background and Purpose of the Report

The Insurance Expense Exhibit is due at NCCI on or before April 1 of the year following the most recent calendar year. As an example, the Insurance Expense Exhibit of 1990 captured calendar year 1990 data is due at NCCI on or before April 1, 1991.

This requirement has been established by the National Association of Insurance Commissioners (NAIC), and NCCI is responsible for compiling this Insurance Expense Exhibit (IEE) financial data.

Data from parts II and III are used in NCCI's annual review of expenses to establish the provisions for general expenses and loss adjustment expenses used in rate filings. Part IV of the IEE contains direct premiums and losses by state for workers compensation. This information is used in the reconciliation process to verify that NCCI's Policy Year, Calendar Year and Calendar/Accident Year data is consistent with the Annual Statement.

The data reported in this call should *include expenses* ★ related to large deductible policies (deductible amount over \$100,000 per claim or per accident).

NCCI compiles the individual company IEEs for workers compensation and distributes the results in its Annual Statistical Bulletin and in a separate booklet.

Filing Requirements

Insurance Expense Exhibit for Current Calendar Year Due April 1 of the following year

In accordance with the approved statistical program, you are hereby requested to file with NCCI on or before April 1 of each year a copy of your Insurance Expense Exhibit for the previous calendar year. This requirement has been established by the National Association of Insurance Commissioners.

NCCI is charged with the responsibility of compiling results for Workers Compensation Insurance for the NAIC. The aggregate results also are required to obtain the necessary expense information in order to determine the appropriate expense allowance to include in manual rates.

In order to facilitate reconciliation of carrier data, we request that the Insurance Expense Exhibit be submitted on an individual company basis rather than a carrier group basis.

Questions or request for additional information should be directed to Aggregate Ratemaking at (407) 997-4395. Please note that NCCI does not publish the blank forms for the Insurance Expense Exhibit. The Insurance Expense Exhibit can be obtained from Brandon Insurance Services at (615) 256-6291.

Please note that the due date for reporting this data is April 1 of each year. Please mail the Insurance Expense Exhibit to:

National Council on Compensation Insurance
750 Park of Commerce Drive
Boca Raton, Florida 33487

ATTENTION: FINANCIAL DATA

TRANSMITTAL LETTER

1. CALL: INSURANCE EXPENSE EXHIBIT ON A CALENDAR YEAR BASIS

2. DUE DATE: April 1 of the following year

3. CARRIER NAME _____ 4. CARRIER CODE

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5. FILING AS: GROUP INDIVIDUAL COMPANY

6. If filing as a group, list individual carrier names or carrier codes:

7. SUBMISSION TYPE:

Original Correction Voluntary Resubmission

MAIL CALL AND TRANSMITTAL LETTER TO:

NATIONAL COUNCIL ON COMPENSATION INSURANCE

750 PARK OF COMMERCE DRIVE

BOCA RATON, FL 33487

ATTN: FINANCIAL DATA

NCCI USE ON
Date Received

Receipt Mailed

NATIONAL COUNCIL ON COMPENSATION INSURANCE
RECEIPT OF CALL NOTIFICATION

8. CALL: INSURANCE EXPENSE EXHIBIT ON A CALENDAR YEAR BASIS

9. DUE DATE: April 1 of the following year

10. DATE RECEIVED AT NCCI _____ BY _____

11. MAIL RECEIPT TO: (Indicate specific individual)

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Statistical Call Overview Document

STATISTICAL CALL NAME:

Call For Premium By Size Of Policy (Call #7)

DESCRIPTION OF CALL:

This call contains dollar amounts for countrywide workers compensation Standard Earned Premium at Company level broken down into five policy size ranges (\$1 - 999), (\$1,000 - 4,999), (\$5,000 - 99,999), (\$100,000 - 499,999), and (\$500,000 and over) along with the number of policies in each range for the specified calendar year. Each NCCI member carrier is required to submit this information for the business they write. Some states require all carriers writing workers compensation policies to submit financial calls.

The Call For Premium by Size of Policy is used to determine premium discount and expense constant offsets.

FILES/DATABASES:

Call for Premium by Size of Policy Production File:

This file serves as the central repository for Premium by Size of Policy data. This file contains all data received from the carriers as well as corrections applied to this data. Corrections to the file are made via ACS keypunching of revised reports with electronic transfer of the data to NCCI for incorporation into the production file.

DESCRIPTION OF ERROR HANDLING:

Premium by Size of Policy data is validated using automated reports. Carriers are sent written correspondence to resolve any errors identified during the initial validation. As revised reports are received, they are checked for accuracy and then if correct are sent to ACS for data entry.

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Statistical Call Overview Document

MODIFICATIONS TO DATA:

Revised reports are processed as they are received. Any data containing errors which remain unresolved at the end of the validation process are removed from the dataset. Due to the relative simplicity of the call, this happens only in rare instances.

All revised data is requested to be submitted on revised reports or via written correspondence. When production deadlines require an immediate response telephone responses are accepted with the stipulation that a written confirmation of the changes also be submitted.

**CALL FOR EXPERIENCE #7
PREMIUM BY SIZE OF POLICY**

Background and Purpose of the Report

The Premium by Size of Policy Call is due at the National Council on or before April 1 of the year following the most recent calendar year. As an example, the 1990 Premium by Size Policy Call data is due at NCCI on or before April 1, 1991.

The intent of this call is to establish a premium schedule according to Standard Earned Premium for one year period. The most recent call requested that this period be 7/1/86 through 6/30/87. Policies effective within this period must be sorted according to premium size, along with the total number of policies and Standard Earned Premium at NCCI DSR.

The distribution of premium by size of policy obtained from this call is used to determine average premium discounts by state in NCCI's annual review of expenses. This is necessary to produce a more accurate indication for general expense needs than is possible from a premium distribution based on Workers Compensation Statistical Plan data.

The data reported in this call should **exclude** experience ★ developed under large deductible policies (deductible amount over \$100,000 per claim or per accident).

The Calendar Year Reconciliation Report (Call #8) has ★ been revised to add lines to reconcile premium and losses to Page 14 of the Annual Statement due to the exclusion of the large deductible policies.

Filing Requirements

Call for Premium by Size of Policy—Due April 1 of each year

In accordance with the approved statistical program, you are hereby requested to file with the National Council on or before April 1, of each year your nationwide distribution of direct standard earned premium by size of policy.

Attached are two copies of the reporting form for the required information. One is to be filed with the National Council and the other is for your records.

Questions regarding reporting requirements on completion of the calls should be directed to Aggregate Ratemaking at (407) 997-4395.

Instructions

Establish a premium schedule according to standard earned premium per risk as indicated on the reporting form. Premium and risk counts for the various intervals should reflect final audited premium. The actual distribution should reflect

latest available audited or estimated audited premiums for policies issued over the one-year period ending June 30, 1989. If necessary, policies issued over the one-year period ending December 31, 1988 may otherwise be reported; if this period is used, please indicate such on the reporting form. **DO NOT REPORT ANY EXPERIENCE FOR POLICIES ISSUED PRIOR TO JANUARY 1, OF THE PREVIOUS YEAR UNDER ANY CIRCUMSTANCES.**

The standard earned premium at Company Level reported shall be the countrywide earned premiums resulting from standard rating procedures; prior to payment of policyholder dividends, prior to the application of premium discounts, prior to the expense modification program when applicable, prior to any retrospective rating premium adjustments, and prior to any schedule rating premium adjustments. Only direct standard earned premium, prior to reinsurance, shall be reported. Report all amounts in whole dollars only. It is only necessary to include the same states that are reported for the Policy Year and Calendar-Accident Year Calls.

This report should **INCLUDE** the experience of all classifications written on a direct basis ("F" Class, Coal Mine, Industrial Classes, Assigned Risk).

EXCLUDE risk counts and premiums associated with three-year fixed rate policies. **EXCLUDE** policies canceled flat (canceled on the effective date).

EXCLUDE risk counts and premiums under policies issued in conjunction with Homeowners and Comprehensive Personal Liability policies covering domestics (such as in California and New Hampshire).

This is the first year Type of Insurer is required on the Call for Premium by Size of Policy.

Please note that the date for reporting this data is April 1 of each year. Please mail this Call to:

National Council on Compensation Insurance
750 Park of Commerce Drive
Boca Raton, Florida 33487

ATTENTION: FINANCIAL DATA

NATIONAL COUNCIL ON COMPENSATION INSURANCE
CALL FOR PREMIUM BY SIZE OF POLICY

CARRIER(S)* _____ CARRIER CODE

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 SUBMITTED BY _____ TITLE _____
 TELEPHONE NUMBER _____ DATE SUBMITTED _____

POLICY STANDARD EARNED PREMIUM AT COMPANY LEVEL	NUMBER OF POLICIES	COUNTRYWIDE STANDARD EARNED PREMIUM AT COMPANY LEVEL
\$1-999		
\$1,000-4,999		
\$5,000-99,999		
\$100,000-499,999		
\$500,000 AND OVER		

TOTAL

POLICY PERIOD (Please Check)

- 1/1-12/31
- 7/1-6/30

Please submit complete audited premium for policy period 7/1 to 6/30 if possible. If not possible, report data for the earlier period.

Type of Insurer

Indicate whether the company(ies) is (are) primarily (check one only)

- i. Participating Stock Company ()
- ii. Non-Participating Stock Company ()
- iii. Mutual Company ()
- iv. Reciprocal Exchange ()
- v. Other (please explain) ()

* If this is a group report, list all carrier names or carrier codes for which any experience is reported.

TRANSMITTAL LETTER

1. CALL: FOR PREMIUM BY SIZE OF POLICY

2. DUE DATE: April 1 of each year

3. CARRIER NAME _____

4. CARRIER CODE

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5. FILING AS: GROUP INDIVIDUAL COMPANY

6. If filing as a group, list individual carrier names or carrier codes:

7. SUBMISSION TYPE:

Original

Correction

Voluntary Resubmission

MAIL CALL AND TRANSMITTAL LETTER TO:

NATIONAL COUNCIL ON COMPENSATION INSURANCE

750 PARK OF COMMERCE DRIVE

BOCA RATON, FL 33487

ATTN: FINANCIAL DATA

NCCI USE ONLY
Date Received

Receipt Mailed

NATIONAL COUNCIL ON COMPENSATION INSURANCE
RECEIPT OF CALL NOTIFICATION

8. CALL: FOR PREMIUM BY SIZE OF POLICY

9. DUE DATE: April 1 of each year

10. DATE RECEIVED AT NCCI _____ BY _____

11. MAIL RECEIPT TO: (Indicate specific individual)

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Statistical Call Overview Document

STATISTICAL CALL NAME:

Calendar Year Reconciliation Report (Call #8)

DESCRIPTION OF CALL:

This call contains dollar amounts for workers compensation Net Direct Earned Premium and Direct Incurred Losses by state for the specified calendar year. Each NCCI member carrier is required to submit this information for each state in which they operate and NCCI produces rate levels. Some states require all carriers writing workers compensation policies to submit financial calls.

The Calendar Year Reconciliation Report is used to reconcile workers compensation experience data reported in the Calendar Year Call, "F" Classification Calendar Year Call, and the Underground Coal Mine Call to the carrier's annual statement.

FILES/DATABASES:

Calendar Year Reconciliation Report Production File:

This file serves as the central repository for Calendar Year Reconciliation Report data. This file contains all data received from the carriers as well as corrections applied to this data. Corrections to the file are made via ACS for data entry of revised reports with electronic transfer of the data to NCCI for incorporation into the production file.

DESCRIPTION OF ERROR HANDLING:

The Calendar Year Reconciliation data is validated using automated reports when the data is received from the carrier. The primary goal of this validation is to ensure the data reported to NCCI ties back to the individual carrier's annual statement. Particular attention is paid to the amounts reported in Line 10 as well as the explanation line to determine whether a company's data is suitable for ratemaking. The aggregate total by state for all carriers is reconciled to statewide figures provided by AM Best. This is to verify NCCI's database includes all significant data in each state where NCCI produces rate levels.

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Statistical Call Overview Document

Carriers are sent written correspondence to resolve any errors identified during the validation. As revised reports are received, they are checked for accuracy and then if correct are sent to ACS for processing.

MODIFICATIONS TO DATA:

Revised reports are processed as they are received. Any data containing unresolved errors at the time of a state's rate level production will be removed from the dataset if remaining errors cannot be resolved within the rate level production schedule. Unresolved errors require removal of a carrier's Policy Year and Calendar-Accident Year data from rate level calculations if they are of sufficient magnitude.

All revised data is requested to be submitted on revised reports or via written correspondence. When production deadlines require an immediate response, telephone responses are accepted with the stipulation that a written confirmation of the changes also be submitted.

NAIC Examination of NCCI
 Description of Data Collection and Data Handling
 Statistical Call Data Documentation

Statistical Call Name: Calendar Year Reconciliation Report (NCCI Call #8)

Data Element	Captured?	Description of Validation
1. Carrier Name	No	
2. Carrier Code	Yes	A. Validated against NCCI carrier membership list. (Visual review of hard copy input)
3. Call Year	Yes	A. Checked for consistency with data submitted on call. (Visual review of a system generated report and hard copy input)
4. Submitted By	No	
5. Title	No	
6. Telephone Number	No	
7. Date Submitted	No	
8. Serial Number	No	
9. State Name	No	
10. State Code	Yes	A. Checked against state name given on call.

NAIC Examination of NCCI
 Description of Data Collection and Data Handling
 Statistical Call Data Documentation

Statistical Call Name: Calendar Year Reconciliation Report (NCCI Call #8)

Data Element	Captured?	Description of Validation
11. Net Direct Earned Premium	Yes	<p>A. Line 1 (Calendar Year Net Direct Earned Premium) is checked against data from the Calendar Year call for Compensation Experience (NCCI call #2).</p> <p>B. Line 2 (F-Class Calendar Year Net Direct Earned Premium) is checked against data from the F-Class Calendar Year call for Compensation Experience (NCCI call #9).</p> <p>C. Line 3 (Underground Coal Mine Calendar Year Net Direct Earned Premium) is checked against data from the Coal Mine Calendar Year call for Compensation Experience (NCCI call #18).</p> <p>D. Line 4 checked against the sum of line 1 through 3.</p> <p>E. Line 8 checked against the sum of line 4 through 7.</p> <p>F. Line 9 (Calendar Year Net Direct Earned Premium) is checked against data from the Insurance Expense Exhibit (NCCI call #6).</p> <p>G. Line 10 is checked against the total of line 9 minus line 8.</p> <p>H. Line 10 is checked for reasonableness as it relates to the fitness of the carrier's Policy Year and Calendar-Accident data for use in ratemaking.</p>

NAIC Examination of NCCI
Description of Data Collection and Data Handling

Statistical Call Data Documentation

Statistical Call Name: Calendar Year Reconciliation Report (NCCI Call #8)

Data Element	Captured?	Description of Validation
12. Direct Incurred Losses	Yes	<p>A. Line 1 (Calendar Year Direct Incurred Losses) is checked against data from the Calendar Year call for Compensation Experience (NCCI call #2).</p> <p>B. Line 2 (F-Class Calendar Year Direct Incurred Losses) is checked against data from the F-Class Calendar Year call for Compensation Experience (NCCI call #9).</p> <p>C. Line 3 (Underground Coal Mine Calendar Year Direct Incurred Losses) is checked against data from the Coal Mine Calendar Year call for Compensation Experience (NCCI call #18).</p> <p>D. Line 4 is checked against the sum of line 1 through 3.</p> <p>E. Line 8 is checked against the sum of line 4 through 7.</p> <p>F. Line 9 (Calendar Year Direct Incurred Losses) is checked against data from the Insurance Expense Exhibit (NCCI call #6).</p> <p>F. Line 10 is checked against the total of line 9 minus line 8.</p> <p>G. Line 10 is checked for reasonableness as it relates to the fitness of the carrier's Policy Year and Calendar-Accident data for use in ratemaking.</p>

NAIC EXAMINATION OF NCCI
FILE DEFINITION - CALENDAR YEAR RECONCILIATION REPORT

DESCRIPTION AND USE:

CALENDAR YEAR RECONCILIATION REPORT PRODUCTION FILE.

THIS FILE SERVES AS THE CENTRAL REPOSITORY FOR CALENDAR YEAR RECONCILIATION REPORT FINANCIAL CALL DATA. THIS FILE CONTAINS ALL DATA RECEIVED FROM THE CARRIERS AS WELL AS CORRECTIONS APPLIED TO THIS DATA.

FILE TYPE : SEQUENTIAL (V=VSAM, S=Sequential, P=PDS, I=IDMS)

DEVICE TYPE : TAPE (D=Disk, T=Tape)

RETENTION : 10 YEARS

ELEMENT DESCRIPTION	ELEMENT ATTRIBUTE	ELEMENT LENGTH	SOURCE
CALL YEAR	ALPHA	2	CALENDAR YEAR RECONCILIATION CALL
SERIAL NUMBER	ALPHA	7	CALCULATED
STATE CODE	NUMERIC	2	CALENDAR YEAR RECONCILIATION CALL
CARRIER CODE	ALPHA	5	CALENDAR YEAR RECONCILIATION CALL
NET DIRECT EARNED PREMIUM (10 OCCURENCES)	NUMERIC	10	CALENDAR YEAR RECONCILIATION CALL
DIRECT INCURRED LOSSES (10 OCCURENCES)	NUMERIC	10	CALENDAR YEAR RECONCILIATION CALL

CALL FOR EXPERIENCE #8
RECONCILIATION REPORT

Background and Purpose of the Report

The Reconciliation Report is due at NCCI on or before April 15 of the year following the most recent Calendar Year. As an example, the Reconciliation Call of 1990 captured Calendar Year 1990 data, for submission to NCCI on or before April 15, 1991.

This Report is one of five standard annual calls for experience subject to the Performance Evaluation Monetary Incentive Program (PEMIP).

For each Annual Call Year, the most recent Calendar Year data must be reported on a state basis. Calendar Year Transactions are those occurring during a particular year, with Calendar Year 1990 being all those transactions occurring from 1/1/90 through 12/31/90. As a result, Calendar Year data will include policy activity, both premium and claim, originating from prior policy years.

The intent of the Reconciliation Report, as the name suggests, is to reconcile data reported on various NCCI requested Calls. Carriers are required to reconcile the Calendar Year Call, "F" Class Calendar Year Call, Coal Mine Calls, National Defense Projects and Excess Policy Data with the Insurance Expense Exhibit (Part IV). If reconciliation to the Insurance Expense Exhibit is not achieved, carriers are required to explain any differences.

Data collected in the Reconciliation Report includes both Net Earned Premium and Incurred Losses on a direct basis with regards to reinsurance.

Filing Requirements

Calendar Year Reconciliation Report by State of the Current Calendar Year Calls to the Current Insurance Expense Exhibit—due April 15, of the following year

In accordance with the approved statistical program, you are hereby requested to file with NCCI on or before April 15 of each year a reconciliation, by state, of data reported on the various Calendar Year Calls to the previous year's Insurance Expense Exhibit.

This Call is included in PEMIP (Performance Evaluation Monetary Incentive Program) and will be subject to assessments for late and/or inaccurate reporting. Details of PEMIP are updated annually in January of each year.

Two reporting forms for the required reconciliation information are provided in the package of forms sent to carriers in October of each year. Since a separate form is required for each state, carriers are asked to reproduce these forms within their organization.

Also included will be two copies of the form for reporting Incurred But Not Reported (IBNR) questionnaire information. One copy is to be filed with NCCI and the other copy is for your records.

Questions regarding reporting requirements on completion of the Calls should be directed to Aggregate Ratemaking at (407) 997-4395.

Reconciliation Instructions

This Call must reconcile data reported in Part IV of the Insurance Expense Exhibit with the data reported to the National Council in the following Calls: Calendar Year Call, "F" Classification Calendar Year Call and Underground Coal Mine Call. Additionally, calendar year experience for National Defense Projects and Excess Policies must be separately reported as reconciliation items since this experience is not included in any Call reported to NCCI. If these reconciliation items and the data reported on the above Calls do not equal that reported in Part IV of the Insurance Expense Exhibit, a detailed explanation for the difference is requested.

Note that since the experience from large deductible ★ policies (over \$100,000 per claim or accident) is being excluded from the Calendar Year Call an extra line is needed on the Reconciliation Report in order to reconcile to Part IV of the Insurance Expense Exhibit. Line (6) asks for the data on a net basis (i.e., the claim amount above the deductible) and is used to reconcile to the Insurance Expense Exhibit. Note that large deductible business is being written by a small minority of companies and that for most companies these lines should be left blank.

In order to facilitate reconciliation, the Insurance Expense Exhibit, Calendar Year Calls, and Reconciliation reports should be submitted on the same basis (group or individual company reports).

It is required to report this call for the same states that the Policy Year and Calendar-Accident Year calls have been submitted.

Amounts to be reported for earned premiums and incurred losses are to be on a direct basis with respect to reinsurance. Amounts reported must be in whole dollars. Please note that since amounts reported on the Insurance Expense Exhibit are in thousands, you are required to enter the low order zeros on Line (8) of the reporting form.

Additionally, please calculate the difference on Line (10) ★ exactly as indicated (Line 9 - Line 8). Indicate negative amounts in parentheses.

IBNR Questionnaire Instructions

The questions on this form are designed to provide further information as to the breakdown of total outstanding losses between the two components "Outstanding Excluding IBNR" and "IBNR" as reported on the Calls for Policy Year and Calendar-Accident Year, evaluated as of December 31.

Listed on the attached forms are several types of reserves, some of which your company may utilize as a portion of its total outstanding losses. For each type of reserve that your company carries, please specify whether that reserve is reported in the category "Outstanding Excluding IBNR" or in the category "IBNR", or some portion of both. In the latter case, please estimate the portion of that type of reserve which is reported in the "IBNR" category. If your company had no reserves for one or more of the types of reserves listed, please mark "X" in the appropriate category of response in most instances.

Additional IBNR Reporting Notes

"None" place an "X" in this column only when you have no portion of your total outstanding losses attributable to this type of loss reserve.

"Outstanding Excl. IBNR" place an "X" in this column for a particular type of loss reserve only when the entire loss reserve of this type is reported as "Outstanding Excluding IBNR," i.e., is included in the totals reported in Columns 11 and 12 of the Policy Year Call form.

"IBNR" place an "X" in this column for a particular type of loss reserve only when the entire loss reserve of this type is reported as "IBNR," i.e., is included in the totals reported in Columns 13 and 14 of the Policy Year Call form.

"Both" place an "X" in this column for a particular type of loss reserve when some portion of that type of reserve is included in "Outstanding Excluding IBNR" and some portion is included in "IBNR."

"% in IBNR" when "Both" is marked for a particular type of reserve, place in this column your best estimate of the approximate proportion of the reserves of the type that are reported as IBNR on the Call form.

Please note that the date for reporting both the Reconciliation and IBNR questionnaire data is on or before April 15 of each year.

Please mail this Call to:

National Council on Compensation Insurance
750 Park of Commerce Drive
Boca Raton, Florida 33487

ATTENTION: FINANCIAL DATA

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 CALENDAR YEAR RECONCILIATION
 REPORT

CARRIER NAME* _____ CARRIER CODE

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SUBMITTED BY _____ TITLE _____

TELEPHONE NO. _____ DATE SUBMITTED _____

STATE _____ STATE CODE _____

This is to certify the reconciliation of the current Calendar Year Data reported to NCCI and the data reported on the Insurance Expense Exhibit—Part IV.

	Net Direct Earned Premium	Direct Incurred Losses
I. Data Reported to National Council		
(1) Calendar Year Call—Excluding Large Deductible Policies (Industrial Classes)	_____	_____
(2) "F" Classification Calendar Year Call	_____	_____
(3) Underground Coal Mine	_____	_____
(4) Subtotal (1) + (2) + (3)	_____	_____
II. Reconciliation Items		
(5) National Defense Projects Experience	_____	_____
(6) Large Deductible Policies—Net Basis	_____	_____
(7) Excess Policies	_____	_____
(8) Total (4) + (5) + (6) + (7)	_____	_____
III. Insurance Expense Exhibit		
(9) Part IV—Column 2, Column 3	_____	_____
IV. Difference—explain below**		
(10) Calculate as indicated (9) – (8)	_____	_____
Reason for differences:		

* If this is a group report, list all carrier names or carrier codes for which any experience is reported.
 ** An explanation is not necessary if the difference is between (\$1,000) and \$1,000.

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 IBNR QUESTIONNAIRE
 EVALUATED AS OF DECEMBER 31 OF EACH YEAR

CARRIER _____ CARRIER CODE

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SUBMITTED BY _____ TITLE _____

TELEPHONE NO. _____ DATE SUBMITTED _____

For each of the following types of reserves place an X in the column which indicates where the reserves were reported.

Type of Reserve	(1) None	(2) Outstanding (Ex. IBNR)	(3) IBNR	(4) Both	(5) % in IBNR
1. Reserves associated with specific open claims	xxx	_____	_____	_____	_____
2. Additional bulk reserves for known open claims	xxx	_____	_____	_____	_____
3. Reserves for closed claims that may reopen	xxx	_____	_____	_____	_____
4. Reserves for anticipated claims not yet reported	xxx	_____	_____	_____	_____
5. Reserves for claims reported to company but not yet in reserve system	xxx	_____	_____	_____	_____
6. Additional statutory reserves required by regulators	_____	_____	_____	_____	_____
7. Other (specify) _____	_____	_____	_____	_____	_____
8. Was the same definition of IBNR used in all states?		<input type="checkbox"/> Yes	<input type="checkbox"/> No		
If No, please explain _____					
9. Is IBNR reported direct or net of reinsurance?		<input type="checkbox"/> Direct	<input type="checkbox"/> Net		
If Net, please explain _____					
10. Is direct IBNR greater than net IBNR?		<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Equal	
11. Is direct IBNR calculated as a function of					
A) direct incurred losses?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	B) net IBNR?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
C) Other (please explain) _____					

TRANSMITTAL LETTER

1. CALL: CURRENT YEAR'S CALENDAR YEAR RECONCILIATION REPORT BY STATE OF THE CURRENT YEAR'S CALENDAR YEAR CALLS TO THE CURRENT YEAR'S INSURANCE EXPENSE EXHIBIT

2. DUE DATE: April 15 of the following year

3. CARRIER NAME _____ 4. CARRIER CODE

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5. FILING AS: GROUP INDIVIDUAL COMPANY

6. If filing as a group, list individual carrier names or carrier codes:

7. SUBMISSION TYPE:

Original Correction Voluntary Resubmission

8. SUBMISSION CONTENT:

Full Partial and Not Final Partial and Final

9. Number of states included _____

10. Number of pages _____

MAIL CALL AND TRANSMITTAL LETTER TO:

NATIONAL COUNCIL ON COMPENSATION INSURANCE

750 PARK OF COMMERCE DRIVE

BOCA RATON, FL 33487

ATTN: FINANCIAL DATA

NCCI USE ONLY
Date Received _____

Receipt Mailed _____

NATIONAL COUNCIL ON COMPENSATION INSURANCE
RECEIPT OF CALL NOTIFICATION

8. CALL: CURRENT YEAR'S CALENDAR YEAR RECONCILIATION REPORT BY STATE OF THE CURRENT YEAR'S CALENDAR YEAR CALLS TO THE CURRENT YEAR'S INSURANCE EXPENSE EXHIBIT

9. DUE DATE: April 15 of the following year.

10. DATE RECEIVED AT NCCI _____ BY _____

11. MAIL RECEIPT TO: (Indicate specific individual)

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Statistical Call Overview Document

STATISTICAL CALL NAME:

"F" Classification Calendar Year Call For Compensation Experience (Call #9)

DESCRIPTION OF CALL:

This call contains dollar amounts for workers compensation Standard Earned Premium at NCCI DSR level, Standard Earned Premium at Company level, Net Earned Premium, and Total Incurred Losses for the specified calendar year. Each NCCI member carrier is required to submit this information for each state in which they operate. Some states require all carriers writing workers compensation policies to submit financial calls.

The "F" Classification Calendar Year Call for Compensation Experience is used to reconcile workers compensation experience data reported in the "F" Classification Policy Year Call to the carrier's annual statement.

FILES/DATABASES:

"F" Classification Calendar Year Call Production File:

This file serves as the central repository for "F" Classification Calendar Year Call data. This file contains all data received from the carriers as well as corrections applied to this data. Corrections to the file are made via ACS for data entry of revised reports with electronic transfer of the data to NCCI for incorporation into the production file.

DESCRIPTION OF ERROR HANDLING:

"F" Classification Calendar Year data is not currently validated.

MODIFICATIONS TO DATA:

"F" Classification Calendar Year data is not currently modified.

CALL FOR EXPERIENCE #9
"F" CLASSIFICATION CALENDAR YEAR CALL

Background and Purpose of the Report

The "F" Classifications Calendar Year Call is due at NCCI on or before April 15 of the year following the most recent Calendar Year. As an example, the 1990 "F" Class Calendar Year Call is due at NCCI on or before April 15, 1991.

For each annual call year, the most recent calendar year data must be reported on a state basis. Calendar Year transactions are those occurring during a specific year. Calendar Year 1990 will be comprised of all premium and loss transactions occurring from 1/1/90 through 12/31/90.

The specific data to be reported in this Call are 27 "F" Classes, identified on the first page of the call for experience. The call indicates that if a carrier is not able to report "F" Class experience on a class-by-class basis, it is permissible to report the total experience on risks in which the "F" Class is the governing classification.

Data from this Call is currently used for "F" Class rate level in the state of Louisiana. Also, this data has the potential of being used in the ratemaking process for other states as well.

"F" Class data collected includes earned premiums and incurred losses on a state basis. Earned premiums are separated between Standard At NCCI DSR Level, Standard At Company Level and Net Earned. The incurred losses include indemnity and medical benefits, along with IBNR.

The data reported in this call should *exclude* experience ★ developed under large deductible policies (deductible amount over \$100,000 per claim or per accident).

The Calendar Year Reconciliation Report (Call #8) has ★ been revised to add lines to reconcile premium and losses to Page 14 of the Annual Statement due to the exclusion of the large deductible policies.

Filing Requirement

"F" Classification Calendar Year Call for Compensation Experience by State—Current Calendar Year—due April 15 of the following year

In accordance with the approved statistical program, you are hereby requested to file with NCCI on or before April 15 of each year your "F" Classification compensation experience for the previous calendar year. Experience included in this Call should be for policies effective January 1, 1974 and subsequent.

The specific "F" Classifications involved in this Call are: 6801F, 6803F, 6824F, 6825F, 6826F, 6827F, 6828F, 6829F, 6843F, 6845F, 6846F, 6869F, 6872F, 6873F, 6874F, 6875F, 7309F, 7313F, 7317F, 7323F, 7327F, 7350F, 7352F, 7366F, 8709F, 8726F, and 9077F.

If a carrier is not able to report "F" Classification experience on a classification-by-classification basis, it is permissible to report the total experience on risks in which the "F" Classification is a governing classification. If this procedure is used

when reporting data under this Call, both the premium and incurred losses must be reported on a risk total basis. The reporting of risk total premium and individual classification losses is not permitted.

Two copies of the reporting form for the required information are provided in the package of reporting forms sent to carriers in October of each year. One copy is to be filed with NCCI and the other copy is for your records. The states (or jurisdictions) for which requested data is to be filed are listed on the attached form.

Questions regarding reporting requirements on completion of the Calls should be directed to Aggregate Ratemaking at (407) 997-4395.

A. GENERAL INSTRUCTIONS

1. Group Report

Carrier name and five-digit code must be shown on both sheets. If this is a group reporting, each carrier writing compensation must be listed individually on the form. With respect to affiliated carriers, it will be appreciated if you will follow the same method of reporting for this Calendar Call for "F" Classification experience (individual company basis or group basis) as was followed in compliance with our Annual Call for Calendar Year Experience. If this is not convenient, kindly advise us when replying to this Call that you have changed procedure. Please note, however, that the experience of stock and non-stock carriers should not be combined in a report.

2. Standard Earned Premiums at NCCI Designated Statistical Reporting Level

Standard earned premiums shall be the entire "F" Classification earned premium for the state resulting from standard rating procedures after the application of:

1. Experience rating plan adjustments (NOTE: Except for Michigan experience, experience rating plan adjustments must reflect only NCCI published modification factors.)
2. Expense Constants (These are the Expense Constants published by NCCI or an independent bureau. For Voluntary Business in pure premium states, Expense Constants at the NCCI DSR level are 0.)
3. Loss Constants (These are the Loss Constants published by NCCI or an independent bureau. For Voluntary Business in pure premium states, Loss Constants at the NCCI DSR level are 0.)

but prior to the application of:

1. Deviations from NCCI Designated Statistical Reporting rates or pure premiums
2. Deviations from published NCCI experience rating plan modification factors (Except Michigan)
3. Retrospective rating plan adjustments

4. Other individual risk rating plan adjustments***
(e.g., Schedule Rating)
5. Premium discounts
6. Expense modification program adjustments
7. Payment of policyholder dividends
- * 8. Premium credits for small deductible coverage

* Carriers must report their Standard Earned Premium at NCCI's experience rating plan level for all states except Michigan. If carriers use their own experience rating plan in Michigan, they may report their Standard Earned Premium at their own experience rating plan level.

** Rates: Arkansas, Connecticut, Georgia, Illinois, Indiana, New Mexico, Rhode Island, Vermont
Pure Premiums: Kentucky, Louisiana (policies effective 4/1/89 and subsequent), Maryland, Michigan, Oregon

*** Note that premium adjustments resulting from the application of individual risk rating plans other than experience rating must be excluded from both Standard Earned Premium at Company Level and Standard Earned Premium at NCCI Designated Statistical Reporting Level.

3. Standard Earned Premium at Company Level

The earned premium on all risks after the application of:

1. Deviations from NCCI Designated Statistical Reporting rates or pure premiums*
2. Experience rating plan adjustments (NOTE: Except for Michigan experience, experience rating plan adjustments must reflect only NCCI published modification factors.)**
3. Expense Constants (Carrier-charged Expense Constants)
4. Loss Constants (Carrier-charged Loss Constants)

but prior to the application of:

1. Deviations from published NCCI experience rating plan modification factors (except Michigan)**
2. Retrospective rating plan adjustments
3. Other individual risk rating plan adjustments***
(e.g., Schedule Rating)
4. Premium discounts
5. Expense modification program adjustments
6. Payment of policyholder dividends
- * 7. Premium credits for small deductible coverage

For every state in which Standard Earned Premium at DSR Level is reported, Standard Earned Premium at Company Level must be reported as well.

* Rates: Arkansas, Connecticut, Georgia, Illinois, Indiana, New Mexico, Rhode Island, Vermont

Pure Premiums: Kentucky, Louisiana (policies effective 4/1/89 and subsequent), Maryland, Michigan, Oregon

** Carriers must report their Standard Earned Premium at NCCI's experience rating plan level for all states except Michigan. If carriers use their own experience rating plan in Michigan, they may report their Standard Earned Premium at their own experience rating plan level.

*** Note that premium adjustments resulting from the application of individual risk rating plans other than experience rating must be excluded from both Standard Earned Premium at Company Level and Standard Earned Premium at NCCI Designated Statistical Reporting Level.

4. Carriers Writing in Competitive Rating States

For Arkansas, Connecticut, Georgia, Illinois, Indiana, Kentucky, Louisiana, Maryland, Michigan, New Mexico, Oregon, Rhode Island and Vermont, carriers must enter the Standard Earned Premium at NCCI Designated Statistical Reporting Level and at Company Level in the appropriate columns on the form. Please reference the enclosed circular titled "Annual Update on Designated Statistical Reporting Levels."

5. Carriers Writing at Deviations from NCCI Rates in Administered Pricing States

For State Funds and other carriers writing at deviations from Bureau rates in non-competitive rating states, the Standard Earned Premium must be adjusted to Bureau rate level and reported in the column labeled "Standard Earned Premium at NCCI Designated Statistical Reporting Level." The Standard Earned Premium at the carrier rate level must be reported in the column labeled "Standard Earned Premium at Company Level."

Carriers that do not deviate from NCCI rates must enter their Standard Earned Premium in the column labeled "Standard Earned Premium at NCCI Designated Statistical Reporting Level" and must enter the same figure in the column labeled "Standard Earned Premium at Company Level."

Also note that when premium credits have been granted in connection with the transition program of payroll limitation rules, both reported Standard Earned Premium figures shall be reduced by such credits.

6. Net Earned Premium

Net earned premiums shall be the actual "F" Classification earned premium on all risks prior to the payment of policyholder dividends, but after application of any retrospective rating premium adjustments, after the application of premium discounts in accordance with Manual Rules, after the expense modification program, and after any deviation or "write-offs" from Bureau rates.

7. Incurred Losses

Losses reported by state should include compensation and medical incurred during this calendar year period. For further details on the inclusion or exclusion of certain losses and/or reserves, please refer to the specific instructions below.

8. Rounding Procedure and Reporting of Credits

Please report amounts of premiums and losses in whole dollars only. Count fifty cents and over as an extra dollar, and reject the cents if less than fifty. Please show negative amounts enclosed within parentheses so that they may be handled properly in punching and tabulating operations.

9. Total Experience

Kindly show the totals of all amounts reported on the last line of sheet 2 captioned "All States."

10. Signature Requirement

The person responsible for the completion and accuracy of this Call should sign and date the reporting form.

11. Full Submission

Report should include ALL States in which company has data to report. Resubmission or correction must also include all states, not just revised states.

B. SPECIFIC INSTRUCTIONS

1. "F" Classifications

This Call is exclusively for experience of the "F" Classifications for policies effective January 1, 1974 and thereafter.

2. Excess Policies

Experience on excess policies **MUST BE EXCLUDED.**

3. National Defense Projects

Experience on National Defense Projects written under the old Comprehensive Rating Plan or the new National Defense Projects Rating Plan **MUST BE EXCLUDED.** Experience incurred on a Defense Base should be included unless written under the National Defense Projects Rating Plan.

4. Reinsurance

No deductions shall be made from premiums and losses for or on account of reinsurance ceded. Premiums and losses arising from reinsurance received by the reporting company shall be excluded from the experience. Experience reported should be **DIRECT BUSINESS ONLY.**

5. Assigned Risk

Experience for assigned risk policies must be **INCLUDED.** Assigned risk policies must be reported at the level of approved assigned risk rates.

6. IBNR

Losses reported by state should include an appropriate reserve for incurred but not reported cases.

7. Reopened Cases

Include an appropriate loss reserve for reopened cases.

8. Reserves for Specific Contingencies

Include medical and other loss reserves to meet specific contingencies.

9. Other Voluntary Reserves

Exclude voluntary reserves other than those mentioned above.

10. Expenses

Exclude all expenses, either allocated or unallocated, except allocated Coverage B loss adjustment expense.

11. Assessments and Special Compensation Funds

The inclusion of assessments and other compensation special funds as incurred losses in the "F" Classification Calendar Year Call follows the same instructions that apply in reporting of experience under NCCI's Calendar Year Call for Compensation Experience.

12. Small Deductible Programs ★

In states in which small deductible programs apply, losses are to be reported on a gross basis inclusive of the employer paid loss amount.

13. Alternate Procedure for Reporting "F" Classification Experience

In a meeting of the Special Committee on Ratemaking held on May 1, 1974, it was agreed that when a company is not able to make a report on a classification by classification basis, an alternative procedure would be the reporting of experience on risks when an "F" Classification was a governing classification. Note that both total risk premium and total risk losses must be reported if this option is used.

14. Taxes and Assessments in Kentucky

Taxes and assessments on premiums earned in Kentucky on or after January 1, 1977 **MUST BE EXCLUDED.**

15. Oregon Assessments

Assessments on premiums written or earned in Oregon on or after July 15, 1982 must be excluded. This is pursuant to the requirements of OAR 436-51-025 and 51-030(2) contained in WCD Administrative Order 8-1982.

Please note that the date for reporting this data is on or before April 15 of each year. It is urged that every effort be made to comply with this reporting date as a delay in receiving this data will seriously hamper NCCI in its preparation of rate revisions. Please mail this Call to:

National Council on Compensation Insurance
750 Park of Commerce Drive
Boca Raton, Florida 33487

ATTENTION: FINANCIAL DATA

NATIONAL COUNCIL ON COMPENSATION INSURANCE
"F" CLASSIFICATION CALENDAR YEAR CALL FOR
COMPENSATION EXPERIENCE BY STATE—CALENDAR YEAR BASIS

CARRIER* _____ CARRIER CODE

SUBMITTED BY _____ TITLE _____

TELEPHONE NO. _____ DATE SUBMITTED _____

		EARNED PREMIUMS			
State		Standard at NCCI Designated Statistical Reporting Level (1)	Standard at Company Level (2)	Net (3)	Incurred Losses (4)
AL	01				
AK	54				
AZ	02				
AR	03				
CA	04				
CO	05				
CT	06				
DE	07				
DC	08				
FL	09				
GA	10				
HI	52				
ID	11				
IL	12				
IN	13				
IA	14				
KS	15				
KY	16				
LA	17				
ME	18				
MD	19				
MA	20				
MI	21				

* If this is a group report, list all carrier names or carrier codes for which any experience is reported.

SHOW AMOUNTS IN DOLLARS ONLY

NATIONAL COUNCIL ON COMPENSATION INSURANCE
"F" CLASSIFICATION CALENDAR YEAR CALL FOR
COMPENSATION EXPERIENCE BY STATE—CALENDAR YEAR BASIS

Page 2

CARRIER* _____ CARRIER CODE

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 SUBMITTED BY _____ TITLE _____
 TELEPHONE NO. _____ DATE SUBMITTED _____

		EARNED PREMIUMS		
State	Standard at NCCI Designated Statistical Reporting Level (1)	Standard at Company Level (2)	Net (3)	Incurred Losses (4)
MS	23			
MO	24			
MT	25			
NE	26			
NH	28			
NJ	29			
NM	30			
NY	31			
NC	32			
OK	35			
OR	36			
PA	37			
RI	38			
SC	39			
SD	40			
TN	41			
TX	42			
UT	43			
VT	44			
VA	45			
WI	48			
All Other	99			
TOTAL	00			

SHOW AMOUNTS IN DOLLARS ONLY

TRANSMITTAL LETTER

1. CALL: "F" CLASSIFICATION CALENDAR YEAR CALL FOR COMPENSATION
EXPERIENCE BY STATE—CALENDAR YEAR BASIS

2. DUE DATE: April 15 of the following year

3. CARRIER NAME _____ 4. CARRIER CODE

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5. FILING AS: GROUP INDIVIDUAL COMPANY

6. If filing as a group, list individual carrier names or carrier codes:

7. SUBMISSION TYPE:

Original

Correction

Voluntary Resubmission

MAIL CALL AND TRANSMITTAL LETTER TO:

NATIONAL COUNCIL ON COMPENSATION INSURANCE

750 PARK OF COMMERCE DRIVE

BOCA RATON, FL 33487

ATTN: FINANCIAL DATA

NCCI USE ONLY
Date Received

Receipt Mailed

NATIONAL COUNCIL ON COMPENSATION INSURANCE
RECEIPT OF CALL NOTIFICATION

8. CALL: "F" CLASSIFICATION CALENDAR YEAR CALL FOR COMPENSATION
EXPERIENCE BY STATE—CALENDAR YEAR BASIS

9. DUE DATE: April 15 of the following year

10. DATE RECEIVED AT NCCI _____ BY _____

11. MAIL RECEIPT TO: (Indicate specific individual)

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Statistical Call Overview Document

STATISTICAL CALL NAME:

"F" Classification Policy Year Call For Compensation Experience (Call #11)

DESCRIPTION OF CALL:

This call contains dollar amounts for workers compensation Standard Earned Premium at NCCI DSR level, Standard Earned Premium at Company level, Net Earned Premium, and Total Incurred Losses by Policy Year for each state in which NCCI produces rate levels. The Total Incurred Losses are broken down to Paid, Outstanding excluding IBNR, and IBNR on page 1. Each of these components is further broken down into its indemnity and medical components and reported along with the Indemnity Claim Count on page 2. In addition, Indemnity and Medical Outstanding excluding IBNR are separated into case and bulk reserves on page 3. Each NCCI member carrier is required to submit this information for each state in which they operate and for which NCCI produces rate levels. Some states require all carriers writing workers compensation policies to submit financial calls.

The "F" Classification Policy Year Call for Compensation Experience is used to determine Industrial Classification market share for use in premium on-level calculations.

FILES/DATABASES:

"F" Classification Policy Year Call Production File:

This file serves as the central repository for "F" Classification Policy Year Call data. This file contains all data received from the carriers as well as corrections applied to this data. Corrections to the file are made via ACS for data entry of revised reports with electronic transfer of the data to NCCI for incorporation into the production file.

DESCRIPTION OF ERROR HANDLING:

"F" Classification Policy Year data is not currently validated.

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Statistical Call Overview Document

MODIFICATIONS TO DATA:

"F" Classification Policy Year data is not currently modified.

2. State

List both the name of the state and the state code number on each state's data submission. Only one state per reporting sheet is allowed.

3. Accumulated Standard Earned Premium at NCCI Designated Statistical Reporting Level

As in last year's Call you are required to report the Accumulated Standard Earned Premium for each of the indicated policy years. Specifically, for any given policy year you are to report the entire "F" Classification Standard Earned Premium since policy inception through December 31 of the current year for those policies becoming effective during the policy year being reported.

For each policy year indicated, the Accumulated Standard Earned Premiums shall be the "F" Classification Accumulated Earned Premium for that particular policy year resulting from standard rating procedures after the application of:

1. Experience rating plan adjustments (NOTE: Except for Michigan experience, experience rating plan adjustments must reflect only NCCI published modification factors.)*
2. Expense Constants (These are the Expense Constants published by the NCCI or an independent bureau. For Voluntary Business in pure premium states, Expense Constants at NCCI DSR level are 0.)
3. Loss Constants (These are the Loss Constants published by NCCI or an independent bureau. For Voluntary Business in pure premium states, Loss Constants at NCCI DSR level are 0.)

but prior to the application of:

1. Deviations from NCCI Designated Statistical Reporting rates or pure premiums**
2. Deviations from published NCCI experience rating plan modification factors (Except Michigan)*
3. Retrospective rating plan adjustments
4. Other individual risk rating plan adjustments*** (e.g., Schedule Rating)
5. Premium discounts
6. Expense modification program adjustments
7. Payment of policyholder dividends
8. Premium credits for small deductible coverage

* Carriers must report their Standard Earned Premium at NCCI's experience rating plan level for all states except Michigan. If carriers use their own experience rating plan in Michigan, they may report their Standard Earned Premium at their own experience rating plan level.

** Rates: Arkansas, Connecticut, Georgia, Illinois, Indiana, New Mexico, Rhode Island, Vermont
Pure Premiums: Kentucky, Louisiana (policies effective 4/1/89 and subsequent), Maryland, Michigan, Oregon

*** Note that premium adjustments resulting from the application of individual risk rating plans other than experience rating must be excluded from both Standard Earned Premium at Company Rate Level and Standard Earned Premium at NCCI Designated Statistical Reporting Level.

4. Standard Earned Premium at Company Level

The earned premium on all risks after the application of:

1. Deviations from NCCI Designated Statistical Reporting rates or pure premium*
2. Experience rating plan adjustments (NOTE: Except for Michigan experience, experience rating plan adjustments must reflect only NCCI published modification factors)**
3. Expense Constants (Carrier-charged Expense Constants)
4. Loss Constants (Carrier-charged Loss Constants)

but prior to the application of:

1. Deviations from published NCCI experience rating plan modification factors (Except Michigan)**
2. Retrospective rating plan adjustments
3. Other individual risk rating plan adjustments*** (e.g., Schedule Rating)
4. Premium discounts
5. Expense modification program adjustments
6. Payment of policyholder dividends
7. Premium credits for small deductible coverage

For every policy year in which Standard Earned Premium at DSR Level is reported, Standard Earned Premium at Company Level must be reported as well.

* Rates: Arkansas, Connecticut, Georgia, Illinois, Indiana, New Mexico, Rhode Island, Vermont

Pure Premiums: Kentucky, Louisiana (policies effective 4/1/89 and subsequent), Maryland, Michigan, Oregon

** Carriers must report their Standard Earned Premium at NCCI's experience rating plan level for all states except Michigan. If carriers use their own experience rating plan in Michigan, they may report their Standard Earned Premium at their own experience rating plan level.

*** Note that premium adjustments resulting from the application of individual risk rating plans other than experience rating must be excluded from both Standard Earned Premium at Company Level and Standard Earned Premium at NCCI Level.

CALL FOR EXPERIENCE #11
"F" CLASSIFICATION POLICY YEAR CALL

Background and Purpose of the Report

The "F" Classification Policy Year Call is due at NCCI on or before April 15 of the year following the most recent policy year. As an example, the "F" Class Policy Year Call valued as of 12/31/90 is due at NCCI on or before April 15, 1991.

In the past, for each annual call year, the most recent eight (8) full years of individual policy years must be reported separately by state. Prior to the eight (8) most recent full years, the total of all "prior to" policy years are grouped together. However, effective with Calls valued as of December 31, 1987, this call will retain the oldest data year. As an example, the Policy Year Call valued as of 12/31/87 will retain the 1978 and prior to data as well as requesting data for 1987. This phased-in retention will result in the collection of 15 full underwriting years of data with calls reported in 1994. The definition of Policy Year refers to a way of organizing financial data based upon policy effective date. As an example, Policy Year 1990 is comprised of all policies with effective dates initiating in 1990 from 1/1/90 to 12/31/90. Additionally, all claims which develop for these policy years reported back to the policy effective year, irrespective of the year the claim arose.

The specific data to be reported in this Call are 27 "F" Classes, identified on the first page of the call for experience. The call indicates that if a carrier is not able to report "F" Class experience on a class-by-class basis, it is permissible to report the total experience on risks when the "F" Class is the governing classification.

Currently, this "F" Classification data is used for "F" Class rate level analysis in the state of Louisiana. This data also has the potential to be used in the ratemaking process for other states as well.

Data collected in the "F" Classification Policy Year Call includes earned premium and incurred losses on a state basis. Policy Year Earned premiums are separated between Standard At NCCI DSR Level, Standard At Company Level, and Net Earned. Policy Year incurred losses include incurred indemnity claim count and indemnity and medical total for paid losses, outstanding losses excluding IBNR, case and bulk reserves in the outstanding losses excluding IBNR, IBNR and total incurred losses.

The data reported in this call should *exclude* experience ★ developed under large deductible policies (deductible amount over \$100,000 per claim or per accident).

The Calendar Year Reconciliation Report (Call #8) has ★ been revised to add lines to reconcile premium and losses to Page 14 of the Annual Statement due to the exclusion of the large deductible policies.

Filing Requirements

"F" Classification Policy Year Call for Compensation Experience by State Valued as of December 31 of the Current Year—due April 15 of the following year

In accordance with the approved statistical program you are hereby requested to file with NCCI on or before April 15 of each year your "F" Classification experience by policy year valued as of December 31 of the prior year. Experience included in this Call should be for policies effective January 1, 1974 and subsequent.

This Call continues the phased-in expansion of the "F" Classification Policy Year Call to ultimately collect 15 full underwriting years of data. This "F" Classification Policy Year Call to be reported in 1990 retains the oldest data year (1978) and includes the current year, thus requiring the collection of a total of 11 full underwriting years of data to be reported in 1990. This phased-in retention will continue until 15 full underwriting years of data are collected.

The specific "F" Classifications involved in this Call are: 6801F, 6803F, 6824F, 6825F, 6826F, 6827F, 6828F, 6829F, 6843F, 6845F, 6846F, 6869F, 6872F, 6873F, 6874F, 6875F, 7309F, 7313F, 7317F, 7323F, 7327F, 7350F, 7352F, 7366F, 8709F, 8726F, and 9077F.

If a carrier is not able to report "F" Classification experience on a classification-by-classification basis, it is permissible to report the total experience on risks when the "F" Classification is a governing classification. If this procedure is used when reporting data under this Call, both the premium and incurred losses must be reported on a risk total basis. The reporting of risk total premium and individual classification losses is not permitted.

Two copies of the reporting form for the required information are provided in the package of reporting forms sent to carriers in October of each year. Since a separate form is required for each state, carriers are asked to reproduce these forms within their organizations.

Questions regarding reporting requirements on completion of the Calls should be directed to Aggregate Ratemaking at (407) 997-4395.

A. GENERAL INSTRUCTIONS

1. Group Report

Carrier name and five-digit code must be shown on each reporting form. If this is a group reporting, each carrier writing compensation must be listed individually on the reporting form. List the carrier names or carrier codes of those companies that have direct business during at least one of the policy years for which data is required in a given state. Carriers are requested to submit the "F" Classification Policy Year Call on the same basis (i.e., group report or individual company report) as the "F" Classification Calendar Year Call. This will facilitate reconciliation of carrier data.

5. Carriers Writing in Competitive Rating States

For Arkansas, Connecticut, Georgia, Illinois, Indiana, Kentucky, Louisiana, Maryland, Michigan, Oregon, Rhode Island and Vermont, carriers must enter the Standard Earned Premium figures at NCCI Designated Statistical Reporting Level and at Company Level in the appropriate columns on the form. Please reference the enclosed circular titled "Annual Update on Designated Statistical Reporting Levels."

6. Carriers Writing at Deviations from NCCI Rates in Administered Pricing States

For State Funds and other carriers writing at deviations from Bureau rates in non-competitive rating states, the Standard Earned Premium must be adjusted to Bureau rate level and reported in the column labeled "Standard Earned Premium at NCCI Designated Stat. Reporting Level." The Standard Earned Premium at the carrier rate level must be reported in the column labeled "Standard Earned Premium at Company Level."

Carriers that do not deviate from NCCI rates must enter their Standard Earned Premium in the column labeled "Standard Earned Premium at NCCI Designated Stat. Reporting Level" and must enter the same figure in the column labeled "Standard Earned Premium at Company Level."

Note that when premium credits have been granted in connection with the Transition Program of payroll limitation rules, both reported Standard Earned Premium figures shall be reduced by such credits.

7. Accumulated Net Earned Premium

As in last year's Call, you are required to report the accumulated net earned premium for each of the indicated policy years. Specifically, for any given policy year, you are to report the entire "F" Classification net earned premium since policy inception through December 31, 1988 for those policies becoming effective during the policy year being reported.

For each policy year indicated, the accumulated net earned premium shall be the "F" Classification accumulated actual earned premium on all risks prior to the payment of policyholder dividends; but after application of any retrospective rating premium adjustments, after the application of premium discounts in accordance with Manual rules, after the expense modification program, after any deviations or "write-offs" from Bureau rates or pure premiums and after the application of any schedule rating premium adjustments.

8. Accumulated Incurred Losses

As in previous "F" Classification Policy Year Calls, you are required to report "F" Classification accumulated total incurred losses (i.e., from date of inception through December 31 of each year). The Call further

requires that accumulated total incurred losses be split into the following components: accumulated indemnity losses (separately for paid, Outstanding Excluding IBNR—Case and Bulk, and IBNR) and accumulated medical losses (separately for paid, Outstanding Excluding IBNR Case and Bulk, and IBNR). It should be noted that all carriers are required to report incurred losses split between indemnity and medical on a mandatory basis.

The Outstanding Excluding IBNR category is designed to capture case reserves and bulk reserves. For the purposes of this Call, the following working definitions may be used by carriers:

Case Reserves—Those outstanding reserves established for specific known cases that would be reported in an aggregate amount to reflect the total case reserve for the company.

Bulk Reserves—Those outstanding reserves for general case reserve inadequacy, supplemental case reserves, cases that may reopen, or other reserves which are not associated to specific claims.

The goal of this reporting is to clearly isolate case reserves without impacting the carrier methodology of reporting IBNR. Carriers should not alter the mix of data that has historically been allocated to IBNR, since doing so would adversely impact the NCCI development of IBNR data.

For this reason, carriers reporting bulk reserves in IBNR should continue to do so. On the Outstanding Excluding IBNR Page 3 Reporting Form, these carriers should respond "Yes" to the question in Note A. In addition, carriers with no bulk reserves should also respond "Yes" to the question in Note A.

Those carriers reporting bulk reserves in the Outstanding Excluding IBNR category, should respond "No" to the question in Note A of the Outstanding Excluding IBNR Page 3 Reporting Form. These carriers should have data reported in both the case reserves and bulk reserves.

The Case and Bulk Reserve Reporting Form accommodates carriers allocating this data on an ACTUAL basis as well as ESTIMATED basis. The reporting form contains a coding box to indicate the actual versus estimated method of allocation.

9. Incurred Indemnity Claim Count

The incurred indemnity claim count (i.e., the accumulated number of claims for which an indemnity payment has been made and/or an outstanding reserve exists) must be reported on a mandatory basis for policy years 1981 and subsequent. (Those carriers that are in a position to do so are requested to report the incurred indemnity claim count for as many policy

years prior to 1981 as possible.) The indemnity claim counts should exclude claims that start out with an indemnity reserve, but were resolved as medical only claims or closed without payment. Also, indemnity claim count should include claims that start out as medical only but are resolved as indemnity at future evaluations. If indemnity claims are reopened, they should not be added to the claim count.

10. No Experience

State reports should not be submitted for any state in which the carrier(s) has (have) never had experience. In instances that for one or more, but not all, of the 1978-1989 Policy Years the carrier(s) failed to have experience in a given state, indicate "NO "F" CLASSIFICATION EXPERIENCE" across the appropriate Policy Year line(s) on that state.

11. Questionnaire

The questionnaire must be completed. Submit only one questionnaire per submission. A separate questionnaire per state is no longer required.

12. Signature Requirement

The person responsible for the completion and accuracy of this Call is only required on the first state's reporting form and does not have to be repeated on every state's form.

13. States for Which the Reporting of "F" Classification Experience is Required:

State	Code	State	Code
Alabama	01	Michigan	21
Alaska	54	Mississippi	23
Arizona	02	Missouri	24
Arkansas	03	Montana	25
Colorado	05	Nebraska	26
Connecticut	06	New Hampshire	28
Dist. of Columbia	08	New Mexico	30
Florida	09	North Carolina	32
Georgia	10	Oklahoma	35
Hawaii	52	Oregon	36
Idaho	11	Rhode Island	38
Illinois	12	South Carolina	39
Indiana	13	South Dakota	40
Iowa	14	Tennessee	41
Kansas	15	Texas	42
Kentucky	16	Utah	43
Louisiana	17	Vermont	44
Maine	18	Virginia	45
Maryland	19	Wisconsin	48

14. Rounding Procedure and Reporting of Credits

Please report amounts of premiums and losses in whole dollars only. Count fifty cents and over as an extra dollar, and reject the cents if less than fifty. Please show negative amounts enclosed within parentheses so that they may be handled properly in punching and tabulating operations.

15. Complete Submission

A complete call submission per state must include all three pages. Page 3 must be completed for each state in which the carrier reports experience.

B. SPECIFIC INSTRUCTIONS

1. "F" Classifications

This Call is exclusively for experience of the "F" Classifications for policies effective January 1, 1974 and thereafter.

2. Excess Policies

Experience on excess policies MUST BE EXCLUDED.

3. National Defense Projects

Experience on National Defense Projects written under the old Comprehensive Rating Plan or the new National Defense Projects Rating Plan MUST BE EXCLUDED. Experience incurred on a Defense Base should be included unless written under the National Defense Projects Rating Plan.

4. Reinsurance

No deductions shall be made from premiums and losses for or on account of reinsurance ceded. Premiums and losses arising from reinsurance received by the reporting company shall be excluded from the experience. Experience reported should be DIRECT BUSINESS ONLY.

5. Assigned Risk

Experience for assigned risk policies must be INCLUDED. Assigned risk policies must be reported at the level of approved assigned risk rates.

6. IBNR

Losses reported by state should include an appropriate reserve for incurred but not reported cases. The IBNR reserve must be reported separately for indemnity and medical.

Commencing with "F" Classification Policy Year Call valued as of December 31, 1986, the Outstanding Excluding IBNR category has been further refined to capture case reserves and bulk reserves.

This reporting clearly isolates case reserves without impacting the carrier methodology of reporting IBNR. Carriers should not alter the mix of data historically allocated to IBNR, since doing so would adversely impact the NCCI development of IBNR data.

For this reason, carriers who have reported bulk reserves in IBNR should continue to do so. On the Outstanding Excluding IBNR Page 3 Reporting Form, these carriers should respond "Yes" to the question in Note A.

7. Reopened Cases

Include an appropriate loss reserve for reopened cases.

8. Reserves for Specific Contingencies

Include medical and other loss reserves to meet specific contingencies.

9. Other Voluntary Reserves

Exclude voluntary reserves other than those mentioned above.

10. Expenses

Exclude all expenses, either allocated or unallocated, except allocated Coverage B loss adjustment expense.

11. Assessments and Special Compensation Funds

The inclusion of assessments and other compensation special funds as incurred losses in the "F" Classification Policy Year Call follow the same instructions that apply in reporting of experience under NCCI's Calendar Year Call for Compensation Experience.

12. Small Deductible Programs ★

In states in which small deductible programs apply, losses are to be reported on a gross basis inclusive of the employer paid loss amount.

13. Alternate Procedure for Reporting "F" Classification Experience

In a meeting of the Special Committee on Ratemaking held on May 1, 1974, it was agreed that when a company is not able to make a report on classification by classification basis, an alternative procedure would be the reporting of experience on risks in which an "F" Classification was a governing classification. Note that both total risk premium and total risk losses must be reported if this option is used.

14. Taxes and Assessments in Kentucky

Taxes and assessments on premiums earned in Kentucky on or after January 1, 1977 MUST BE EXCLUDED.

Please note that the date for reporting this data is April 15 of each year. It is urged that every effort be made to comply with this reporting date as a delay in receiving this data will seriously hamper NCCI in its preparation of rate revisions. Please mail this Call to:

National Council on Compensation Insurance
750 Park of Commerce Drive
Boca Raton, Florida 33487

ATTENTION: FINANCIAL DATA

NATIONAL COUNCIL ON COMPENSATION INSURANCE Page 1
 "F" CLASSIFICATION POLICY YEAR CALL FOR COMPENSATION EXPERIENCE BY STATE VALUED AS OF DECEMBER 31 OF EACH YEAR

CARRIER(S)* _____ CARRIER CODE NUMBER _____
 STATE NAME _____ STATE CODE NUMBER _____

Policy Year	SUBMITTED BY		Standard AI NCCI Designated Stat. Reporting Level (1)	Policy Year Accumulated Earned Premium		Net (3)	Paid (9) + (10) (4)	Accumulated Policy Year Incurred Losses - Total		Incurred Losses Including IBNR (4) + (5) + (6) (7)
	Standard AI Company Level (2)	Title		Telephone No	Date Submitted			Outstanding Excluding IBNR (11) + (12) (5)	IBNR (13) + (14) (6)	
A. Prior to 1978										
B. 1978										
C. 1979										
D. 1980										
E. 1981										
F. 1982										
G. 1983										
H. 1984										
I. 1985										
J. 1986										
K. 1987										
L. 1988										
M. 1989										
N. 1990										
O. 1991										
P. 1992										
Q. 1993										
R. Total To Current Year										
S. Total To Last Year										
T. Current Calendar Year Experience (R-S)										

* If this is a group report, list all carrier names or carrier codes for which any experience is reported

NATIONAL COUNCIL ON COMPENSATION INSURANCE
Reporting Guidebook for the Annual Calls for Experience

Effective January 1, 1990

Part IV
Page 11:9

Original Printing

Page 2

NATIONAL COUNCIL ON COMPENSATION INSURANCE

"F" CLASSIFICATION POLICY YEAR CALL FOR COMPENSATION EXPERIENCE BY STATE VALUED AS OF DECEMBER 31 OF EACH YEAR

CARRIER(S) _____ CARRIER CODE NUMBER _____

STATE NAME _____ STATE CODE NUMBER _____

CARRIER(S)

STATE NAME

ACCUMULATED POLICY YEAR INCURRED LOSSES

Policy Year	Incurred Indemnity Claim Count (8)	Paid		Outstanding Excluding IBNR		IBNR	
		Indemnity (9)	Medical (10)	Indemnity (11)	Medical (12)	Indemnity (13)	Medical (14)
A Prior to 1978							
B 1978							
C 1979							
D 1980							
E 1981							
F 1982							
G 1983							
H 1984							
I 1985							
J 1986							
K 1987							
L 1988							
M 1989							
N 1990							
O 1991							
P 1992							
Q 1993							
R Total to Current Year							
S Total to Last Year							
T Current Calendar Year Experience (R-S)							

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 "F" CLASSIFICATION POLICY YEAR CALL FOR COMPENSATION EXPERIENCE
 BY STATE VALUED AS OF DECEMBER 31 OF EACH YEAR

CARRIER(S) _____ CARRIER CODE NUMBER _____
 STATE NAME _____ STATE CODE NUMBER _____

Policy Year	Outstanding Excluding IBNR Indemnity		Outstanding Excluding IBNR Medical	
	Case (15)	Bulk (16)	Case (17)	Bulk (18)
A. Prior to 1978				
B. 1978				
C. 1979				
D. 1980				
E. 1981				
F. 1982				
G. 1983				
H. 1984				
I. 1985				
J. 1986				
K. 1987				
L. 1988				
M. 1989				
N. 1990				
O. 1991				
P. 1992				
Q. 1993				
R. Total to Current Year				
S. Total to Last Year				
T. Current Calendar Year Experience (R-S)				

NOTE:

A. Does your company currently report all bulk reserves for indemnity and medical under the IBNR columns on page 2? Indicate by placing an "X" in the appropriate space below.
 ___ No ___ Yes

If "No," data should be reported in Columns 15 through 18. If "Yes," Columns 15 through 18 should be left blank.

B. If your company currently reports any bulk reserves for indemnity and medical under the outstanding excluding IBNR columns of page 2 then:
 1. Columns 15 + 16 on this page must equal Column 11 on page 2.
 2. Columns 17 + 18 on this page must equal Column 12 on page 2.

Please indicate if the amounts shown on this page are actual or estimated by placing an "x" in the appropriate space provided below.

___ Actual ___ Estimated

C. If you have provided estimated amounts, will your company be able to provide NCCI with actual amounts in subsequent reports?

___ No ___ Yes

NATIONAL COUNCIL ON COMPENSATION INSURANCE
"F" CLASSIFICATION POLICY YEAR CALL QUESTIONNAIRE

Page 4

CARRIER NAME _____

CARRIER CODE _____

1. Does Line R from the previous call correspond to that reported on Line S from the current call?

Yes No. If no, please explain why for every state.

2. Does Line T agree with the current years' Calendar Year Call submitted by your company for all states?

Yes No. If no, please reconcile every state.

3. If a credit appears in Columns (1) through (5), (7) through (12), or (15) through (18) on Lines E through M, please explain why for every state.

TRANSMITTAL LETTER

1. CALL: "F" CLASSIFICATION POLICY YEAR CALL FOR COMPENSATION EXPERIENCE BY
STATE VALUED AS OF DECEMBER 31 OF EACH YEAR

2. DUE DATE: April 15, of the following year

3. CARRIER NAME _____ 4. CARRIER CODE

--	--	--	--	--	--

5. FILING AS: GROUP INDIVIDUAL COMPANY

6. If filing as a group, list individual carrier names or carrier codes:

7. SUBMISSION TYPE:

Original Correction Voluntary Resubmission

8. SUBMISSION CONTENT:

Full Partial and Not Final Partial and Final

9. Number of states included _____

10. Number of pages _____

MAIL CALL AND TRANSMITTAL LETTER TO:

NATIONAL COUNCIL ON COMPENSATION INSURANCE

750 PARK OF COMMERCE DRIVE

BOCA RATON, FL 33487

ATTN: FINANCIAL DATA

NCCI USE ONLY
Date Received

Receipt Mailed

NATIONAL COUNCIL ON COMPENSATION INSURANCE
RECEIPT OF CALL NOTIFICATION

8. CALL: "F" CLASSIFICATION POLICY YEAR CALL FOR COMPENSATION EXPERIENCE BY
STATE VALUED AS OF DECEMBER 31 OF EACH YEAR

9. DUE DATE: April 15 of the following year

10. DATE RECEIVED AT NCCI _____ BY _____

11. MAIL RECEIPT TO: (Indicate specific individual)

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Statistical Call Overview Document

STATISTICAL CALL NAME:

Calendar Year Expense Call (Call #14)

DESCRIPTION OF CALL:

This call contains dollar amounts for workers compensation premiums, losses and expenses. Each NCCI member carrier is required to submit this by state for all the states in which they operate. Some states require all carriers writing workers compensation policies to submit financial calls.

The Calendar Year Expense Call is used to determine target cost ratios and to help support expense allowances in rate filings.

FILES/DATABASES:

Calendar Year Expense Call Production File:

This file serves as the central repository for Calendar Year Expense Call data. This file contains all data received from the carriers as well as corrections applied to this data. Corrections to the file are made via ACS data entry of revised reports with electronic transfer of the data to NCCI for incorporation into the production file.

DESCRIPTION OF ERROR HANDLING:

Calendar Year Expense data is validated using automated reports when the data is received from the carrier.

Carriers are sent written correspondence to resolve any errors identified during validation. As revised reports are received, they are checked for accuracy and then if correct are sent to ACS for processing.

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Statistical Call Overview Document

MODIFICATIONS TO DATA:

Revised reports are processed as they are received. Any data containing errors which can not be resolved in a timely manner are removed from the dataset.

All revised data is requested to be submitted on revised reports or via written correspondence. When production deadlines require an immediate response, telephone responses are accepted with the stipulation that a written confirmation of the changes also be submitted.

CALL FOR EXPERIENCE #14
CALENDAR YEAR EXPENSE DATA BY STATE

Background and Purpose of the Report

The Calendar Year Expense Data by State is due at NCCI on or before May 15 of the year following the most recent calendar year. As an example, the 1990 Call is due at NCCI on or before May 15, 1991.

For each annual call year, the most recent calendar year expense data must be reported on a state basis. Additionally, an addendum to this call requires the reporting of Maine expenses, for the purpose of capturing Safety Engineering and Loss Control expenses separately from other General expenses.

The purpose of collecting this data is to help support expense allowances in rate filings. In selected jurisdictions, data from this call is provided to regulators in conjunction with rate filings. Also, this expense data has been used in research such as studies of allocated Loss Adjustment Expense by state.

The data reported in this call should *include* expenses* related to large deductible policies (deductible amount over \$100,000 per claim or per accident).

**Call for Current Calendar Year Expense Data by State—
Due May 15 of the following year**

In accordance with the approved statistical program you are hereby requested to file with NCCI on or before May 15 of each year your Workers Compensation expense data by state for the previous calendar year. Additionally, addendums to this Call must be reported for:

1. The state of Maine pursuant to Maine House Bill 605
2. The state of Rhode Island pursuant to House Bill 6172

Attached are two sets of the reporting form for the required information. Since a separate form is required for each state, carriers are asked to reproduce these forms within their organization.

Questions regarding reporting requirements on completion of the calls should be directed to Aggregate Ratemaking at (407) 997-4395.

A. GENERAL INSTRUCTIONS

The Call for this data should be completed to include:

1. A copy for each state listed under item (14) of the instructions for those states in which your company writes workers compensation insurance.
2. A copy of ALL OTHER states combined (i.e., all jurisdictions not in 1), and
3. A copy of a total for all states combined (sum of 1 and 2). The latter should reconcile with your Countrywide Insurance Expense Exhibit.

B. SPECIFIC INSTRUCTIONS

1. **Direct Written Premiums**
To agree with Page 14 of the Annual Statement.
2. **Direct Net Earned Premiums**
To agree with Part IV of the Insurance Expense Exhibit.

3. Direct Standard Earned Premiums

This shall be the entire earned premiums for the state resulting from standard rating procedures prior to payment of policyholder dividends; prior to the application of premium discounts, prior to any applicable expense modification program, prior to application of any schedule rating modification, prior to any retrospective rating adjustments, and prior to the effects of any deviations or "write-offs" from Bureau rates or pure premiums.

In other words, report the Standard Earned Premium at NCCI Designated Statistical Reporting Level as described on the Calendar Year Call and the "F" Class Calendar Year Call for Compensation Experience by State.

4. Direct Acquisition, Field Supervision and Collection Expenses Incurred

A. Commission and Brokerage

Show amounts of Commission and Brokerage expenses incurred on the state's business, reflecting each state's Commission and Brokerage rates, subject to the Rules in Regulation 30. Indicate the basis of allocation using the allocation codes described in item (12) below.

B. All Other

(i) Branch Office—State's Share

Show actual expenses if you maintain an office within the state involved that processed only this state's business. Allocation by line of insurance must be made in accordance with Regulation 30. If you maintained a regional branch office in the state involved or any other state that processed this particular state's business along with business of other states, use the actual branch office expenses and determine the individual state's portion by appropriate allocation. In either case, indicate the basis of allocation using the allocation codes described in item (12) below.

(ii) Home Office—State's Share

Determine by appropriate allocation and indicate the basis of allocation using the allocation codes described in item (12) below.

5. Direct Losses

Both paid and incurred losses are actual amounts. Incurred should agree with Part IV of the Insurance Expense Exhibit.

6. Direct Unallocated Loss Adjustment Expense

Determine by appropriate allocation if the state's actual data is not available. In either case, please indicate

the basis of allocation using the allocation codes described in item (12) below.

7. Direct Allocated Loss Adjustment Expense

Determine by appropriate allocation if the state's actual data is not available. In either case, please indicate the basis of allocation for incurred allocated loss adjustment expenses using the allocation codes described in item (12) below. (Note: report actual amounts for paid allocated loss adjustment expense.)

8A. Direct Boards and Bureaus Expense

Determine all fees paid to Boards and Bureaus by appropriate allocation if the state's actual data is not available. In either case, please indicate the basis of allocation using the allocation codes described in item (12) below.

8B. Direct Audit, Inspection and Other General Expenses

This item includes all General Expenses other than Boards and Bureaus Expense. Determine by appropriate allocation if the state's actual data is not available. In either case, please indicate the basis of allocation using the allocation codes described in item (12) below.

9. Direct Taxes, Licenses and Fees

Show the actual state's data. This item includes the appropriate state's Premium Tax, Miscellaneous Taxes, Licenses and Fees.

10. Type of Insurer

Please identify carrier in accordance with the following table:

- N—Non-Participating Stock Companies
- P—Participating Stock Companies
- M—Mutual Companies
- R—Reciprocal Exchanges
- F—State Funds
- X—Miscellaneous Companies

Note: If this report is for a group with both participating and non-participating stock companies, please indicate the predominant type of insurer.

11. All amounts must be reported in whole dollars. Count fifty cents and over as an extra dollar, and reject cents if less than fifty.

12. Allocation Codes

Method of determining reported expense. Below is a table of allocation codes. For each item allocated, enter the code number of the basis that best describes the method used. When none of the listed bases are suitable, enter code number 7, and include an explanation of the method used on reverse side of each form. Exactly one code number should be entered in

the appropriate box for each of the items 4A, 4Bi, 4Bii, 6, 7, 8A and 8B.

Please use Actual expenses (code number 1) whenever possible

Allocation Code	Allocation Basis
1	Actual Expenses
2	Written Premium
3	Earned Premium
4	Losses
5	Salaries
6	Time Studies
7	Other, please explain on reverse side of each form.

13. Signature Requirement

The person responsible for the completion and accuracy of the Call should sign and date only the "All States Combined" page.

14. States for which Reporting on an Individual Basis is Required

State	Code No.	State	Code No.
Alabama	01	Mississippi	23
Alaska	54	Missouri	24
Arizona	02	Montana	25
Arkansas	03	Nebraska	26
Colorado	05	New Hampshire	28
Connecticut	06	New Mexico	30
Dist. of Columbia	08	North Carolina	32
Florida	09	Oklahoma	35
Georgia	10	Oregon	36
Hawaii	52	Rhode Island	38
Idaho	11	South Carolina	39
Illinois	12	South Dakota	40
Indiana	13	Tennessee	41
Iowa	14	Texas	42
Kansas	15	Utah	43
Kentucky	16	Vermont	44
Louisiana	17	Virginia	45
Maine	18	Wisconsin	48
Maryland	19	All Other	99*
Massachusetts	20	All States	00
Michigan	21		

* Include all jurisdictions not specifically listed (such as Minnesota, New York, New Jersey, etc.) under this code.

Please note that the due date for this Call is May 15 of each year. Please mail this Call to:

National Council on Compensation Insurance
750 Park of Commerce Drive
Boca Raton, Florida 33487

ATTENTION: FINANCIAL DATA

MAINE AND RHODE ISLAND ADDENDUM
CALENDAR YEAR EXPENSE DATA
REPORTING INSTRUCTIONS

I. CALENDAR YEAR EXPENSE DATA FORM

A. OVERVIEW

This form must be completed for the States of Maine and Rhode Island only, by all insurers writing Workers Compensation Insurance in Maine and Rhode Island, to comply with Maine House Bill 605 and Rhode Island House Bill 6172.

The requirements of this addendum are due **May 15 of each year**. Maine and Rhode Island data must be completed **separately**.

B. CALENDAR YEARS TO BE REPORTED

Separate Calendar Year Expense Data Forms must be completed for Calendar Year 1989 for Maine and Rhode Island.

C. REPORTING FORM DATA ELEMENTS

1. **Loss Control Services Expense**—Those expenses incurred in carrying out recommendations made to improve the quality of a risk as a result of safety engineering surveys or otherwise, including such programs as employee training seminars, equipment maintenance programs, safety incentive programs, etc.
2. **Safety Engineering Expense**—Those expenses incurred in thorough on-site inspections and review of an insured's operations in an effort to formulate a program to improve the quality of the risk.
3. **Remaining General Expenses**—That portion of General Expenses not allotted to Loss Control and Safety Engineering expense.
4. **Total General Expenses**—Those expenses incurred for fees paid to Boards and Bureaus plus Direct Audit, Inspection and all Other General Expenses. This item shows balance to Maine and Rhode Island experience reported on lines 8(A) plus (+) 8(B) on the Calendar Year Expense Data by State.
5. **Type of Insurer**—Please identify carrier in accordance with the following table:
N—Non-Participating Stock Companies
P—Participating Stock Companies
M—Mutual Companies
R—Reciprocal Exchanges
F—State Funds
X—Miscellaneous Companies

Note: If this report is for a group with both participating and non-participating stock companies, please indicate the predominant type of insurer.

D. REPORTING NOTES

1. Expense data reported should be in whole dollars only, **no cents reported**.

2. The sum of Loss Control Expenses (1), Safety Engineering Expenses (2), and Remaining General Expenses (3) should equal Total General Expenses (4).
3. Total General Expenses (4) should equal General Expenses as reported on lines (8A) and (8B) of the Call for Calendar Year Expense Data.
4. Report separate forms for the current calendar year.

II. LOSS CONTROL AND SAFETY ENGINEERING QUESTIONNAIRE

This questionnaire requests information on changes and improvements in loss control and safety engineering by each carrier writing in Maine and Rhode Island. Answer all questions, with **separate Maine and Rhode Island responses required for each calendar year**.

III. EXPLANATION OF LOSS RESERVING QUESTIONNAIRE

This questionnaire requires carriers to document the reserving policy used for Maine and Rhode Island Workers Compensation loss reserves. Also included are the interest rates accessed in determining present value to the reserves for which they apply. **Separate Maine and Rhode Island responses are required for loss reserves valued as of December 31 of each year.**

IV. RHODE ISLAND INTEREST AND PENALTIES QUESTIONNAIRE

This questionnaire requires carriers to provide information on the amount of money expended to pay back (accrued) interest to claimants and the amount of money expended to pay all penalties required by the Workers Compensation Act. The information reported should reflect all monies expended for interest and penalties during calendar year 1990.

This questionnaire is mandated for all carriers that had premium writings in Rhode Island in the year reported. If no interest or penalties were paid, complete the top of the questionnaire and indicate this by checking the no interest or penalties to report box.

If you do not write workers compensation insurance in Rhode Island and had no interest or penalties paid on previous policy years, please complete the carrier information on the top of the questionnaire and check the box that indicates no workers compensation premiums were written in Rhode Island in the year shown on the form.

V. REPORTING DUE DATE AND NCCI MAILING ADDRESS

The complete Maine and Rhode Island Calendar Year Expense Data Addendums and the Rhode Island Interest and Penalties Questionnaire for Calendar Year are due at NCCI no later than **May 15 of the following year**.

These addendums to the Calendar Year Expense Data Call should be mailed along with Call for Experience #14.

NATIONAL COUNCIL ON COMPENSATION INSURANCE
CALL FOR CALENDAR YEAR EXPENSE DATA

CARRIER* _____
 SUBMITTED BY _____
 TELEPHONE NUMBER _____
 STATE _____

CARRIER CODE

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 TITLE _____
 DATE SUBMITTED _____
 STATE CODE _____

- (1) Direct Written Premiums..... (1)
- (2) Direct Net Earned Premiums..... (2)
- (3) Direct Standard Earned Premiums..... (3)

- (4) Acquisition, Field Supervision
 Collection Expenses
 - A. Commission and Brokerage..... (4A)
 - B. All Other (i) Branch Office—State Share..... (4Bi)
 - (ii) Home Office—State Share..... (4Bii)
- (5) Direct Losses..... (5)
- (6) Unallocated Loss Adjustment Expenses..... (6)
- (7) Allocated Loss Adjustment Expenses..... (7)
- (8A) Boards and Bureau Expense..... (8A)
- (8B) Audit, Inspection and Other General Expenses..... (8B)
- (9) Taxes, Licenses and Fees..... (9)

Alloc. Code	Paid	Incurred
	XXX	
	XXX	
	XXX	
XX		
	XXX	
	XXX	
	XXX	
	XXX	

(10) Type of Insurer
 (Please use Code)..... (10)

--

* If this is a group report, list all carrier names or carrier codes for which any experience is reported.

NATIONAL COUNCIL ON COMPENSATION INSURANCE
MAINE CALENDAR YEAR EXPENSE DATA FORM
CALENDAR YEAR—BASIS

CARRIER* _____ CARRIER CODE

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SUBMITTED BY _____ TITLE _____

TELEPHONE NUMBER _____ DATE SUBMITTED _____

TO BE COMPLETED FOR THE STATE OF MAINE
IN ORDER TO COMPLY WITH MAINE HOUSE BILL NO. 605

- 1. Loss Control Expenses (1) _____
- 2. Safety Engineering Expenses (2) _____
- 3. Remaining General Expenses (3) _____
- 4. Total General Expenses** (1) + (2) + (3) (4) _____
- 5. Type of Insurer (Please use Code) (5) _____

* If this is a group report, list all carrier names or carrier codes for which any experience is reported.
** To agree with the sum of lines (8A) and (8B) on Call for Calendar Year Expense Data for the state of Maine.

NATIONAL COUNCIL ON COMPENSATION INSURANCE
RHODE ISLAND CALENDAR YEAR EXPENSE DATA FORM
CALENDAR YEAR—BASIS

CARRIER* _____ CARRIER CODE

SUBMITTED BY _____ TITLE _____

TELEPHONE NUMBER _____ DATE SUBMITTED _____

TO BE COMPLETED FOR THE STATE OF RHODE ISLAND
IN ORDER TO COMPLY WITH RHODE ISLAND HOUSE BILL NO. 6172

1. Loss Control Expenses (1) _____
2. Safety Engineering Expenses (2) _____
3. Remaining General Expenses (3) _____
4. Total General Expenses** (1) + (2) + (3) (4) _____
5. Type of Insurer (Please use Code) (5) _____

* If this is a group report, list all carrier names or carrier codes for which any experience is reported.

** To agree with the sum of lines (8A) and (8B) on Call for Calendar Year Expense Data for the state of Rhode Island.

NATIONAL COUNCIL ON COMPENSATION INSURANCE

MAINE LOSS CONTROL AND SAFETY ENGINEERING QUESTIONNAIRE—TO BE ANSWERED BY
ALL CARRIERS WRITING IN MAINE AS OF THE CURRENT CALENDAR YEAR

CARRIER* _____ CARRIER CODE _____

- A. Describe the personnel and other resources that were available for loss control and safety engineering for Workers Compensation risks in Maine for the previous Calendar Year. **Attach responses to this questionnaire.**
- B. Describe the changes and improvements that were effected during the repeated Calendar Year. If no changes or improvements were made, indicate "NONE." **Attach response to this questionnaire.**

*If this is a group report, list all carrier names or carrier codes for which any experience is reported.

NATIONAL COUNCIL ON COMPENSATION INSURANCE

MAINE EXPLANATION OF LOSS RESERVING QUESTIONNAIRE—TO BE ANSWERED BY ALL CARRIERS
WRITING IN MAINE AS OF 12/31 OF THE CURRENT YEAR

CARRIER* _____

CARRIER CODE

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Explain the reserving policy used for Maine Workers Compensation loss reserves valued as of 12/31 of the current year. This should include:

- A. Initial reserve procedure.
- B. Interest rates used for discounting losses.
- C. Description of reserve procedure for incurred but not reported (IBNR) reserves, bulk reserve adjustments not associated with a specific case.
- D. Identification of mortality, morbidity, remarriage and other tables.

Attach responses to this questionnaire.

*If this is a group report, list all carrier names or carrier codes for which any experience is reported.

NATIONAL COUNCIL ON COMPENSATION INSURANCE

RHODE ISLAND LOSS CONTROL AND SAFETY ENGINEERING QUESTIONNAIRE—TO BE ANSWERED BY
ALL CARRIERS WRITING IN RHODE ISLAND AS OF THE CURRENT CALENDAR YEAR

CARRIER* _____

CARRIER CODE

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- A. Describe the personnel and other resources that were available for loss control and safety engineering for Workers Compensation risks in Rhode Island for the previous Calendar Year. **Attach responses to this questionnaire.**
- B. Describe the changes and improvements that were effected during the current Calendar Year. If no changes or improvements were made, indicate "NONE." **Attach response to this questionnaire.**

*If this is a group report, list all carrier names or carrier codes for which any experience is reported.

NATIONAL COUNCIL ON COMPENSATION INSURANCE
RHODE ISLAND EXPLANATION OF LOSS RESERVING QUESTIONNAIRE—TO BE ANSWERED BY ALL CARRIERS
WRITING IN RHODE ISLAND AS OF 12/31 OF THE CURRENT YEAR

CARRIER* _____ CARRIER CODE

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Explain the reserving policy used for Rhode Island Workers Compensation loss reserves valued as of 12/31 of the current year. This should include:

- A. Initial reserve procedure.
- B. Interest rates used for discounting losses.
- C. Description of reserve procedure for incurred but not reported (IBNR) reserves, bulk reserve adjustments not associated with a specific case.
- D. Identification of mortality, morbidity, remarriage and other tables.

Attach responses to this questionnaire.

*If this is a group report, list all carrier names or carrier codes for which any experience is reported.

NATIONAL COUNCIL ON COMPENSATION INSURANCE
RHODE ISLAND INTEREST AND PENALTIES QUESTIONNAIRE
CALENDAR YEAR—BASIS

CARRIER* _____ CARRIER CODE

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SUBMITTED BY _____ TITLE _____

TELEPHONE NUMBER _____ DATE SUBMITTED _____

TO BE COMPLETED FOR THE STATE OF RHODE ISLAND
REQUIRED TO COMPLY WITH RHODE ISLAND-RELATED LAWS TO INSURANCE CODE, CHAPTER 35

1. Amount of Back Interest Paid to Claimants (1) _____
2. Amount Required to Pay Penalties (2) _____
3. Total Interest and Penalties Paid (1 + 2) (3) _____

If any interest or penalties are being reported on line 3, please answer the following questions.

(a) How does your company report the amount of money paid for back interest?

- Losses Expenses Charged against surplus Other (Explain) _____

(b) How are penalties reported?

- Losses Expenses Charged against surplus Other (Explain) _____

We do not write compensation insurance in Rhode Island and did not pay any interest or penalties for any previous policy years.

We do write workers compensation insurance in Rhode Island. However, we did not pay any interest or penalties last year.

* If this is a group report, list all carrier names or carrier codes for which any experience is reported.

TRANSMITTAL LETTER

1. CALL: CURRENT CALENDAR YEAR EXPENSE DATA BY STATE

2. DUE DATE: May 15 of the following year

3. CARRIER NAME _____ 4. CARRIER CODE

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5. FILING AS: GROUP INDIVIDUAL COMPANY

6. If filing as a group, list individual carrier names or carrier codes:

7. SUBMISSION TYPE:

Original

Correction

Voluntary Resubmission

8. SUBMISSION CONTENT:

Full

Partial and Not Final

Partial and Final

9. Number of states included _____

10. Number of pages _____

MAIL CALL AND TRANSMITTAL LETTER TO:

NATIONAL COUNCIL ON COMPENSATION INSURANCE

750 PARK OF COMMERCE DRIVE

BOCA RATON, FL 33487

ATTN: FINANCIAL DATA

NCCI USE ONLY
Date Received

Receipt Mailed

NATIONAL COUNCIL ON COMPENSATION INSURANCE
RECEIPT OF CALL NOTIFICATION

8. CALL: CURRENT CALENDAR YEAR EXPENSE DATA BY STATE

9. DUE DATE: May 15 of the following year

10. DATE RECEIVED AT NCCI _____ BY _____

11. MAIL RECEIPT TO: (Indicate specific individual)

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Statistical Call Overview Document

STATISTICAL CALL NAME:

Semiannual Call For Compensation Experience (Call #17)

DESCRIPTION OF CALL:

This call contains dollar amounts for workers compensation Standard Earned Premium at NCCI DSR level, Standard Earned Premium at Company level, Net Earned Premium, and Total Incurred Losses for the first half of the specified calendar year. Each NCCI member carrier is required to submit this information for each state in which they operate. Some states require all carriers writing workers compensation policies to submit financial calls.

The Semiannual Call for Compensation Experience is used to derive 1/1 through 6/30 Calendar Year data. This allows semiannual updates of exhibits utilizing Calendar Year data which would be limited to annual updates if the Semiannual Call for Compensation Experience were not collected.

FILES/DATABASES:

Semiannual Call Production File:

This file serves as the central repository for Semiannual Call data. This file contains all data received from the carriers as well as corrections applied to this data. Corrections to the file are made via ACS for data entry of revised reports with electronic transfer of the data to NCCI for incorporation into the production file.

Semiannual Call SAS Dataset:

This dataset serves as the work file for producing exhibits utilizing this data. Actuarial analysis and reporting programs are executed using the data in this file.

SAS datasets are created for only those states for which exhibits are produced. The SAS dataset only contains data for the specified state. This file is created through an extraction from the Calendar Year Call production file.

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Statistical Call Overview Document

DESCRIPTION OF ERROR HANDLING:

Semiannual data is validated using automated reports as the data is received from the carrier.

Carriers are sent written correspondence to resolve any errors identified during validation. As revised reports are received, they are checked for accuracy and then if correct are sent to ACS for processing.

MODIFICATIONS TO DATA:

Revised reports are processed as they are received. Any data containing unresolved errors will be removed from the dataset if resolution of the remaining errors is not possible within the framework of the production schedule.

All revised data is requested to be submitted on revised reports or via written correspondence. When production deadlines require an immediate response, telephone responses are accepted with the stipulation that a written confirmation of the changes also be submitted.

CALL FOR EXPERIENCE #17
SEMI-ANNUAL CALENDAR YEAR CALL

Background and Purpose of the Report

The Semi-Annual Calendar Year Call is due at NCCI on or before August 15 of the same year as the experience being collected. As an example, the Semi-Annual Call for January 1, 1990 through June 30, 1990 Calendar Year Experience is due at NCCI on or before August 15, 1991.

This call is one of the five standard annual calls for experience subject to the Performance Evaluation Monetary Incentive Program (PEMIP).

For each Semi-Annual Call Year, the first six-months of data must be reported on a state basis. The Semi-Annual Call is reported only once every year, with the current Calendar Year January-June data the reportable experience. Semi-Annual Calendar Year Transactions include all premium and claims transactions that occurred in the first six-months of the current year. As a result, this six-months of Calendar Year data will include policy activity, both premium and claim which originated from prior policy years.

The Semi-Annual Call is no longer used by NCCI Actuarial for ratemaking as it has been replaced by the Calendar/Accident Year Call. However, this Call is used occasionally to support rate level filings, proving useful. Results for this call are still distributed to Members and Subscribers. It is also used internally to recognize and analyze state and industry trends.

Data collected in the Semi-Annual Calendar Year Call includes earned premium and incurred losses on a state basis. Earned Premiums are separated between Standard At NCCI DSR Level and Standard At Company Level. The incurred losses include indemnity and medical benefits, along with IBNR.

The data reported in this call should **exclude experience** * developed under large deductible policies (deductible amount over \$100,000 per claim or per accident).

The Calendar Year Reconciliation Report (Call #8) has * been revised to add lines to reconcile premium and losses to Page 14 of the Annual Statement due to the exclusion of the large deductible policies.

Filing Requirements

Semiannual Call for Compensation Experience by State—Calendar Period January 1 through June 30 of the Current Year—Due August 15 of the same year

In accordance with the approved statistical program, you are hereby requested to file with NCCI on or before August 15 of each year your compensation experience for the Calendar Year period from January 1 to June 30 of the same year.

This Call is included in PEMIP (Performance Evaluation Monetary Incentive Program) and will be subject to assessments for late and/or inaccurate reporting. Details of PEMIP are updated annually in January of each year.

Note that the data required on the Semiannual Calendar Year Call is now identical to that required on the annual

Calendar Year Call (Call #2). Net Earned Premium has been added to the Call and the Loss Ratio eliminated.

Two copies of the form for reporting the required information are provided in the package of calls sent to carriers in October of each year. One copy is to be filed with NCCI and the other copy is for your records. The states (or jurisdictions) for which the requested data is to be filed are listed on the attached forms.

Questions regarding reporting requirements on completion of the Calls should be directed to Aggregate Ratemaking at (407) 997-4395.

A. GENERAL INSTRUCTIONS

1. Group Report

Carrier name and five-digit code must be shown on reporting forms. If this is a group reporting, each carrier writing compensation must be listed individually on the form. With respect to affiliated carriers, it will be appreciated if you will follow the same method of reporting for this Call (individual company basis or group basis) as was followed in compliance with Call for Experience #2, the Calendar Year Call. If this is not convenient, please advise us that you have changed procedure.

2. Standard Earned Premiums at NCCI Designated Statistical Reporting Level

Standard earned premiums shall be the entire earned premium for the state resulting from standard rating procedures after the application of:

1. Experience rating plan adjustments (Note: Except for Michigan experience, experience rating plan adjustments must reflect only NCCI published modification factors.)*
2. Expense Constants (These are the Expense Constants published by NCCI or an independent bureau. For Voluntary Business in pure premium states, Expense Constants at NCCI DSR level are 0.)
3. Loss Constants (These are the Loss Constants published by NCCI or an independent bureau. For Voluntary Business in pure premium states, Loss Constants at NCCI DSR level are 0.)

but prior to the application of:

1. Deviations from NCCI designated Statistical Reporting rates or pure premiums**
2. Deviations from published NCCI experience rating plan modification factors (except Michigan)*
3. Retrospective rating plan adjustments
4. Other individual risk rating plan adjustments*** (e.g., Schedule Rating)

Effective January 1, 1990

5. Premium discounts
6. Expense modification program adjustments
7. Payment of policyholder dividends
8. Premium credits for small deductible coverage

* Carriers must report their Standard Earned Premium at NCCI's experience rating plan level for all states except Michigan. For Michigan, carriers may report their Standard Earned Premium at their own experience rating plan level if they use their own experience rating plan.

** Rates: Arkansas, Georgia, Illinois, Indiana, Rhode Island, and Vermont
Pure Premiums: Connecticut (for policies effective 1/1/90 and subsequent), Kentucky, Louisiana, Maryland, Michigan, New Mexico (for policies effective 1/1/90 and subsequent), Oregon

*** Note that premium adjustments resulting from the application of individual risk rating plans other than experience rating must be excluded from both Standard Earned Premium at Company Rate Level and Standard Earned Premium at NCCI Level.

3. Standard Earned Premium at Company Level

The earned premium on all risks after the application of:

1. Deviations from NCCI Designated Statistical Reporting rates or pure premiums*
2. Experience rating plan adjustments (Note: Except for Michigan experience, experience rating plan adjustments must reflect only NCCI published modification factors.)**
3. Expense Constants (Carrier charged Expense Constants)
4. Loss Constants (Carrier charged Loss Constants)

but prior to the application of:

1. Deviations from published NCCI experience rating plan modification factors (Except Michigan)**
2. Retrospective rating plan adjustments
3. Other individual risk rating plan adjustments*** (e.g., Schedule Rating)
4. Premium discounts
5. Expense modification program adjustments
6. Payment of policyholder dividends
7. Premium credits for small deductible coverage

* Rates: Arkansas, Georgia, Illinois, Indiana, Rhode Island, and Vermont
Pure Premiums: Connecticut (for policies effective 1/1/90 and subsequent), Kentucky, Louisiana, Maryland, Michigan, New Mexico (for policies effective 1/1/90 and subsequent), Oregon

** Carriers must report their Standard Earned Premium at NCCI's experience rating plan level for all states except Michigan. For Michigan, carriers may report their

Standard Earned Premium at their own experience rating plan level if they use their own experience rating plan

*** Note that premium adjustments resulting from the application of individual risk rating plans other than experience rating must be excluded from both Standard Earned Premium at Company Rate Level and Standard Earned Premium at NCCI Rate Level.

For every state in which Standard Earned Premium at DSR Level is reported, Standard Earned Premium at Company Level must be reported as well.

4. Carriers Writing at Deviations from NCCI Rates in Administered Pricing States

For State Funds and other carriers writing at deviations from Bureau Rates in non-competitive rating states, the Standard Earned Premiums must be adjusted to Bureau rate level and must be reported in the column labeled "STD NCCI Designated Stat. Reporting Level." The Standard Earned Premiums at the carrier rate level must be reported in the column labeled "Standard Earned Premium at Company Level."

Carriers that do not deviate from NCCI rates must enter their standard earned premium in the column labeled "STD NCCI Designated Stat. Reporting Level" and must enter the same figure in the column labeled "Standard Earned Premium at Company Level."

5. Competitive Rating States

For Arkansas, Connecticut, Georgia, Illinois, Indiana, Kentucky, Louisiana, Maryland, Michigan, New Mexico, Oregon, Rhode Island and Vermont, carriers must enter the standard earned premium figures at NCCI level and company level in the appropriate columns on the form.

6. Net Earned Premium

Net earned premium shall be the actual earned premium on all risks prior to the payment of policyholder dividends, but after application of any retrospective rating premium adjustments, after the application of premium discounts in accordance with Manual Rules, after the expense modification program, after any deviations or "write-offs" from Bureau rates or pure premiums, and after the effect of any schedule rating premium adjustments.

7. Incurred Losses

Losses reported by state should include compensation and medical incurred during this calendar year period. For further details on the inclusion or exclusion of certain losses and/or reserves, please refer to the specific instructions below.

8. Rounding Procedure and Reporting of Credits

Please report amounts of premiums and losses in whole dollars only. Count fifty cents and over as an extra dollar, and reject the cents if less than fifty. Please show negative amounts enclosed within parentheses so that they may be handled properly in data entry operations.

9. Total Experience

Kindly show the totals of all amounts reported on the last line captioned "Countrywide Total."

10. Signature Requirement

The person responsible for the completion and accuracy of this Call should sign and date the reporting form.

11. Full Submission

Report should include ALL States in which company has data to report. Resubmission or correction must also include all states, not just revised states.

B. SPECIFIC INSTRUCTIONS

1. "F" Classifications

Experience of the "F" Classifications for policies effective January 1, 1974, and thereafter, **MUST BE EXCLUDED.**

2. Coal Mine Experience

Underground Coal Mine experience **MUST BE EXCLUDED** in all states except Pennsylvania and Virginia. In Pennsylvania and Virginia **ALL Coal Mine Experience MUST BE EXCLUDED.**

3. Excess Policies

Experience on excess policies **MUST BE EXCLUDED.**

4. National Defense Projects

Experience on National Defense Projects written under the old Comprehensive Rating Plan or the new National Defense Projects Rating Plan **MUST BE EXCLUDED.** Experience incurred on a Defense Base should be included unless written under the National Defense Projects Rating Plan.

5. Reinsurance

No deductions shall be made from premiums and losses for or on account of reinsurance ceded. Premiums and losses arising from reinsurance received by the reporting company shall be excluded from the experience. Experience reported should be **DIRECT BUSINESS ONLY.**

6. Assigned Risk

Experience for assigned risk policies must be **INCLUDED.** Assigned risk policies must be reported at the level of approved assigned risk rates.

7. Experience Incurred Under Occupational Disease Act

Experience incurred under any Occupational Disease Act which is separate and distinct from the Compensation Act for the state shall be combined with the traumatic experience under the State Compensation Act, and the total of such combined experience shall be reported.

8. IBNR

Losses reported by state should include an appropriate reserve for incurred but not reported cases.

9. Reopened Cases

Include an appropriate loss reserve for reopened cases.

10. Reserves for Specific Contingencies

Include medical and other loss reserves to meet specific contingencies.

11. Other Voluntary Reserves

Exclude voluntary reserves other than those mentioned above.

12. Expenses

Exclude all expenses, either allocated or unallocated except allocated Coverage B loss adjustment expense.

13. Assessments and Special Compensation Funds

The inclusion of assessments and other compensation special funds as incurred losses in the Calendar Year data follows the same instructions that apply in reporting of experience under the NCCI Workers Compensation Unit Statistical Plan Manual. Specifically, when the compensation law states that, in connection with certain types of injury a specified amount shall be paid into special funds (e.g., a Second Injury Fund), and that such amounts are in addition to the compensation payable to the injured worker or his dependents, then the combined total amount shall be reported as incurred indemnity losses. Examples are: (1) payments in no-dependent death claims, and (2) a specified percentage of the permanent partial award. However, any special payments to the states that are assessed on total premium writings, total losses paid or incurred, or total indemnity losses paid or incurred instead of on a per claim basis, shall not be reported as losses to the rating bureau. Assessments on USL&HW Act cases as required by the U.S. Department of Labor should also be excluded. In other words, special funds or assessments are reported as incurred losses only when the assessment is levied on certain types of injuries.

A list of specific assessments and other compensation special funds for each state and the proper treatment for including these assessments in calendar year submissions is attached.

14. Small Deductible Programs *

In states in which small deductible programs apply, losses are to be reported on a gross basis inclusive of the employee paid loss amount.

15. Taxes and Assessments in Kentucky

Taxes and assessments on premiums earned in Kentucky on or after January 1, 1977 **MUST BE EXCLUDED.**

Please note that the date for reporting this data is on or before August 15 of each year. It is urged that every effort be made to comply with this reporting date, as a delay in receiving this data will seriously hamper NCCI in its preparation of rate revisions. Please mail this Call to:

National Council on Compensation Insurance
750 Park of Commerce Drive
Boca Raton, Florida 33487
ATTENTION: FINANCIAL DATA

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 SEMIANNUAL CALL FOR COMPENSATION EXPERIENCE BY STATE—
 CALENDAR PERIOD JANUARY 1 THROUGH JUNE 30 OF EACH YEAR

Page 1

CARRIER* _____ CARRIER CODE _____
 SUBMITTED BY _____ TITLE _____
 TELEPHONE NO. _____ DATE SUBMITTED _____

EARNED PREMIUMS

State	Standard at NCCI Designated Statistical Reporting Level (1)	Standard at Company Level (2)	Net (3)	Incurred Losses (4)
AL 01				
AK 54				
AZ 02				
AR 03				
CA 04				
CO 05				
CT 06				
DE 07				
DC 08				
FL 09				
GA 10				
HI 52				
ID 11				
IL 12				
IN 13				
IA 14				
KS 15				
KY 16				
LA 17				
ME 18				
MO 19				
MA 20				
MI 21				

* If this is a group report, list all carrier names or carrier codes for which any experience is reported.

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 SEMIANNUAL CALL FOR COMPENSATION EXPERIENCE BY STATE—
 CALENDAR PERIOD JANUARY 1 THROUGH JUNE 30 OF EACH YEAR

CARRIER* _____ CARRIER CODE _____
 SUBMITTED BY _____ TITLE _____
 TELEPHONE NO. _____ DATE SUBMITTED _____

EARNED PREMIUMS

State	Standard at NCCI Designated Statistical Reporting Level (1)	Standard at Company Level (2)	Net (3)	Incurred Losses (4)
MS	23			
MO	24			
MT	25			
NE	26			
NH	28			
NJ	29			
NM	30			
NY	31			
NC	32			
OK	35			
OR	36			
PA	37			
RI	38			
SC	39			
SD	40			
TN	41			
TX	42			
UT	43			
VT	44			
VA	45			
WI	48			
All Other	99			
TOTAL	00			

SHOW AMOUNTS IN DOLLARS ONLY

TRANSMITTAL LETTER

1. CALL: SEMIANNUAL CALL FOR COMPENSATION EXPERIENCE BY STATE—
CALENDAR PERIOD JANUARY 1 THROUGH JUNE 30 OF EACH YEAR

2. DUE DATE: August 15 of the same year

3. CARRIER NAME _____ 4. CARRIER CODE _____

5. FILING AS: GROUP INDIVIDUAL COMPANY

6. If filing as a group, list individual carrier names or carrier codes:

7. SUBMISSION TYPE:

Original

Correction

Voluntary Resubmission

MAIL CALL AND TRANSMITTAL LETTER TO:

NATIONAL COUNCIL ON COMPENSATION INSURANCE

750 PARK OF COMMERCE DRIVE

BOCA RATON, FL 33487

ATTN: FINANCIAL DATA

NCCI USE ONLY
Date Received

Receipt Mailed

NATIONAL COUNCIL ON COMPENSATION INSURANCE
RECEIPT OF CALL NOTIFICATION

8. CALL: SEMIANNUAL CALL FOR COMPENSATION EXPERIENCE BY STATE—
CALENDAR YEAR PERIOD JANUARY 1 THROUGH JUNE 30 OF EACH YEAR

9. DUE DATE: August 15 of the same year

10. DATE RECEIVED AT NCCI _____ BY _____

11. MAIL RECEIPT TO: (Indicate specific individual)

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Statistical Call Overview Document

STATISTICAL CALL NAME:

Loss Adjustment Expense Call On Countrywide Direct Workers Compensation Business
(Call #19)

DESCRIPTION OF CALL:

This call contains dollar amounts for workers compensation Incurred Losses , Allocated Loss Adjustment Expense, Unallocated Loss Adjustment Expense, and Total Loss Adjustment Expense separated into indemnity and medical components by Accident Year. Each NCCI member carrier is required to submit this in aggregate for all the states in which they operate. Some states require all carriers writing workers compensation policies to submit financial calls.

The Loss Adjustment Expense Call is used to determine Loss Adjustment Expense provisions included in NCCI manual rates and advisory rate filings.

FILES/DATABASES:

Loss Adjustment Expense Call Production File:

This file serves as the central repository for Loss Adjustment Expense Call data. This file contains all data received from the carriers as well as corrections applied to this data. Corrections to the file are made via ACS for data entry of revised reports with electronic transfer of the data to NCCI for incorporation into the production file.

DESCRIPTION OF ERROR HANDLING:

Loss Adjustment Expense data is validated using automated reports when the data is received from the carrier.

Carriers are sent written correspondence to resolve any errors identified during validation. As revised reports are received, they are checked for accuracy and then if correct are sent to ACS for keypunching.

DESCRIPTION OF DATA COLLECTION AND DATA HANDLING

Statistical Call Overview Document

MODIFICATIONS TO DATA:

Revised reports are processed as they are received. Any data containing errors which can not be resolved in a time for rate filing deadlines is removed from the dataset.

All revised data is requested to be submitted on revised reports or via written correspondence. When production deadlines require an immediate response telephone responses are accepted with the stipulation that a written confirmation of the changes also be submitted.

CALL FOR EXPERIENCE #19
CALL FOR LOSS ADJUSTMENT EXPENSE

Background and Purpose of the Report

The Call for Loss Adjustment Expense—Countrywide Direct Workers Compensation Business is due at NCCI on June 1 of the current year for loss adjustment expense data valued as of December 31 of the previous year.

At its October 12, 1988 meeting, the Actuarial Committee reviewed the latest available loss adjustment expense data. Currently, Staff has the following data available concerning loss adjustment expense:

1. Calendar year loss adjustment data on a direct basis.
2. Accident year allocated and unallocated loss adjustment expense data on a net basis.

The Committee wants to collect accident year loss adjustment expense information on a direct basis for the purpose of better analyzing loss adjustment expenses.

The data for completing Call #19 is similar to the data from Schedule 'P' Part 1D of the carrier's Annual Statement; except the data for this Call is on a direct basis.

The Call contains the same amount of accident years as Schedule 'P' of the Annual Statement. The carrier's definition of allocated loss adjustment expense is to be consistent with the definition adhered to in Schedule 'P'. The Call includes total paid and total outstanding loss adjustment expenses. Unallocated loss adjustment expenses are reported for all accident years.

The intent of this Call is to collect accident year loss adjustment expense information on a direct basis. This data is used for calculating the loss adjustment expense included in the NCCI manual rates.

Filing Requirements

Call for Loss Adjustment Expense—Countrywide Direct Workers Compensation Business as of December 31 of each year—Due June 1 of the following year

In accordance with the approved statistical program, you are hereby requested to file with NCCI on or before June 1 of each year, your loss adjustment expense—countrywide direct workers compensation business valued as of December 31 of the previous year.

Two copies of the reporting form for the required information are provided in the package of reporting forms sent to carriers in October of each year. One copy is to be filed with NCCI and the other copy is for your records.

Questions regarding reporting requirements on completion of the Call should be directed to Claims Cost Analysis at (407) 997-4347.

GENERAL INSTRUCTIONS

1. Group Report

Carrier name and five-digit code must be shown on the reporting form. If this is a group reporting, each carrier writing compensation must be listed individually on the reporting form. List only the names or carrier codes of those carriers that have direct business during at least one of the policy years for which data is required.

2. Accident Year Losses

- (1) Paid: Enter all Workers Compensation loss payments figures. This is similar to item #3 of Schedule 'P' Part 1D for the required years, except this Call requires direct business information.
- (2) Outstanding: Enter all Workers Compensation losses unpaid. This is similar to item #9 of Schedule 'P' Part 1D for the required years, except this Call requires direct business information.

LOSS ADJUSTMENT EXPENSE

3. Accident Year Allocated

- (3) Paid: Enter all Workers Compensation allocated loss expense payment figures. This is similar to column #4 of Schedule 'P' Part 1D for the required years, except this Call requires direct business information.
- (4) Outstanding: The method for calculating the figures to be reported in this column is to be consistent with the method used for splitting paid allocated and unallocated loss adjustment expense on Schedule 'P'.

4. Accident Year Unallocated

- (5) Paid: Enter all Workers Compensation unallocated loss expense payment figures. This is similar to column #5 of Schedule 'P' Part 1D for the required years, except this Call requires direct business information.
- (6) Outstanding: The method for calculating the figures to be reported in this column is to be consistent with the method used for splitting paid allocated and unallocated loss adjustment expense on Schedule 'P'.

5. Accident Year Total

- (7) Paid: Enter the sum of the figures reported in column #3 (paid allocated LAE) and column #5 (paid unallocated LAE) for the years required.

(8) Outstanding: Enter the sum of the figures reported in column #4 (allocated outstanding LAE) and column #6 (unallocated outstanding LAE) for the years required.

5a. Total (of A to L)

Enter the sum of lines a to l for each column (1 to 8).

6. Current Calendar Year

The last line of the call for Loss Adjustment Expenses asks for LAE data for the calendar year being reported. The required information is defined as follows:

COLUMN NUMBER	DATA DEFINITION
(1)	Enter the amount paid in Workers Compensation losses for the year being reported.
(2)	Enter the amount of change in Workers Compensation loss reserves for the year being reported.

(3) Enter the amount paid in allocated loss adjustment expense for the year being reported.

(4) Enter the amount of change in allocated loss adjustment expense reserves for the year being reported.

(5) Enter the amount paid in unallocated loss adjustment expense for the year being reported.

(6) Enter the amount of change in unallocated loss adjustment expense reserves for the year being reported.

(7) Enter the total paid Loss Adjustment Expense for the year being reported.

(8) Enter the change in Loss Adjustment Expense reserves for the year being reported.

Please note that the date for reporting this data is on or before June 1 of each year.

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 Reporting Guidebook for the Annual Calls for Experience

Effective January 1, 1990

Part IV
 Page 19:3

Original Printing

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 CALL FOR LOSS ADJUSTMENT EXPENSES ON COUNTRYWIDE DIRECT WORKERS COMPENSATION BUSINESS AS OF DECEMBER 31 OF EACH YEAR
 CARRIER(S)*

SUBMITTED BY	TITLE	TELEPHONE NO	DATE SUBMITTED	Losses		Allocated		Loss Adjustment Expense Unallocated		Total	
				Paid (1)	Outstanding (2)	Paid (3)	Outstanding (4)	Paid (5)	Outstanding (6)	Paid (7) + (5)	Outstanding (8) + (6)
A	Prior to 1978										
B	1978										
C	1979										
D	1980										
E	1981										
F	1982										
G	1983										
H	1984										
I	1985										
J	1986										
K	1987										
L	1988										
M	1989										
N	1990										
O	1991										
P	1992										
Q	1993										
R	Total To Current Year										
S	Total To Last Year										
T	Current Calendar Year Experience (R - S)										

* If this is a group report, list all carrier names or carrier codes for which any experience is reported

TRANSMITTAL LETTER

1. CALL: CALL FOR LOSS ADJUSTMENT EXPENSE—COUNTRYWIDE DIRECT WORKERS COMPENSATION
BUSINESS AS OF DECEMBER 31 OF EACH YEAR

2. DUE DATE: June 1 of the following year

3. CARRIER NAME _____ 4. CARRIER CODE

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5. FILING AS: GROUP INDIVIDUAL COMPANY

6. If filing as a group, list individual carrier names or carrier codes:

7. SUBMISSION TYPE:

Original

Correction

Voluntary Resubmission

MAIL CALL AND TRANSMITTAL LETTER TO:

NATIONAL COUNCIL ON COMPENSATION INSURANCE

750 PARK OF COMMERCE DRIVE

BOCA RATON, FL 33487

ATTN: FINANCIAL DATA

NCCI USE ONLY
Date Received

Receipt Mailed

NATIONAL COUNCIL ON COMPENSATION INSURANCE
RECEIPT OF CALL NOTIFICATION

8. CALL: CALL FOR LOST ADJUSTMENT EXPENSE—COUNTRYWIDE DIRECT WORKERS COMPENSATION
BUSINESS AS OF DECEMBER 31 OF EACH YEAR

9. DUE DATE: June 1 of the following year

10. DATE RECEIVED AT NCCI _____ BY _____

11. MAIL RECEIPT TO: (Indicate specific individual)

NAIC

Examination of NCCI

Section I: Data Collection and Data Quality

Volume II: Description of Data Collection and Data Handling
Appendix

May 15, 1991



Milliman & Robertson, Inc.

ARTHUR
ANDERSEN
ARTHUR ANDERSEN & CO., S.C.

NAIC Examination of NCCI

Section I: Data Collection and Data Handling

Description of Data Collection and Data Handling

Appendix

Table of Contents

- 1) How To Use the Flowcharts
- 2) Overview
- 3) Overall Rate Level
- 4) Unit Card Data Conversion
- 5) Unit Card Data Administration
- 6) Class Ratemaking
- 7) Experience Rating
- 8) Policy Issue Capture System (PICS)
- 9) Detailed Claim Information (DCI)

NAIC Examination of NCCI
Description of Data Collection and Data Quality
How to Use the Flowchart Documentation

Introduction:

The processing at NCCI has been documented using a graphic representation known as flowcharting. Flowcharts depict manual and automated procedures. They are read from the left to right, top to bottom unless otherwise noted by arrows.

The Section II Appendix includes flowcharts which detail the processing at NCCI. The flowcharts are divided into seven functional areas defined in the Description of Data Collection and Data Handling and depicted on the Overall Processing Flow (000).

The flowcharts for the seven functional areas are comprised of up to four levels of detail which are identified by numbers ranging in 100's, 200's, 300's, and 400's. The first is a high level depiction of the specified function. High level flows are exploded into more detail are indicated by the flowchart immediately above it.

Each flowchart is identified by a code located in the upper right hand corner of each flow diagram. The first character identifies the functional area. The second character defines the level of detail. The third, fourth and fifth characters specify the sequence of the flowcharts, much like page numbers.

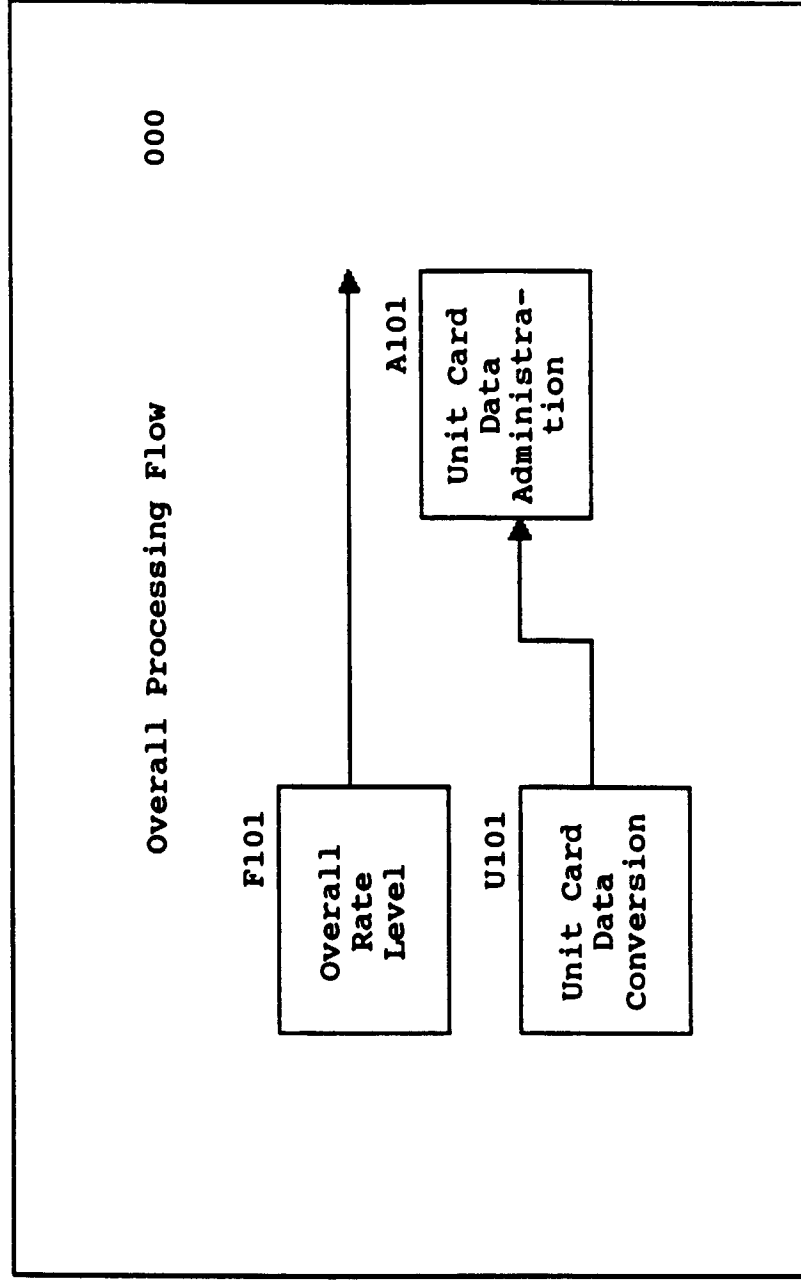
NAIC Examination of NCCI

Description of Data Collection and Data Quality

How to Use the Flowchart Documentation

Introduction:

The following example, taken from the Overall Processing Flow (000), references the Unit Card Data Conversion (U101), Overall Rate Level (F101) and Unit Card Data Administration (A101) areas.



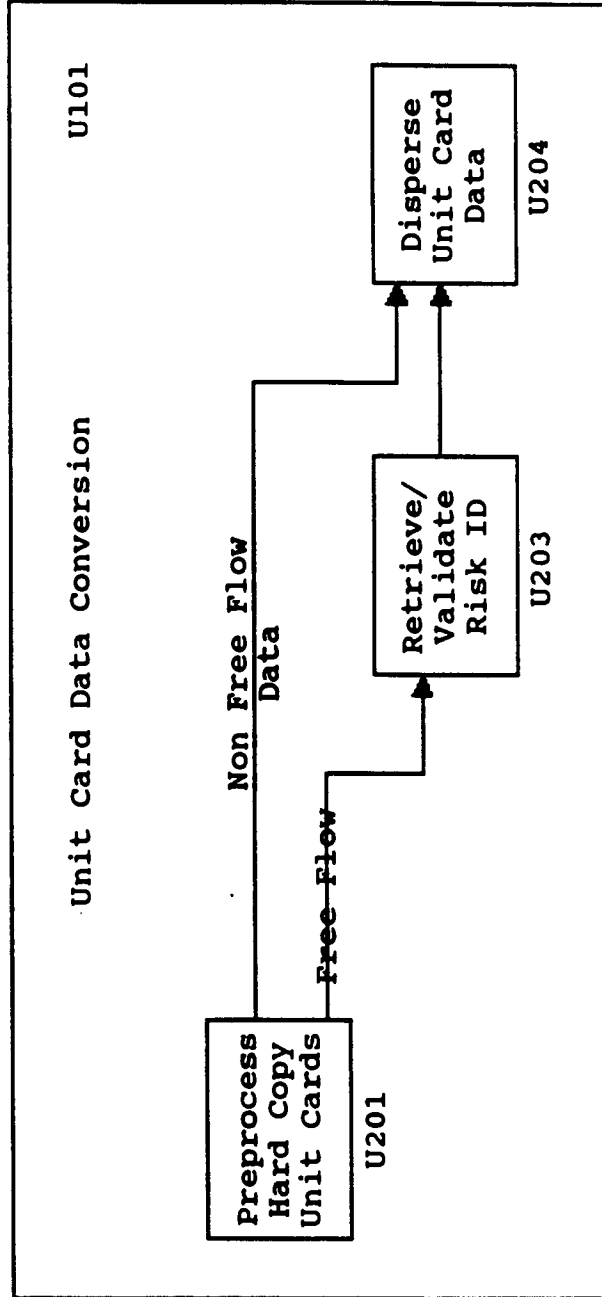
NAIC Examination of NCCI

Description of Data Collection and Data Quality

How to Use the Flowchart Documentation

Introduction:

The Unit Card Data Conversion area is referenced on the Overall Processing Flow (000) on the previous page by the U101 indicator. The Unit Card Data Conversion 100 level flow identified by U101, references 200 level processes within the Unit Card Data Conversion area. Examples of the 200 level processes would be Preprocess Hard Copy Unit Cards (U201), Retrieve/Validate Risk ID (U203) and Disperse Unit Card Data (U204). The Preprocess Hard Copy Unit Cards (U201) diagram references more detailed, 300 level flows.



NAIC Examination of NCCI

Description of Data Collection and Data Quality

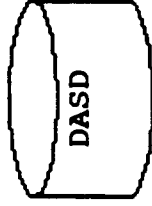
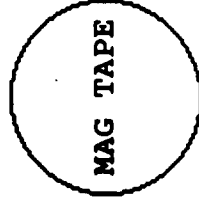
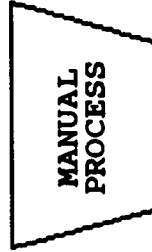
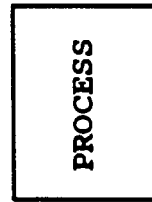
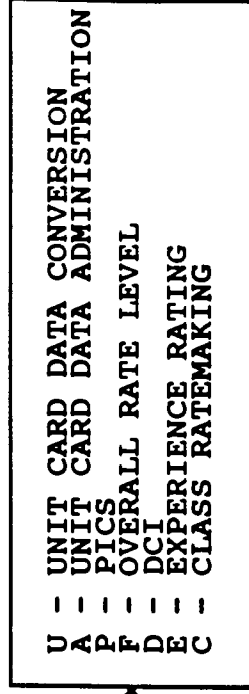
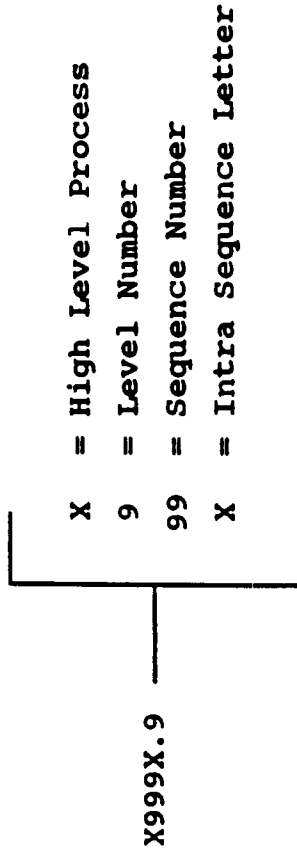
How to Use the Flowchart Documentation

Introduction:

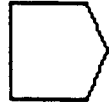
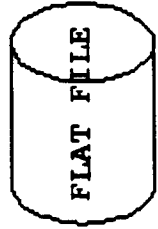
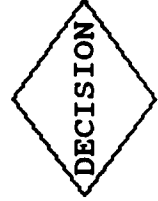
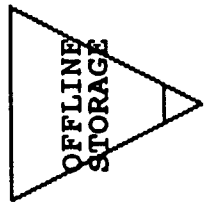
The flowchart symbols and numbering conventions are further clarified on the following page.

NAIC Examination of NCCI
 (high level process title)
 (specific process title)

DOCUMENT NUMBERING



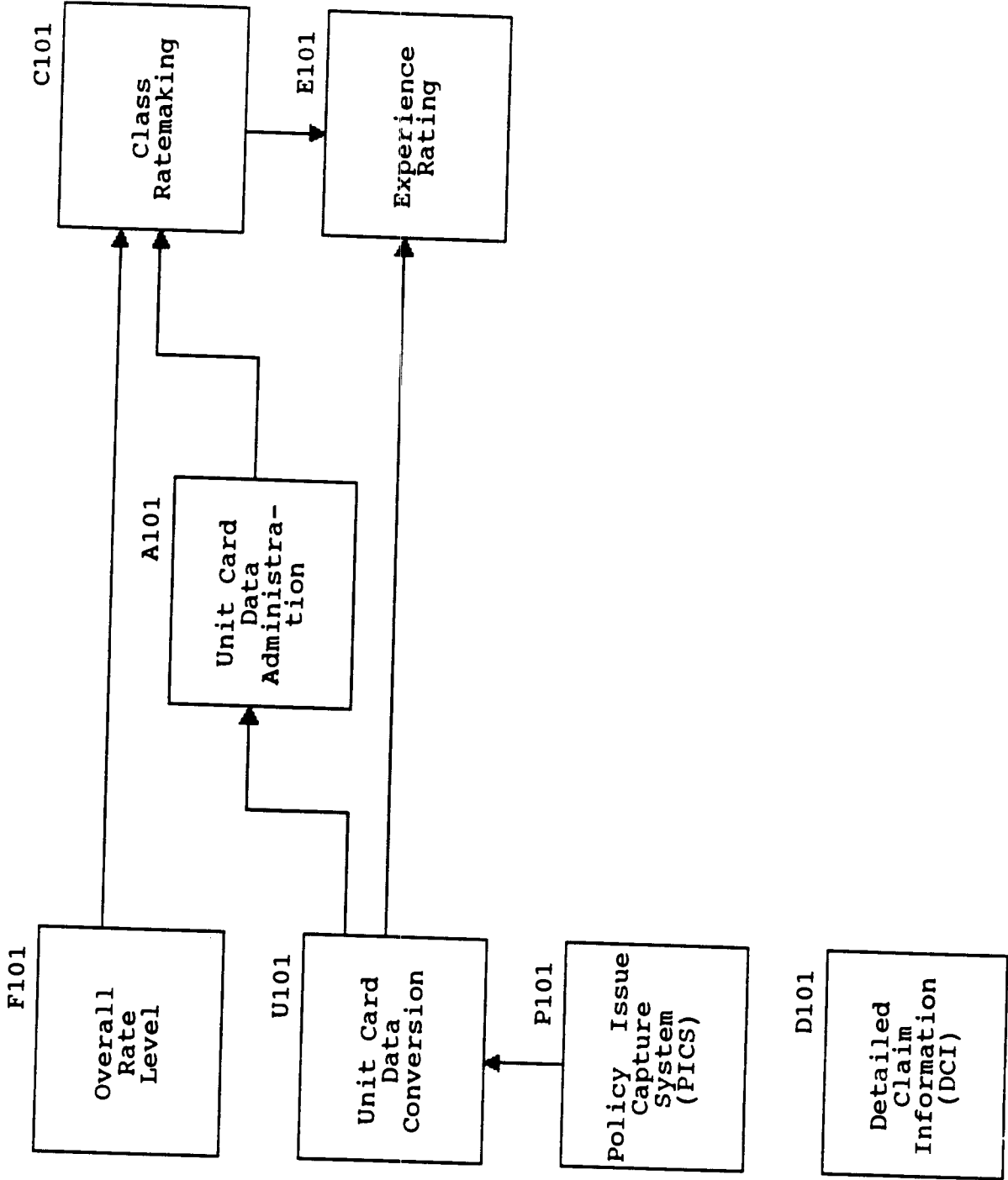
CONTROL POINT



OFF PAGE CONNECTOR

NAIC Examination of NCCI
Overall Processing Flow

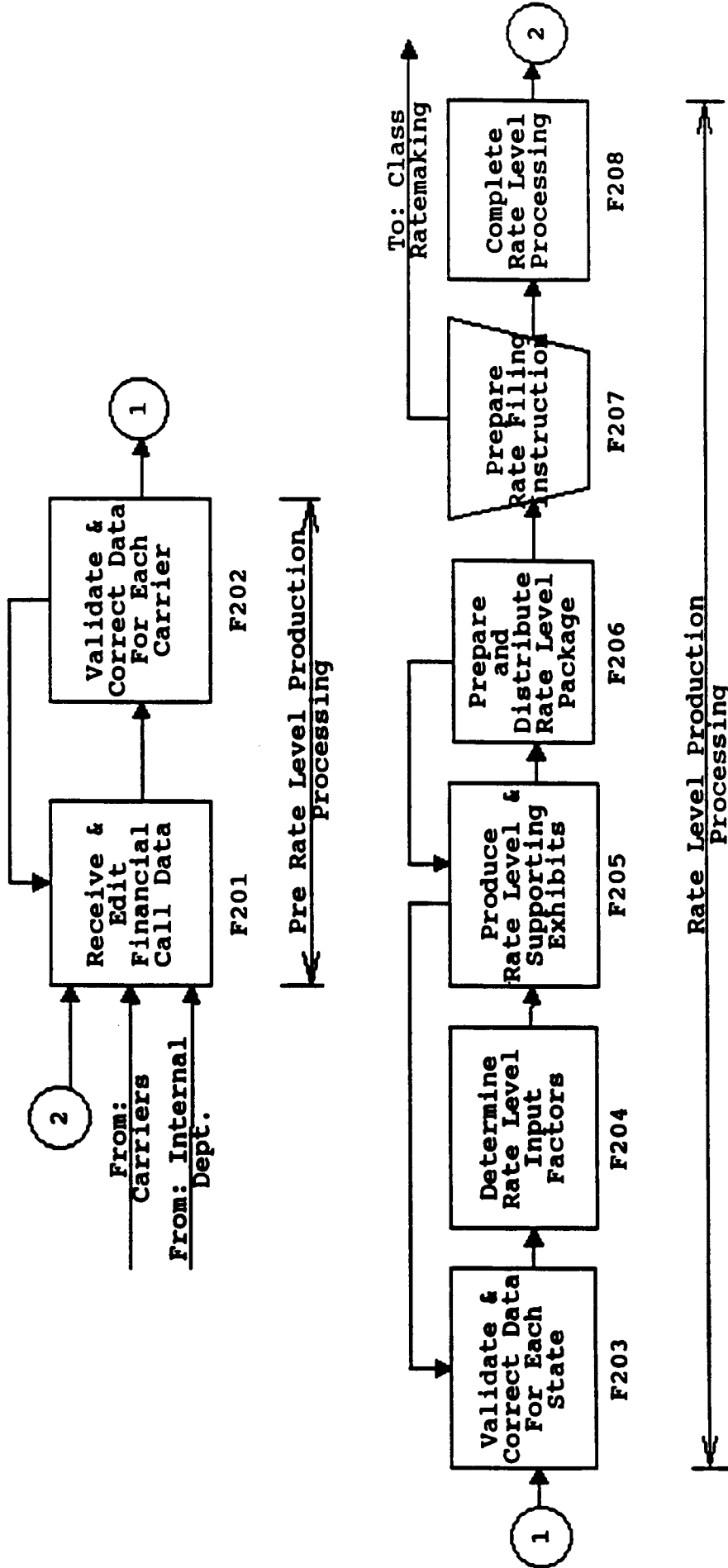
000



NAIC Examination of NCCI

Overall Rate Level

High Level Flow



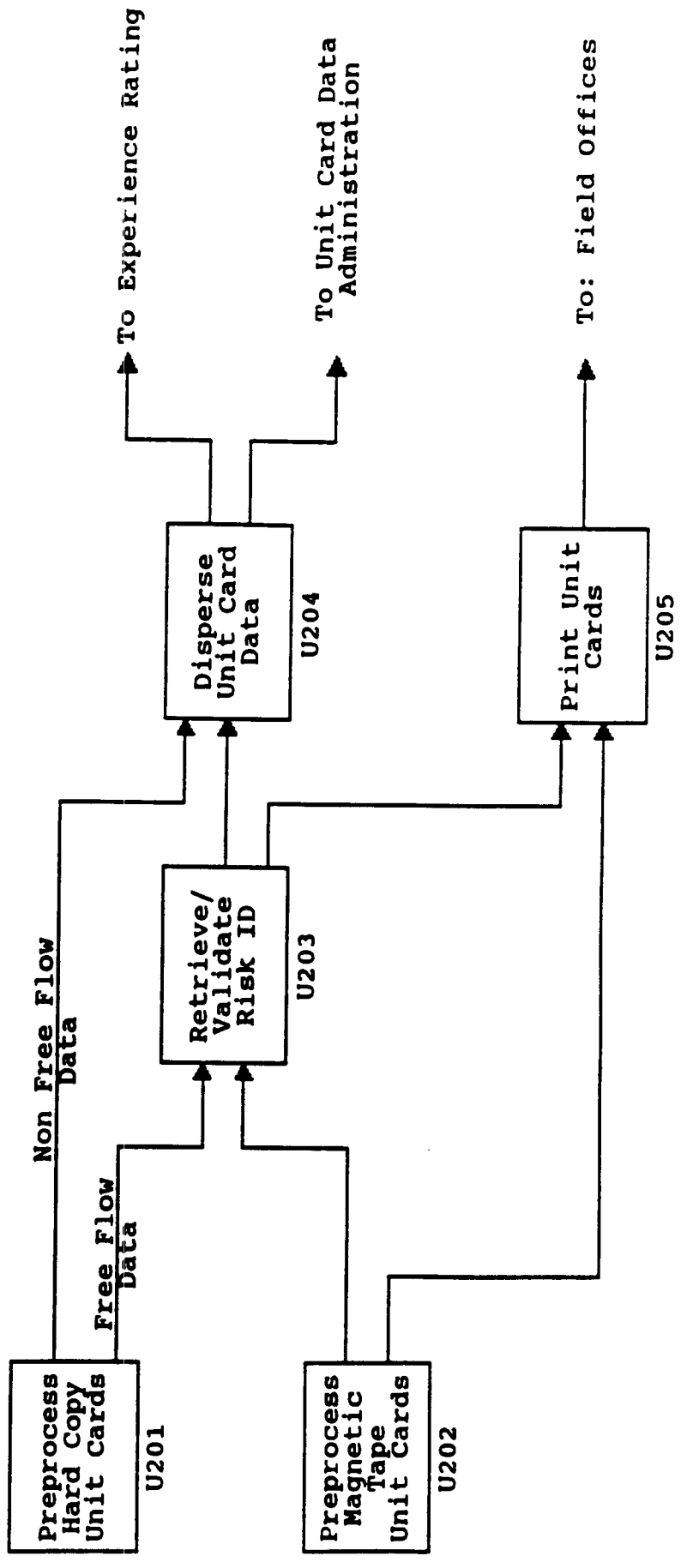
Note: Process F202 will continue even after information has been passed to Process F203.

NAIC Examination of NCCI

U101

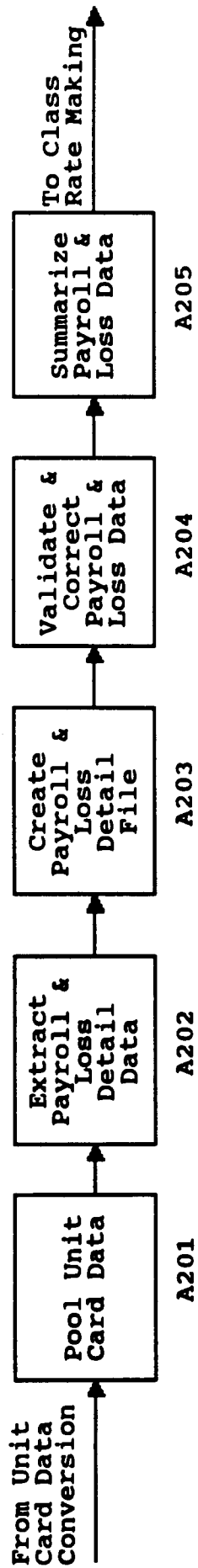
Unit Card Data Conversion

High Level Flow



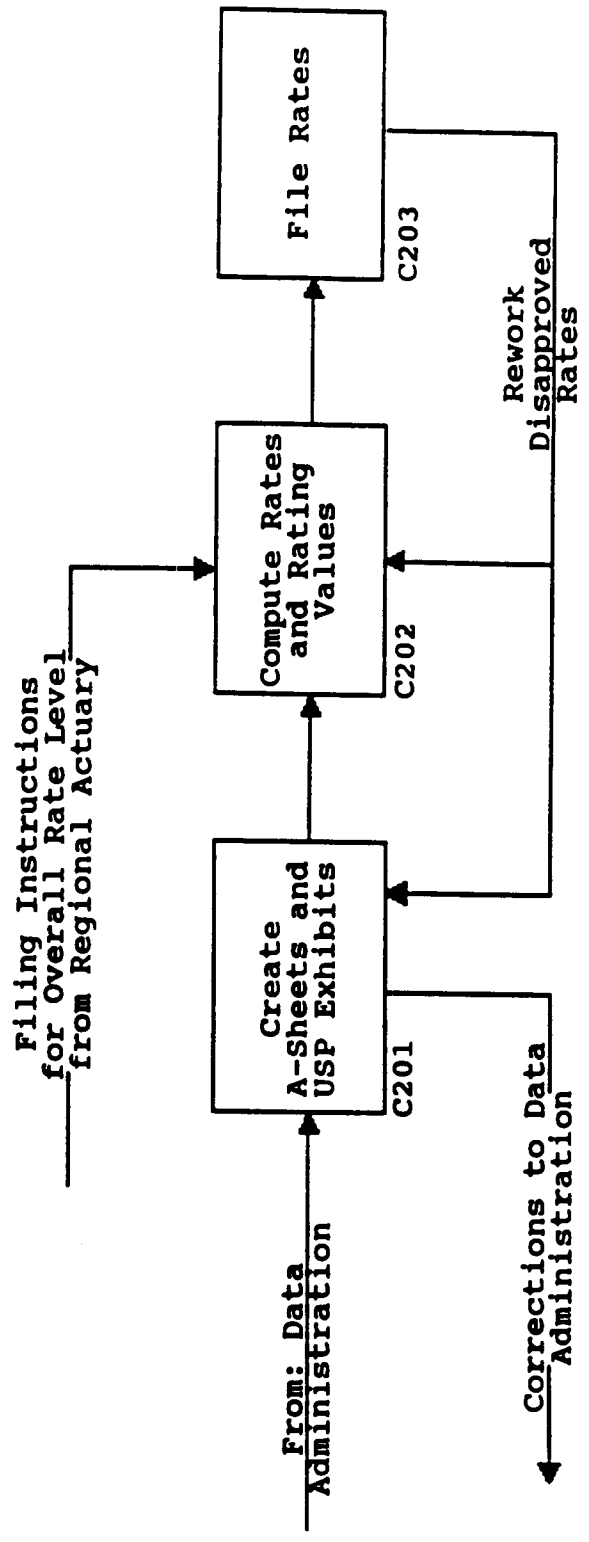
NAIC Examination of NCCI
Unit Card Data Administration
High Level Flow

A101



NAIC Examination of NCCI
Class Ratemaking
High Level Flow

C101

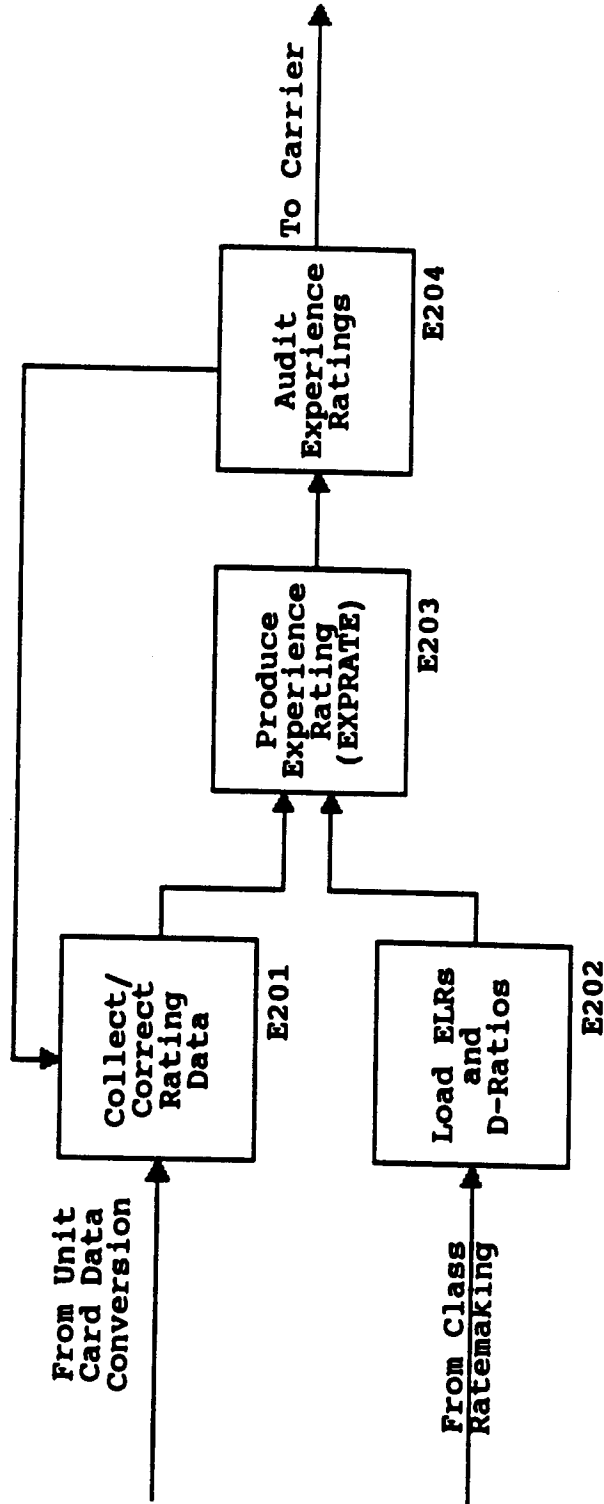


NAIC Examination of NCCI

Experience Rating

High Level Flow

E101

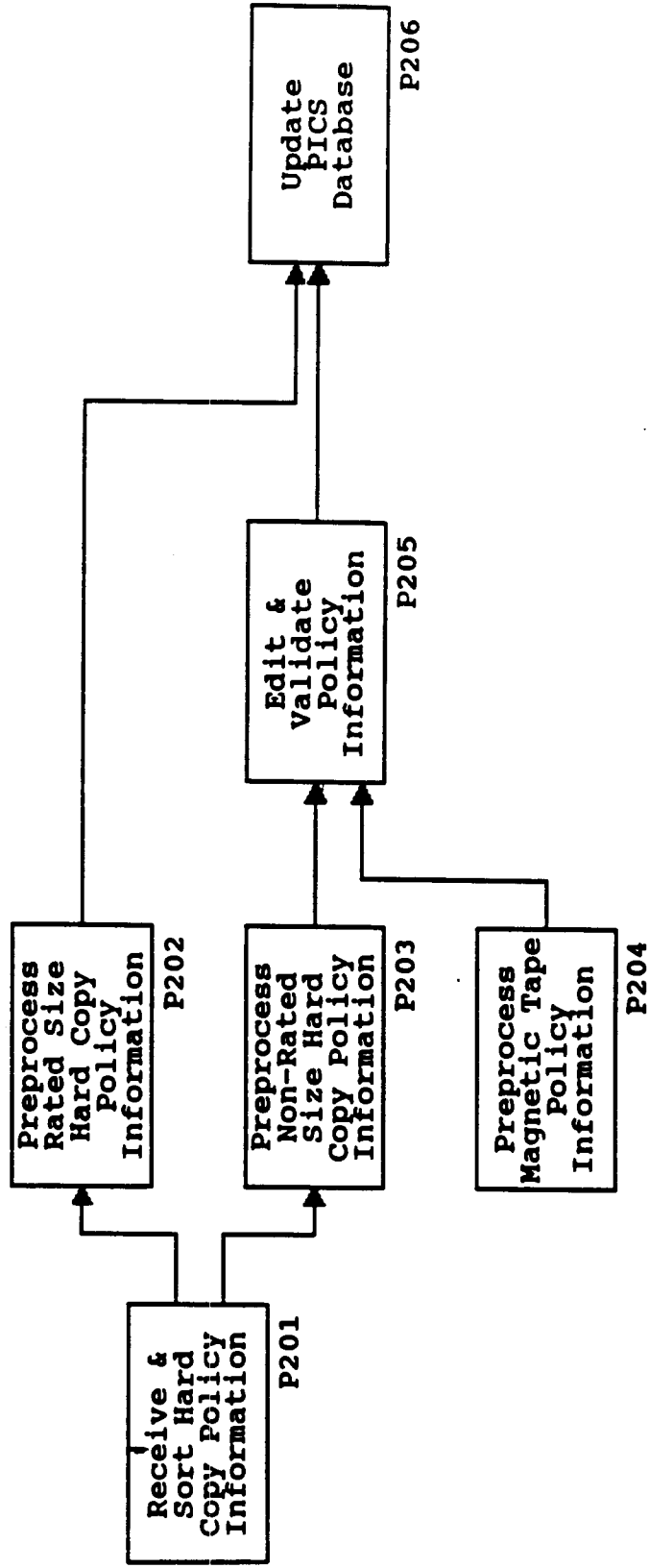


NAIC Examination of NCCI

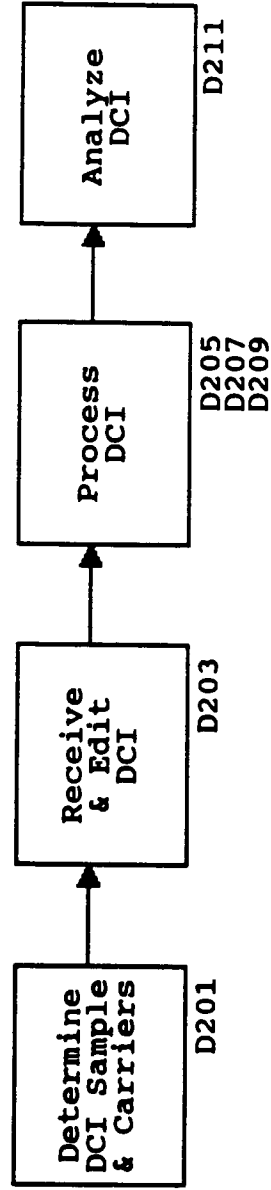
P101

PICS Processing

High Level Flow



NAIC Examination of NCCI
Detailed Claim Information Processing (DCI)
High Level Flow

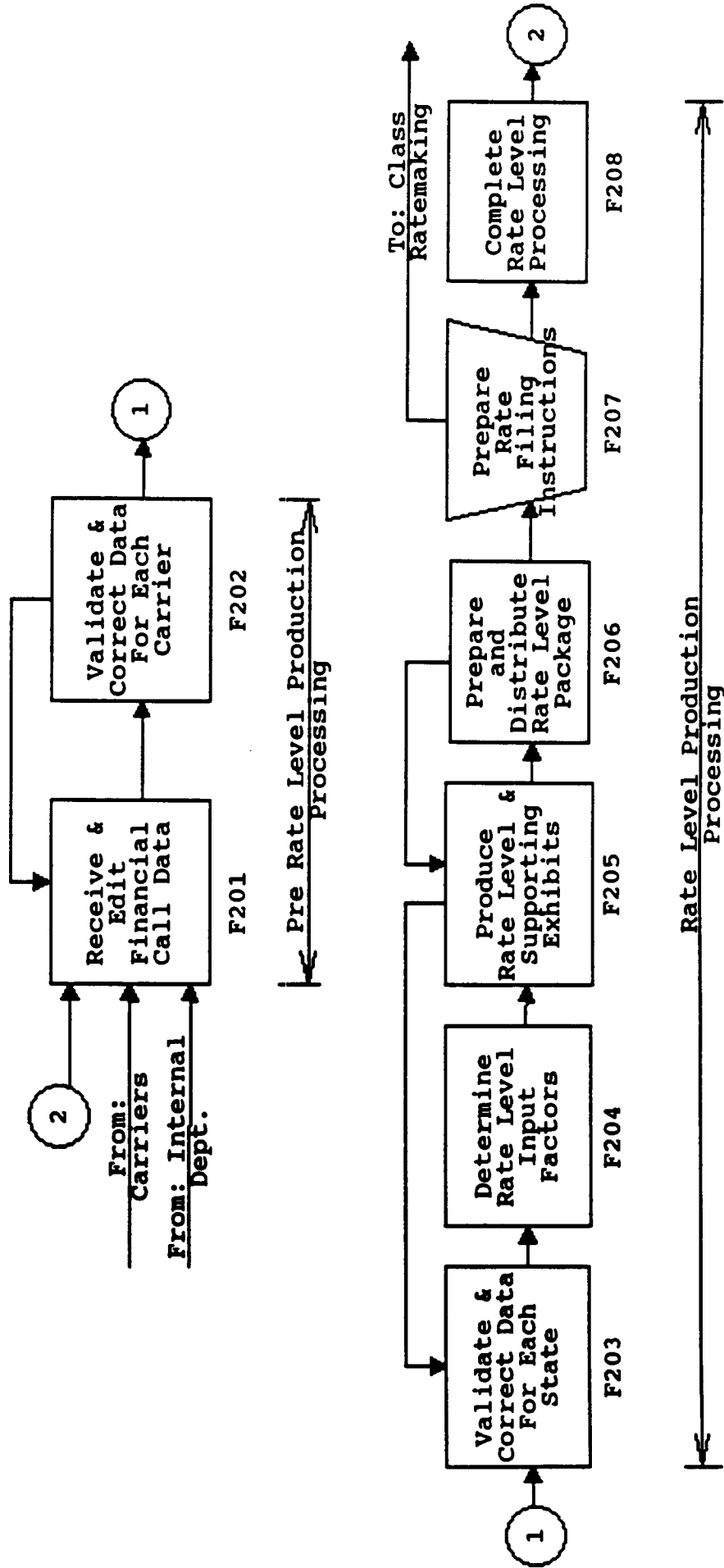


NAIC Examination of NCCI

F101

Overall Rate Level

High Level Flow

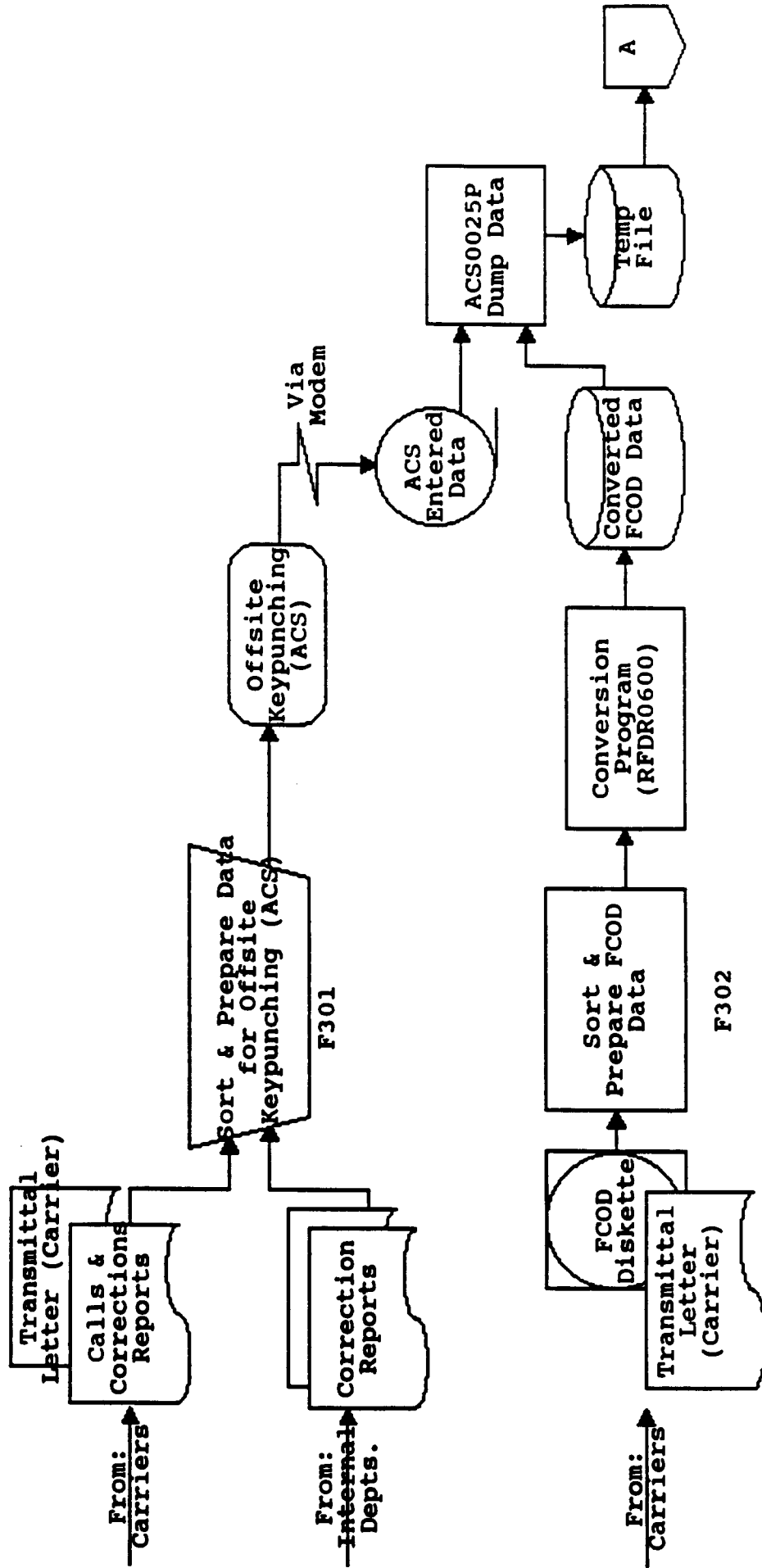


Note: Process F202 will continue even after information has been passed to Process F203.

NAIC Examination of NCCI

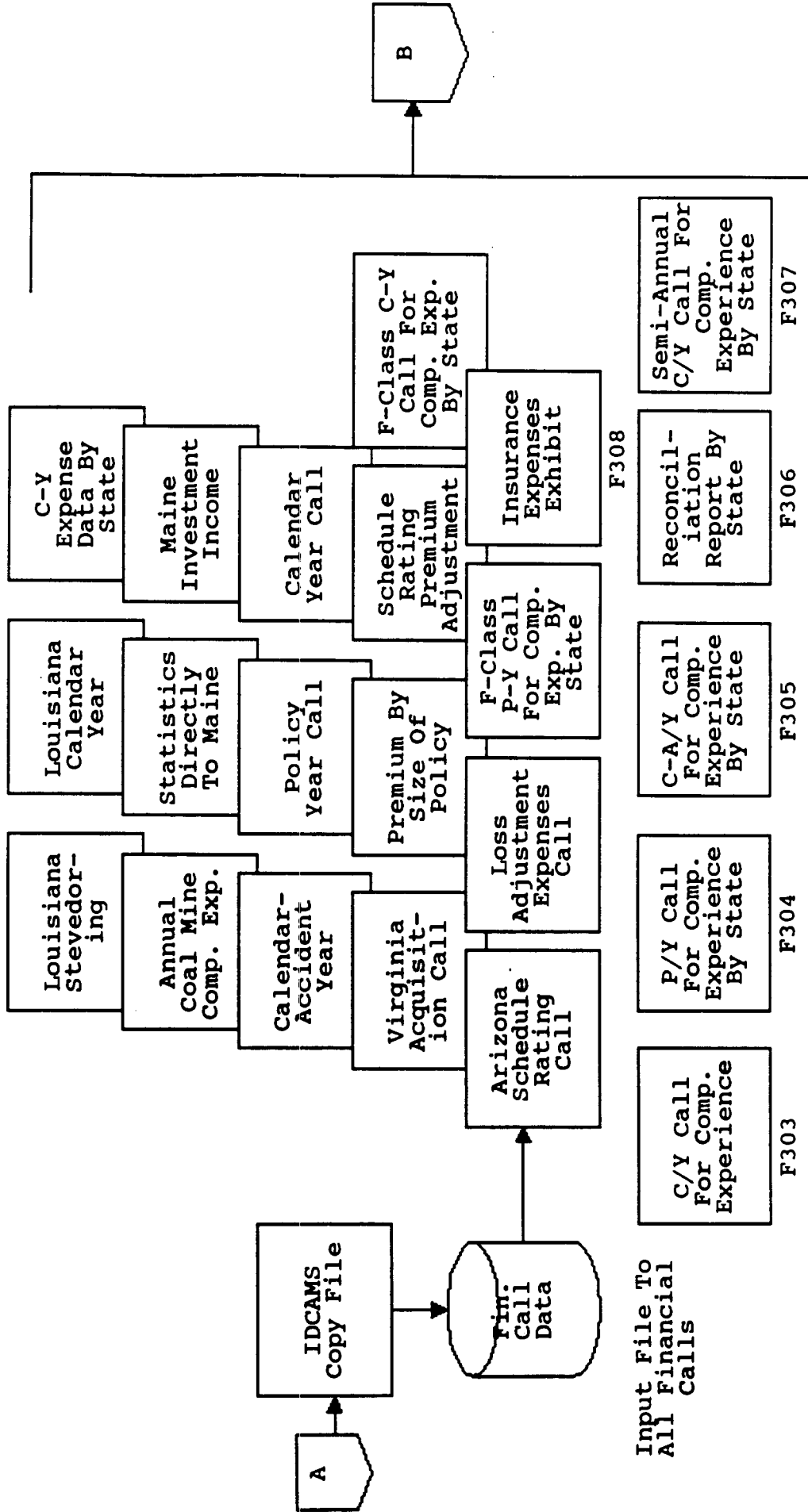
Overall Rate Level

Receive & Edit Financial Call Data



NAIC Examination of NCCI

Overall Rate Level
Receive & Edit Financial Call Data

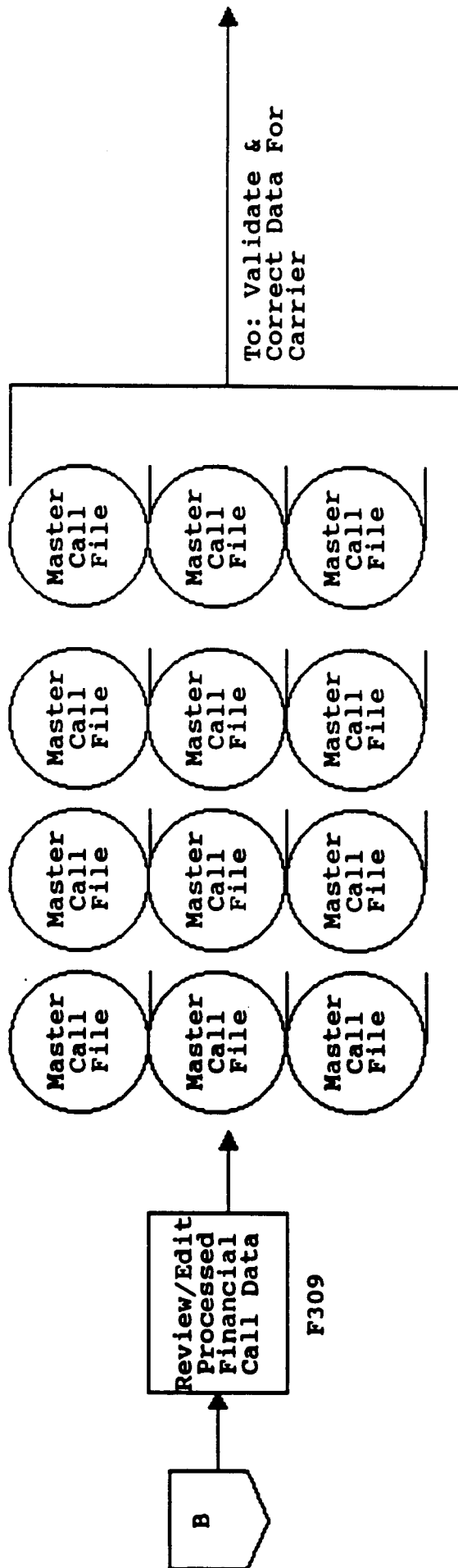


* We are only providing detail for those Financial Calls which affect Aggregate Rate Levels

NAIC Examination of NCCI

Overall Rate Level

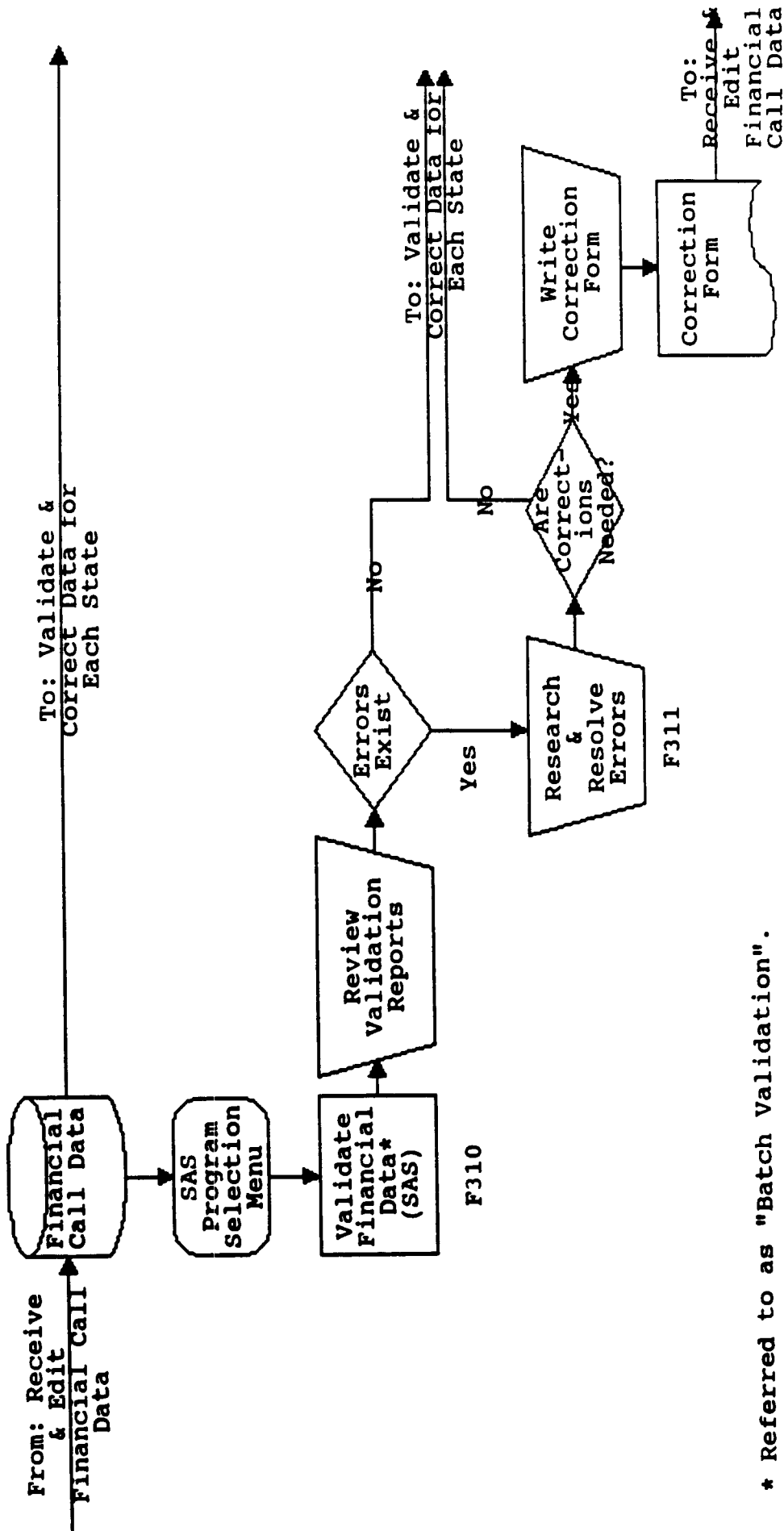
Receive & Edit Financial Call Data



NAIC Examination of NCCI

Overall Rate Level

Validate & Correct Data for Each Carrier

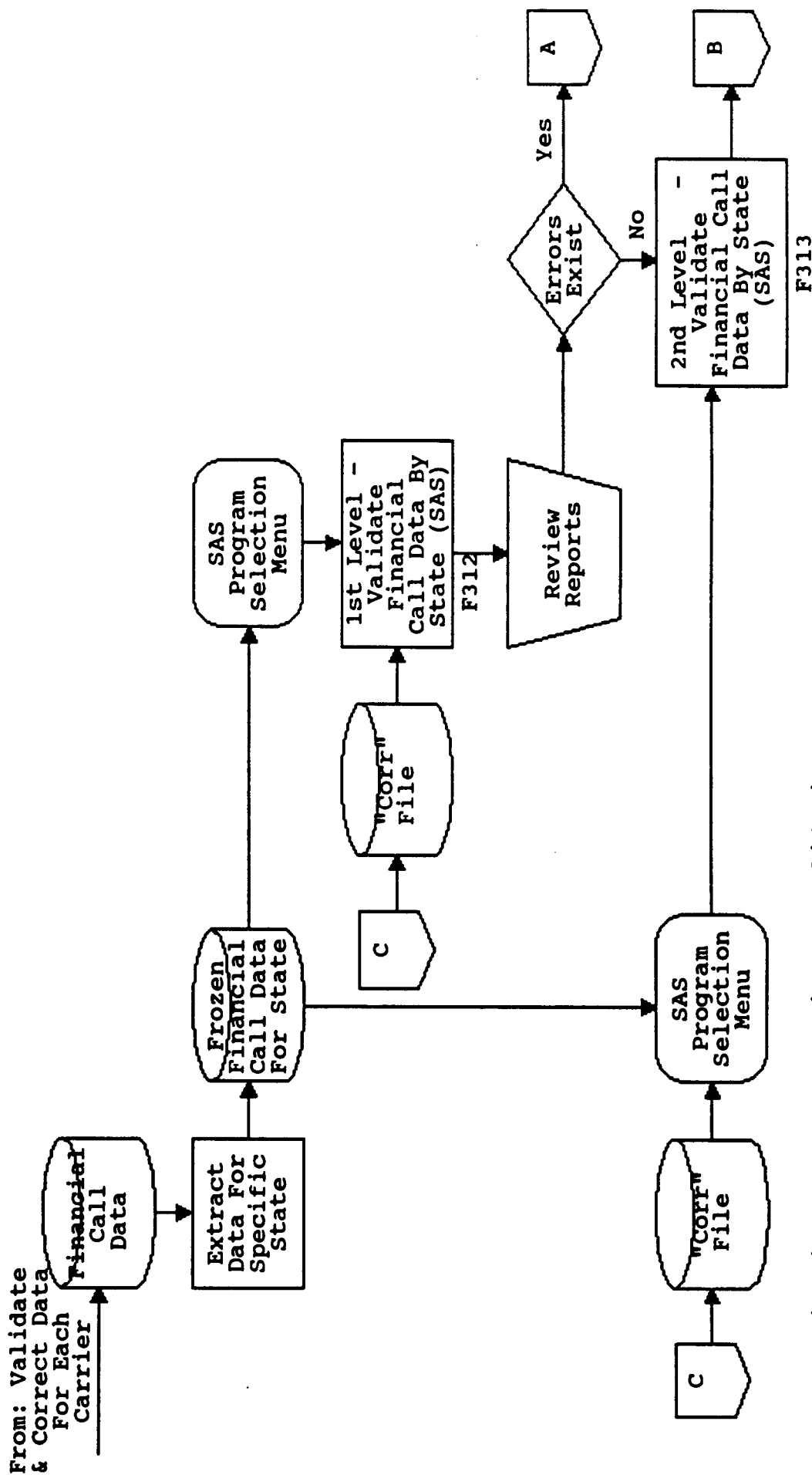


* Referred to as "Batch Validation".

NAIC Examination of NCCI

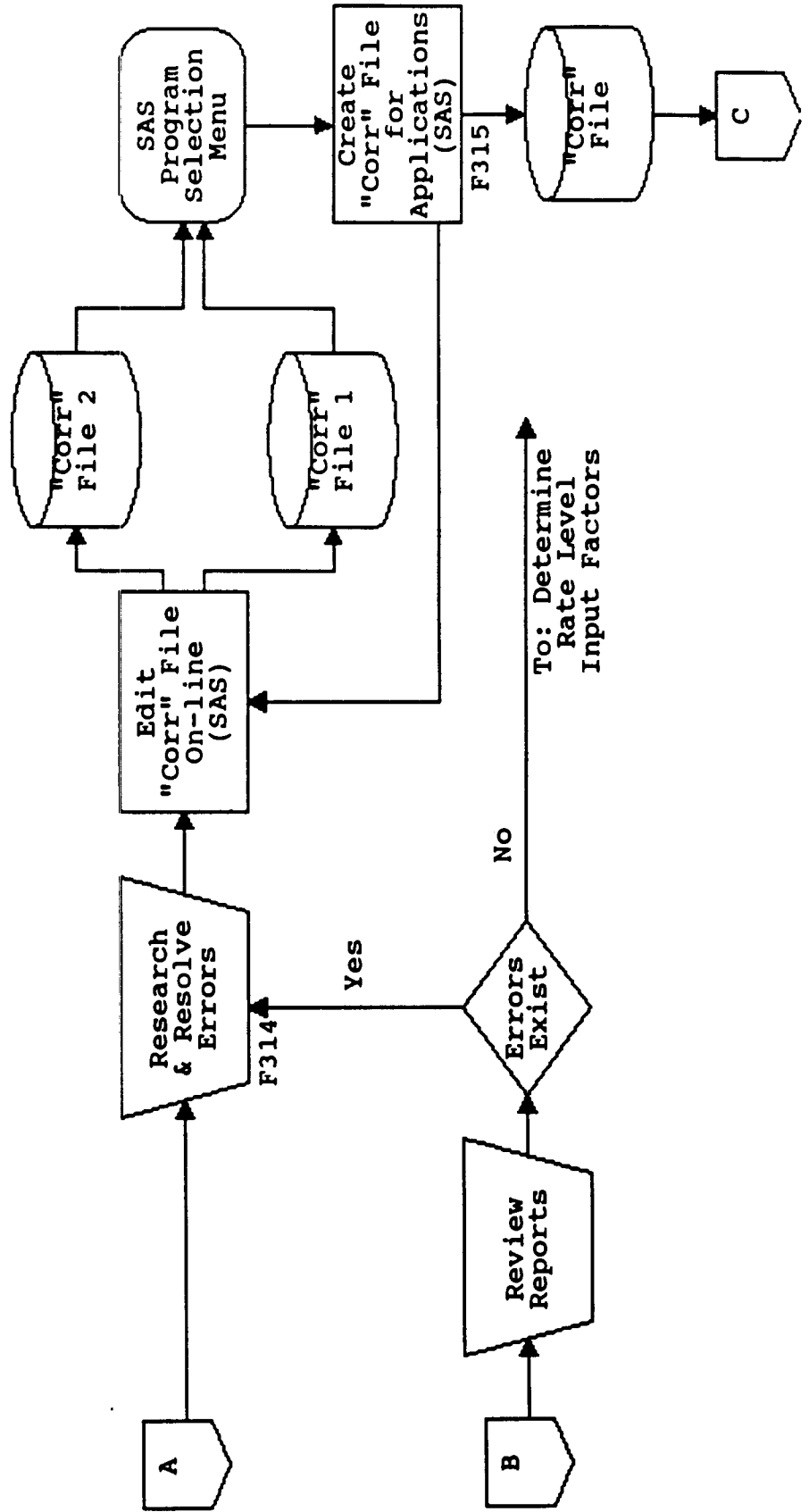
Overall Rate Level

Validate & Correct Data for Each State



* "Corr" File is created later in the validation process during On-Line processing

NAIC Examination of NCCI
Overall Rate Level
Validate & Correct Data for Each State

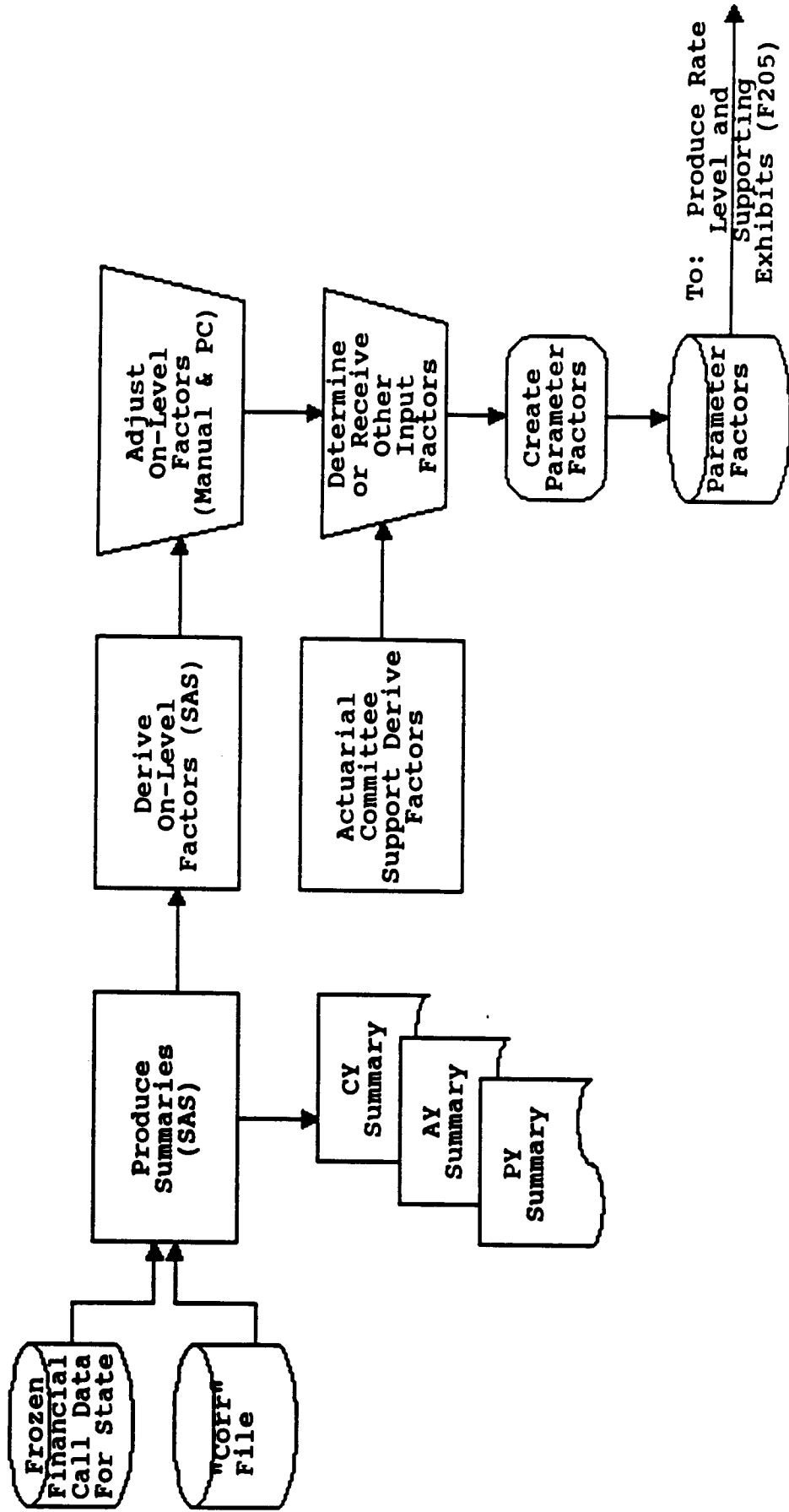


NAIC Examination of NCCI

F204

Overall Rate Level

Determine Rate Level Input Factors

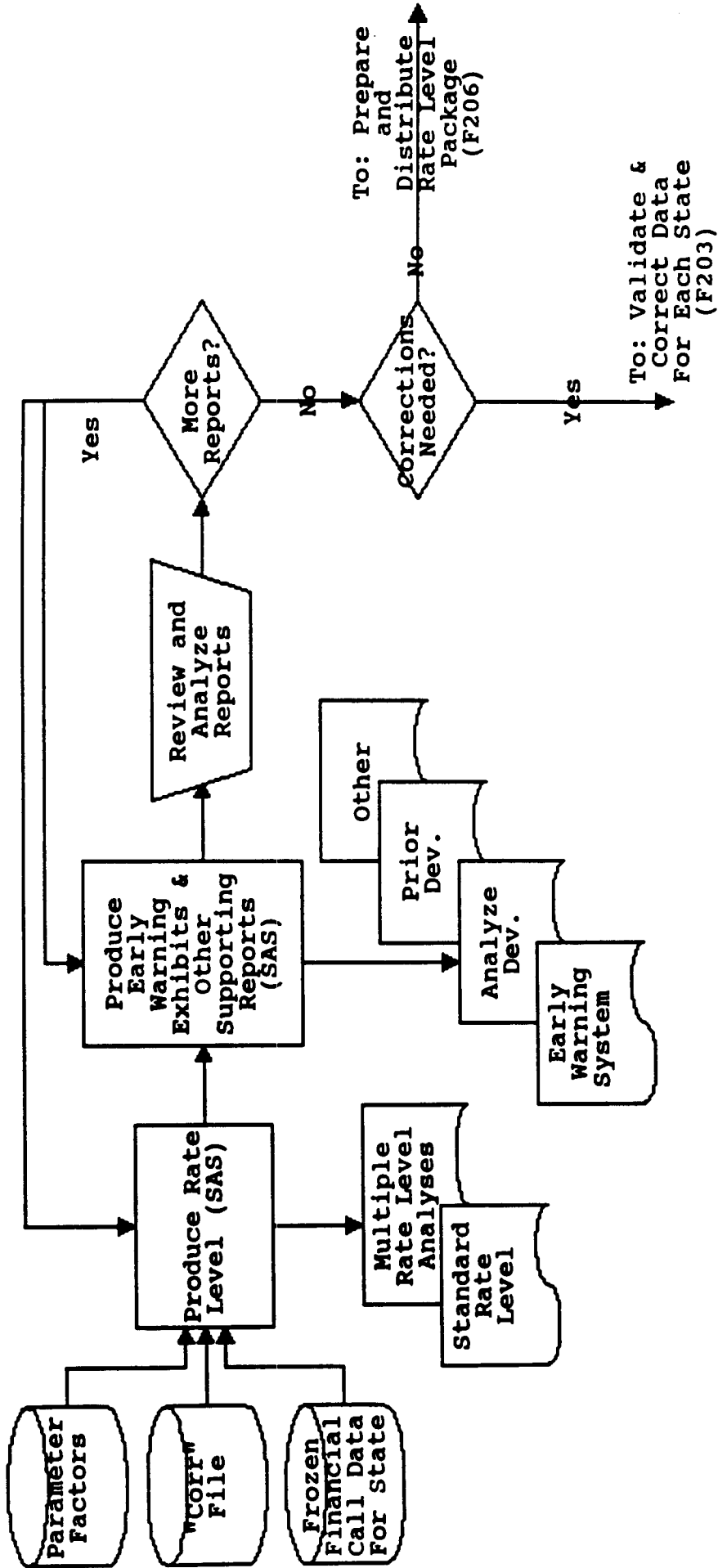


NAIC Examination of NCCI

F205

Overall Rate Level

Produce Rate Level and Supporting Exhibits

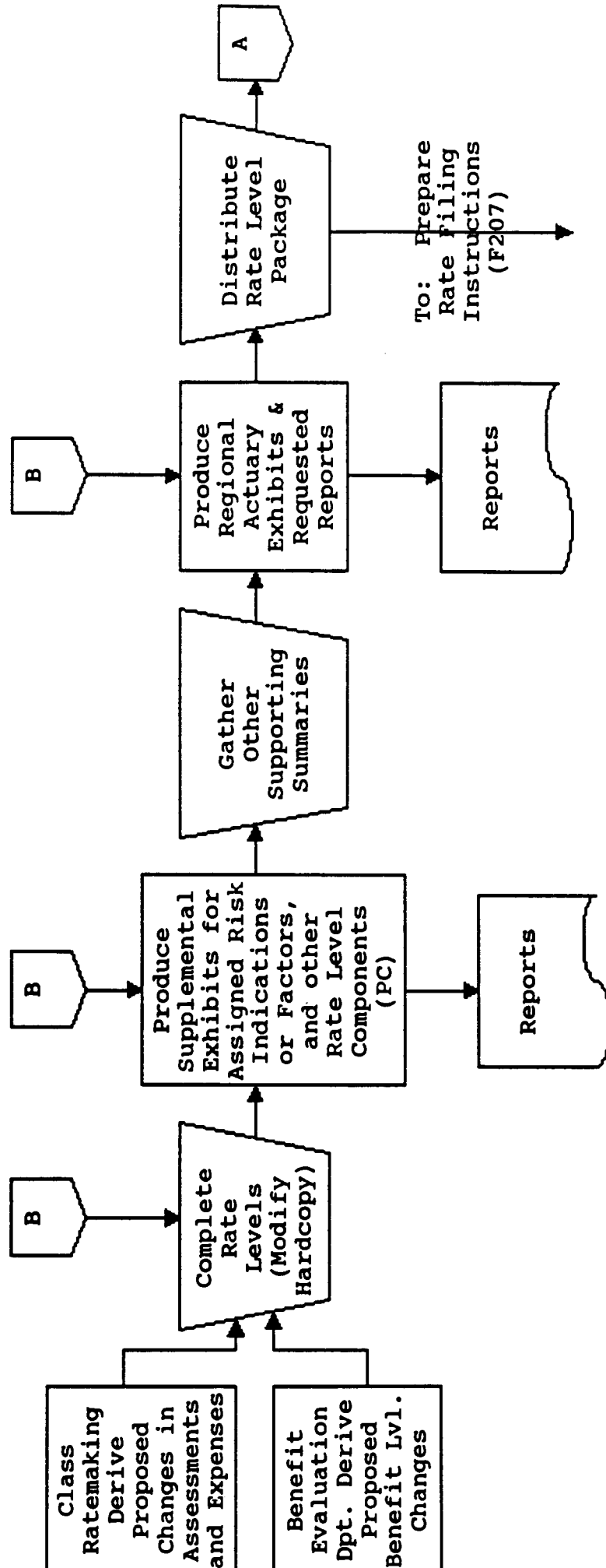


NAIC Examination of NCCI

F206A

Overall Rate Level

Prepare and Distribute Rate Level Package

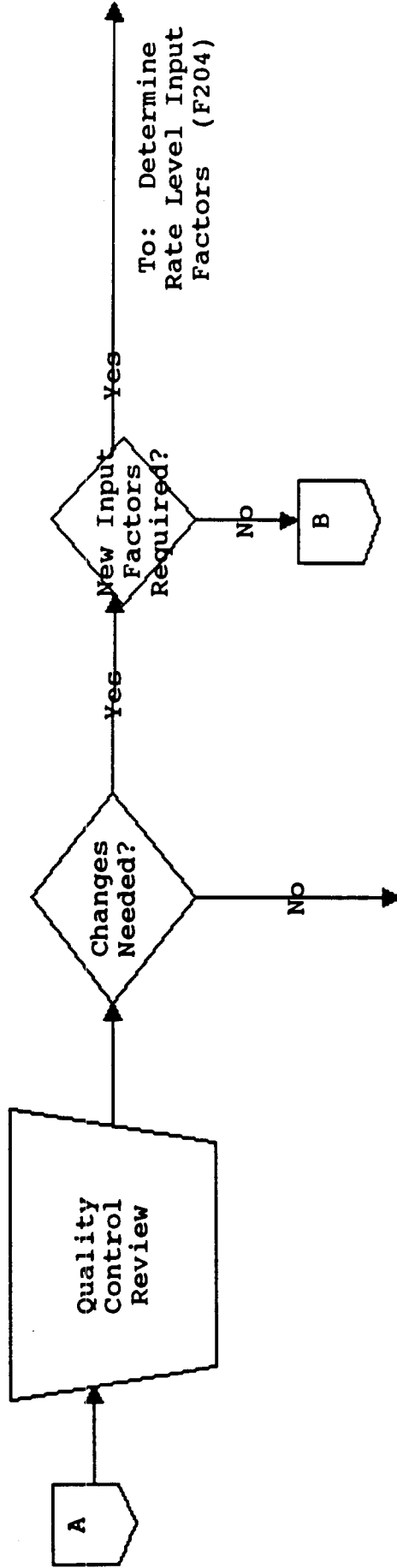


NAIC Examination of NCCI

F206B

Overall Rate Level

Prepare and Distribute Rate Level Package



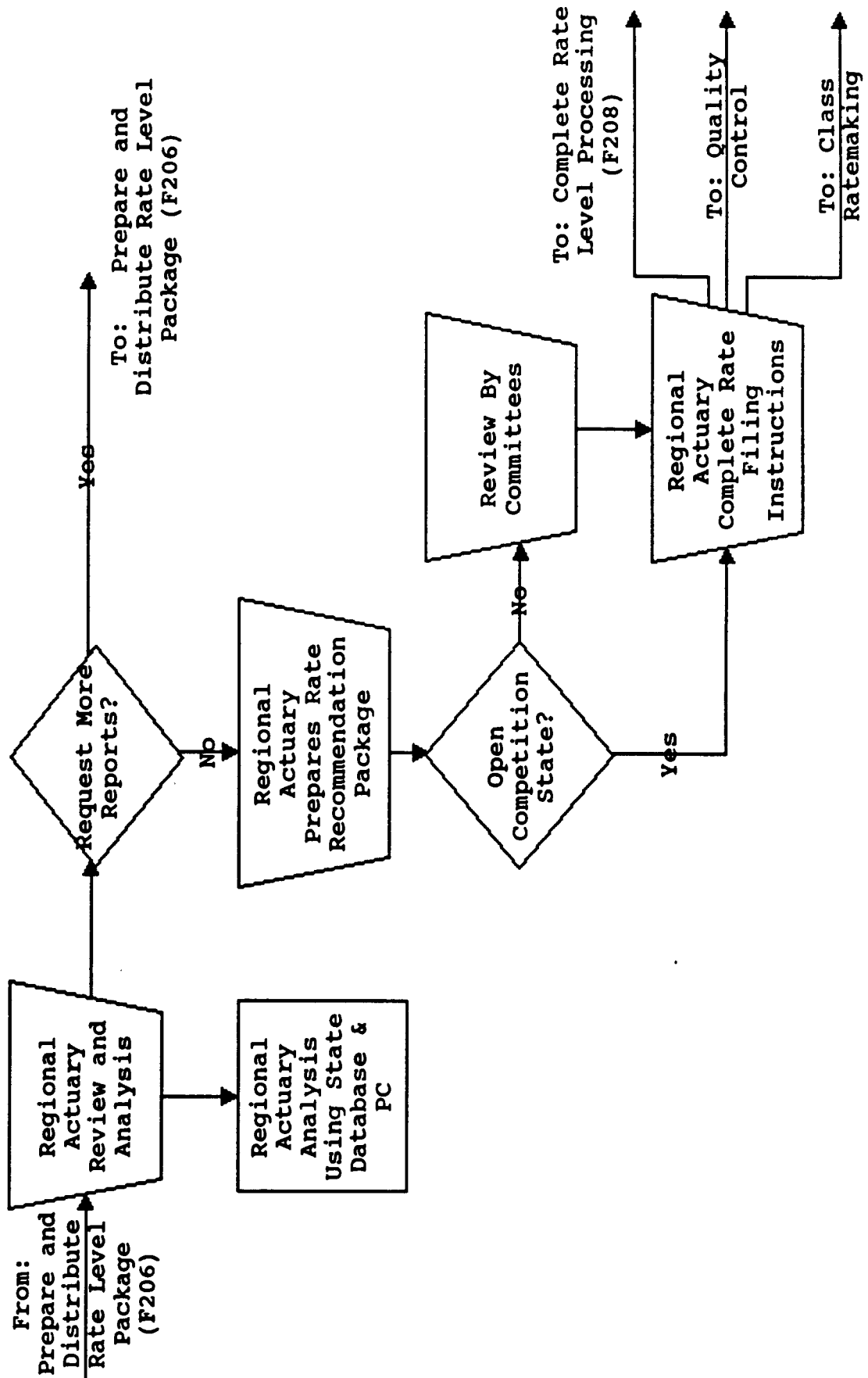
To: Prepare Rate Filing Instructions (F207)

NAIC Examination of NCCI

F207

Overall Rate Level

Prepare Rate Filing Instructions

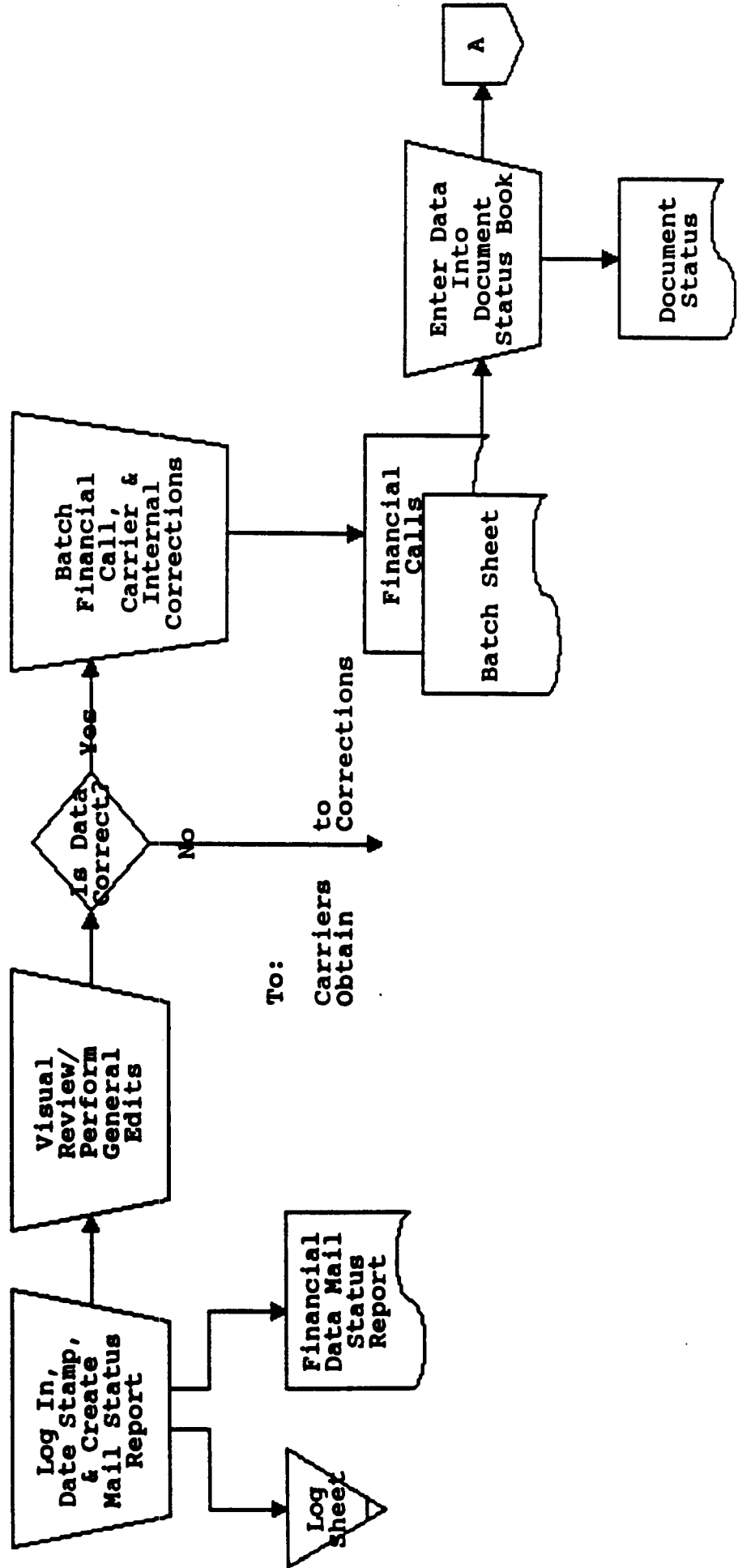


NAIC Examination of NCCI

Overall Rate Level

Sort & Prepare Data for Offsite Key punching (ACS)

F301A

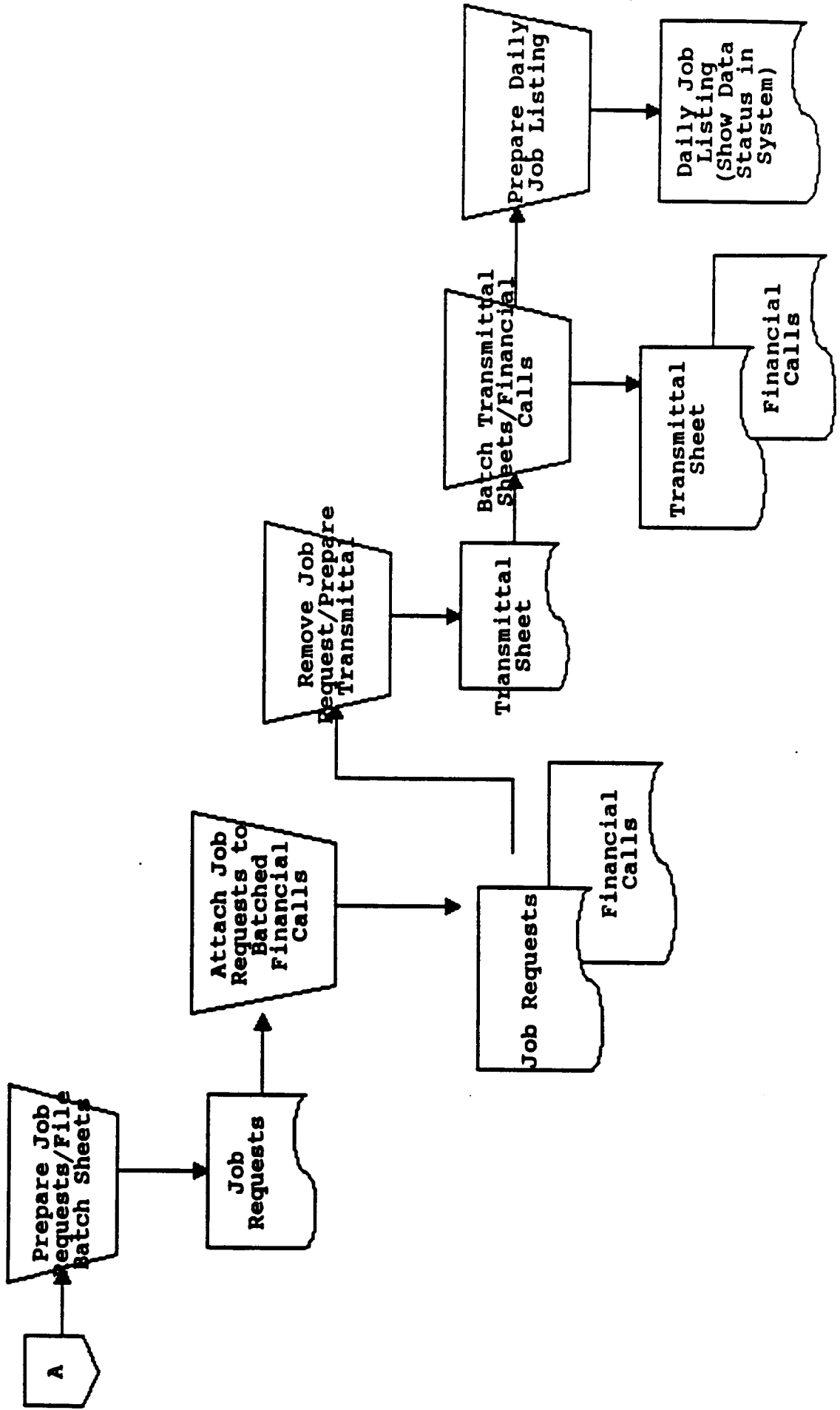


NAIC Examination of NCCI

Overall Rate Level

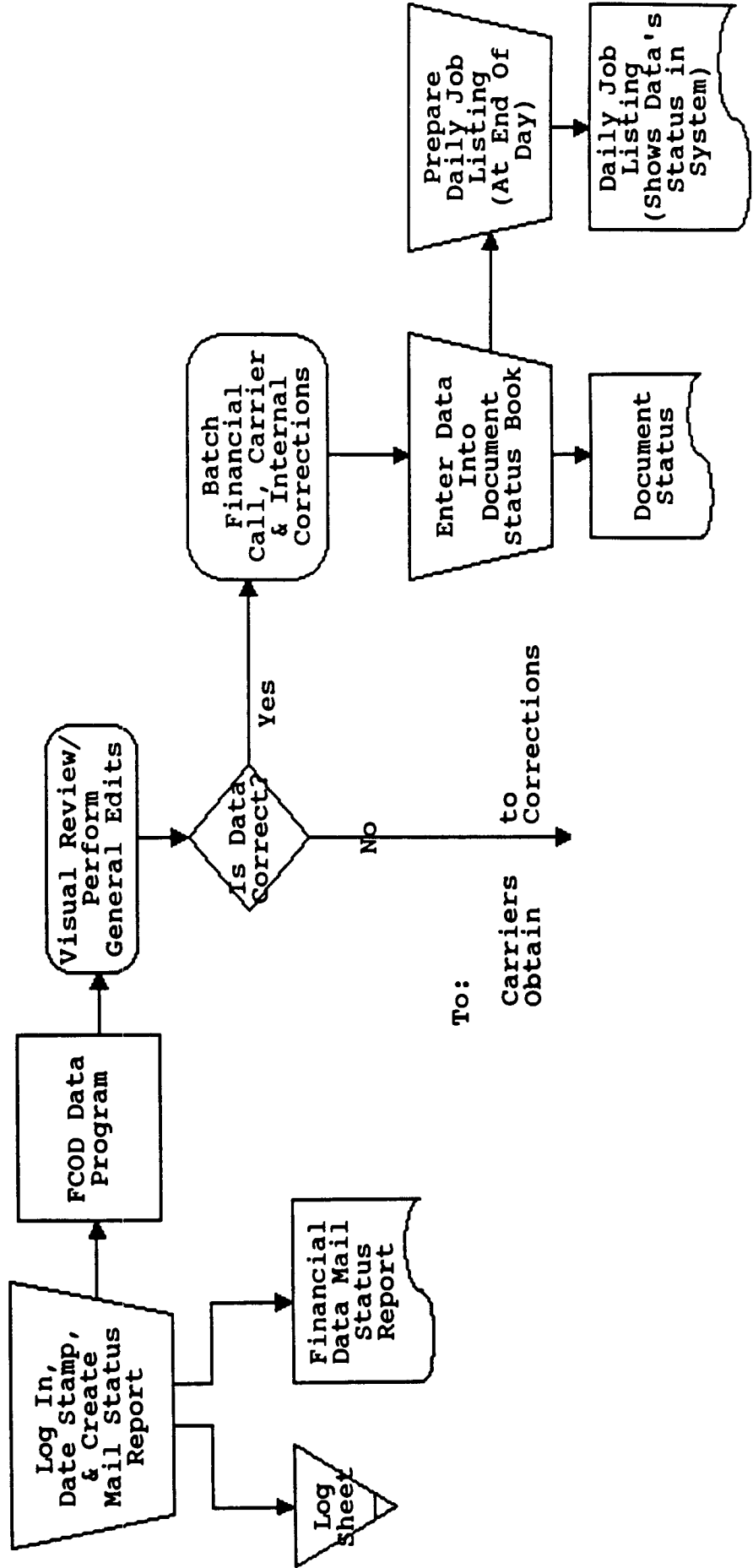
Sort & Prepare Data for Offsite Key punching (ACS)

F301B



NAIC Examination of NCCI
 Overall Rate Level
 Sort & Prepare FCOD Data

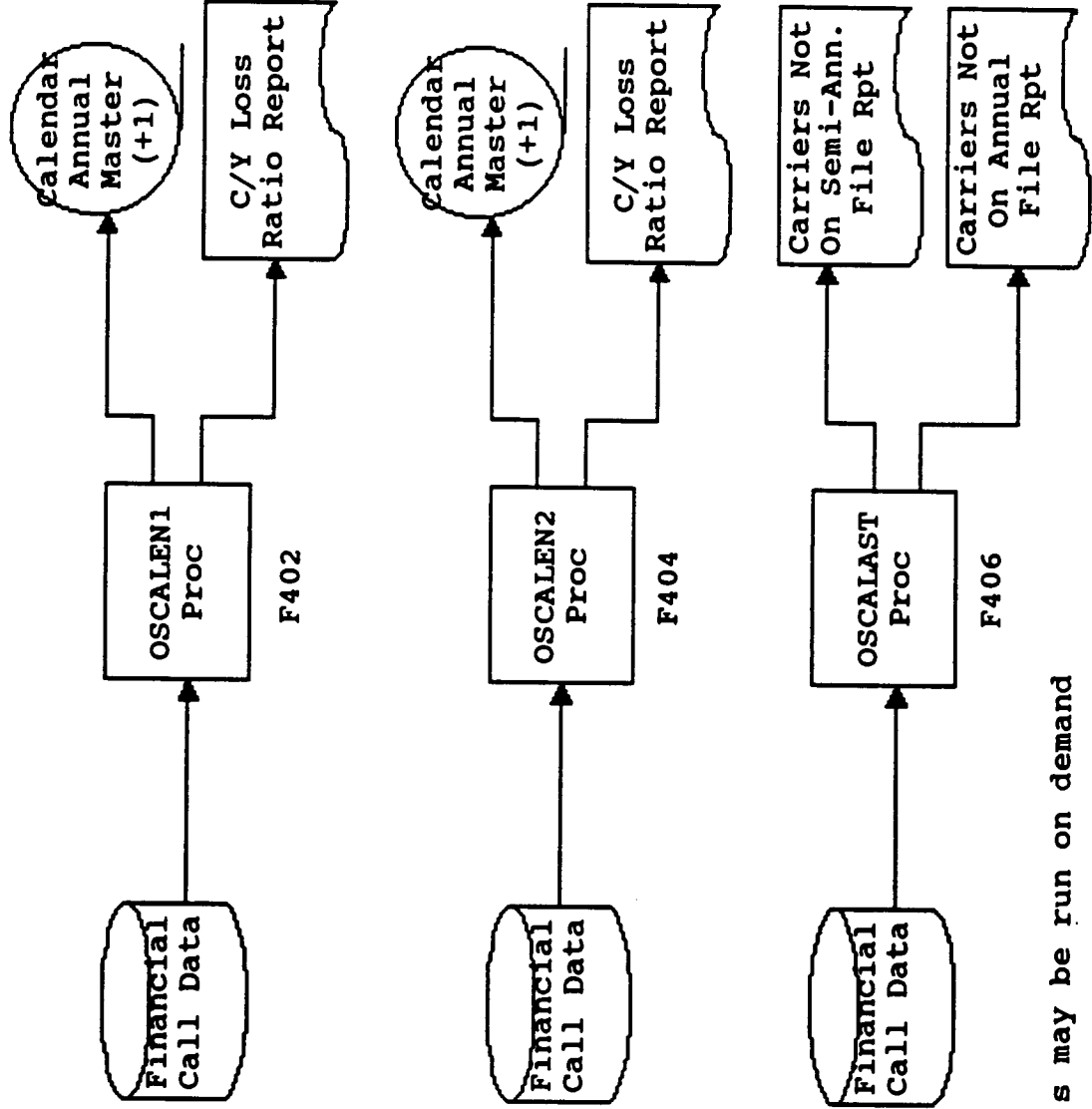
F302



NAIC Examination of NCCI
Overall Rate Level

F303

C/Y Call For Comp. Experience By State



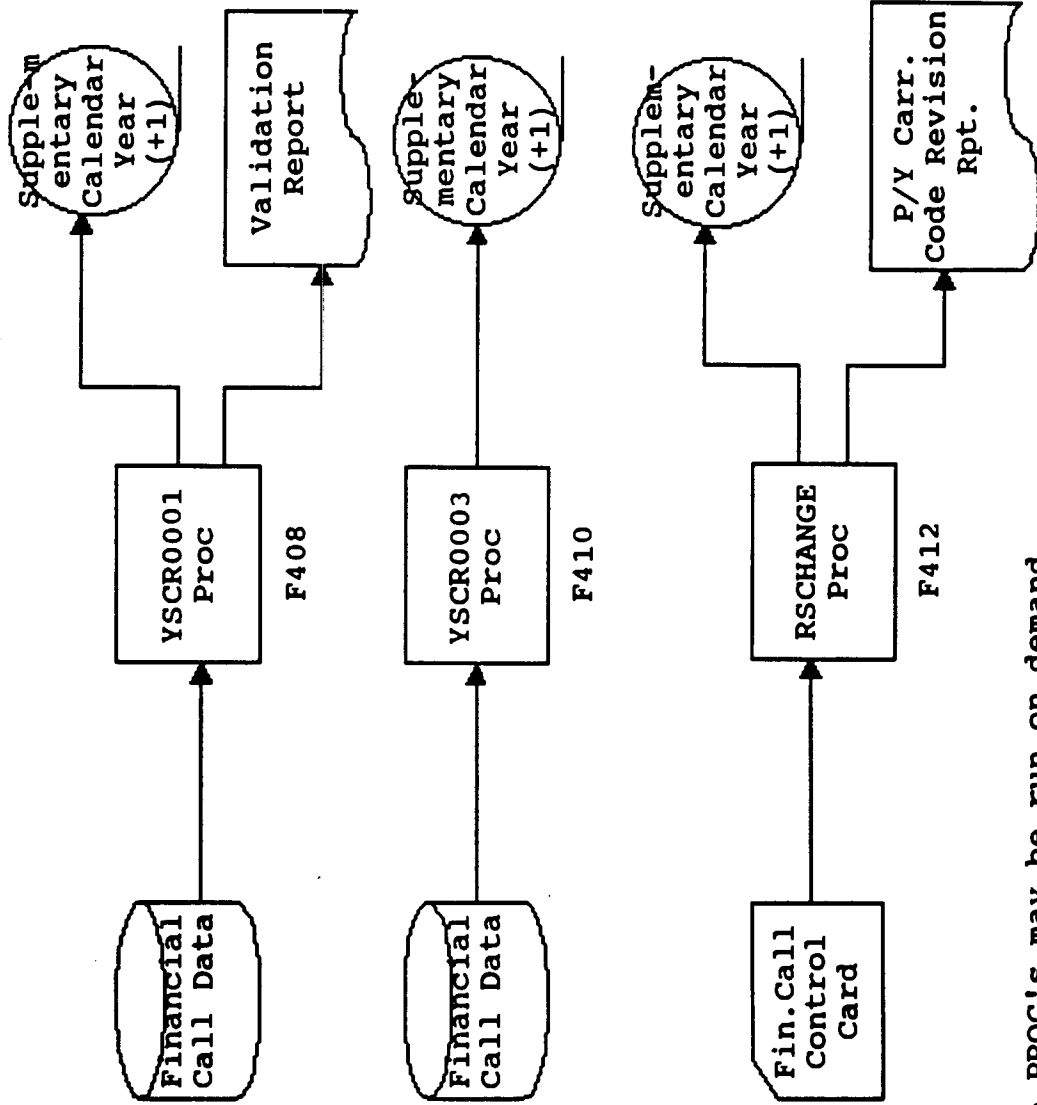
* Any of these PROC's may be run on demand

NAIC Examination of NCCI

Overall Rate Level

P/Y Call For Comp. Experience By State

F304A

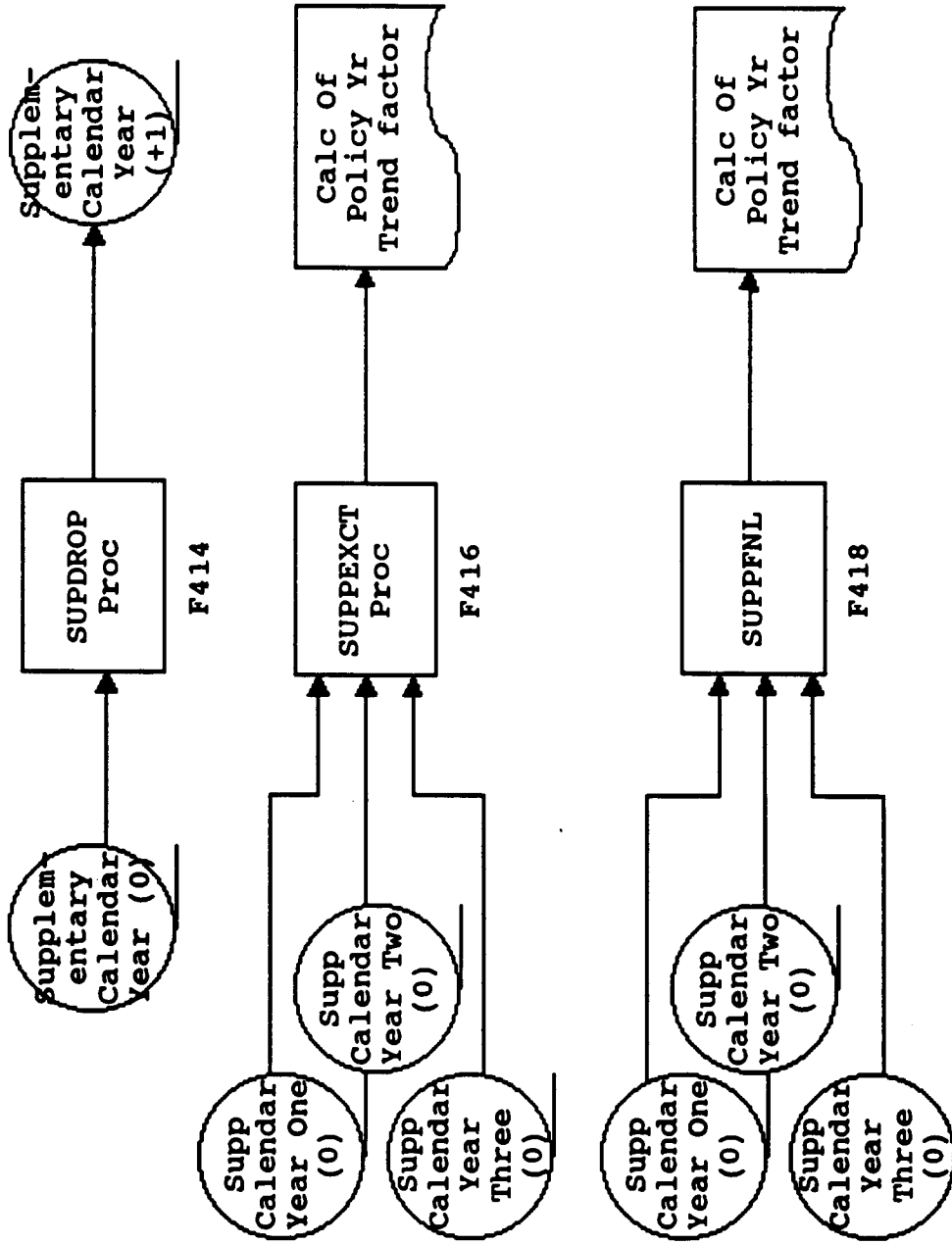


* Any of these PROC's may be run on demand

NAIC Examination of NCCI

Overall Rate Level

P/Y Call For Comp. Experience By State

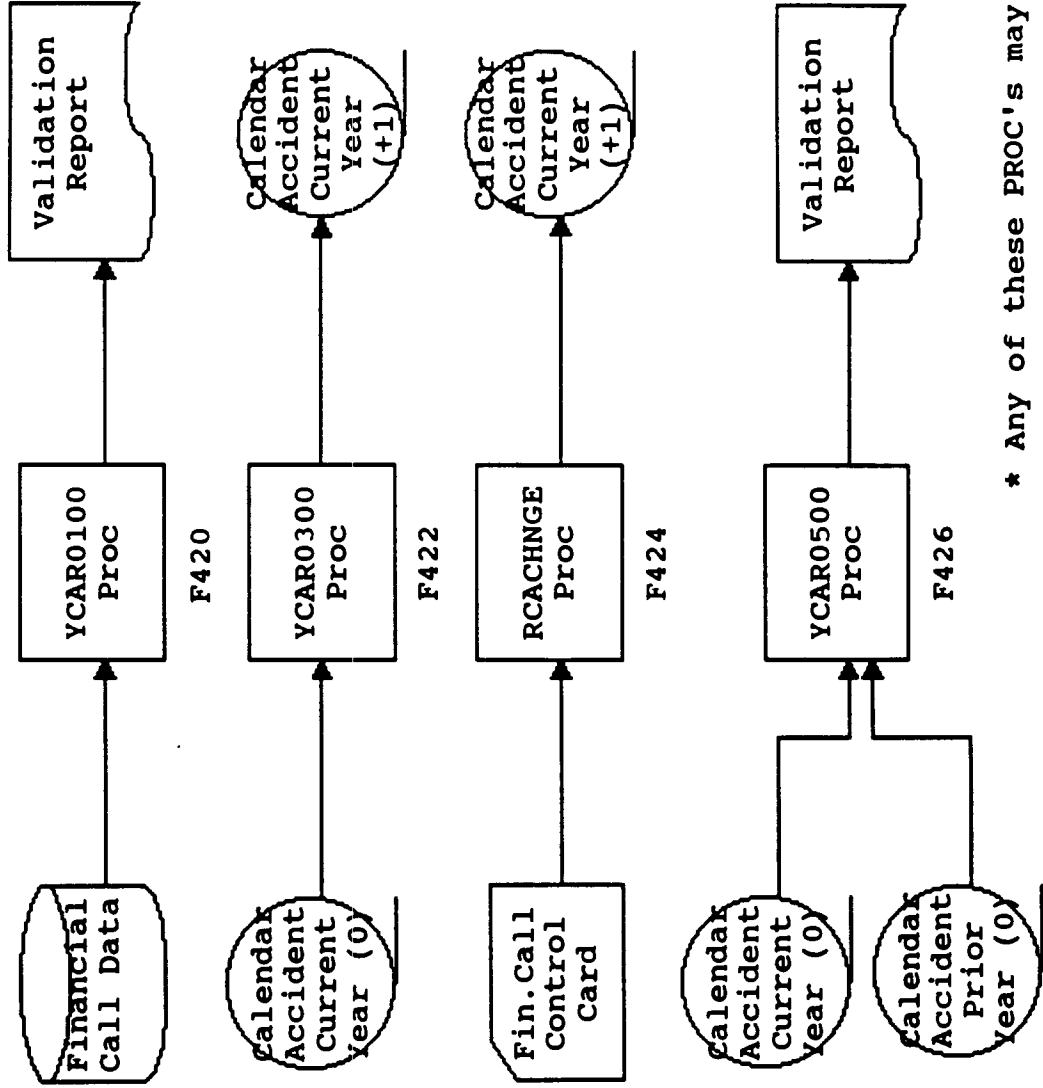


* Any of these PROC's may be run on demand

NAIC Examination of NCCI
Overall Rate Level

F305

C-A/Yr. Call For Comp. Experience By State



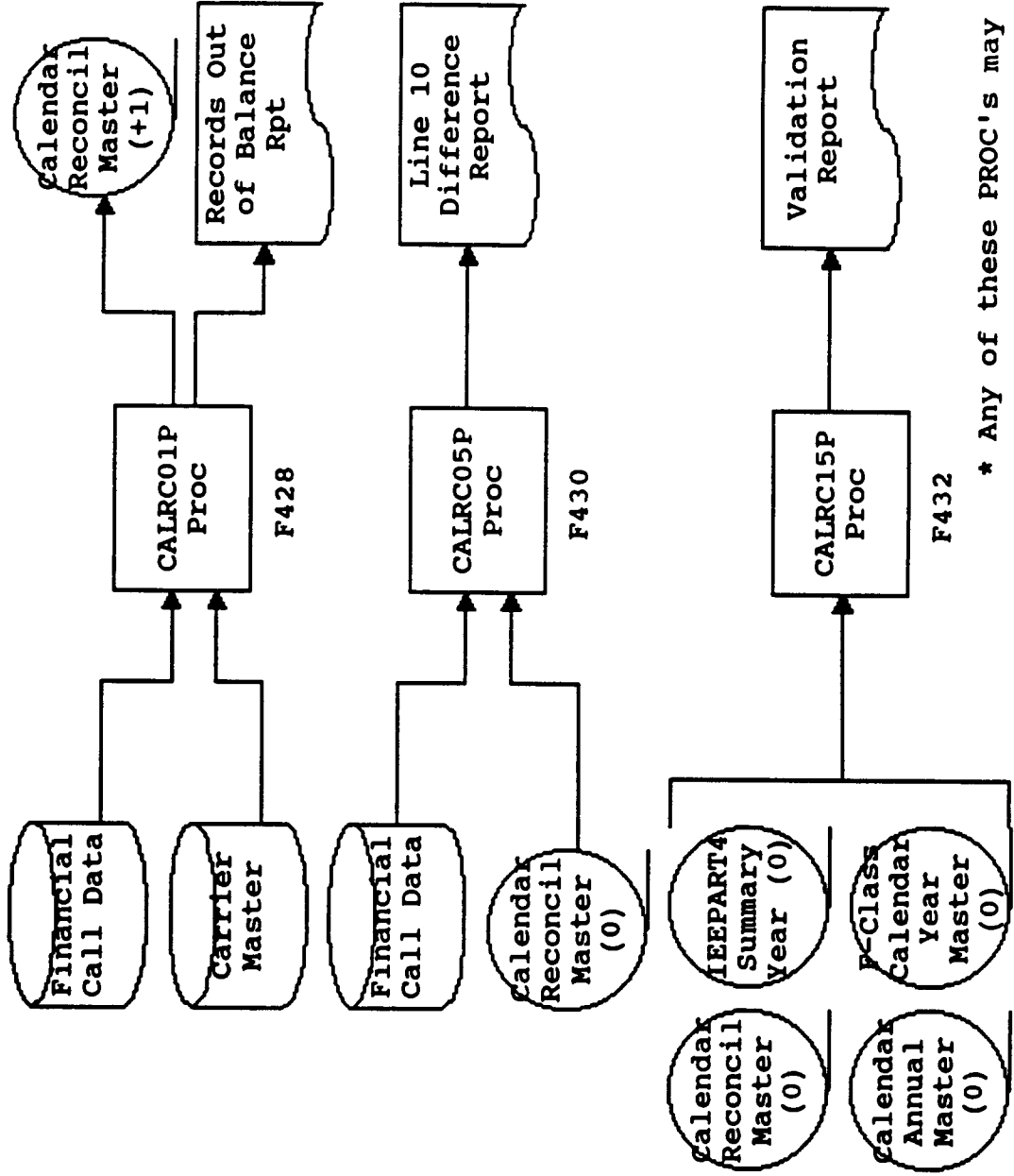
* Any of these PROC's may be run on demand

NAIC Examination of NCCI

F306

Overall Rate Level

Reconciliation Report By State



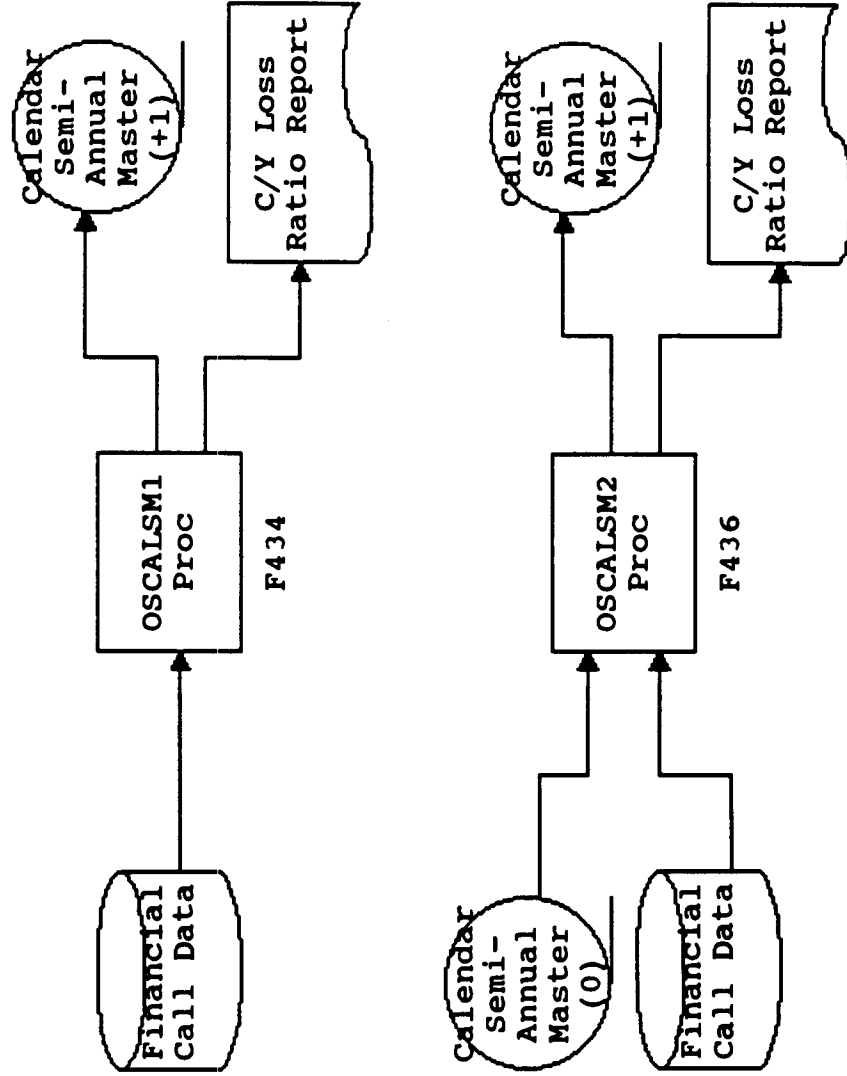
* Any of these PROC's may be run on demand

NAIC Examination of NCCI

F307

Overall Rate Level

Semi-Annual C/Y Call For Comp. Experience By State

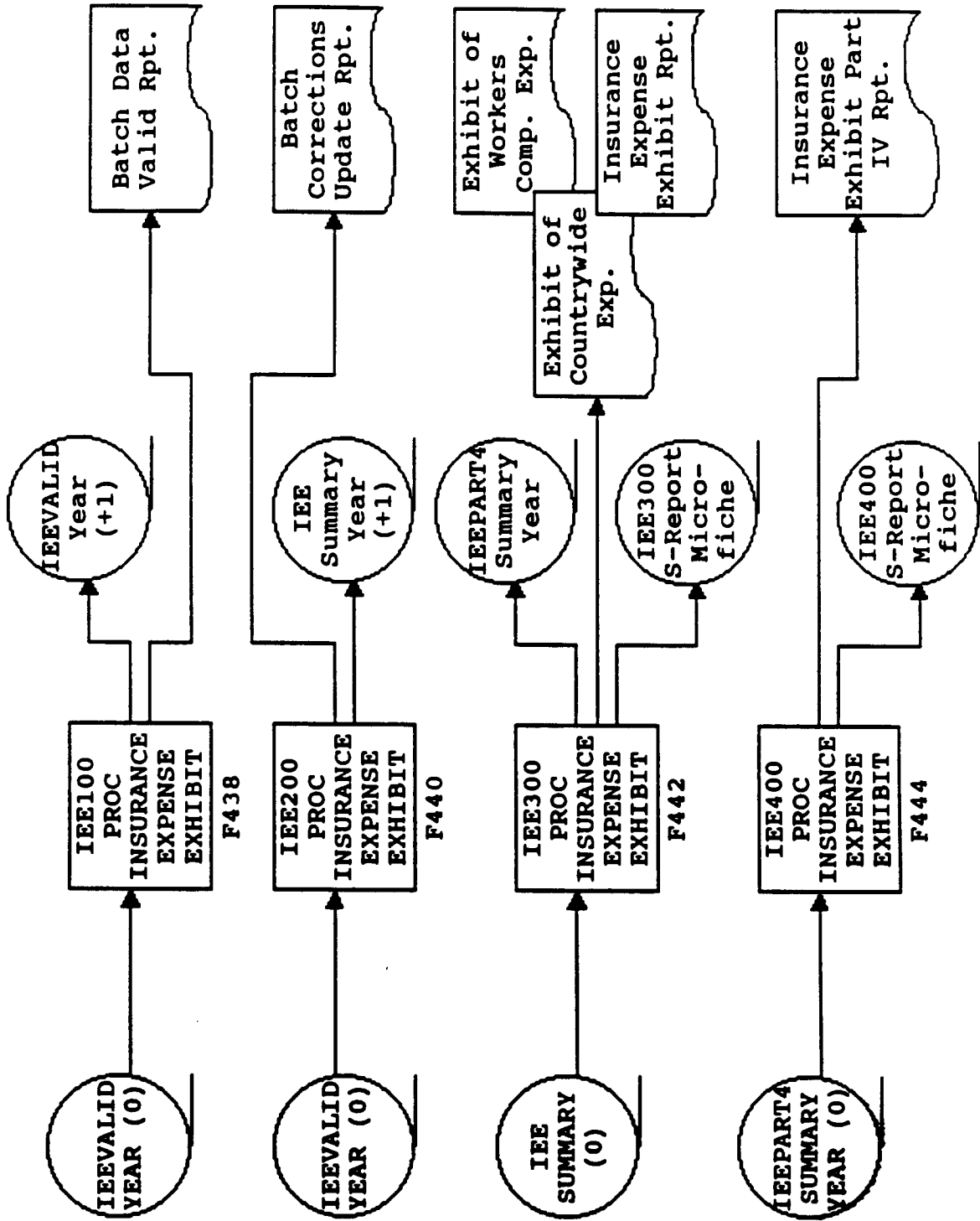


* Any of these PROC's may be run on demand

NAIC Examination of NCCI
Overall Rate Level

Insurance Expense Exhibit

F308

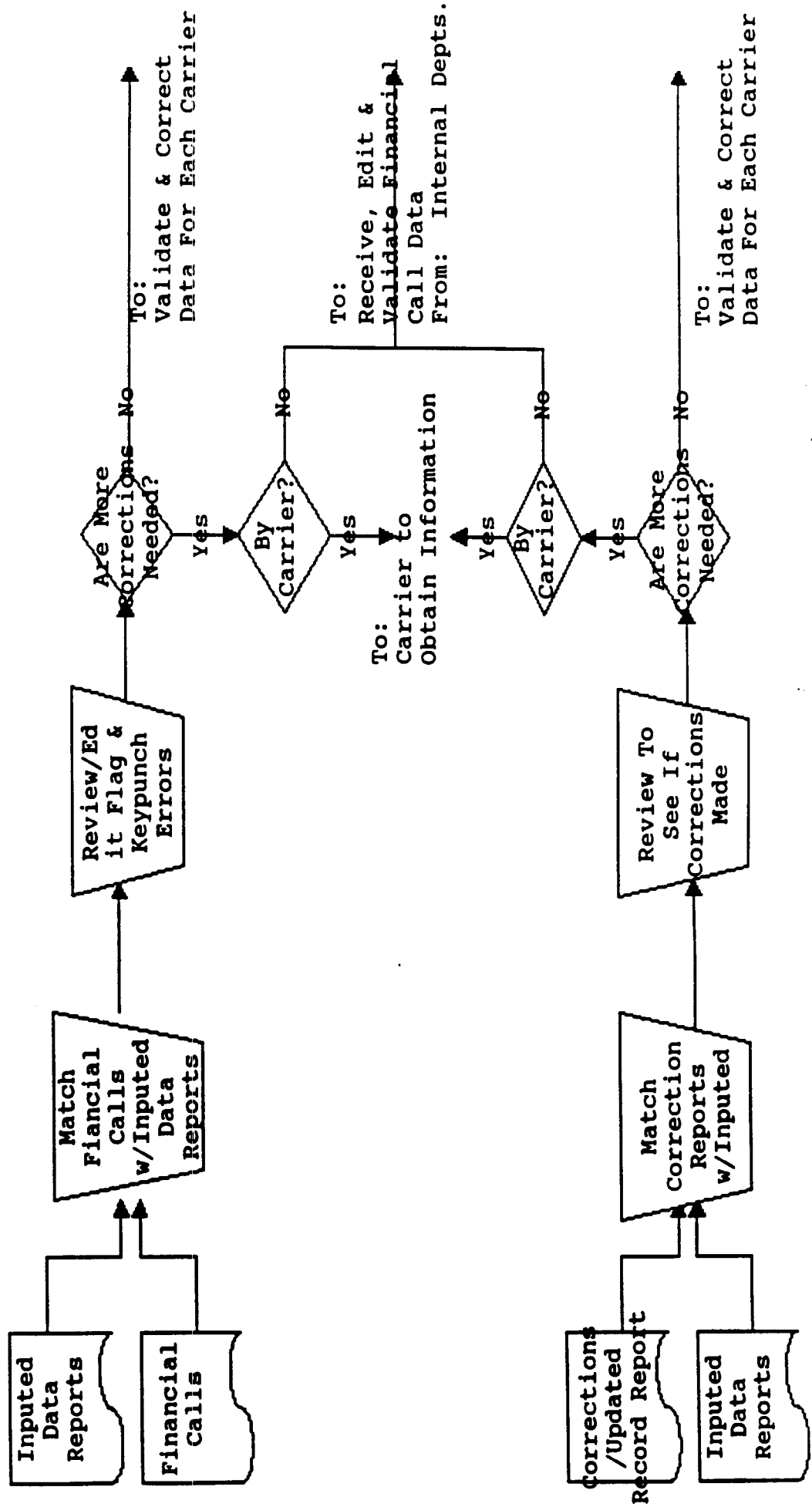


NAIC Examination of NCCI

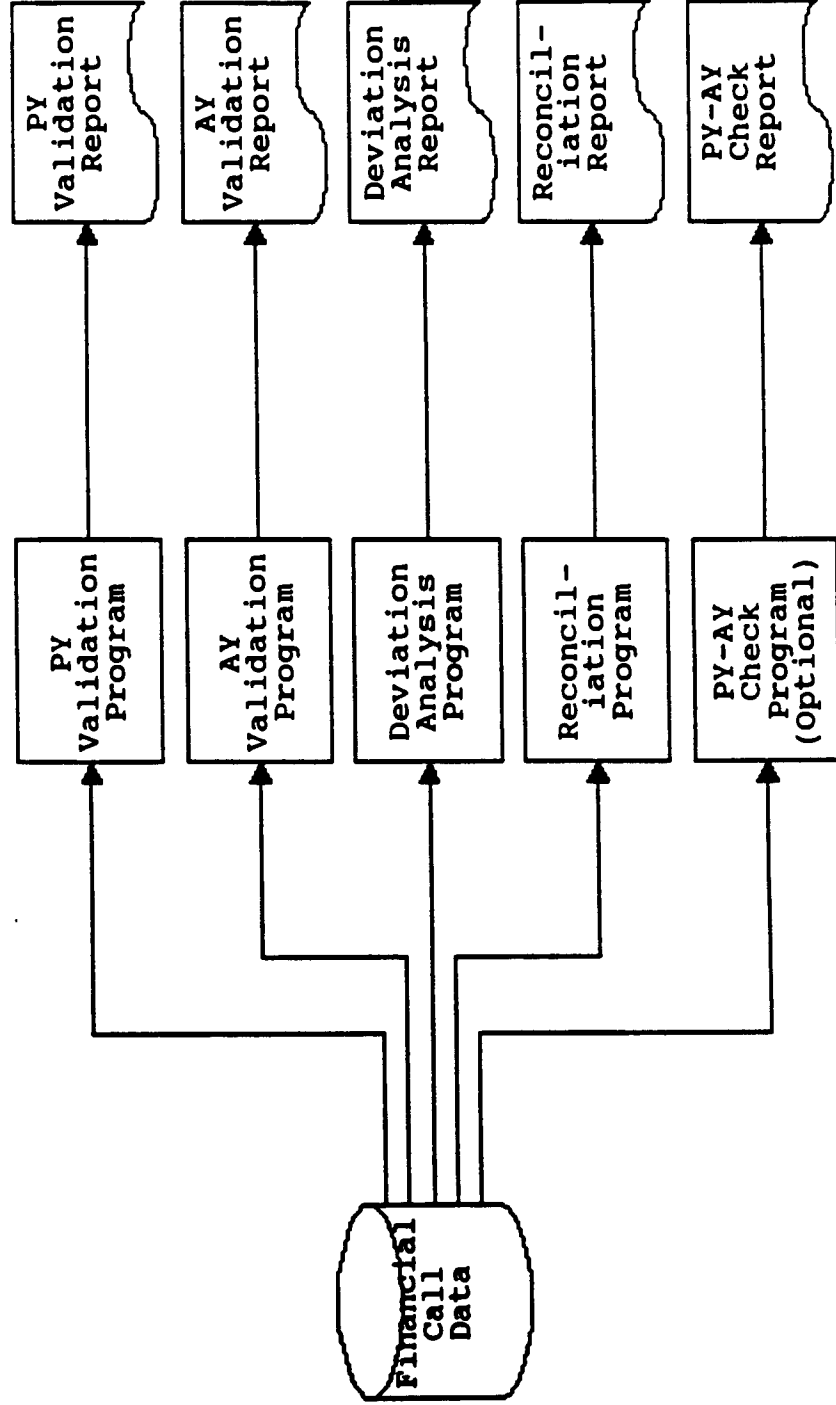
F309

Overall Rate Level

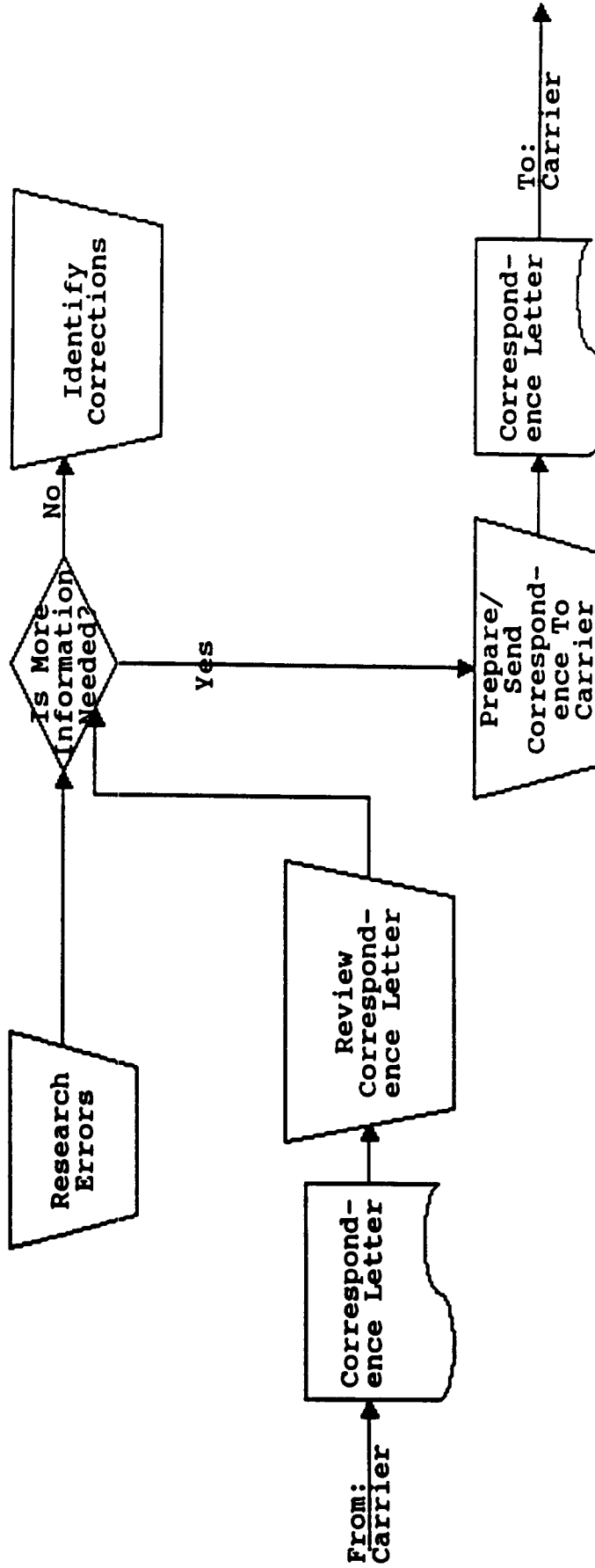
Receive/ Edit Processed Financial Call Data



NAIC Examination of NCCI
Overall Rate Level
Validate Financial Call Data By Carrier (SAS)



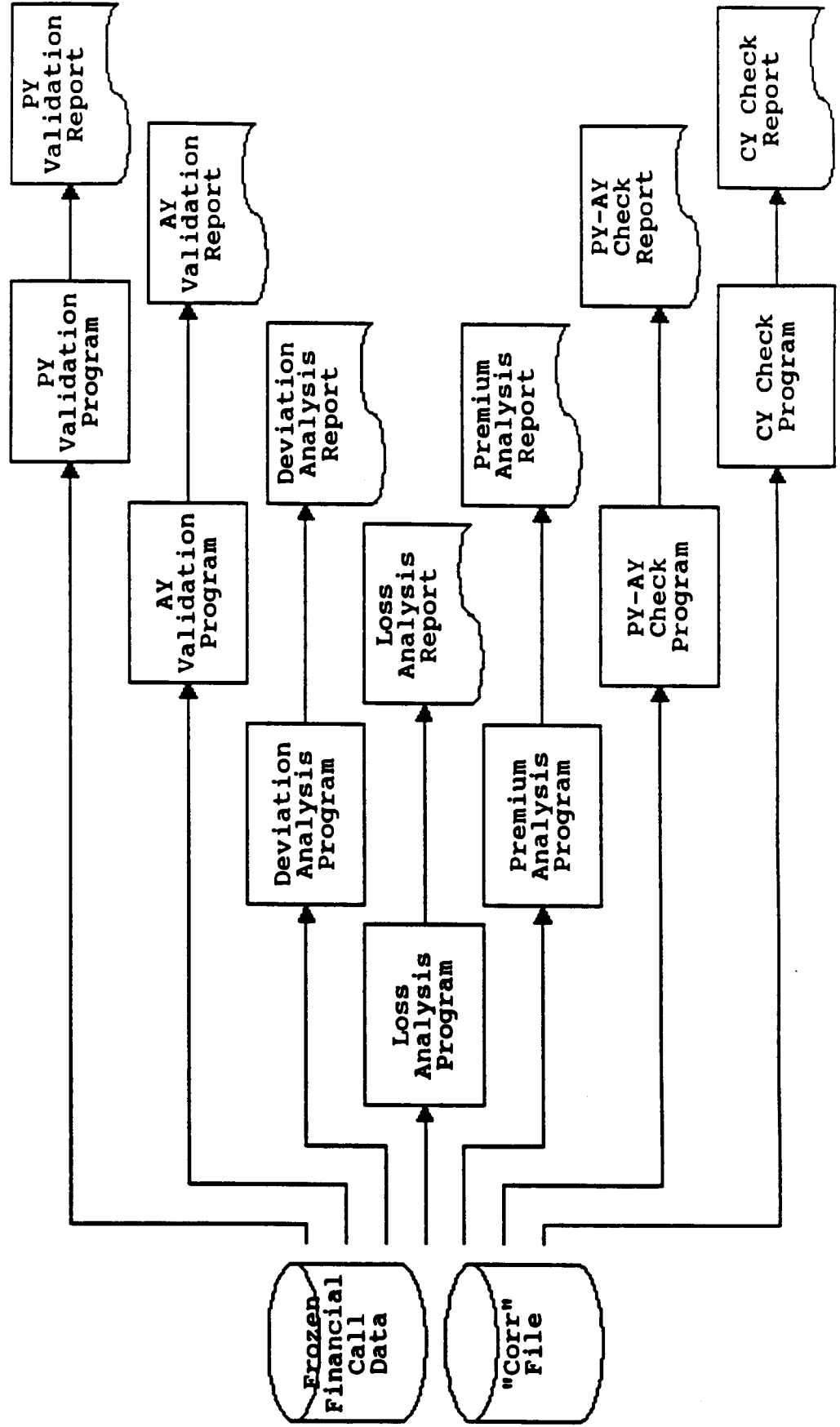
NAIC Examination of NCCI
Overall Rate Level
Research & Resolve Errors



NAIC Examination of NCCI

Overall Rate Level

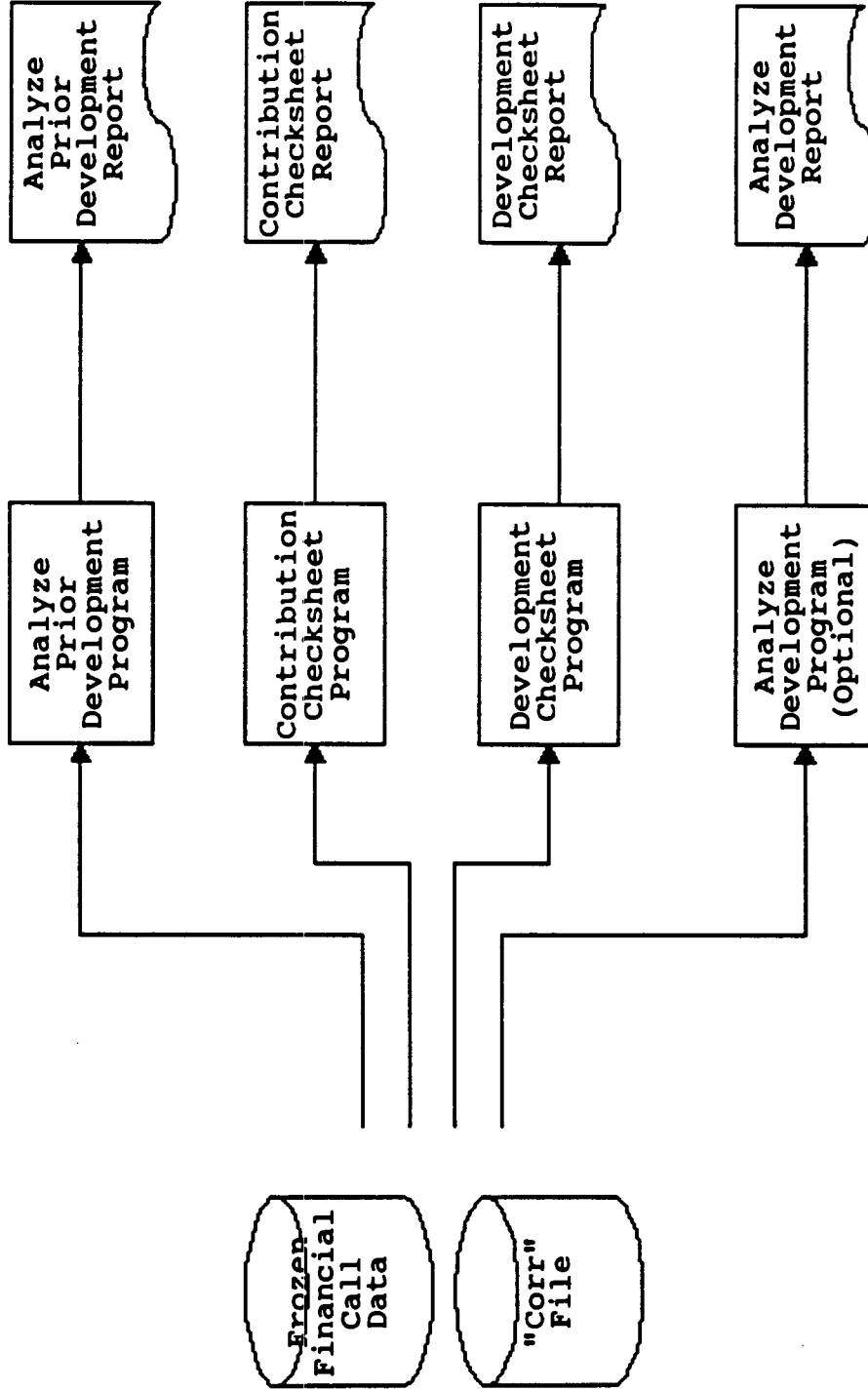
1st Level - Validate Financial Call Data By State (SAS)



NAIC Examination of NCCI

Overall Rate Level

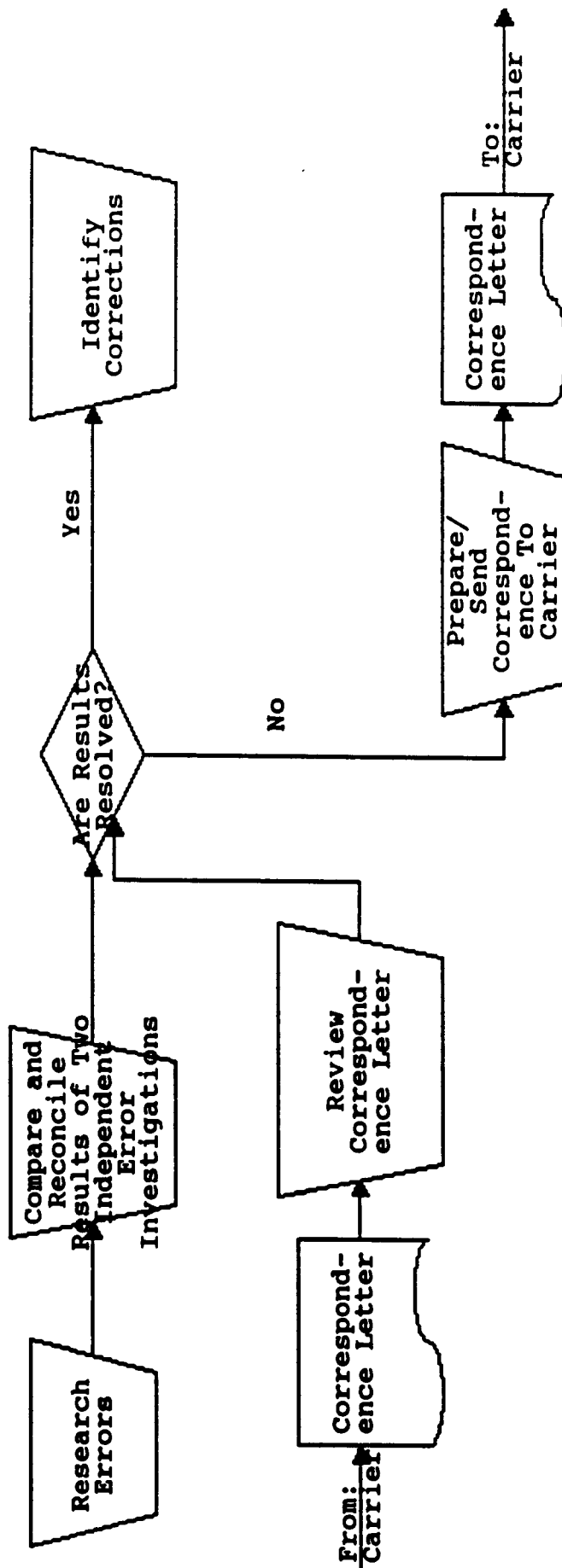
2nd Level - Validate Financial Call Data By State (SAS)



NAIC Examination of NCCI

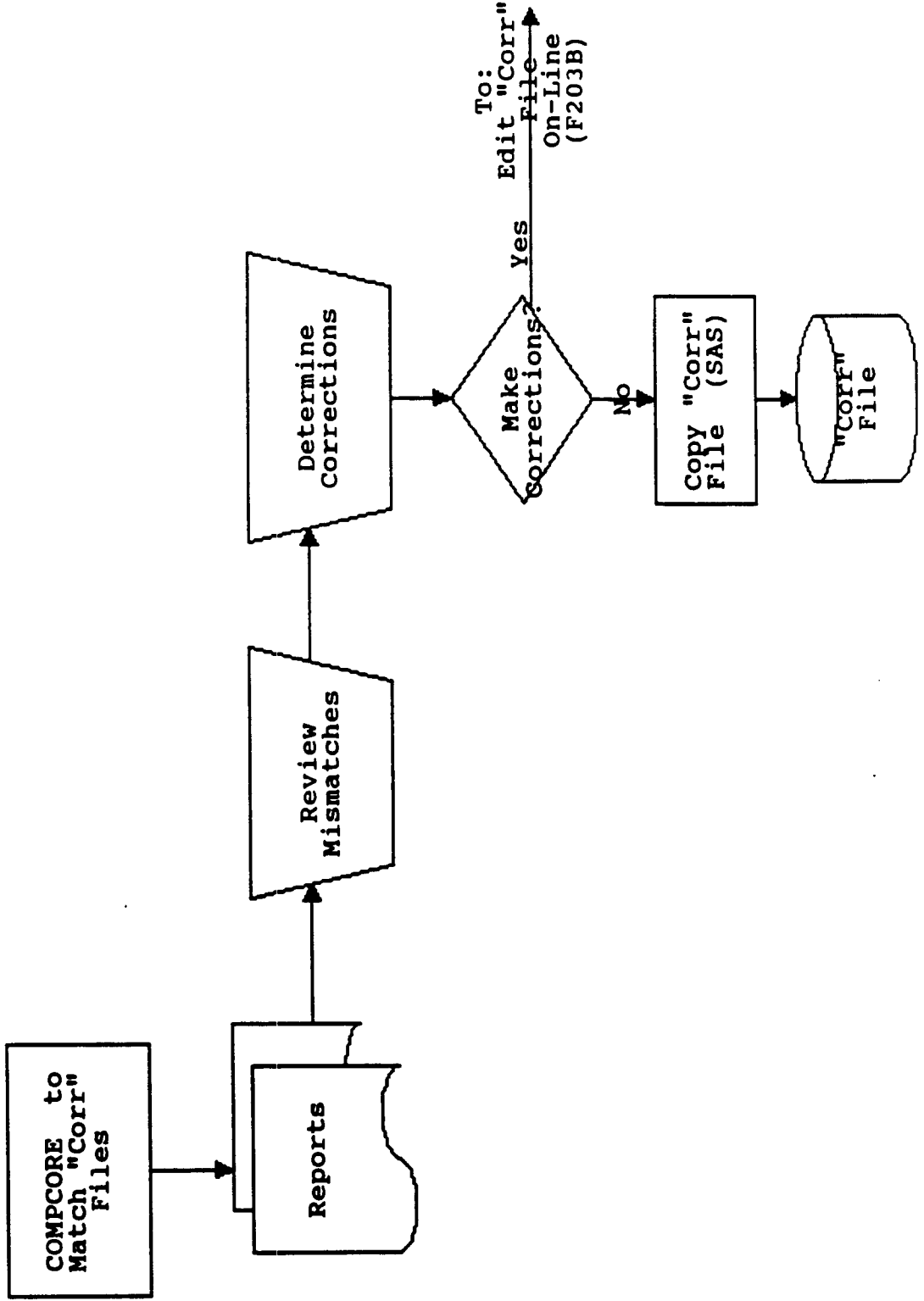
Overall Rate Level

Research & Resolve Errors For Each State



NAIC Examination of NCCI
Overall Rate Level

Create "Corr" File For Applications (SAS)



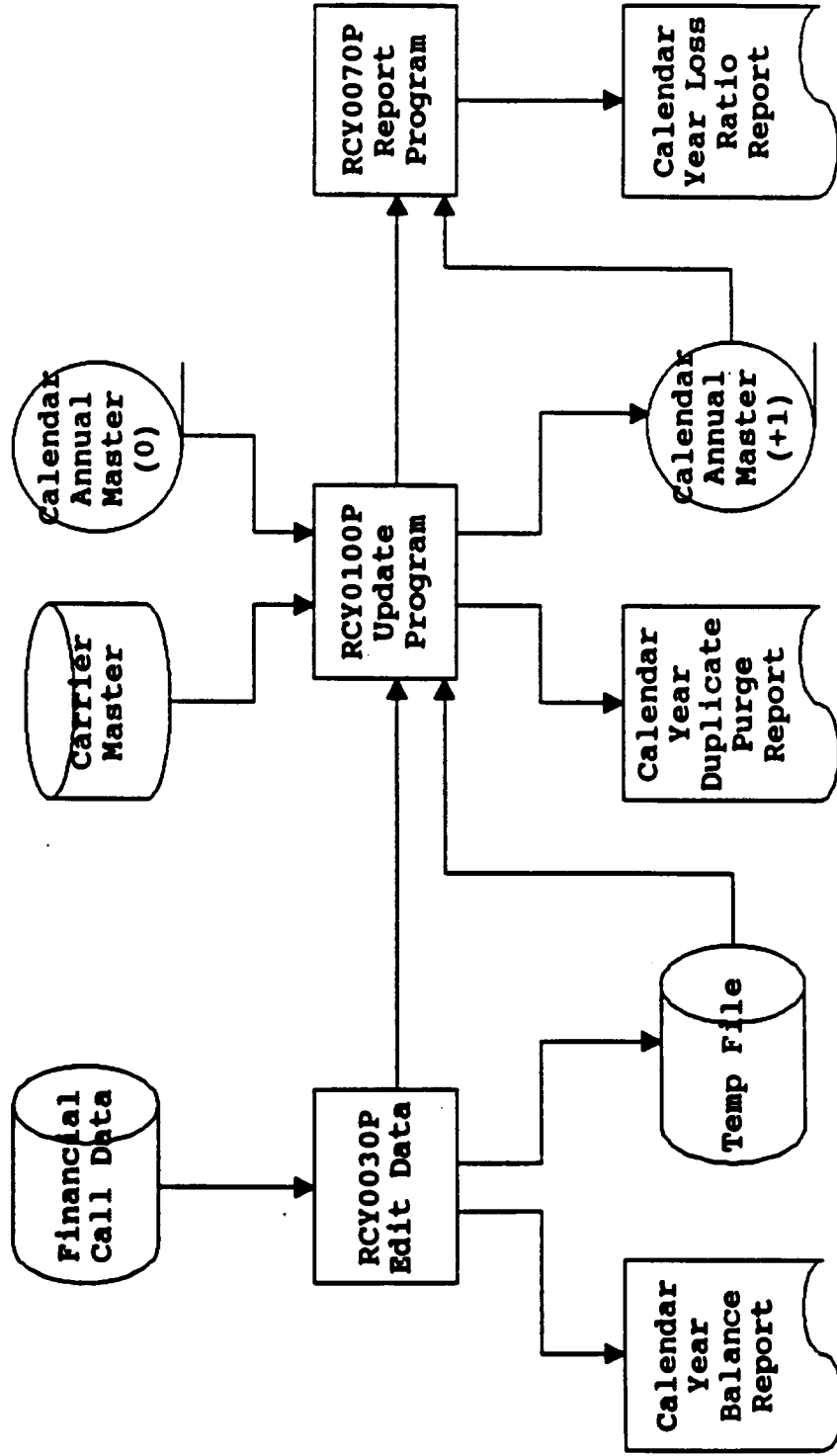
NAIC Examination of NCCI

Overall Rate Level

F402

C/Y Call For Comp. Experience By State

OSCALEN1 Proc



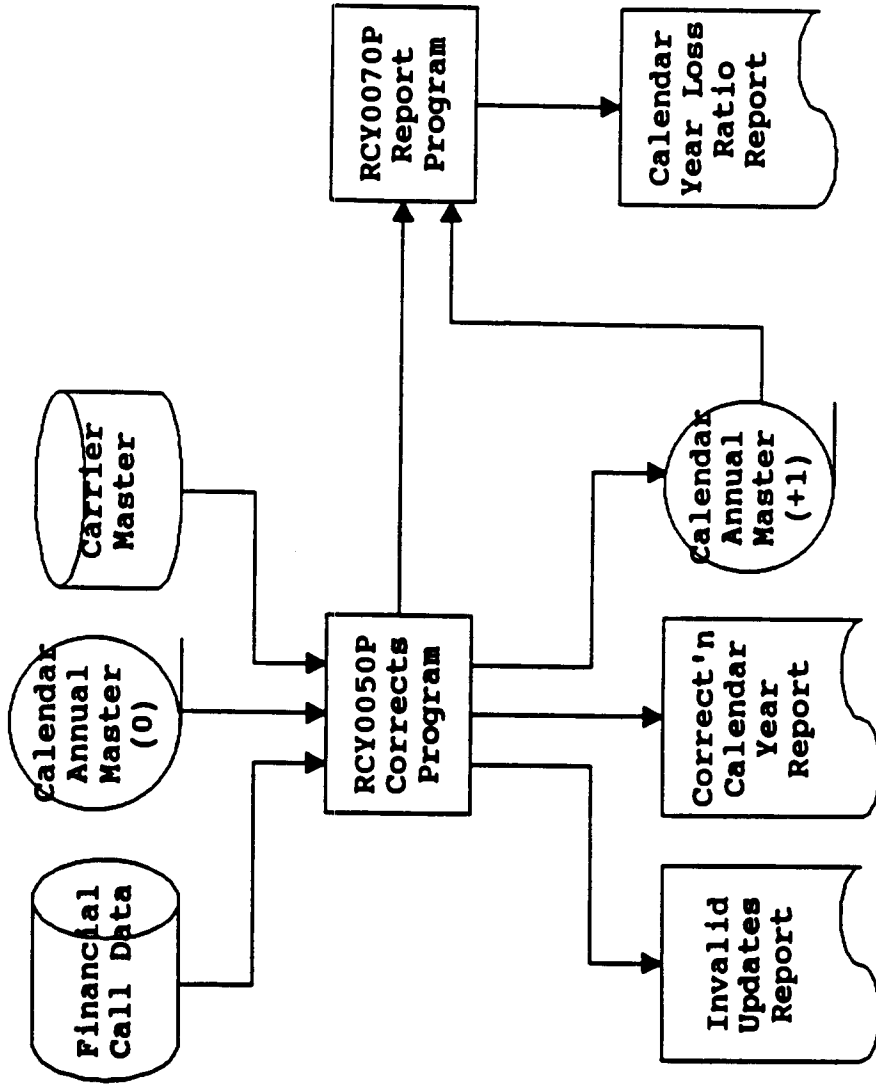
NAIC Examination of NCCI

Overall Rate Level

F404

C/Y Call For Comp. Experience By State

OSCALEN2 Proc



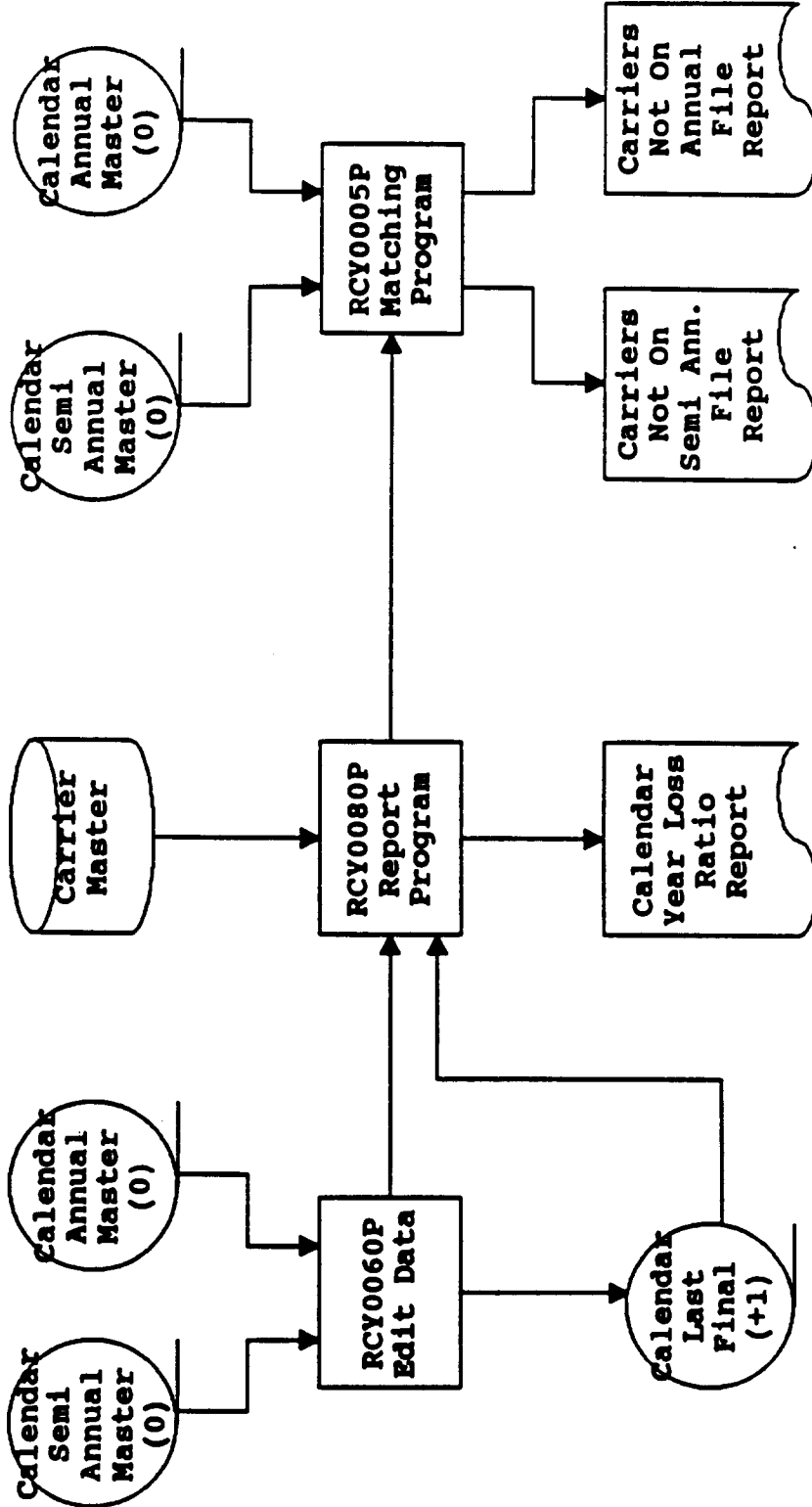
NAIC Examination of NCCI

Overall Rate Level

F406

C/Y Call For Comp. Experience By State

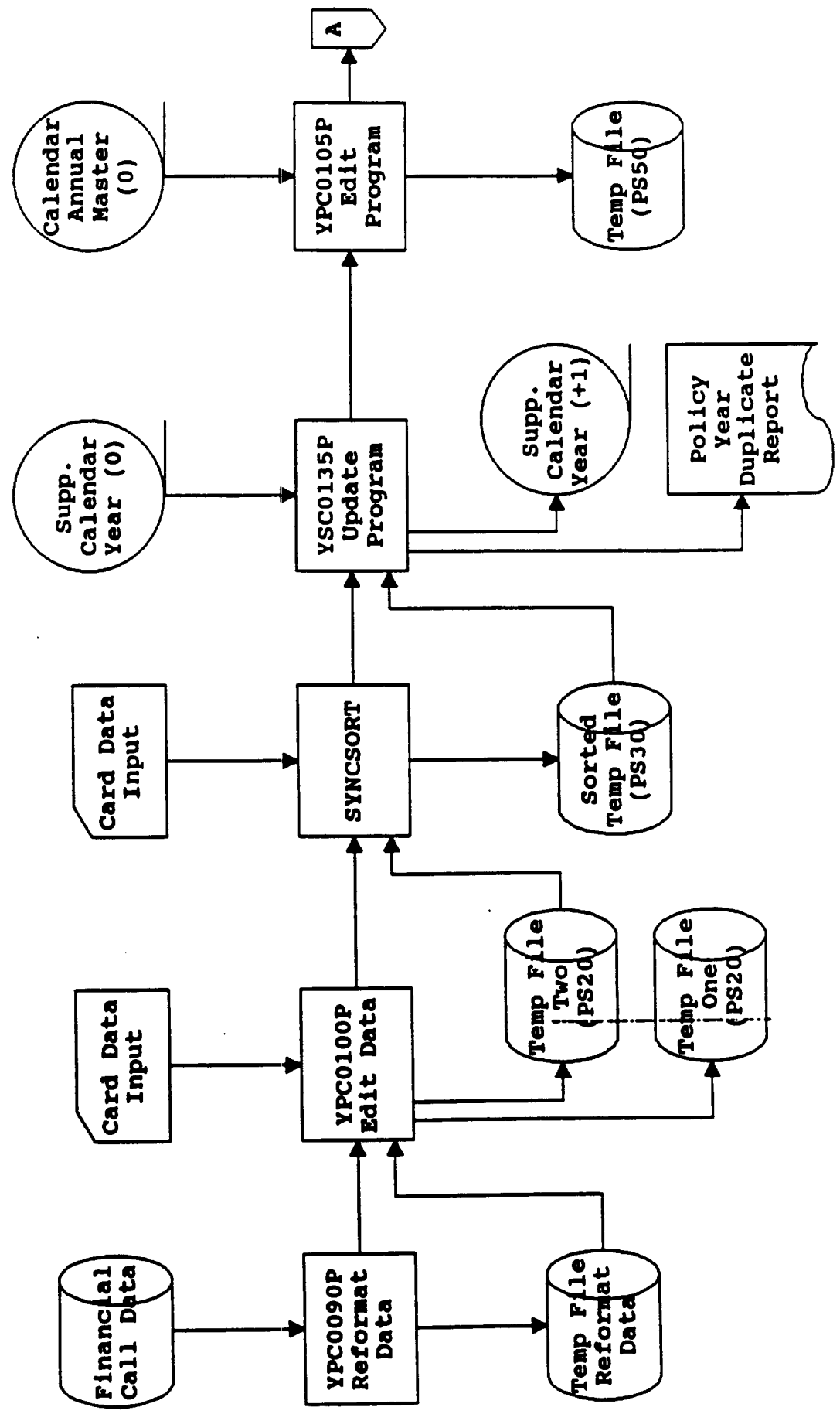
OSCALAST Proc



NAIC Examination of NCCI
Overall Rate Level

F408A

P/Y Call For Comp. Experience By State
YSCR0001 Proc



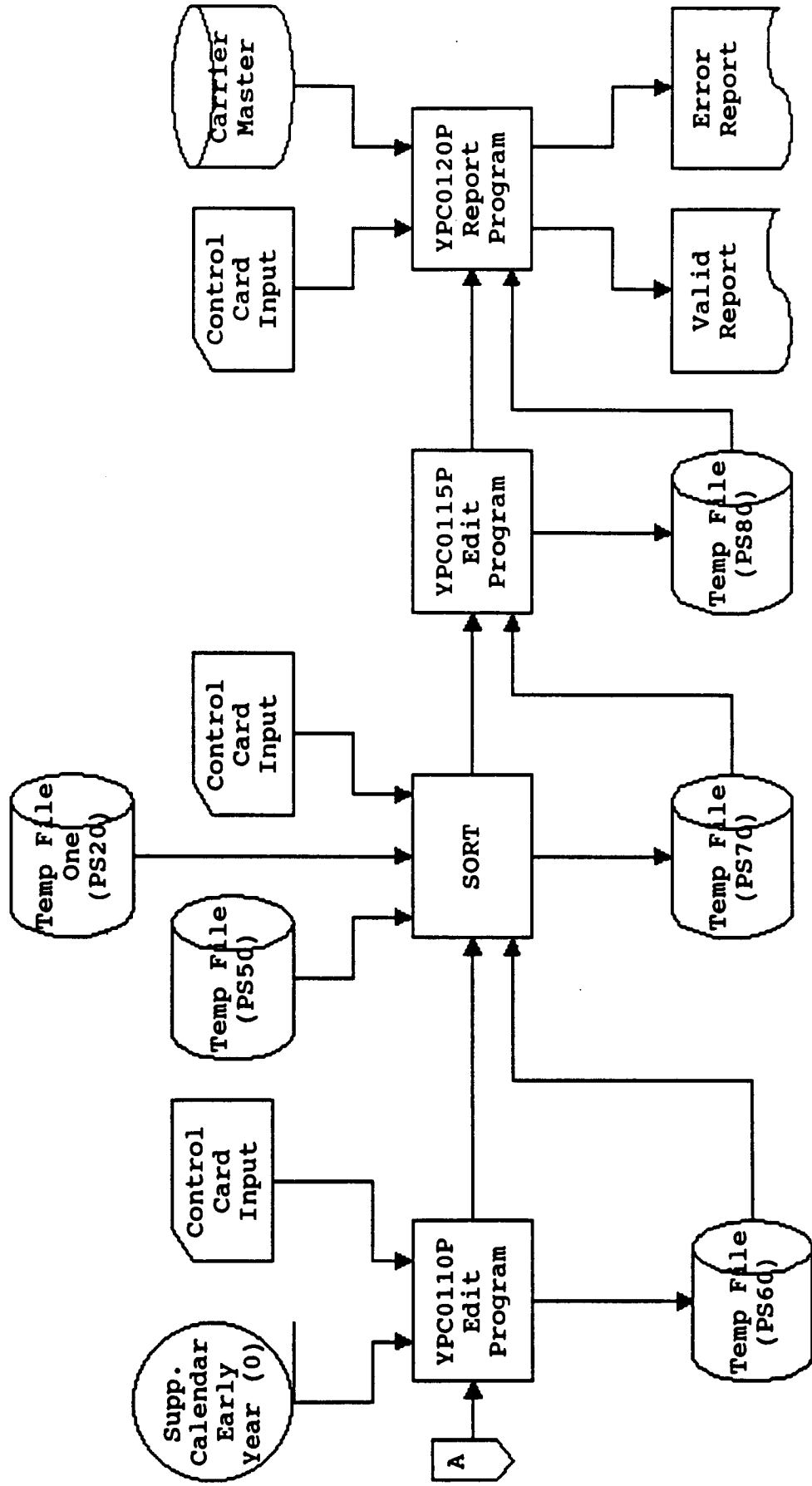
NAIC Examination of NCCI

F408B

Overall Rate Level

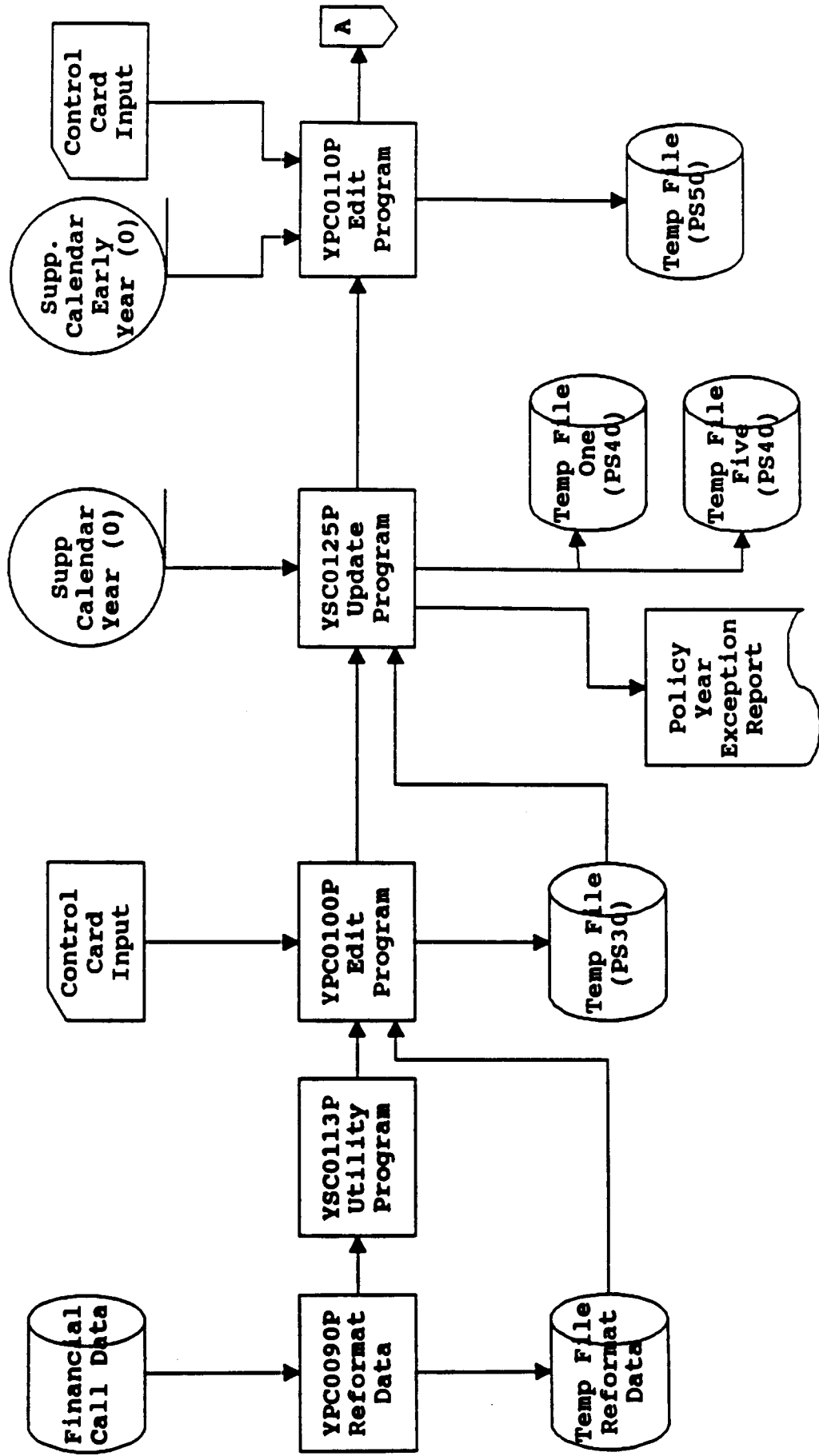
P/Y Call For Comp. Experience By State

YSCR0001 Proc



NAIC Examination of NCCI
 Overall Rate Level
 P/Y Call For Comp. Experience By State
 YSCR0003 Proc

F410A



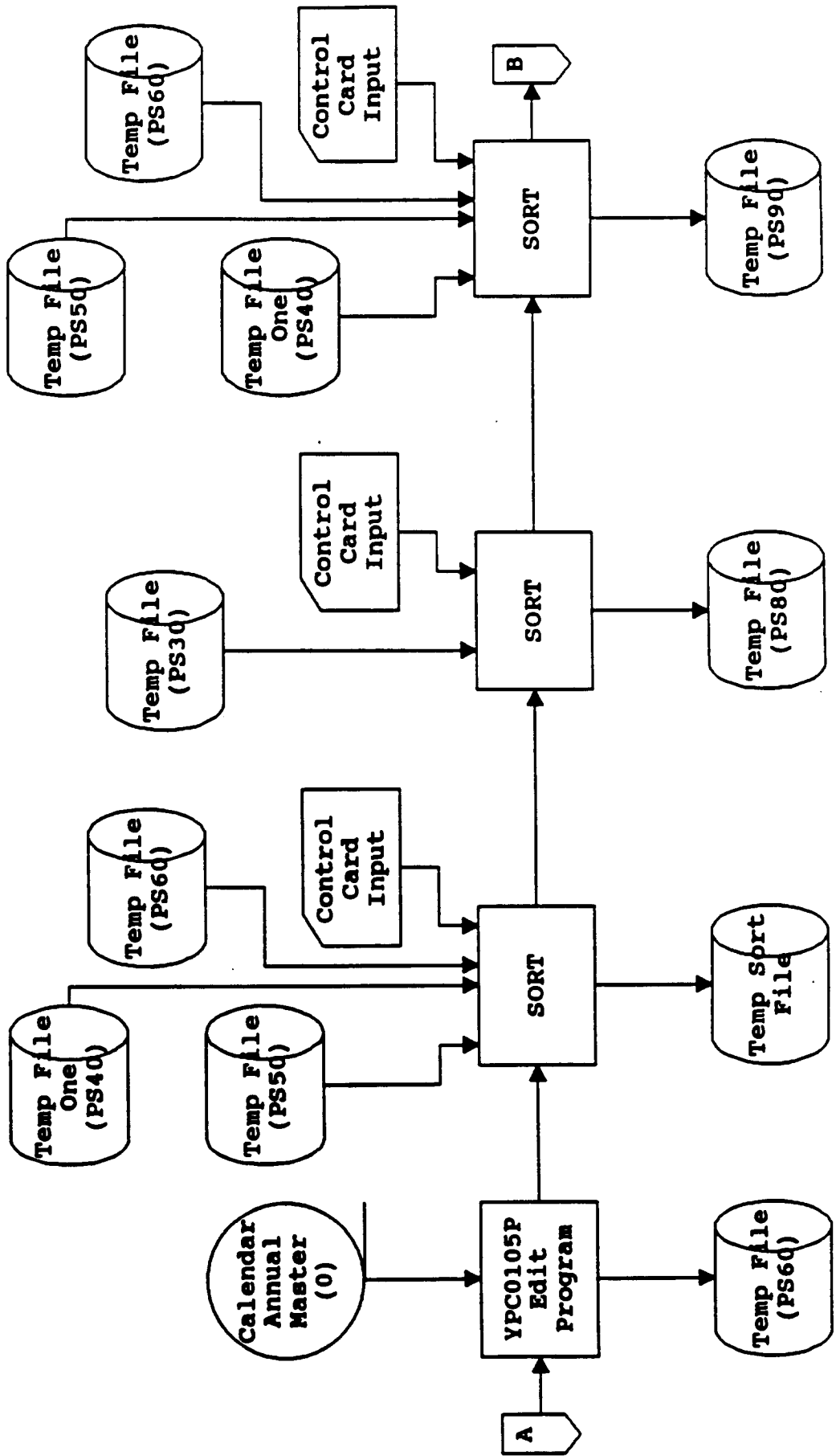
NAIC Examination of NCCI

F410B

Overall Rate Level

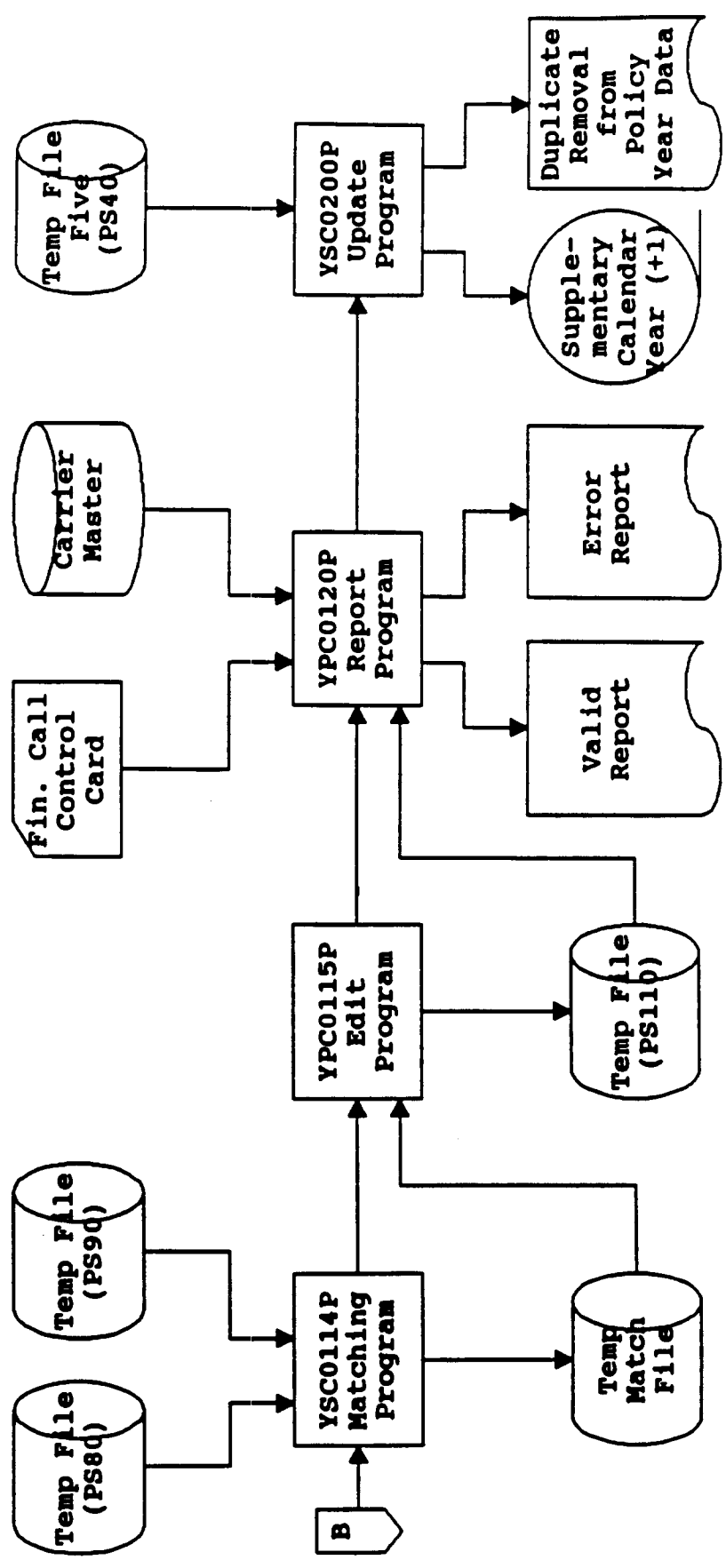
P/Y Call For Comp. Experience By State

YSCR0003 Proc



NAIC Examination of NCCI
 Overall Rate Level
 P/Y Call For Comp. Experience By State
 YSCR0003 Proc

F410C



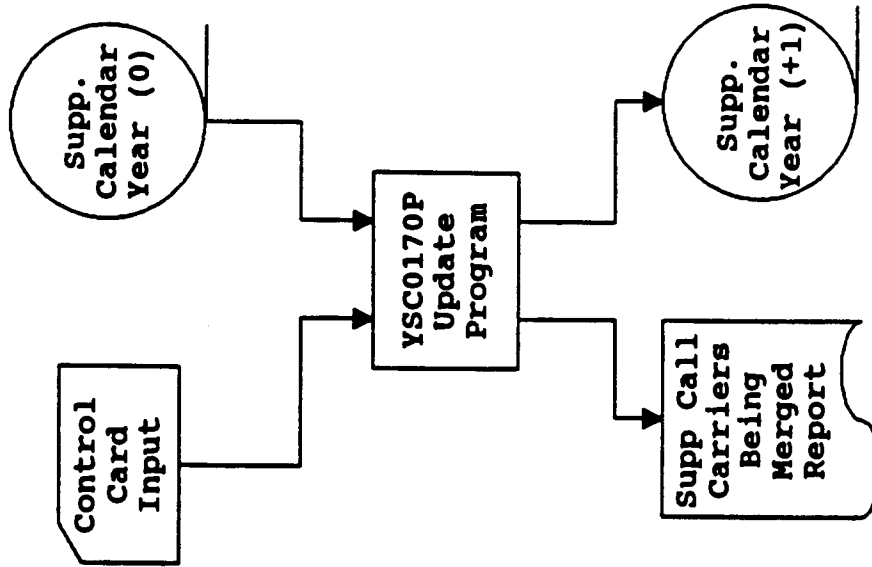
NAIC Examination of NCCI

F410

Overall Rate Level

P/Y Call For Comp. Experience By State

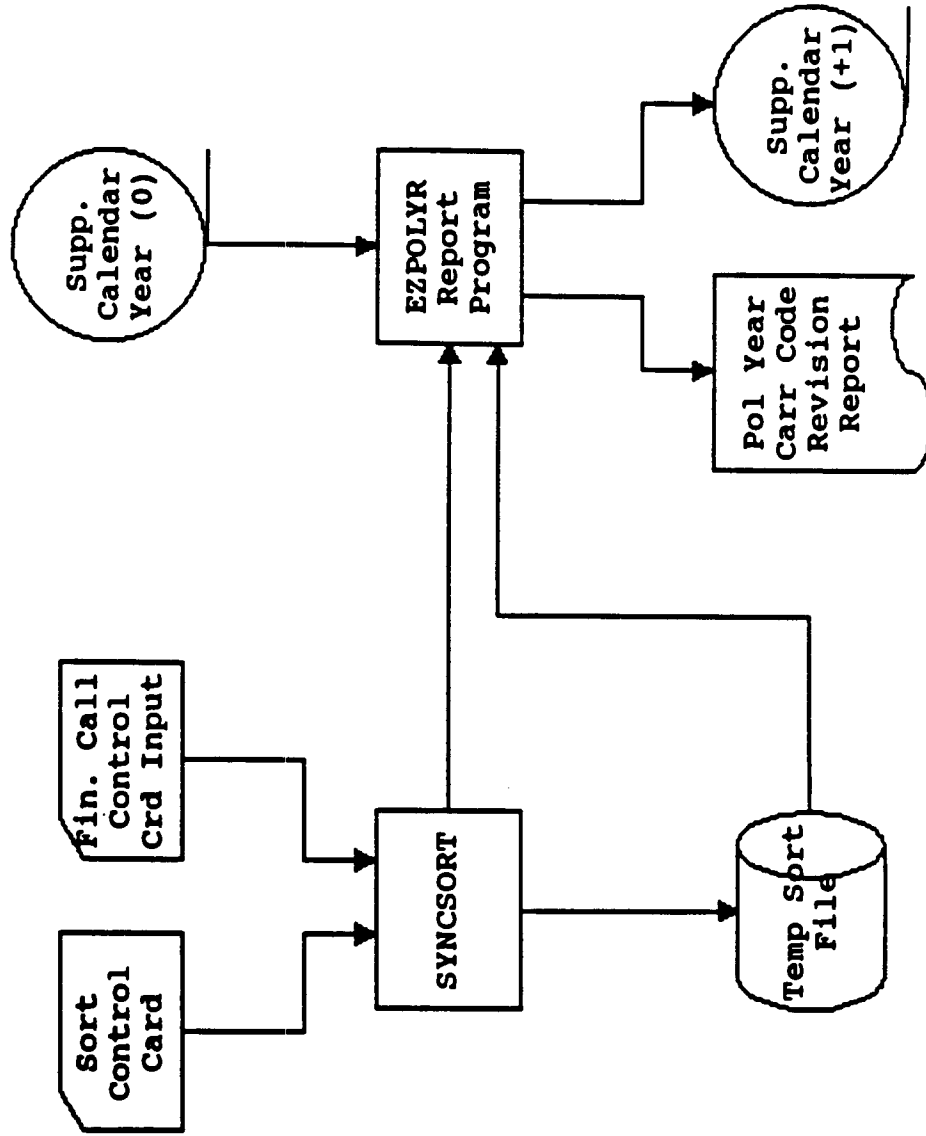
SUPPMRGE Proc



NAIC Examination of NCCI
Overall Rate Level

F412

P/Y Call For Comp. Experience By State
RSCHANGE Proc



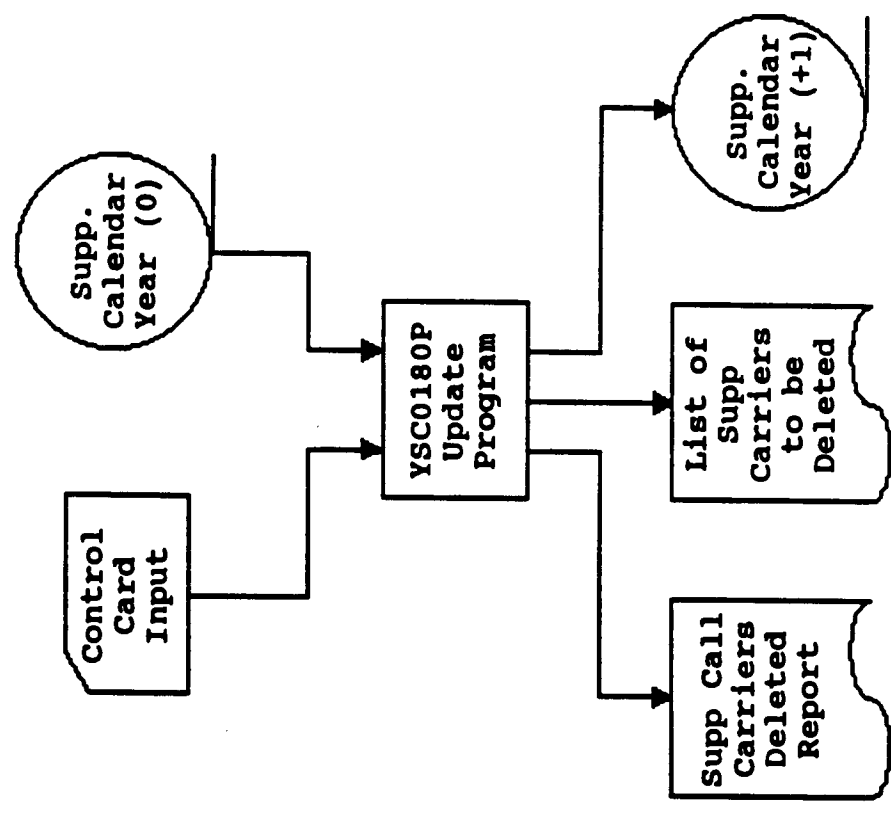
NAIC Examination of NCCI

Overall Rate Level

P/Y Call For Comp. Experience By State

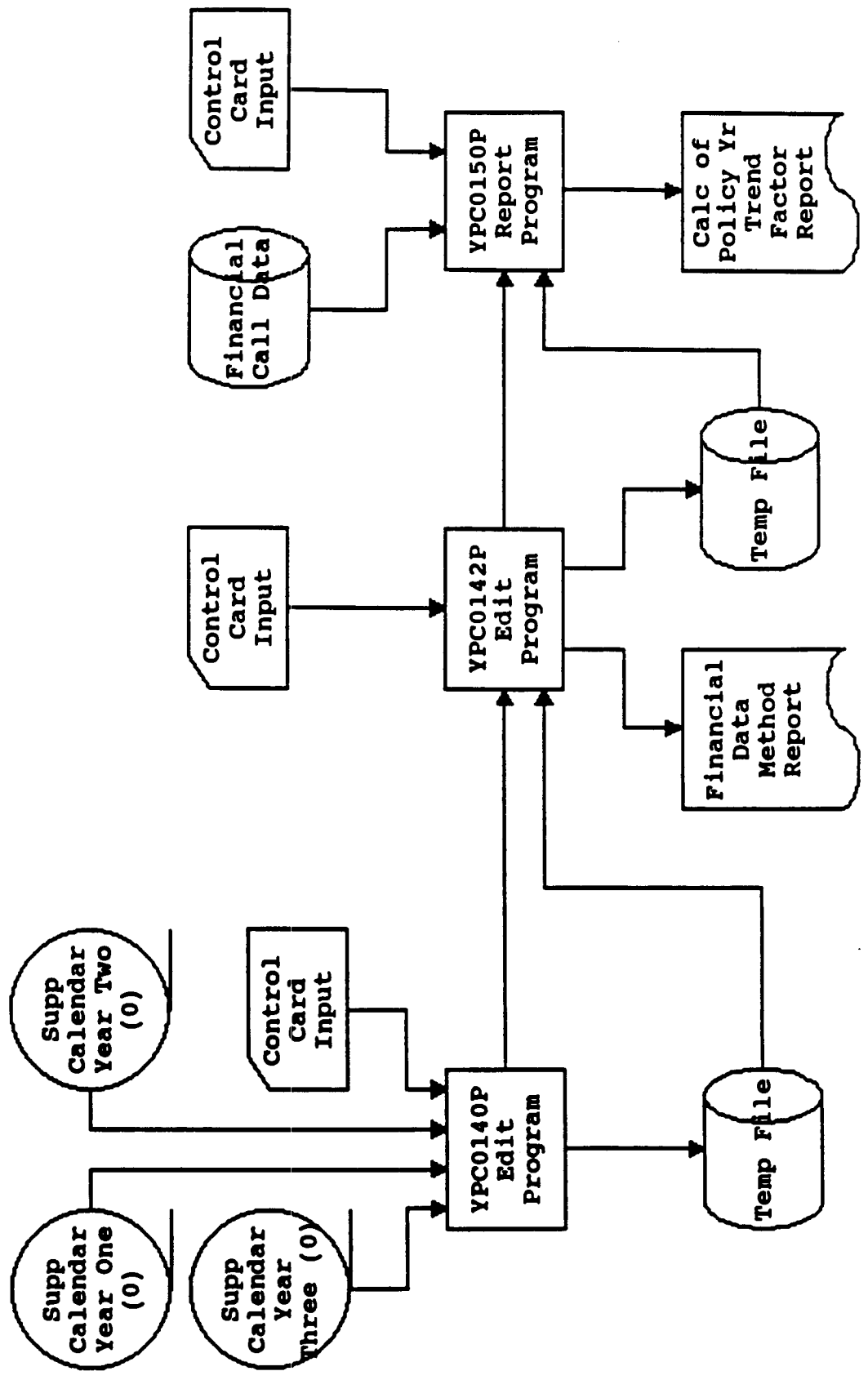
SUPDROP Proc

F414



NAIC Examination of NCCI
 Overall Rate Level
 P/Y Call For Comp. Experience By State
 SUPPEXCT Proc

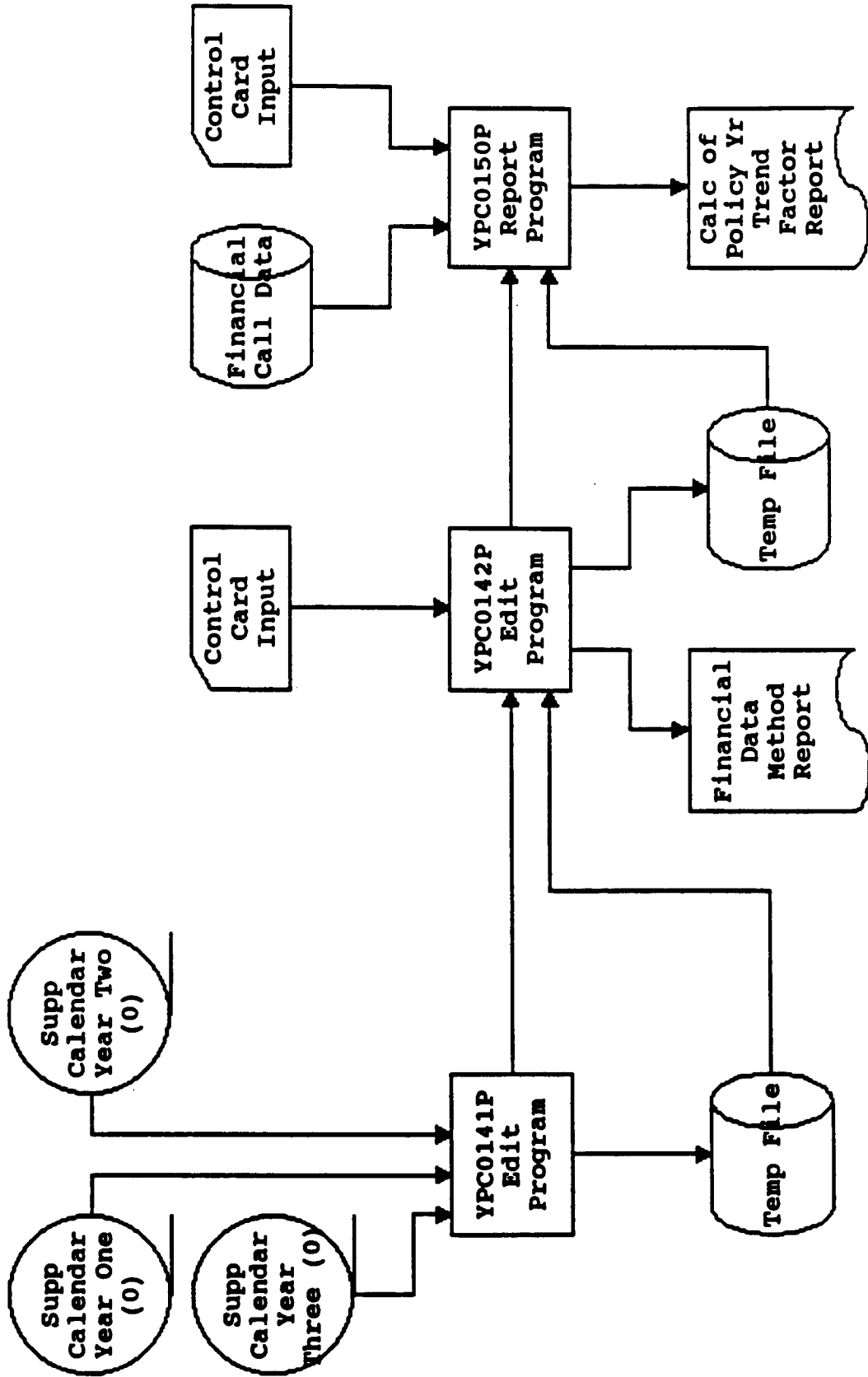
F416



NAIC Examination of NCCI
Overall Rate Level

F418

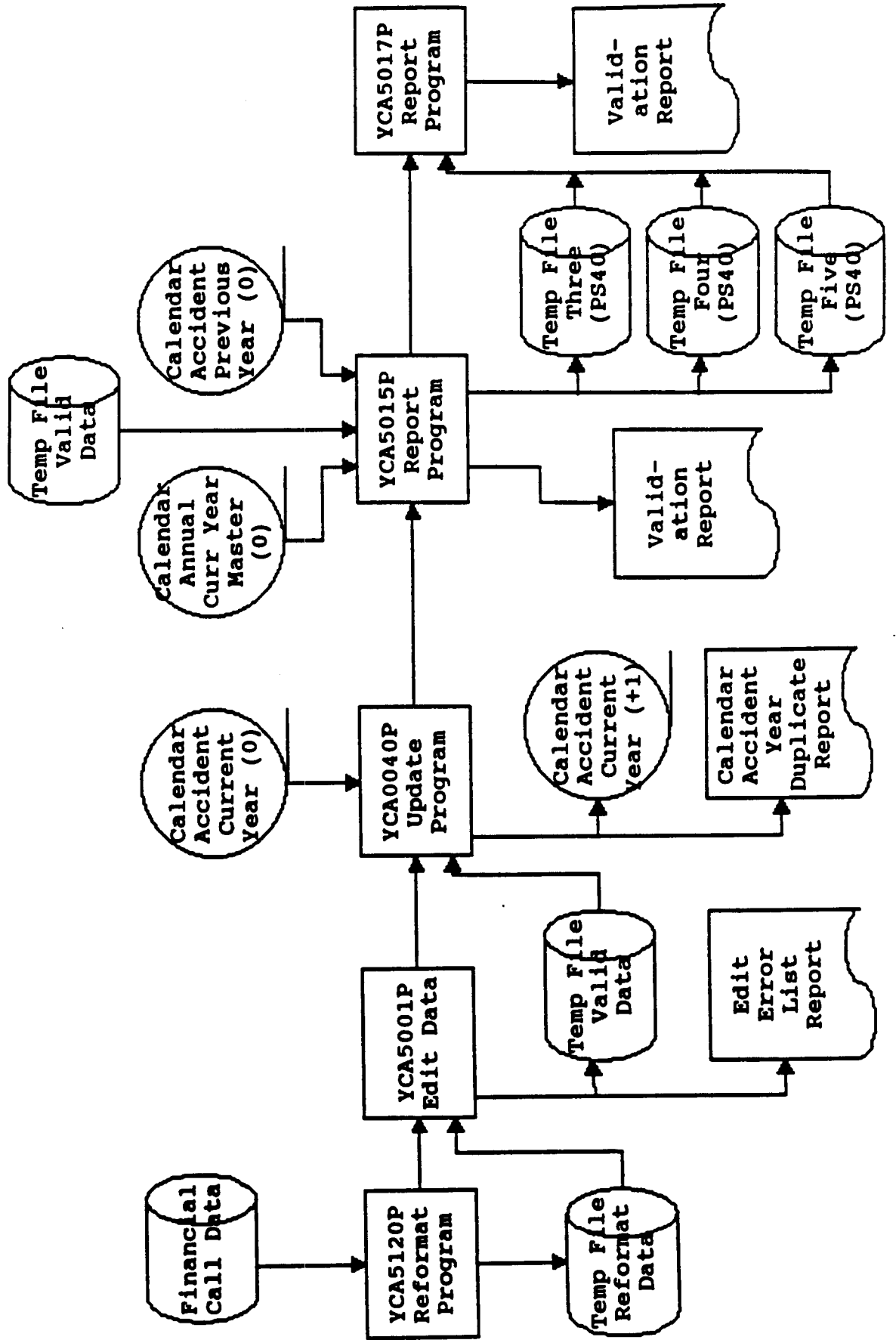
P/Y Call For Comp. Experience By State
SUPPFNL Proc



NAIC Examination of NCCI
Overall Rate Level

F420

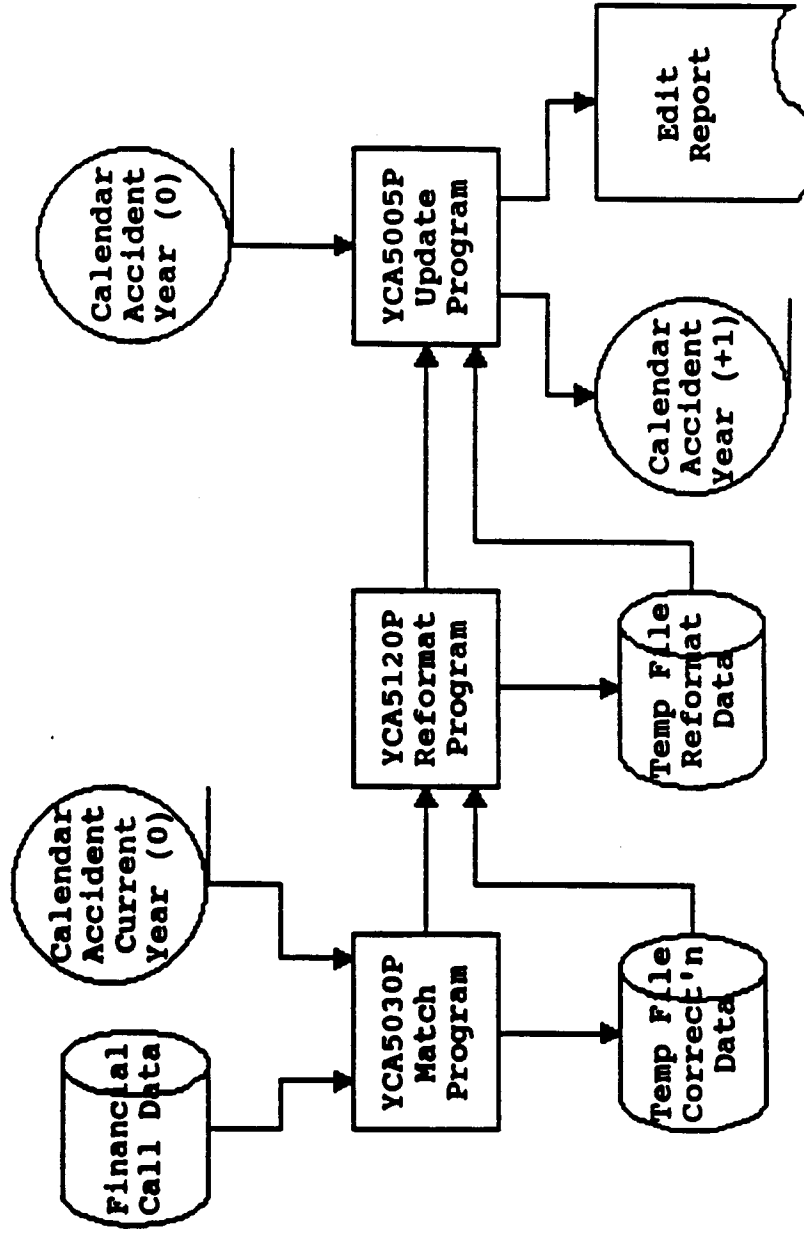
C-A/Yr. Call For Comp. Experience By State
YCAR0100 Proc



NAIC Examination of NCCI
Overall Rate Level

F422

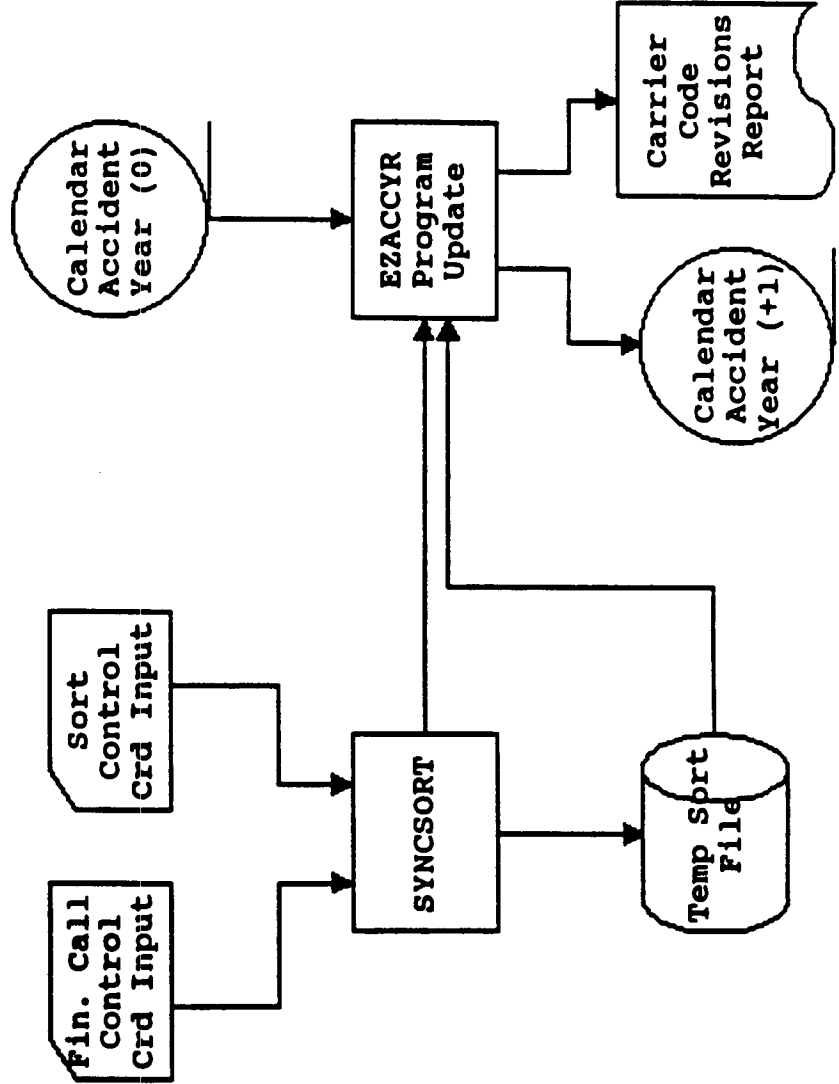
C-A/Yr. Call For Comp. Experience By State
YCAR0300 Proc



NAIC Examination of NCCI
Overall Rate Level

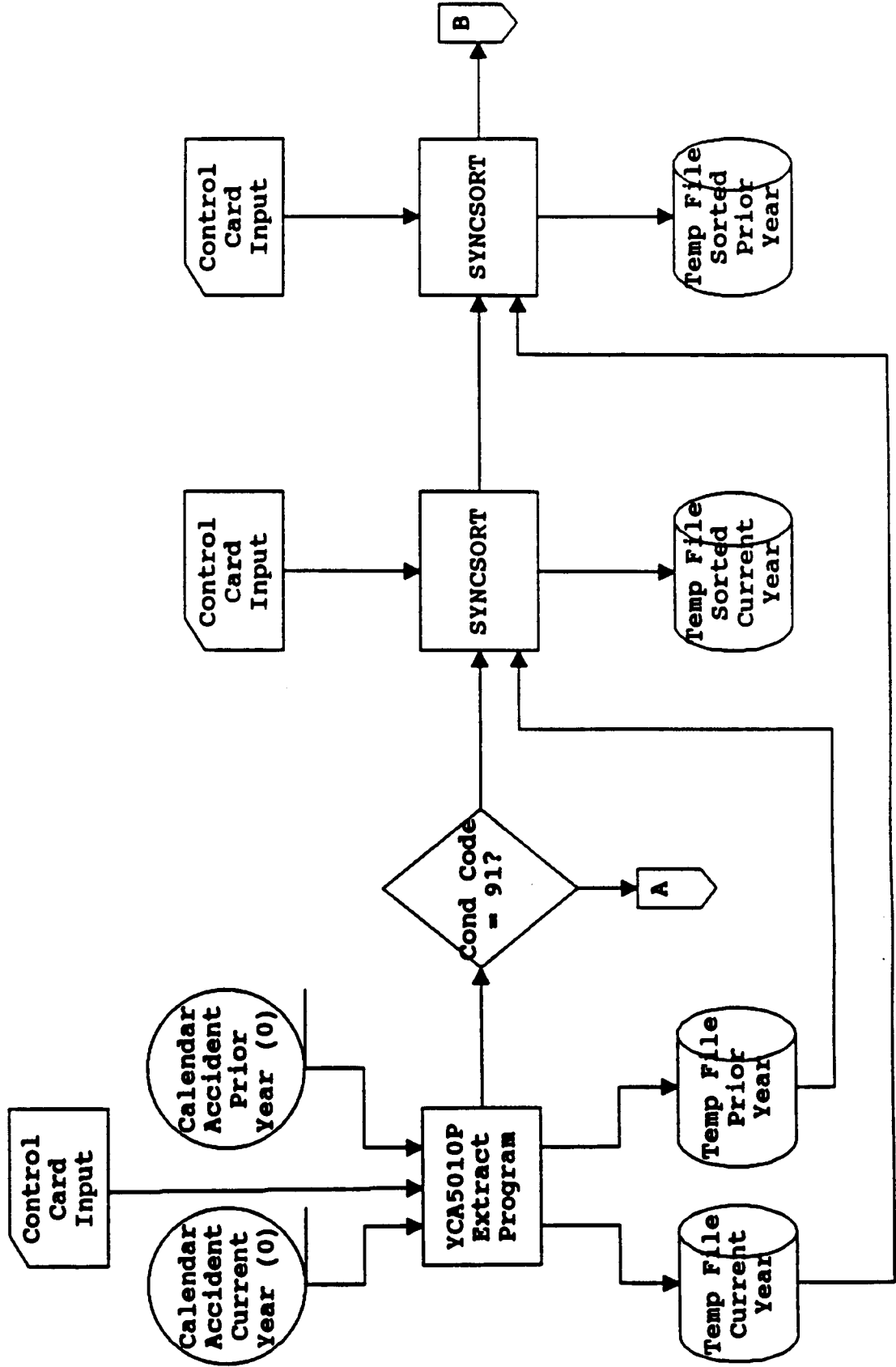
F424

C-A/Yr. Call For Comp. Experience By State
RCACHNGE Proc



NAIC Examination of NCCI
 Overall Rate Level
 C-A/Yr. Call For Comp. Experience By State
 YCAR0500 Proc

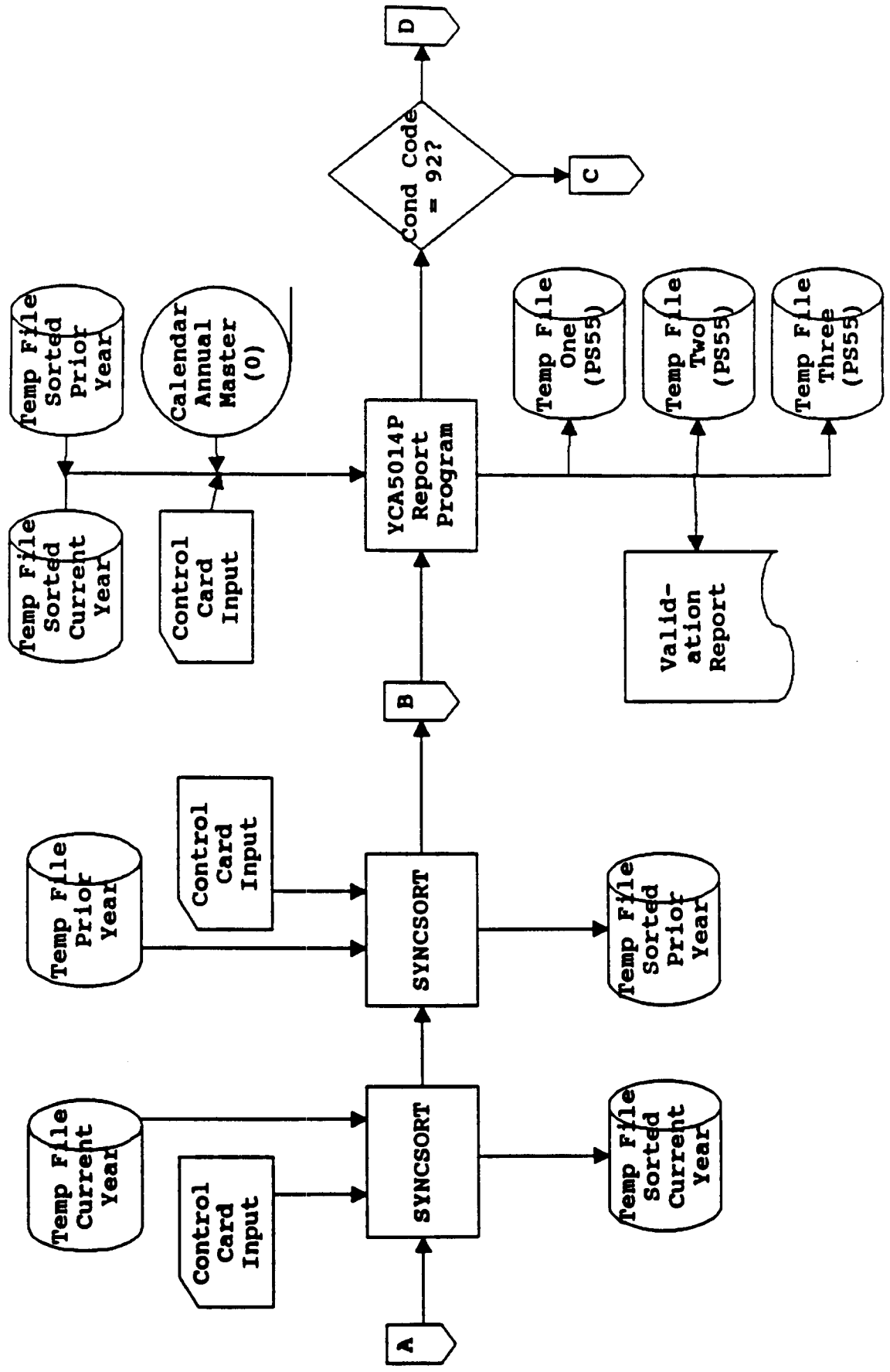
F426A



NAIC Examination of NCCI
Overall Rate Level

F426B

C-A/Yr. Call For Comp. Experience By State
YCAR0500 Proc

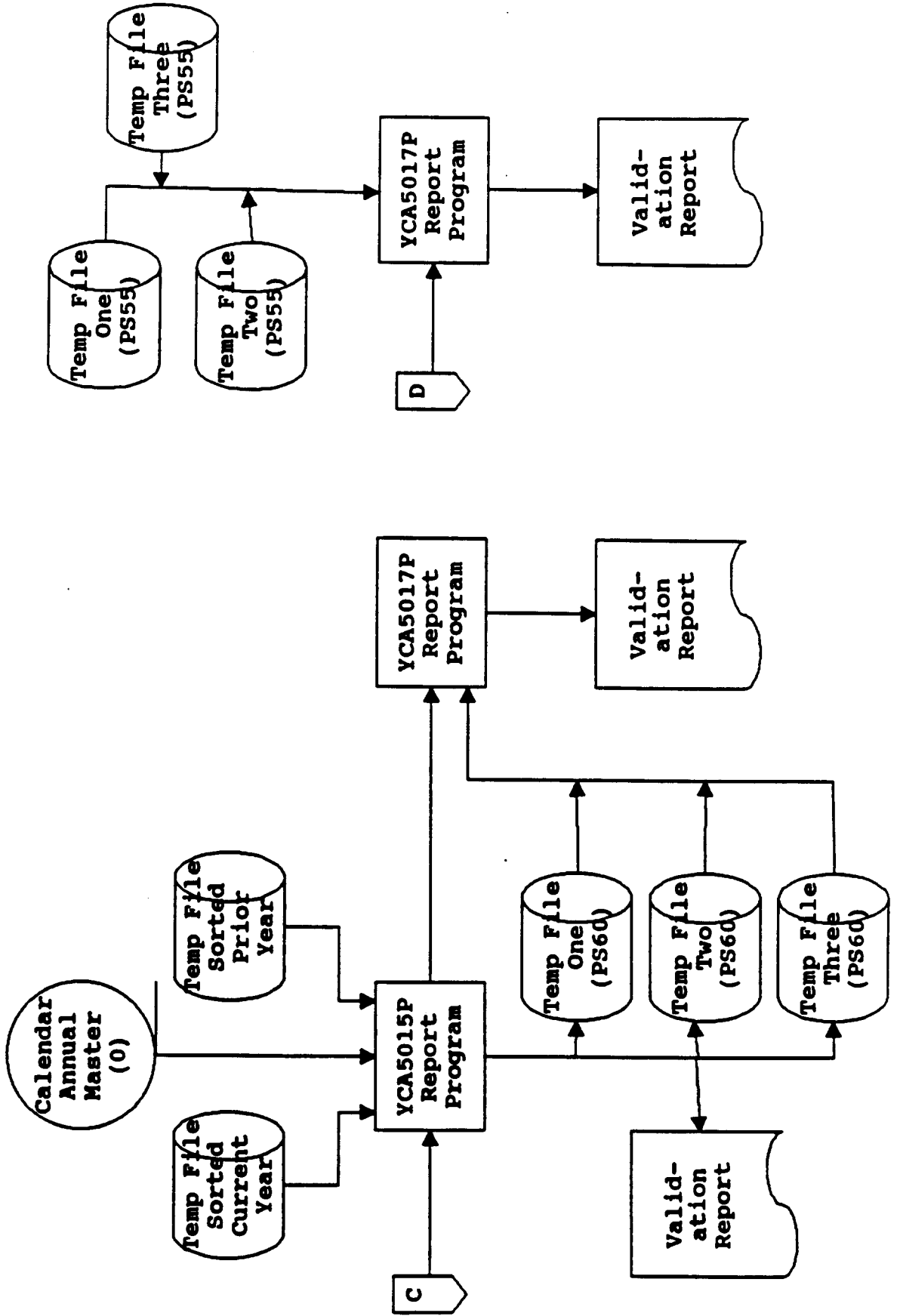


NAIC Examination of NCCI
Overall Rate Level

F426C

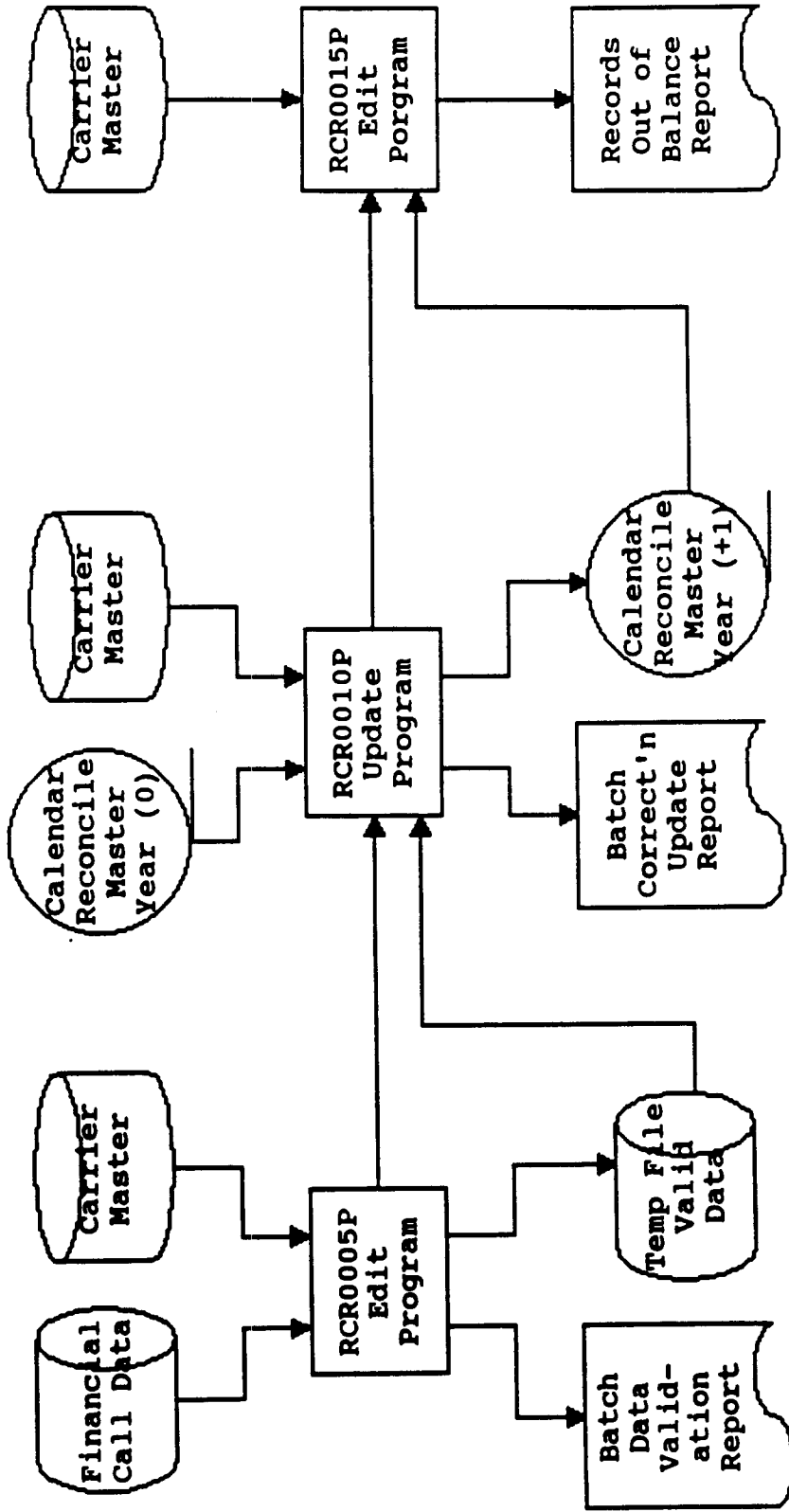
C-A/Yr. Call For Comp. Experience By State

YCAR0500 Proc



NAIC Examination of NCCI
 Overall Rate Level
 Reconciliation Report By State
 CALRC01P Proc

F428



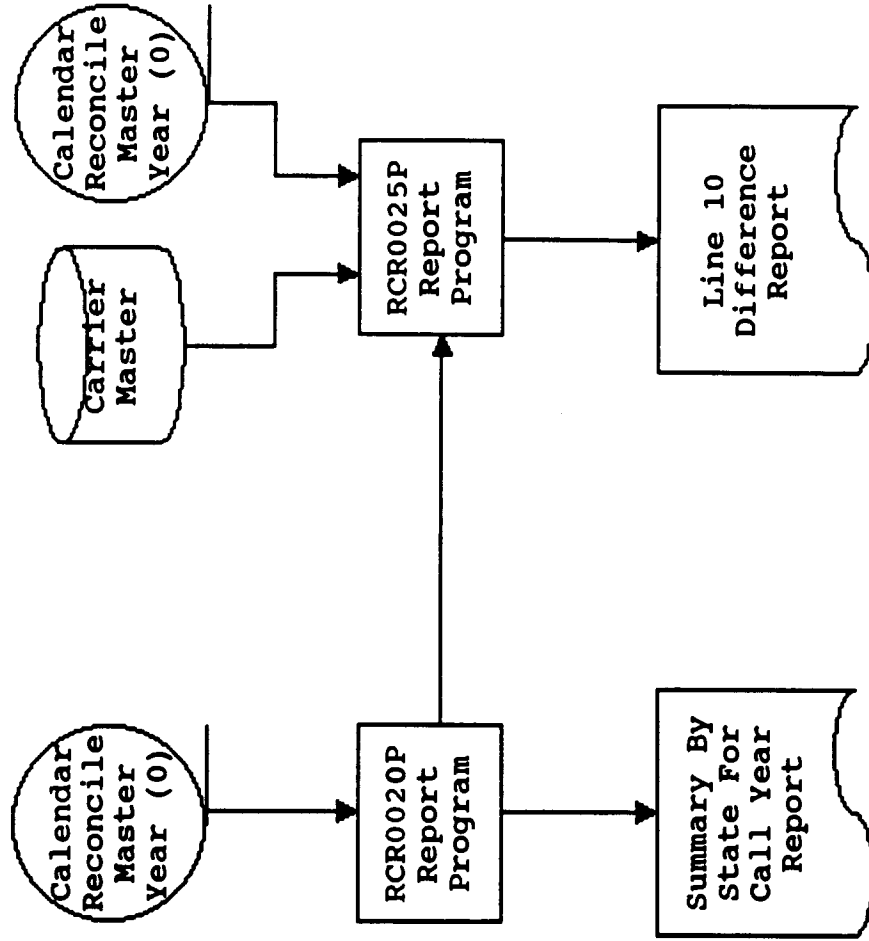
NAIC Examination of NCCI

F430.3

Overall Rate Level

Reconciliation Report By State

CALRC05P Proc



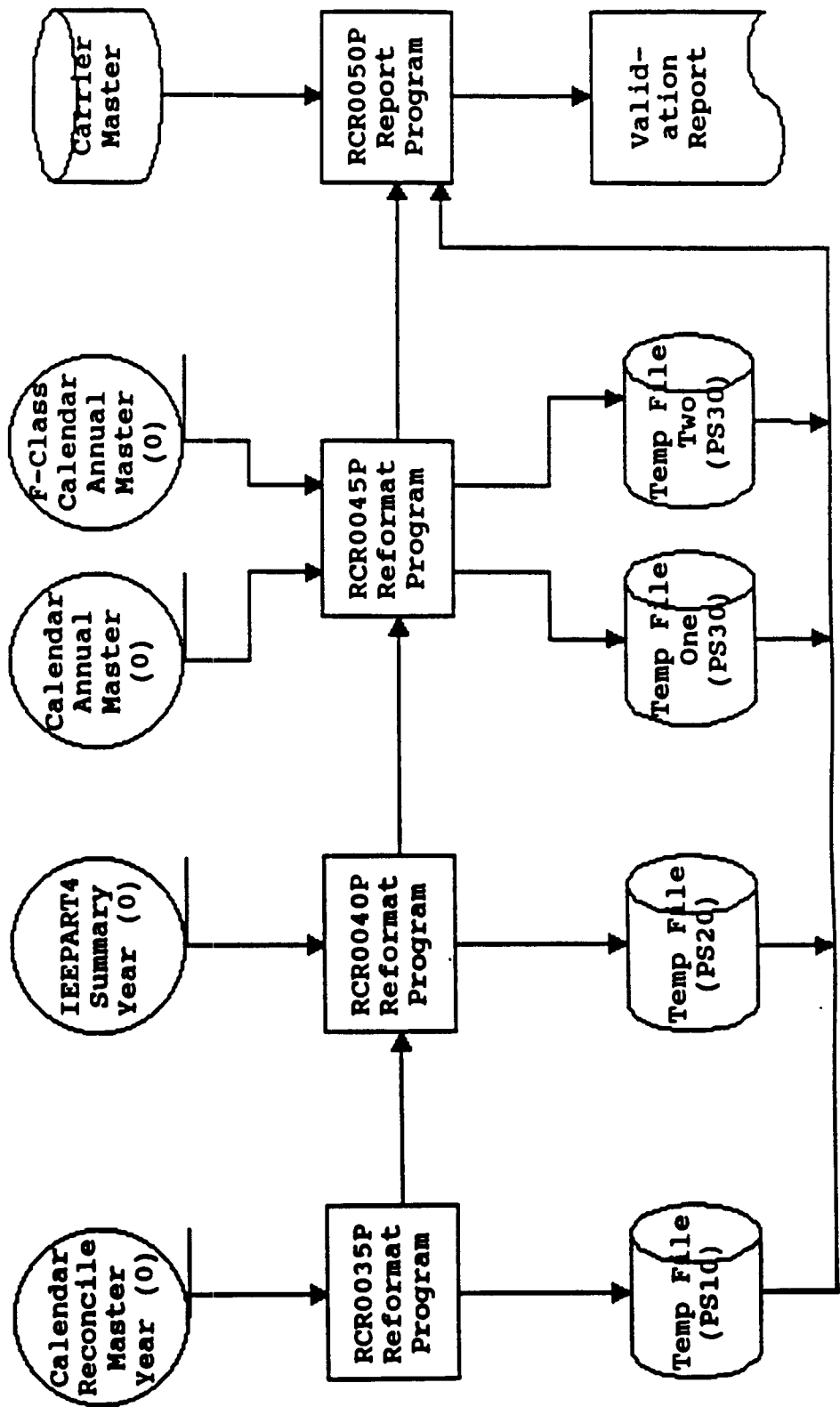
NAIC Examination of NCCI

F432

Overall Rate Level

Reconciliation Report By State

CALRC15P Proc



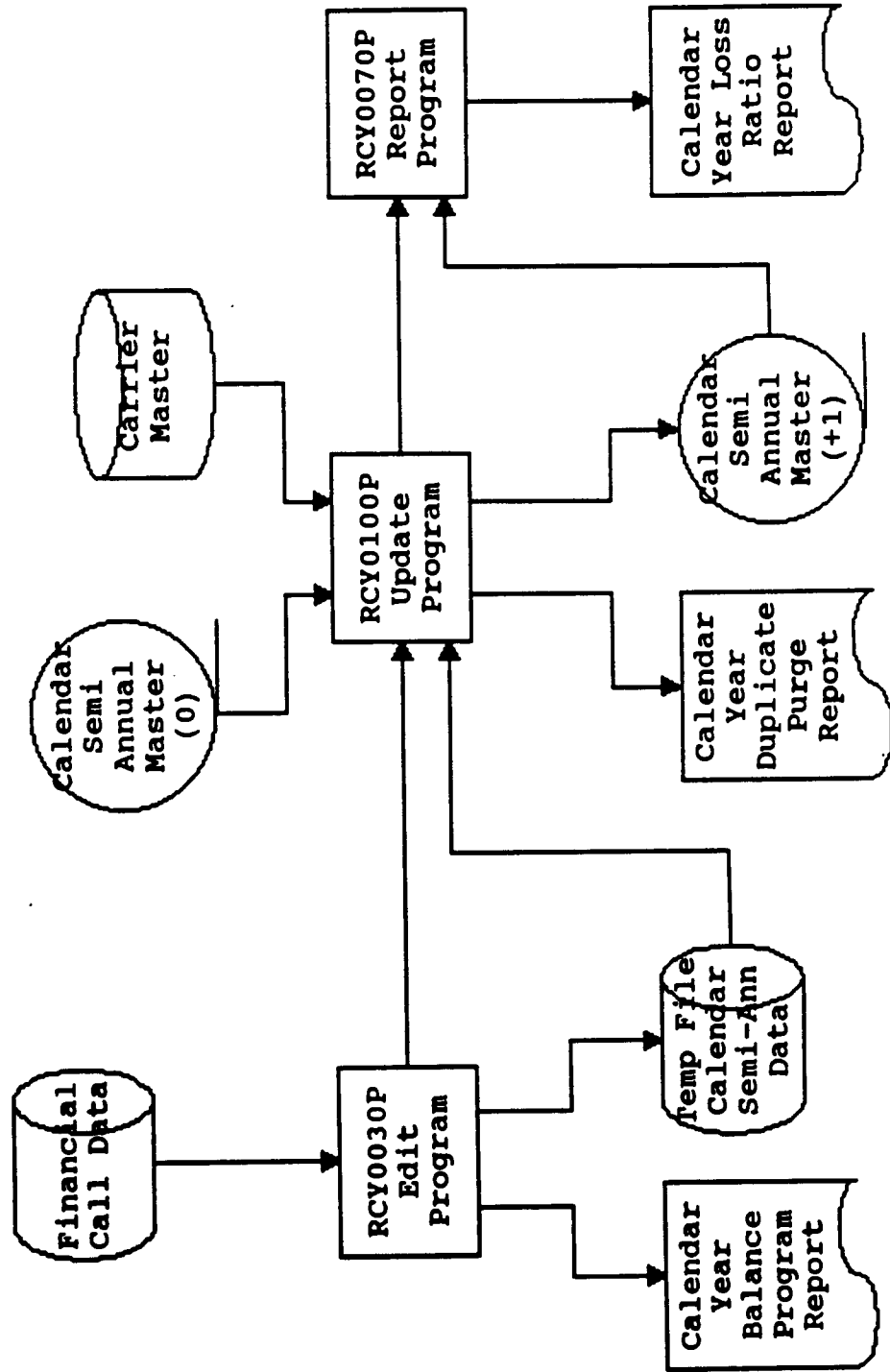
NAIC Examination of NCCI

F434

Overall Rate Level

Semi-Annual C/Y Call For Comp. Experience By State

OSCALSM1 Proc



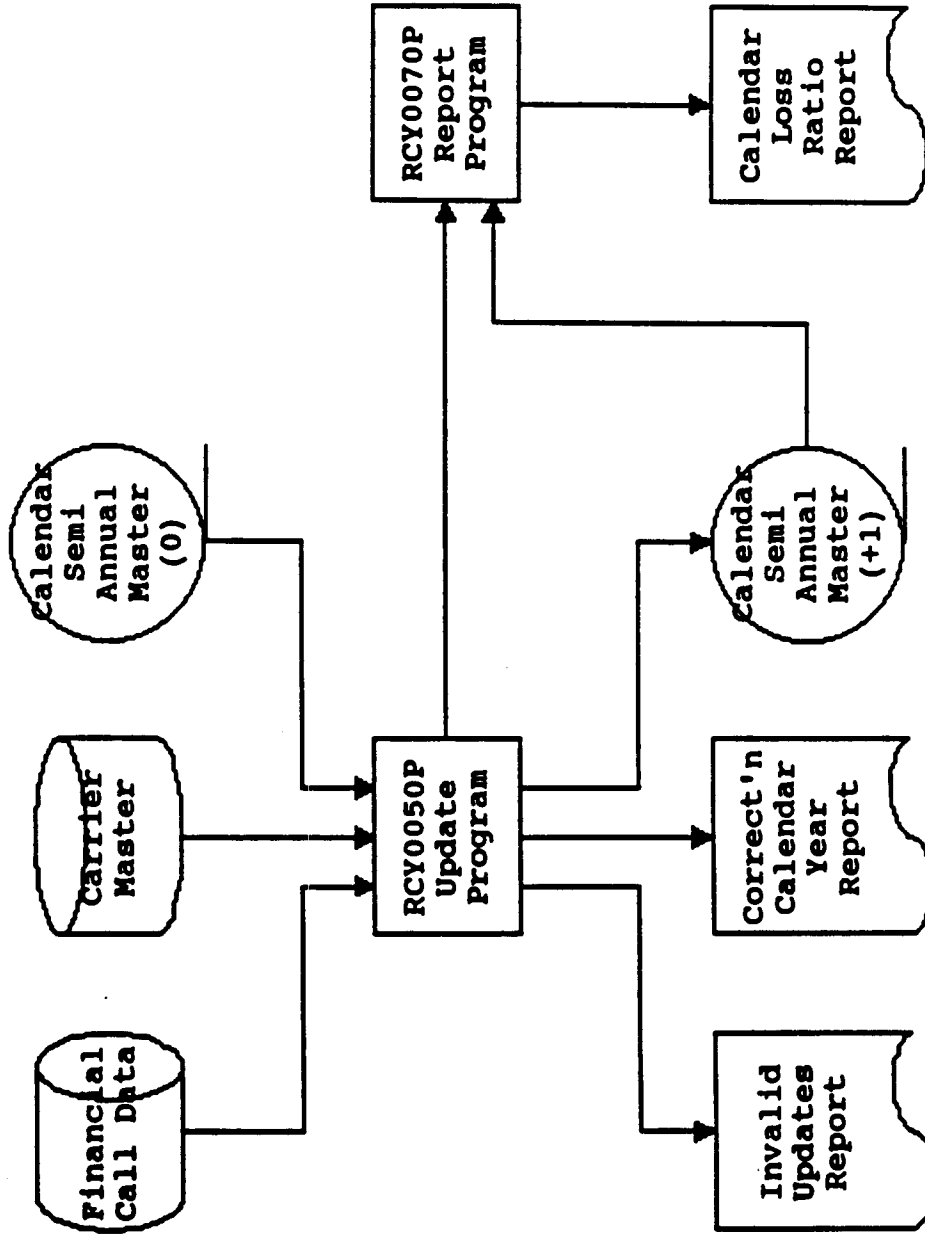
NAIC Examination of NCCI

F436

Overall Rate Level

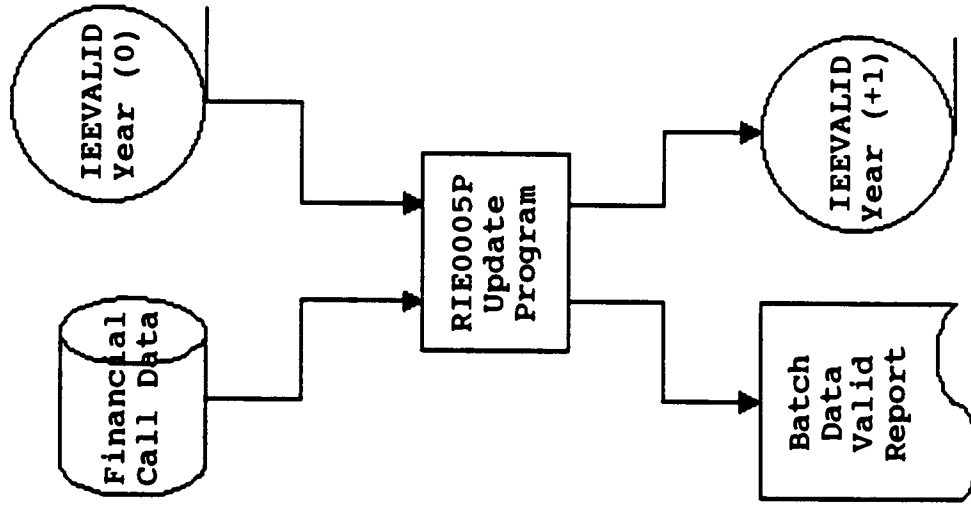
Semi-Annual C/Y Call For Comp. Experience By State

OSCALSM2 Proc



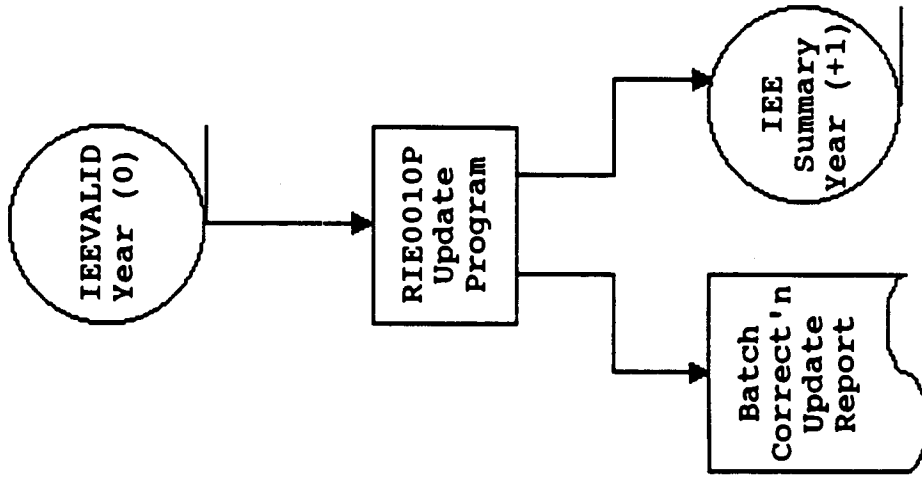
NAIC Examination of NCCI
Overall Rate Level
Insurance Expense Exhibit
IEE100 Proc

F438



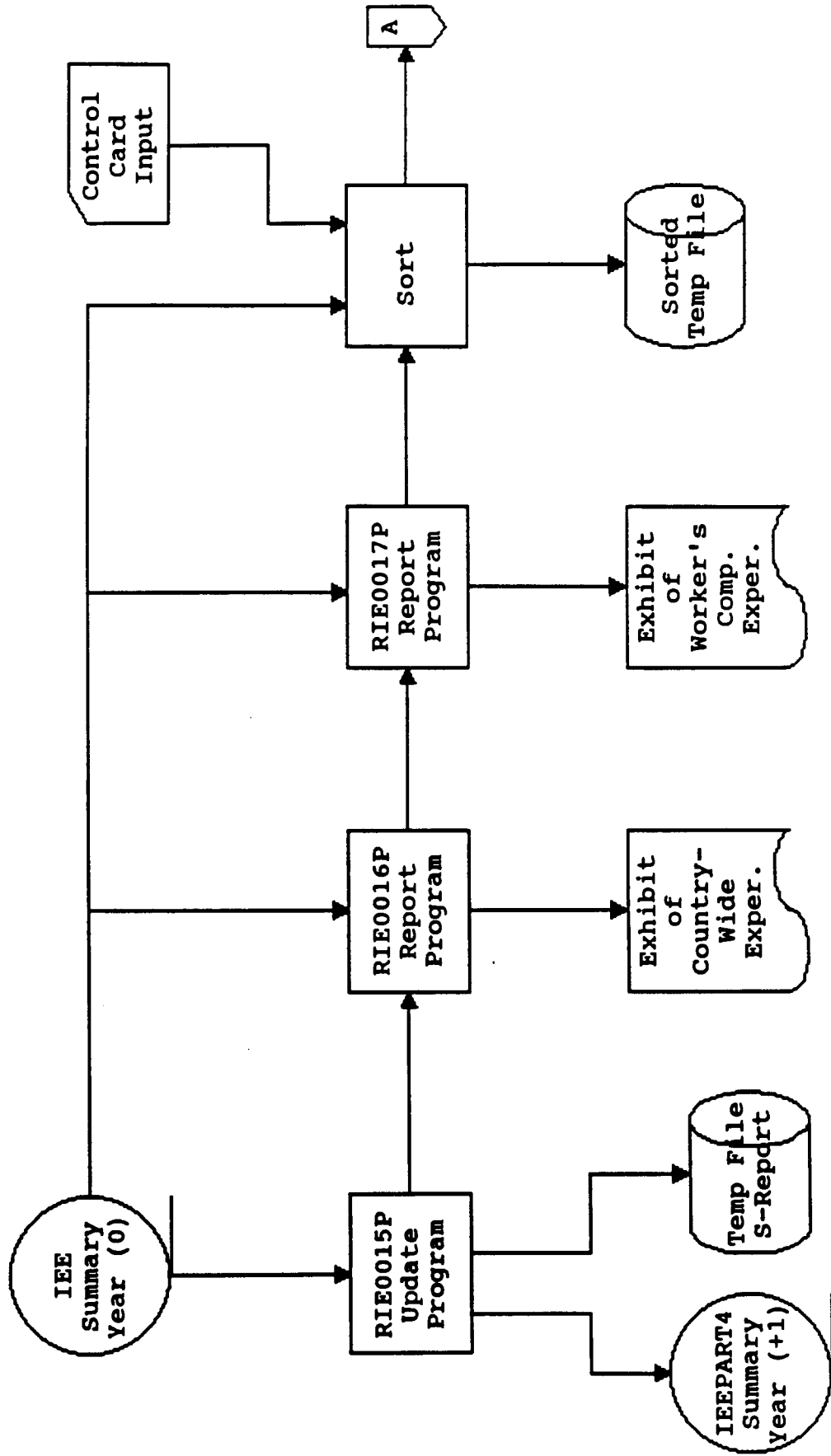
NAIC Examination of NCCI
Overall Rate Level
Insurance Expense Exhibit
IEE200 Proc

F440



NAIC Examination of NCCI
 Overall Rate Level
 Insurance Expense Exhibit
 IEE300 Proc

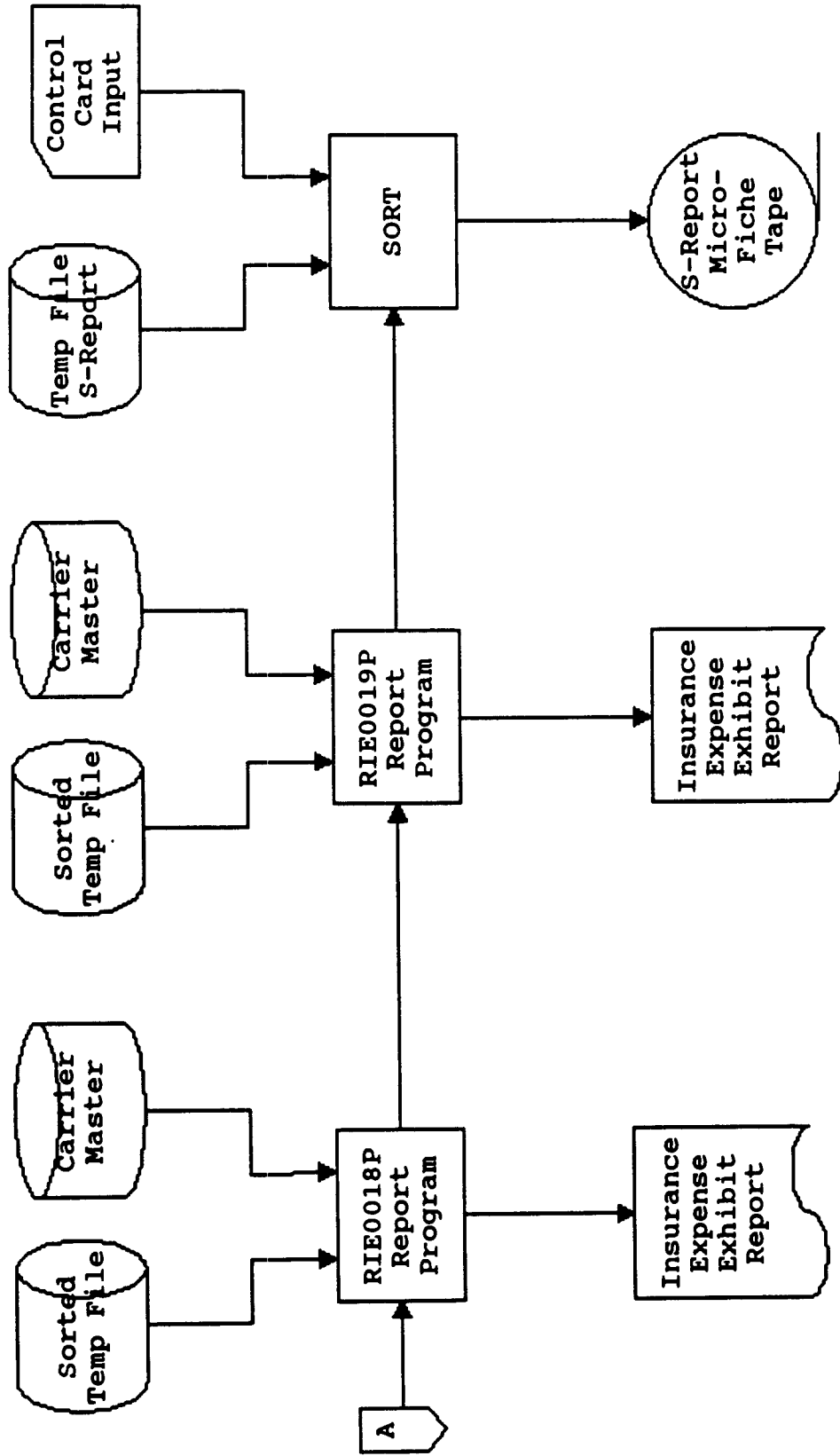
F442A



NAIC Examination of NCCI
Overall Rate Level
Insurance Expense Exhibit

IEE300 Proc

F442B



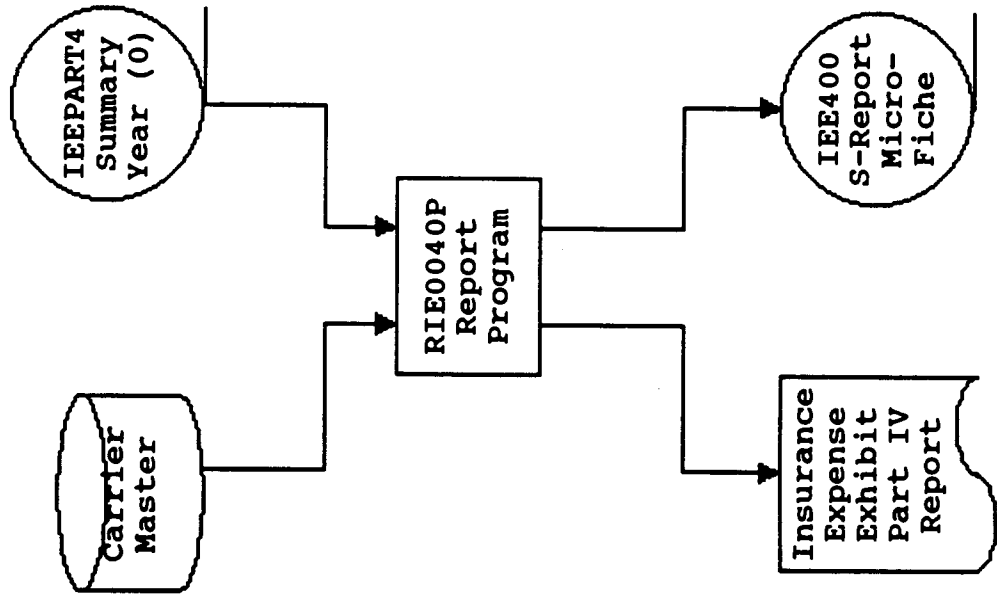
NAIC Examination of NCCI

F444

Overall Rate Level

Insurance Expense Exhibit

IEE400 Proc

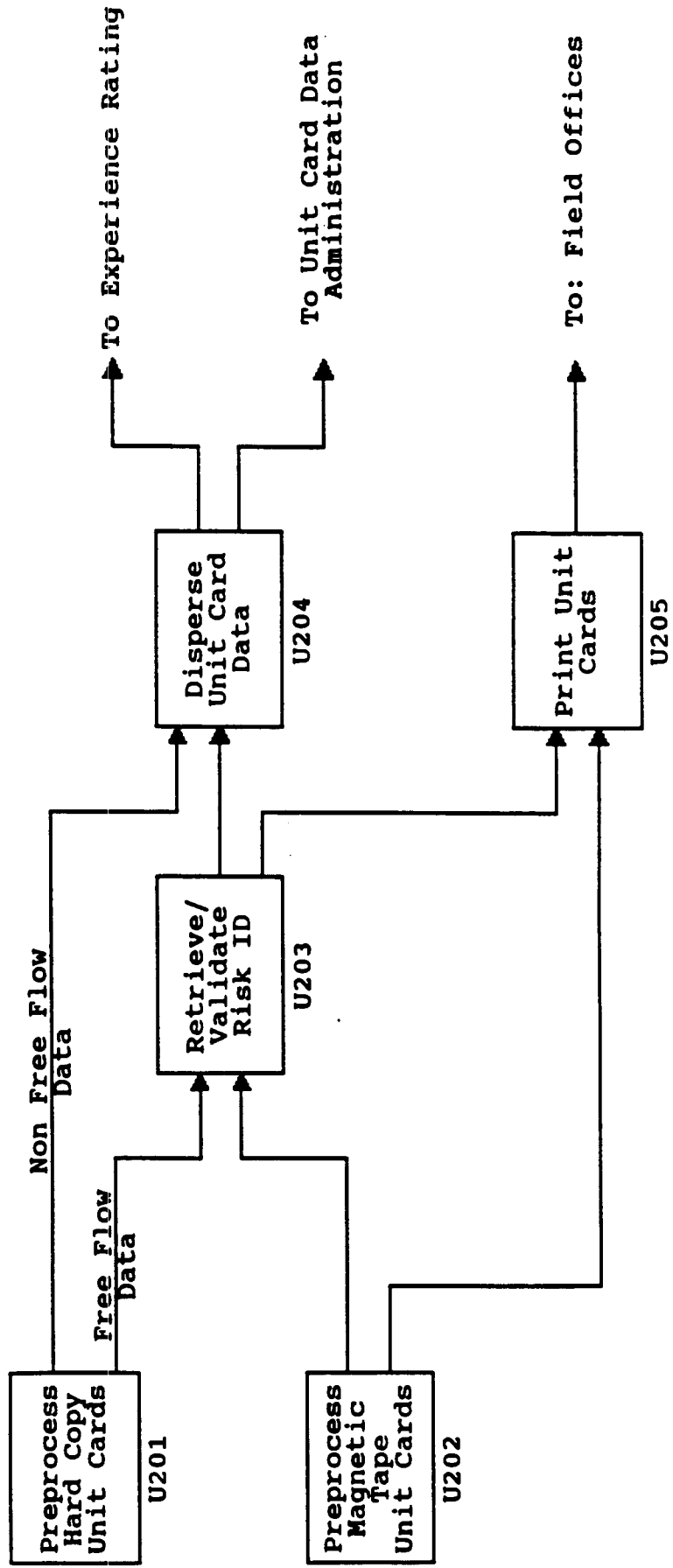


NAIC Examination of NCCI

U101

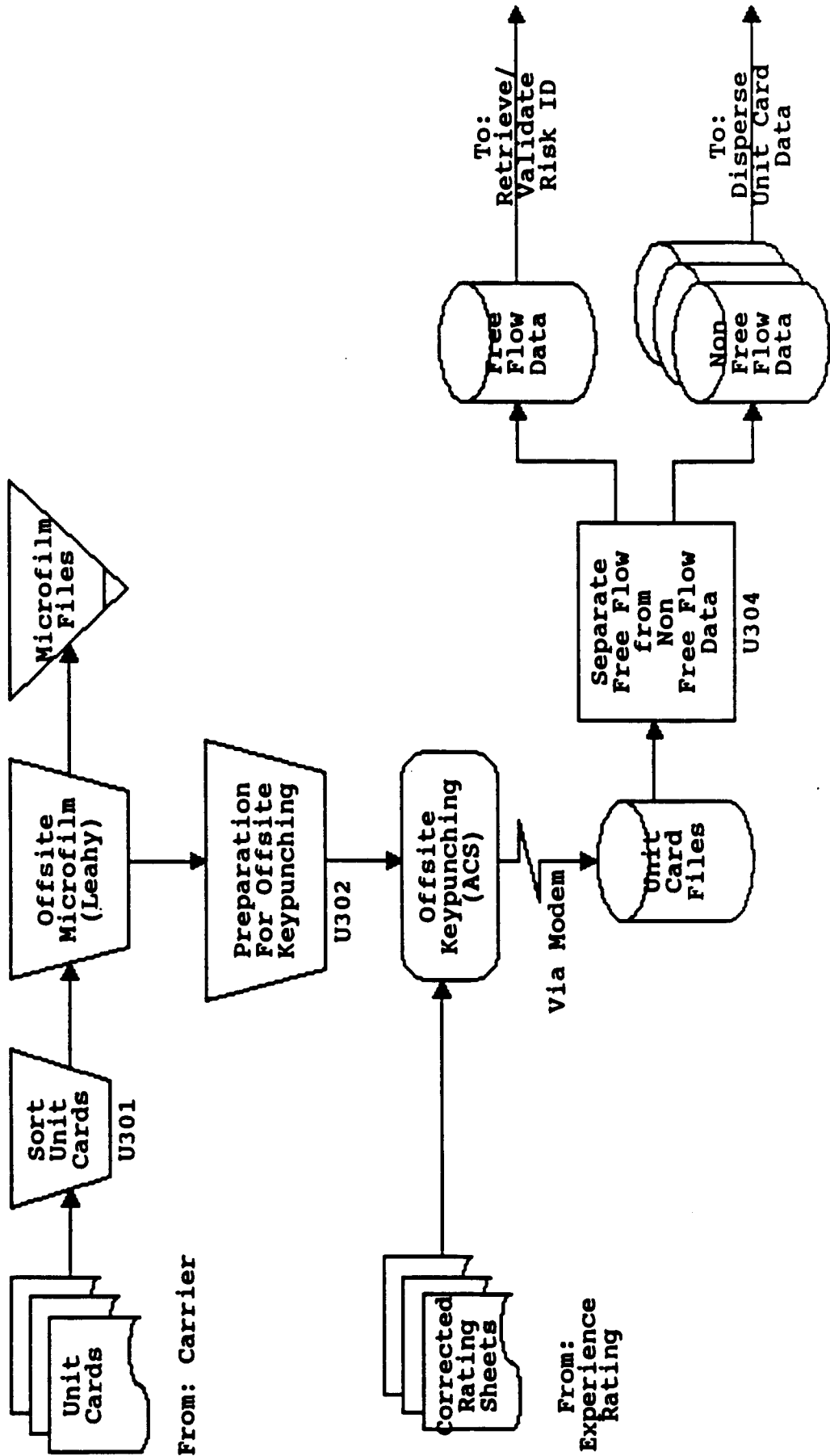
Unit Card Data Conversion

High Level Flow



Unit Card Data Conversion

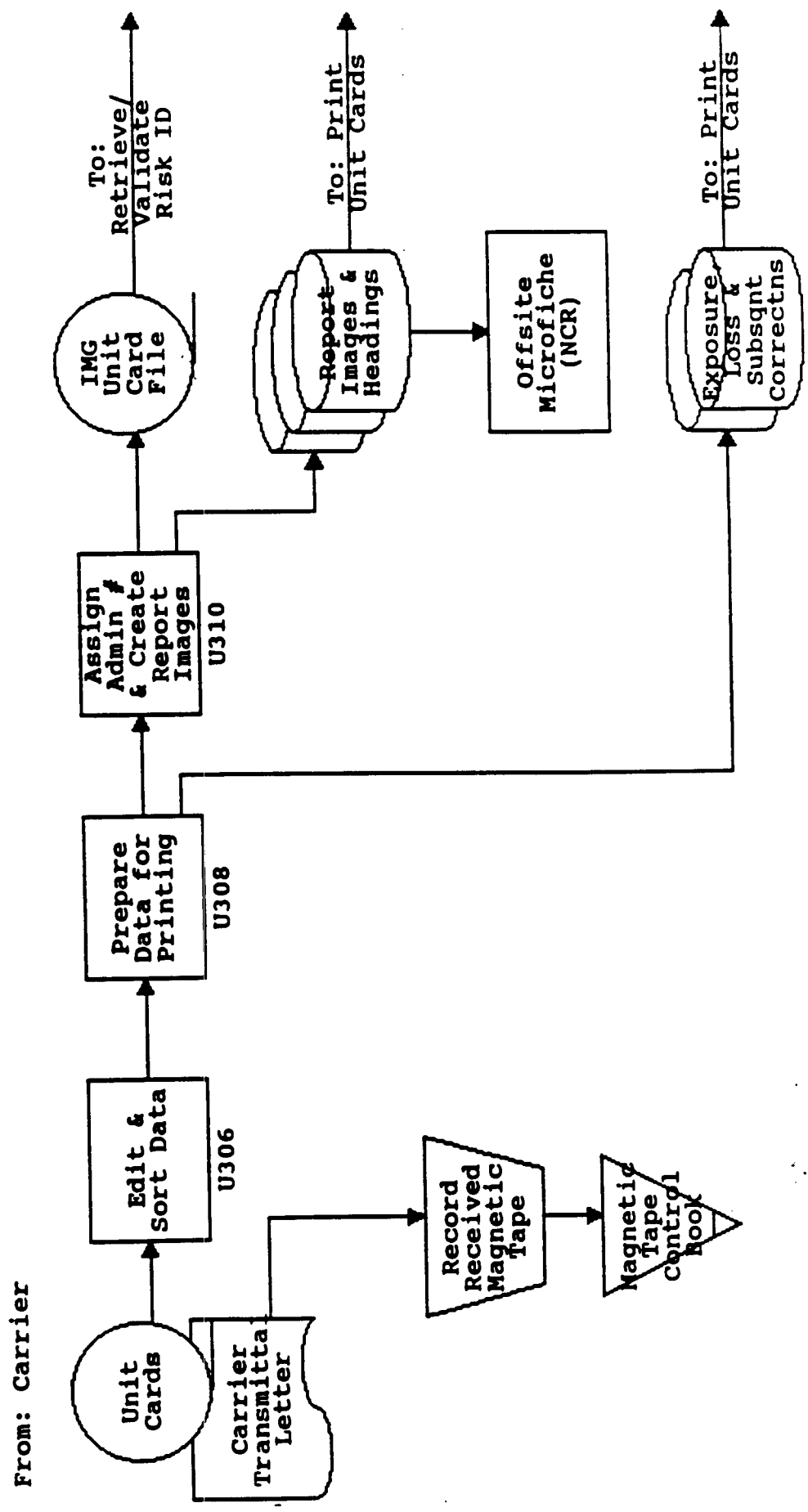
Preprocess Hard Copy Unit Cards



NAIC Examination of NCCI

Unit Card Data Conversion

Preprocess Magnetic Tape Unit Cards

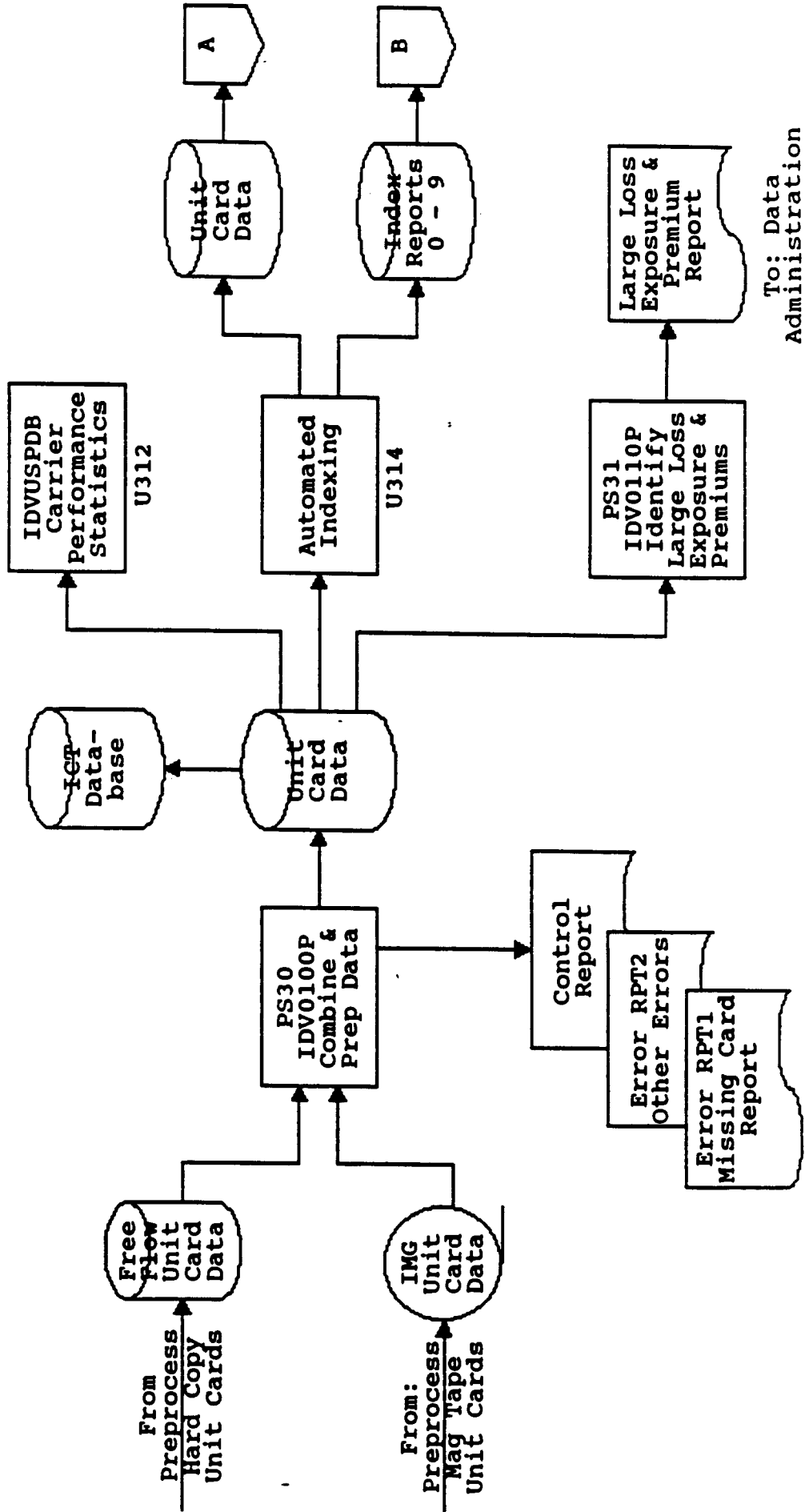


NAIC Examination of NCCI

U203A

Unit Card Data Conversion

Retrieve/Validate Risk ID

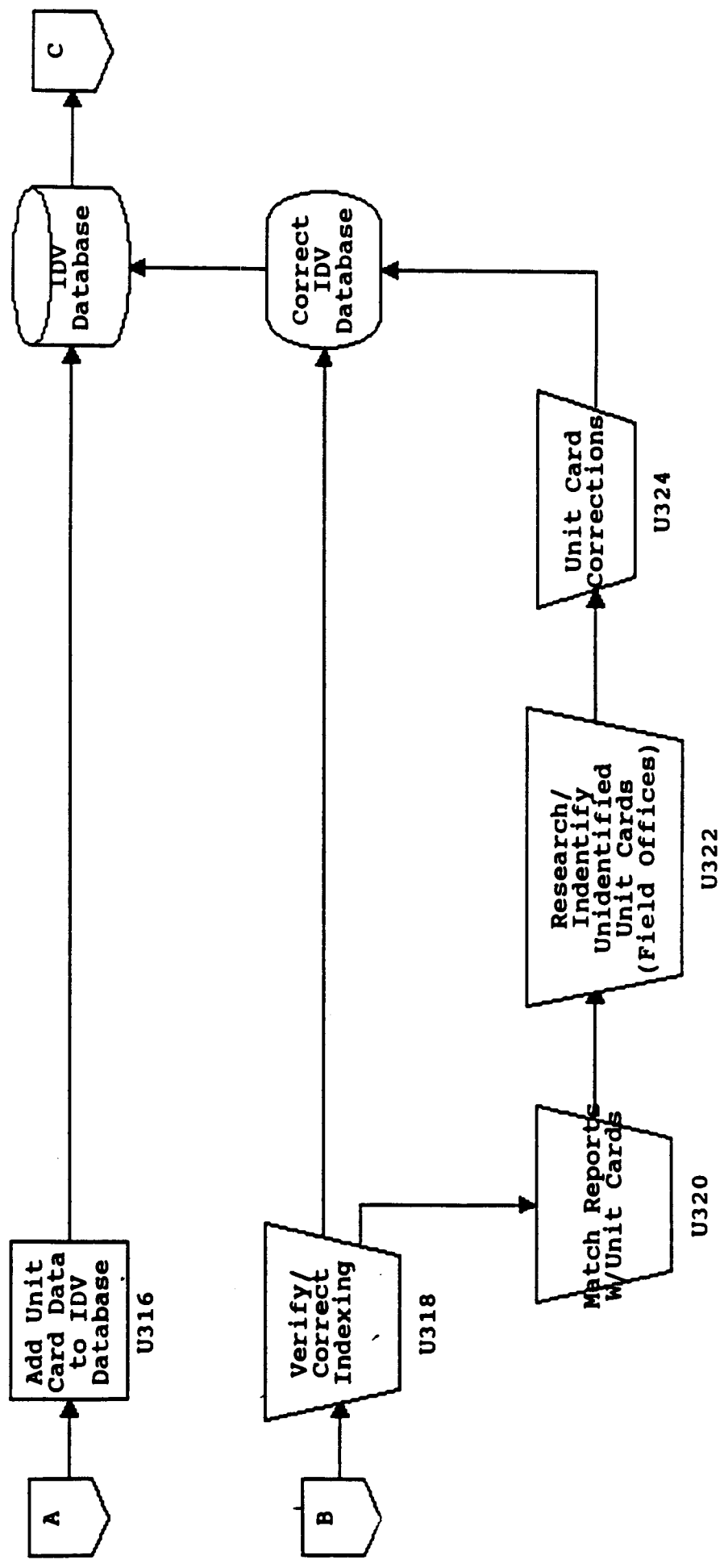


NAIC Examination of NCCI

U203B

Unit Card Data Conversion

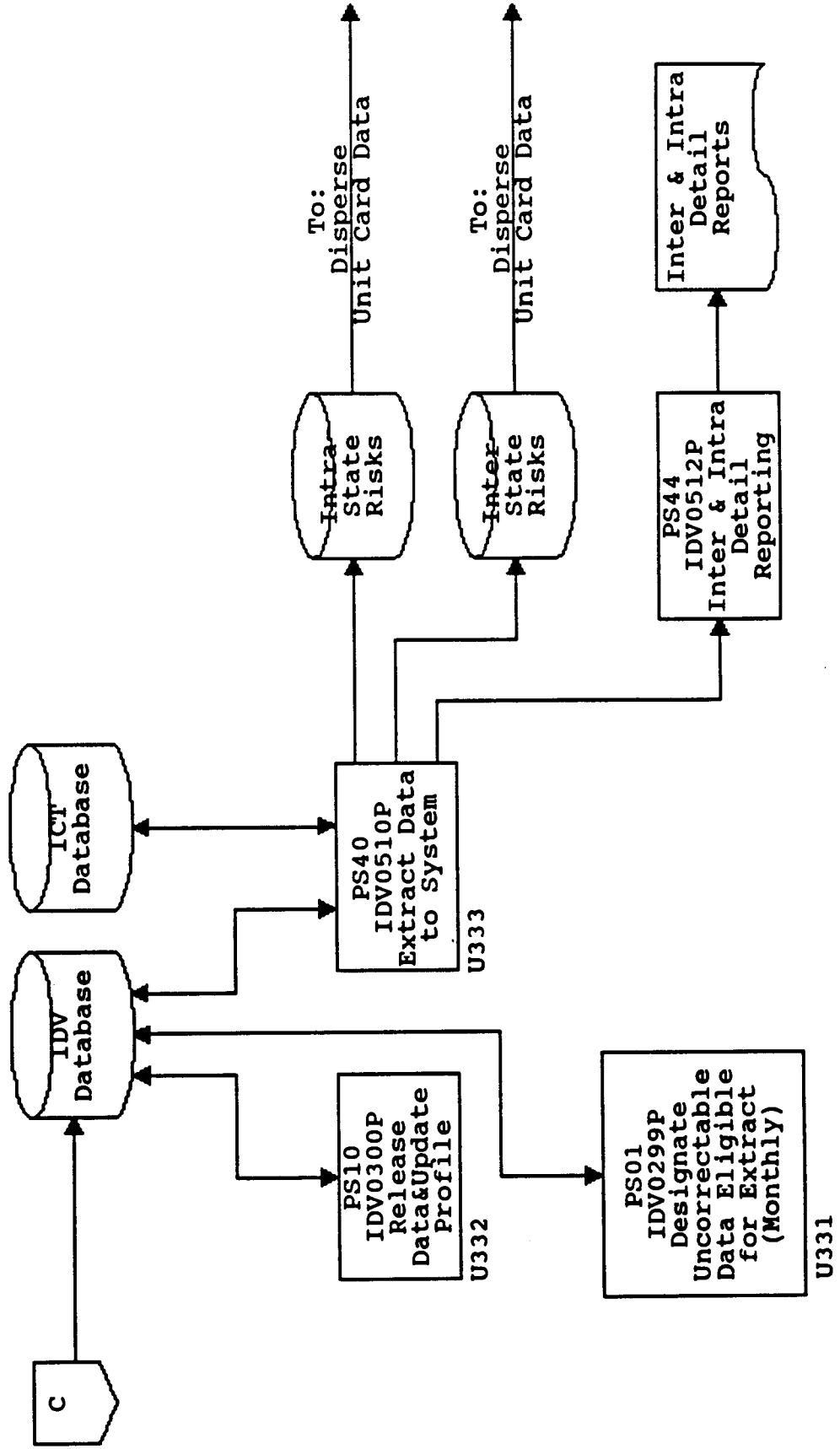
Retrieve/Validate Risk ID



NAIC Examination of NCCI

Unit Card Data Conversion

Retrieve/Validate Risk ID

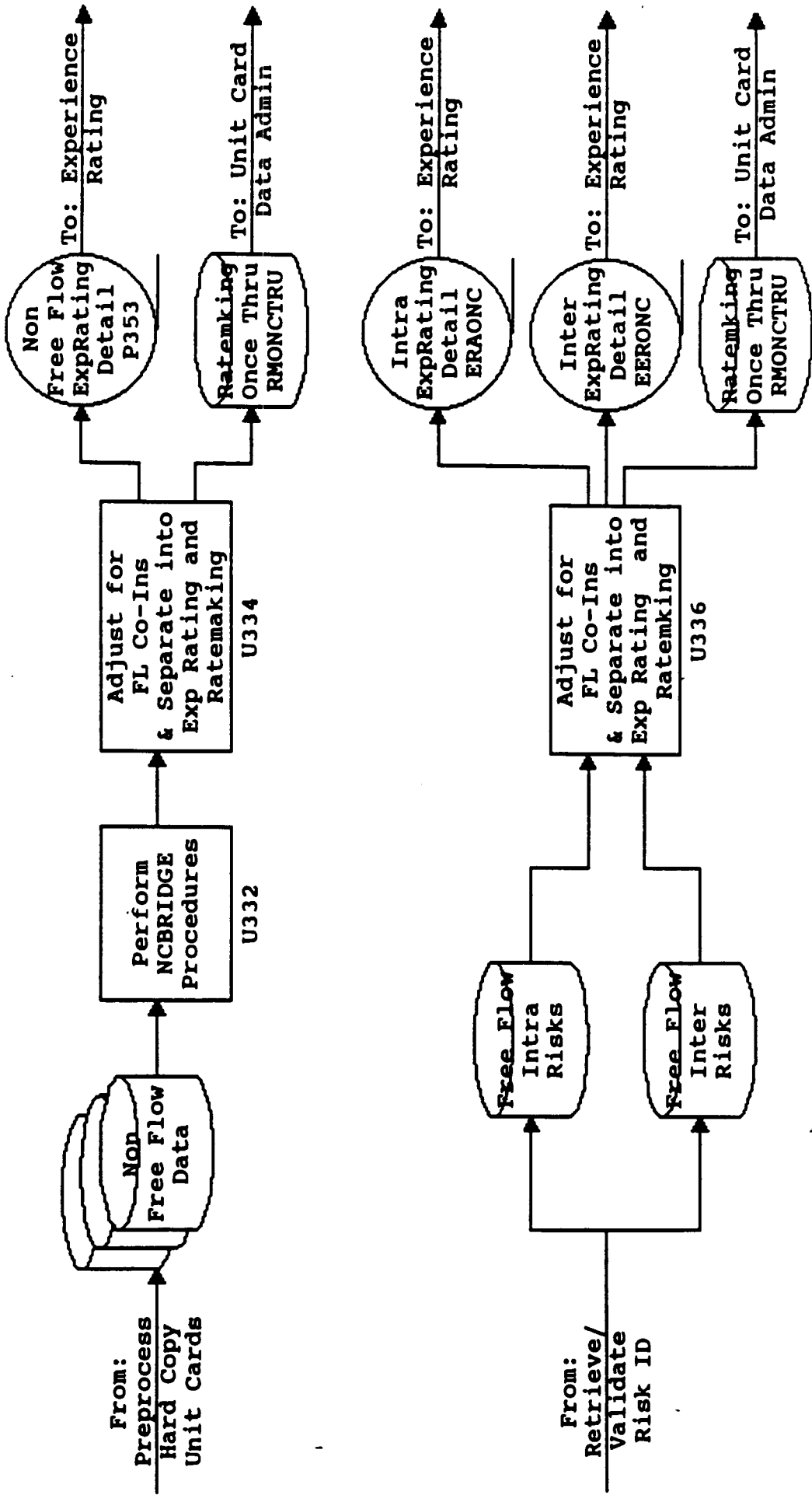


NAIC Examination of NCCI

U204

Unit Card Data Conversion

Disperse Unit Card Data

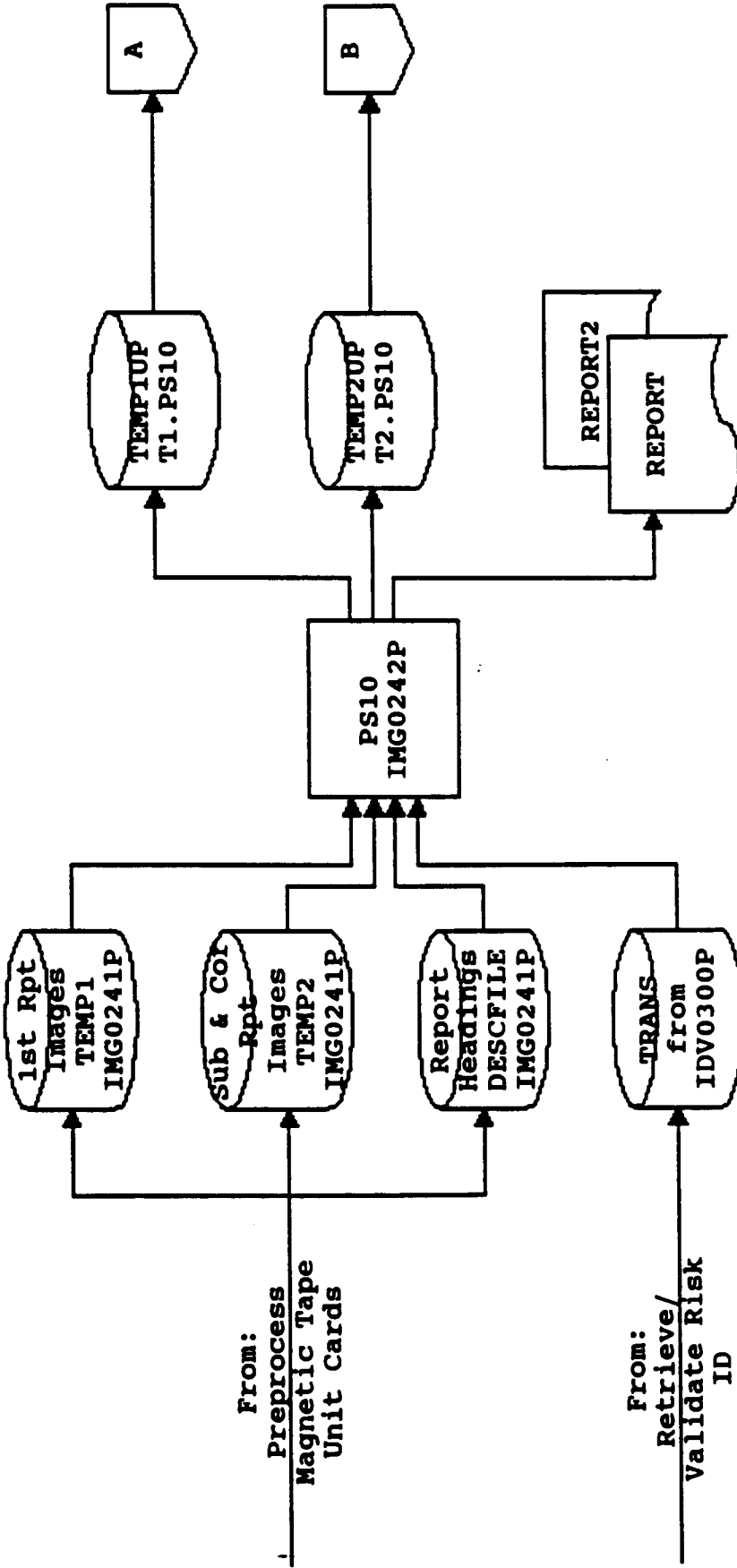


NAIC Examination of NCCI

U205A

Unit Card Data Conversion

Print Unit Cards (IMGR02PA)

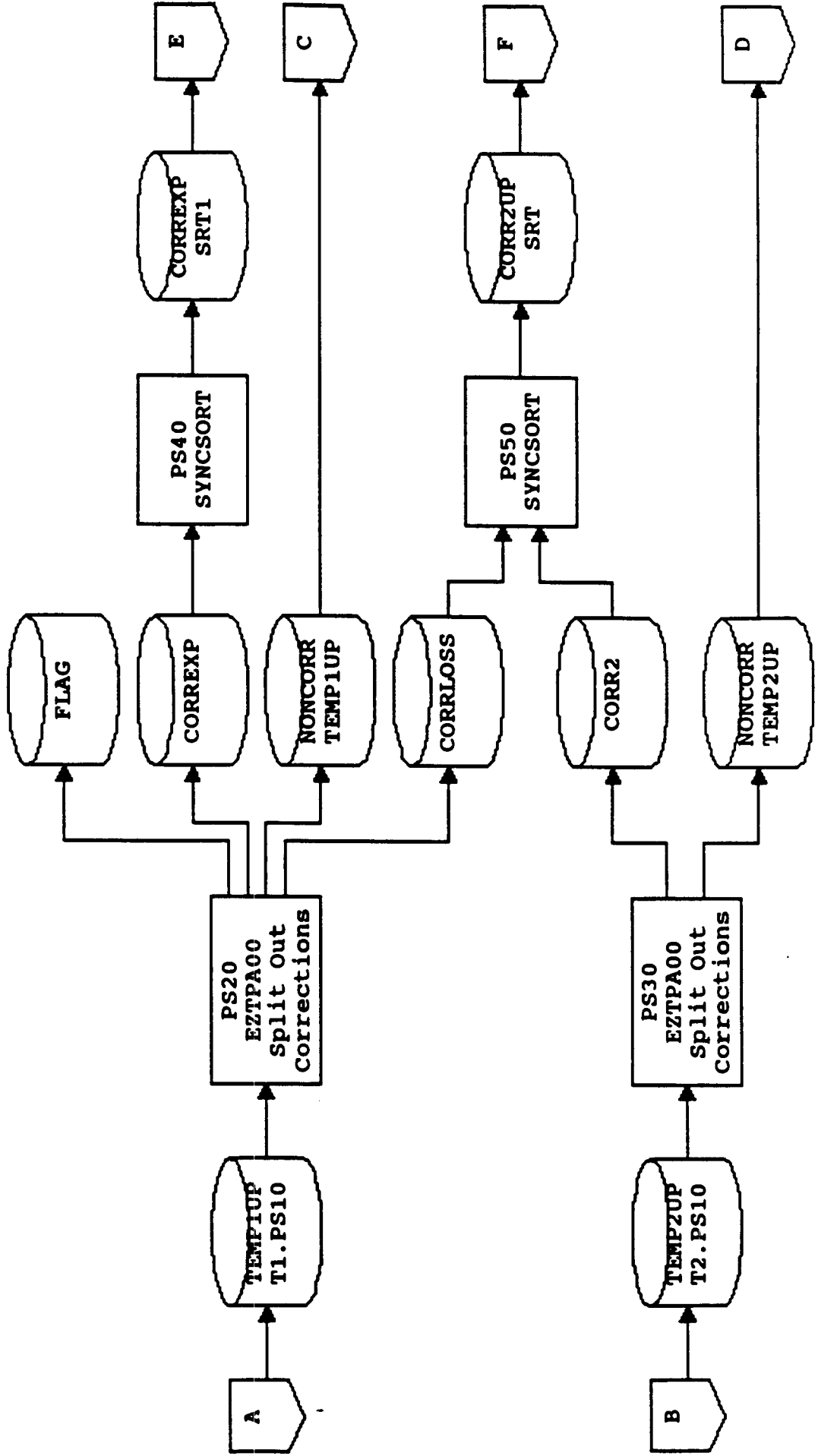


NAIC Examination of NCCI

U205B

Unit Card Data Conversion

Print Unit Cards (IMGR02PA)

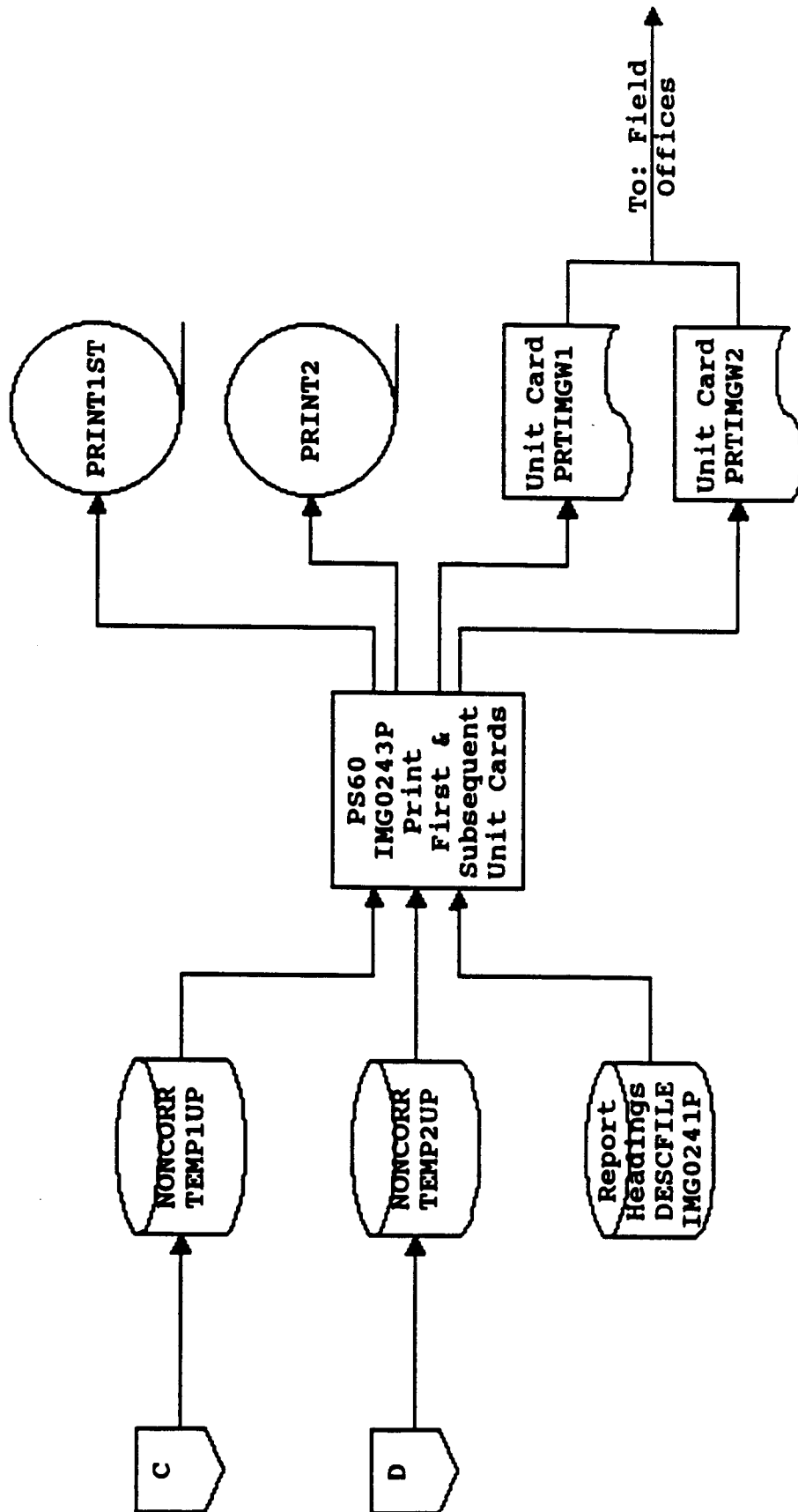


NAIC Examination of NCCI

U205C

Unit Card Data Conversion

Print Unit Cards (IMGR02PA)

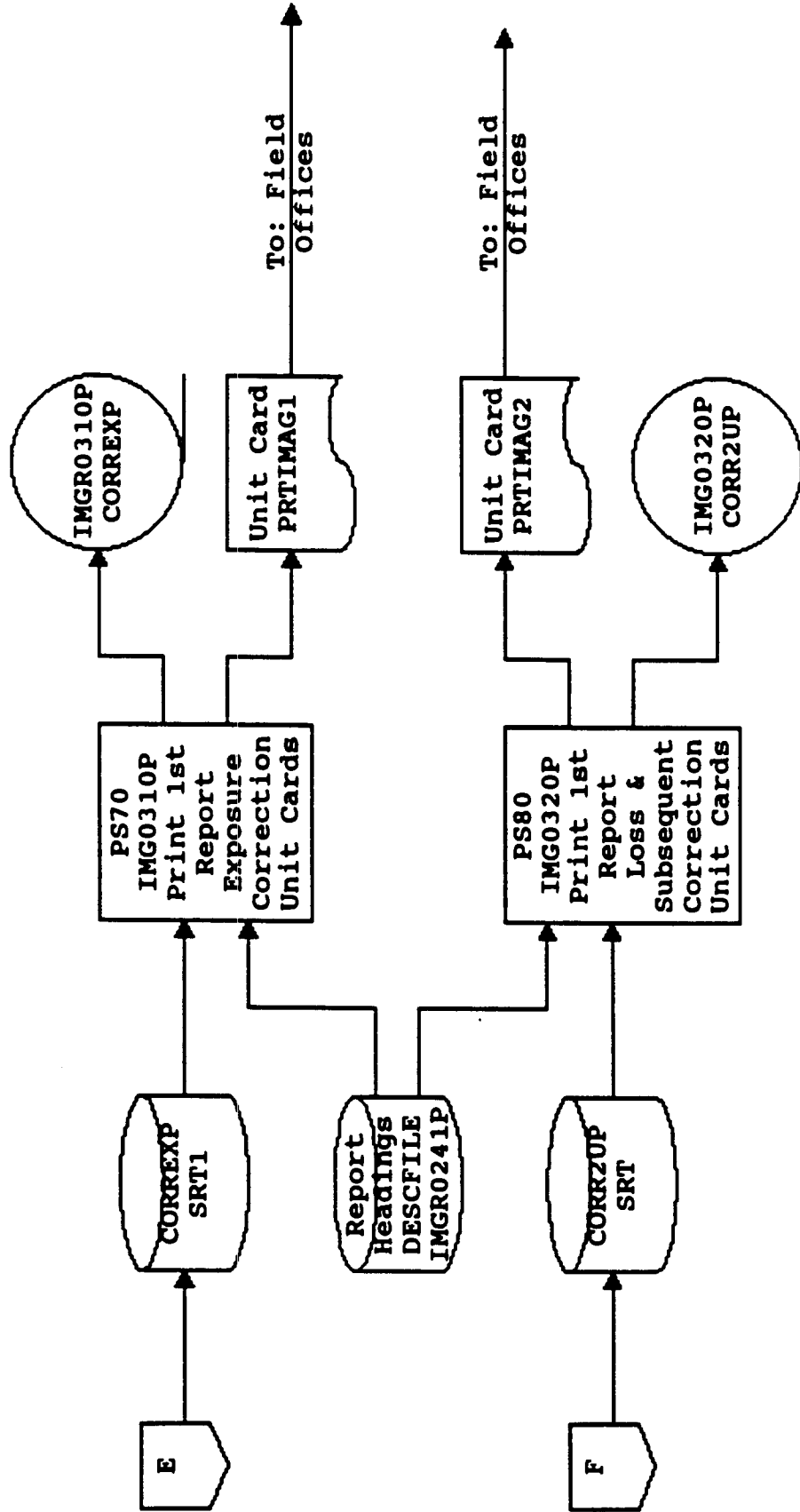


NAIC Examination of NCCI

U205D

Unit Card Data Conversion

Print Unit Cards (IMGR02PA)

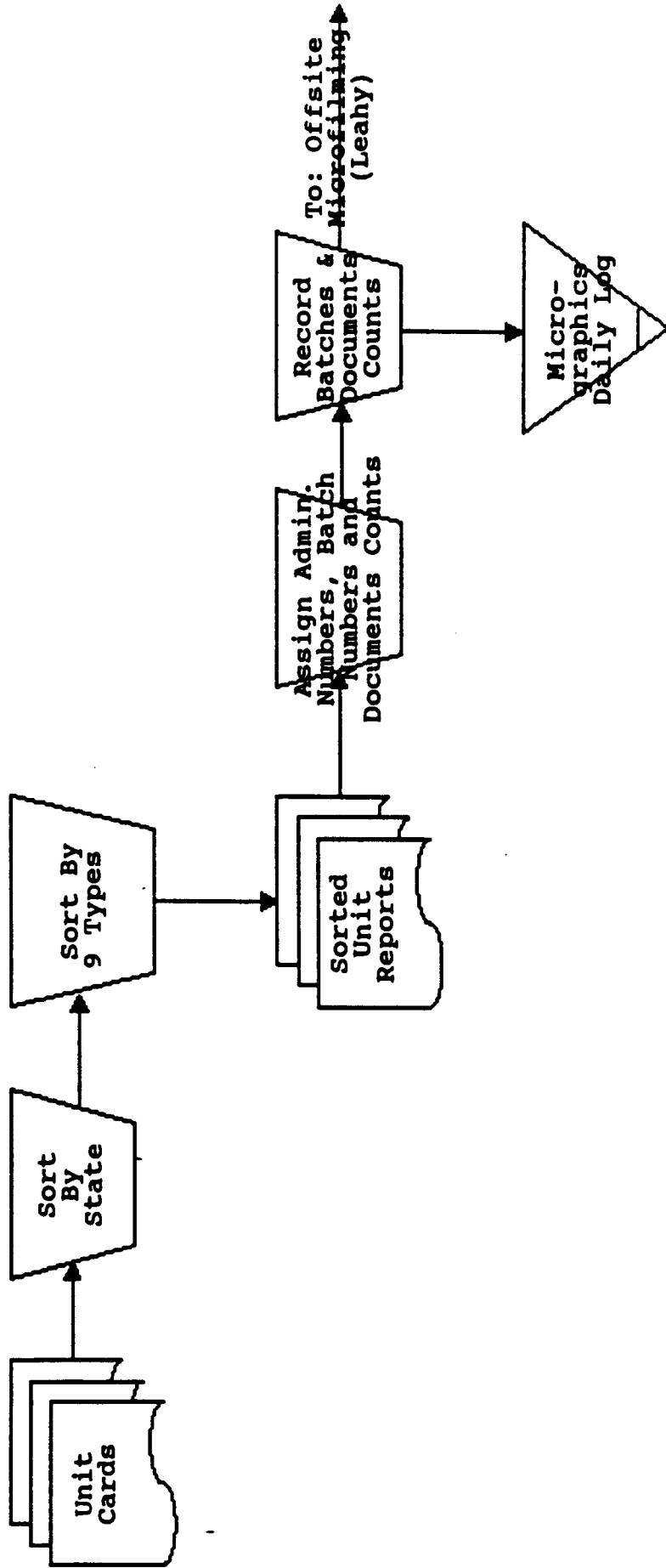


NAIC Examination of NCCI

U301

Unit Card Data Conversion

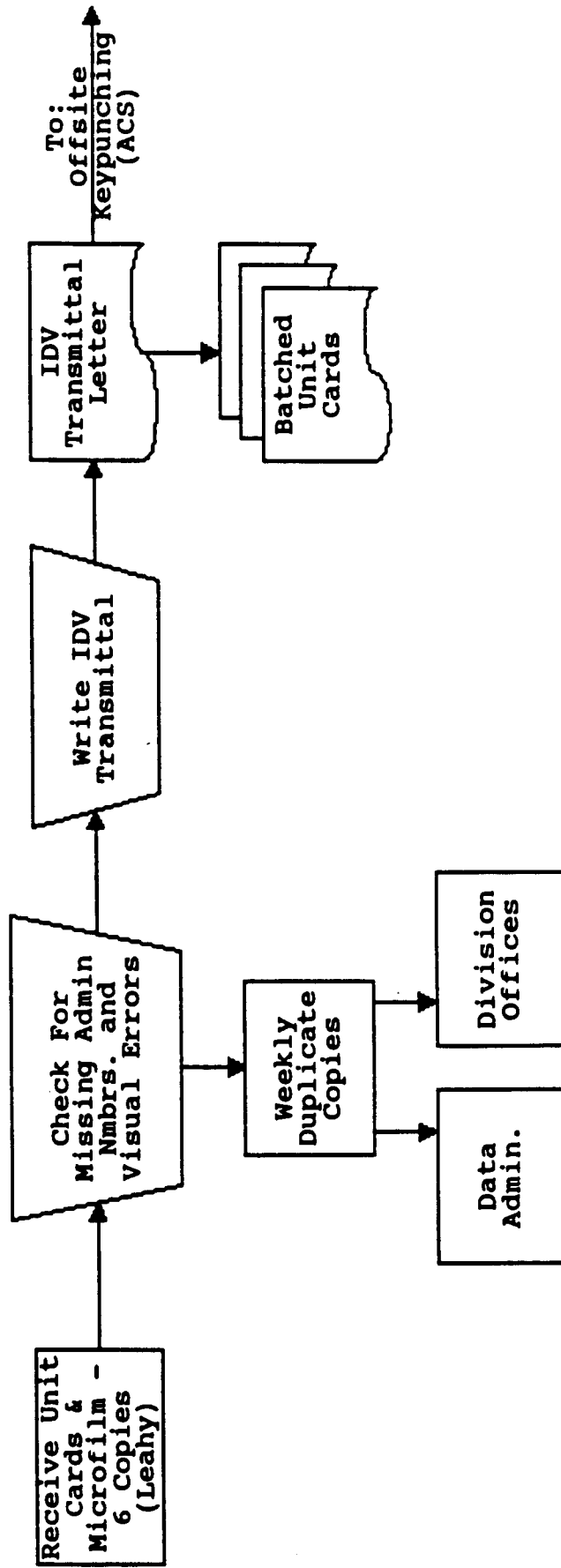
Sort Unit Cards



NAIC Examination of NCCI

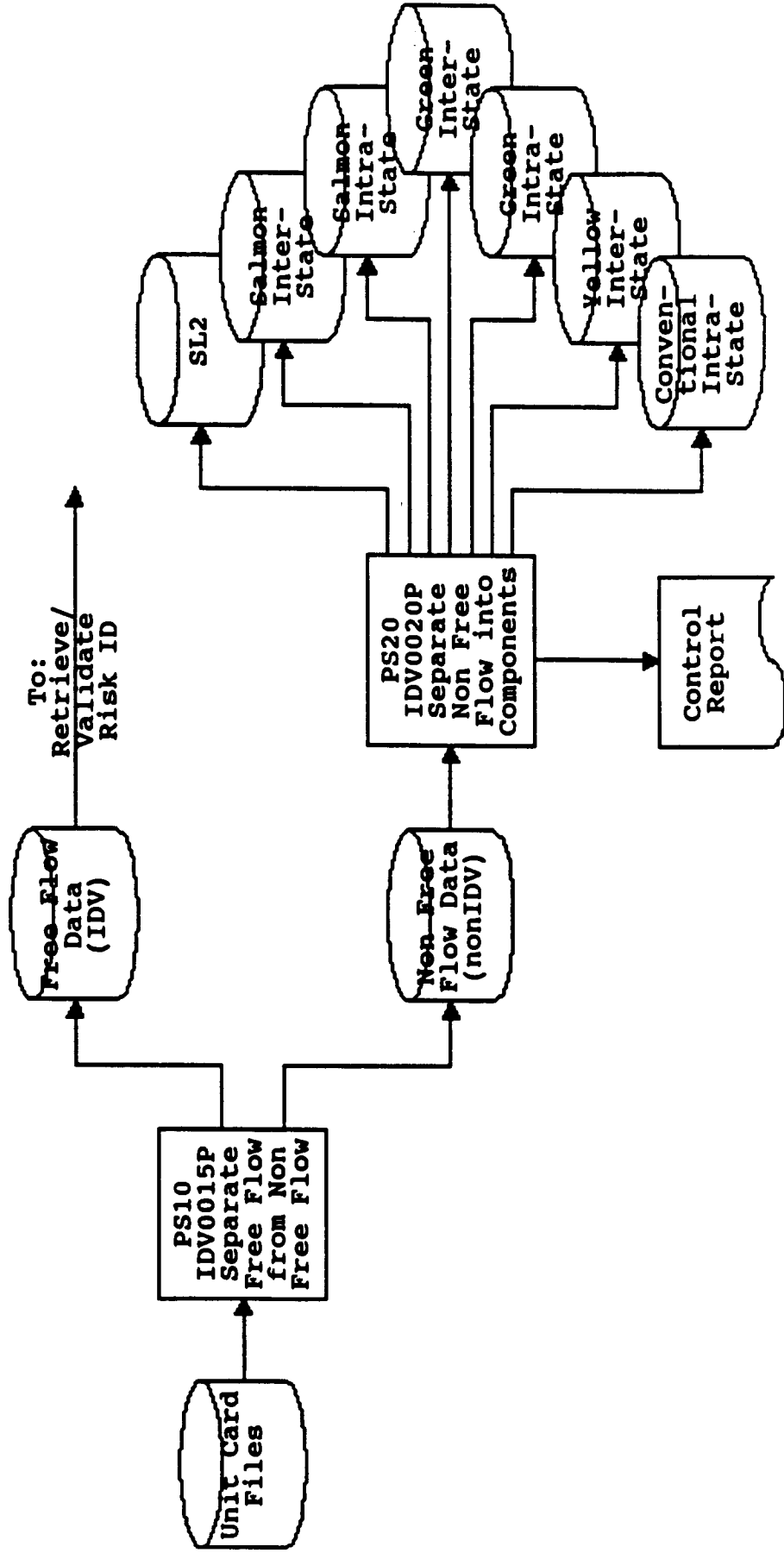
Unit Card Data Conversion

Preparation For Offsite Keypunching



Unit Card Data Conversion

Separate Free Flow from Non Free Flow Data

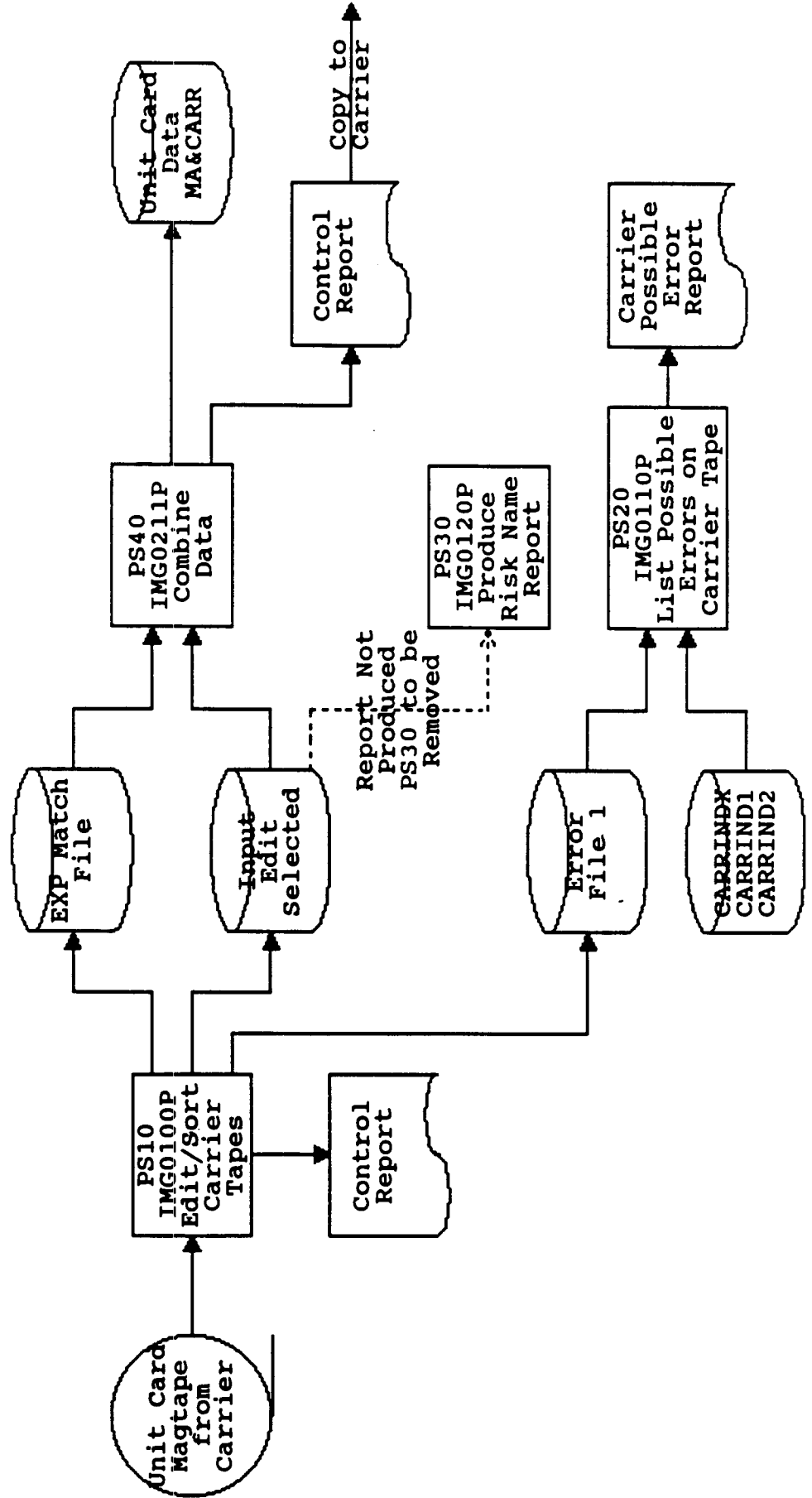


To: Disperse Unit Card Data

NAIC Examination of NCCI

Unit Card Data Conversion

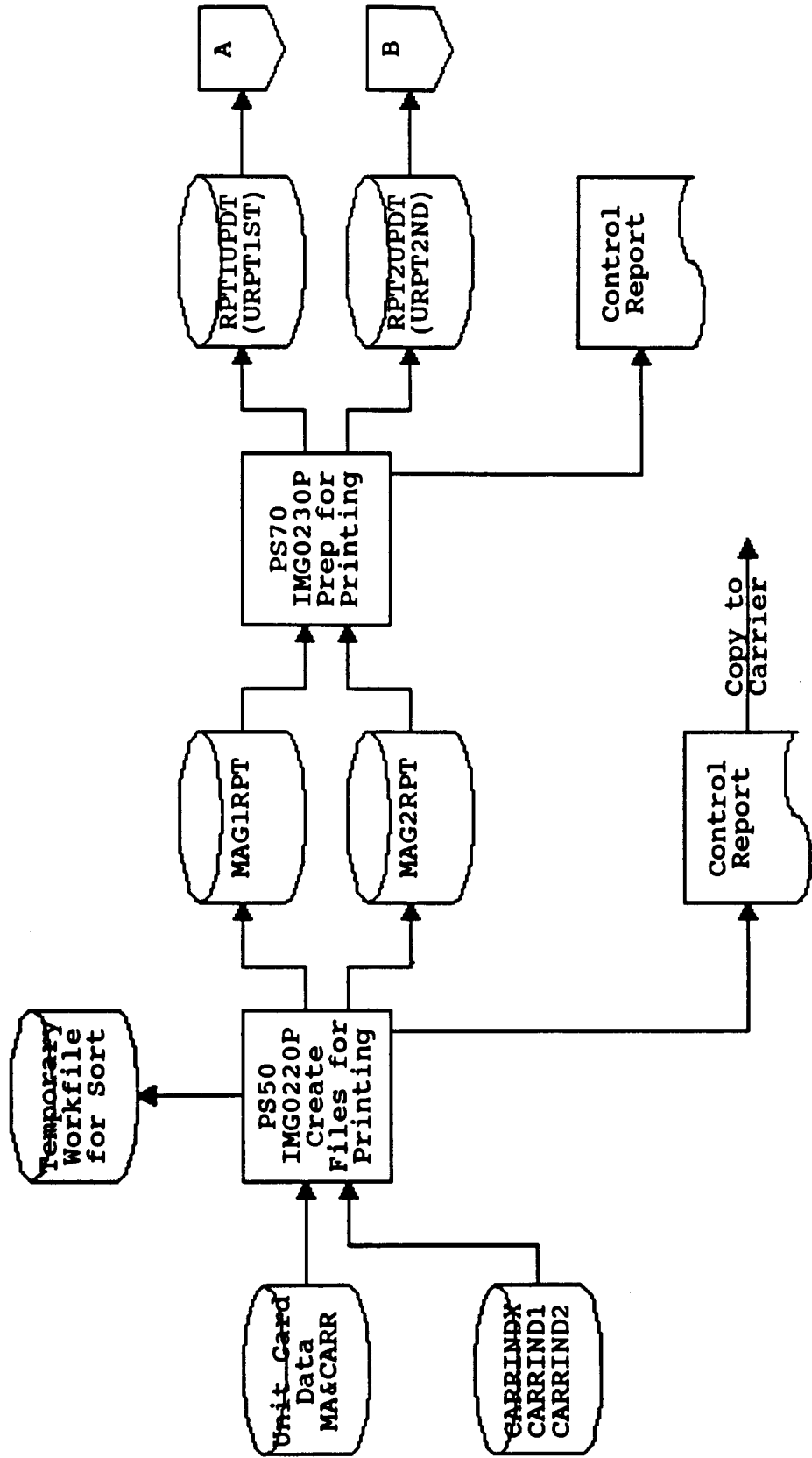
Edit & Sort Data (IMGR01PA)



NAIC Examination of NCCI

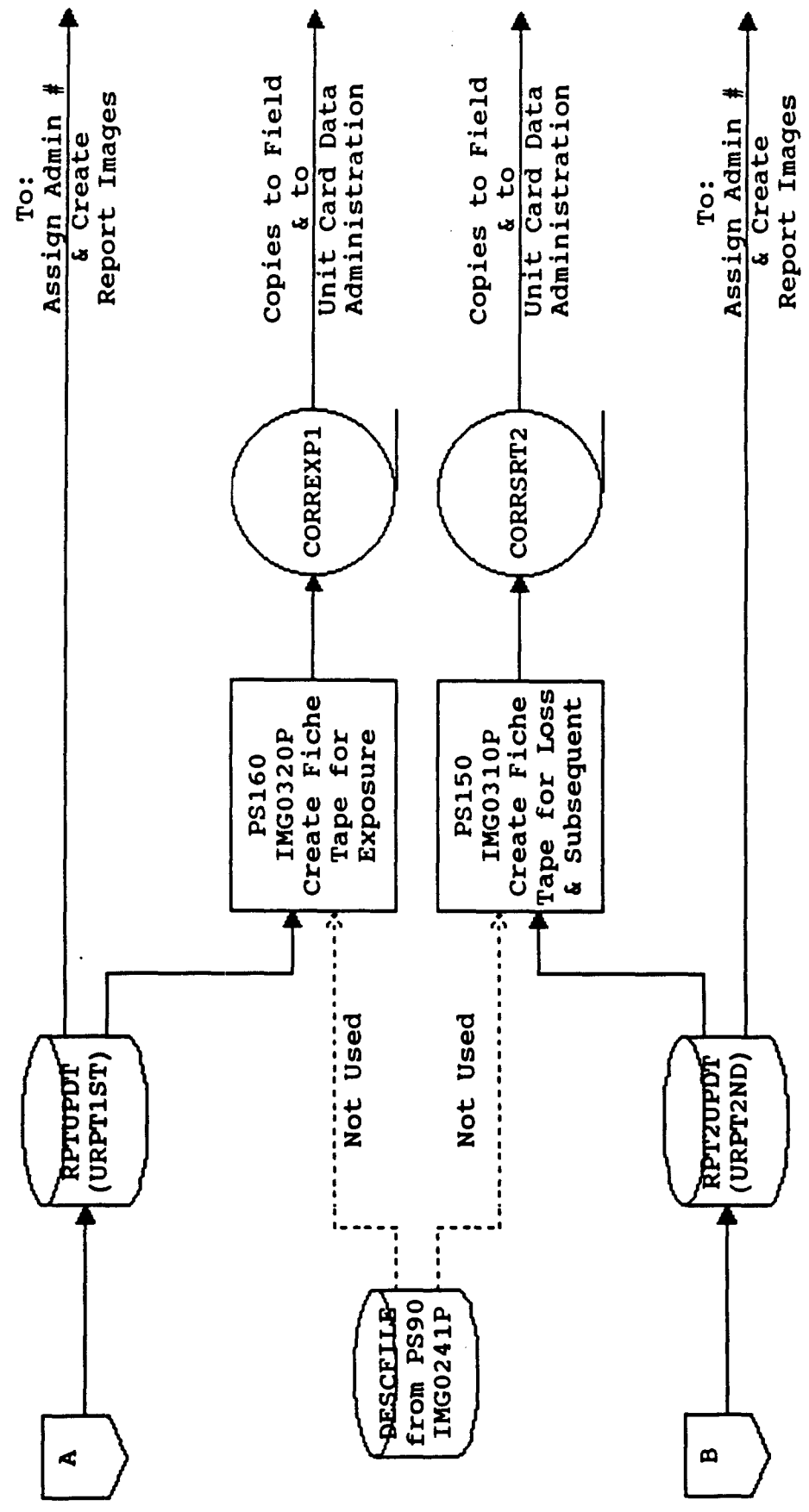
Unit Card Data Conversion

Prepare Data for Printing (IMGR01PA)



NAIC Examination of NCCI
Unit Card Data Conversion

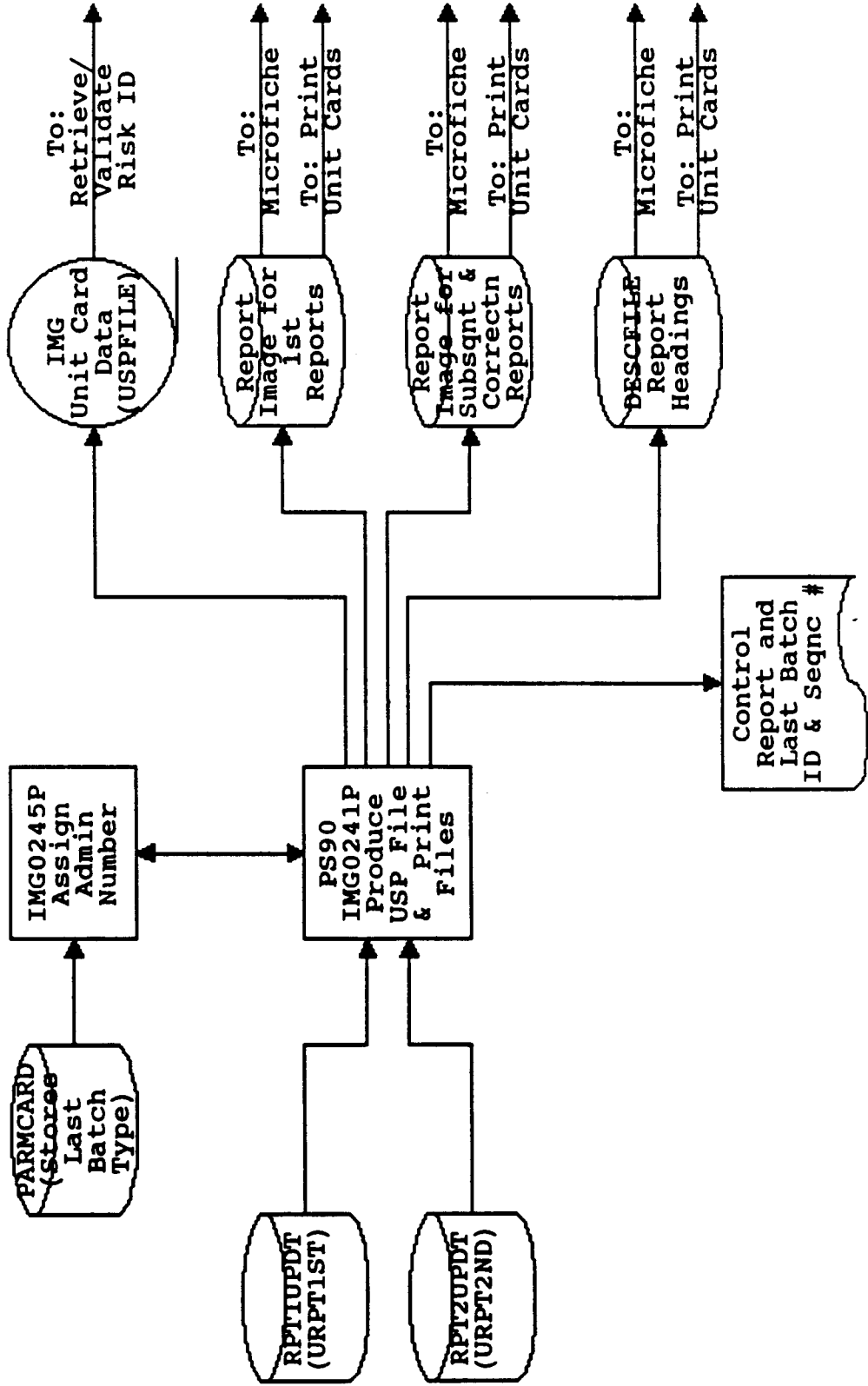
Prepare Data for Printing (IMGR01PA)



NAIC Examination of NCCI

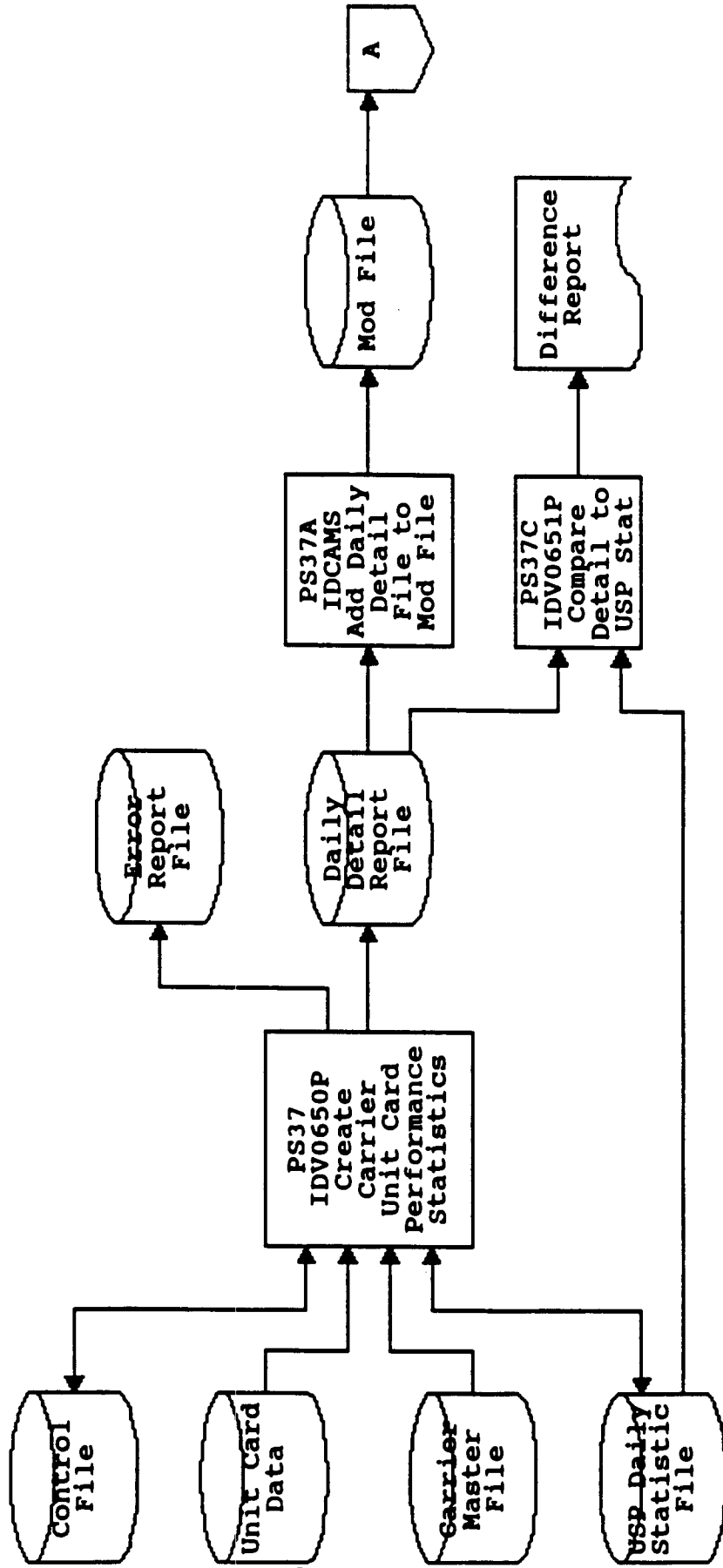
Unit Card Data Conversion

Assign Admin # and Create Report Images (IMG01PA)

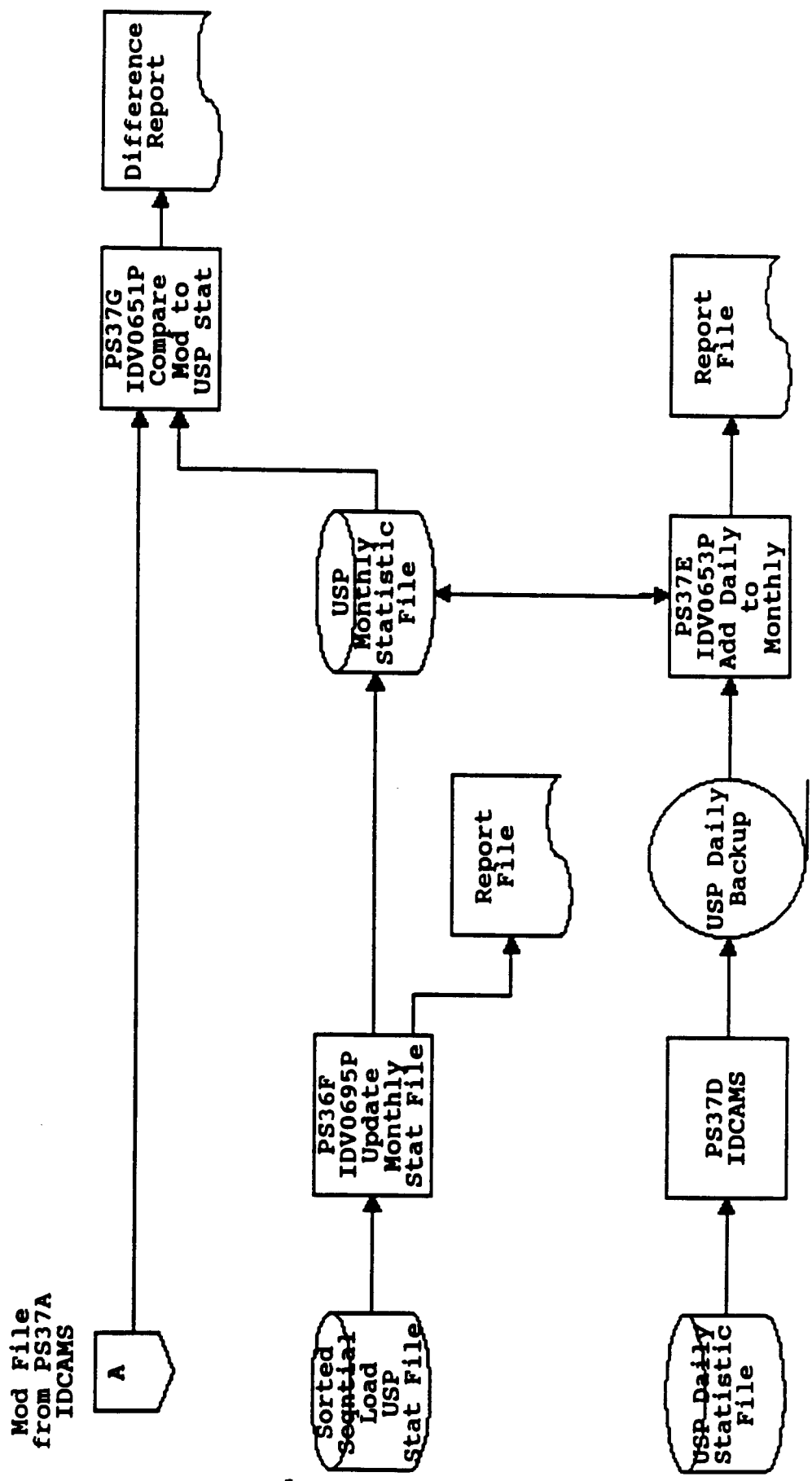


Unit Card Data Conversion

Carrier Performance Statistics

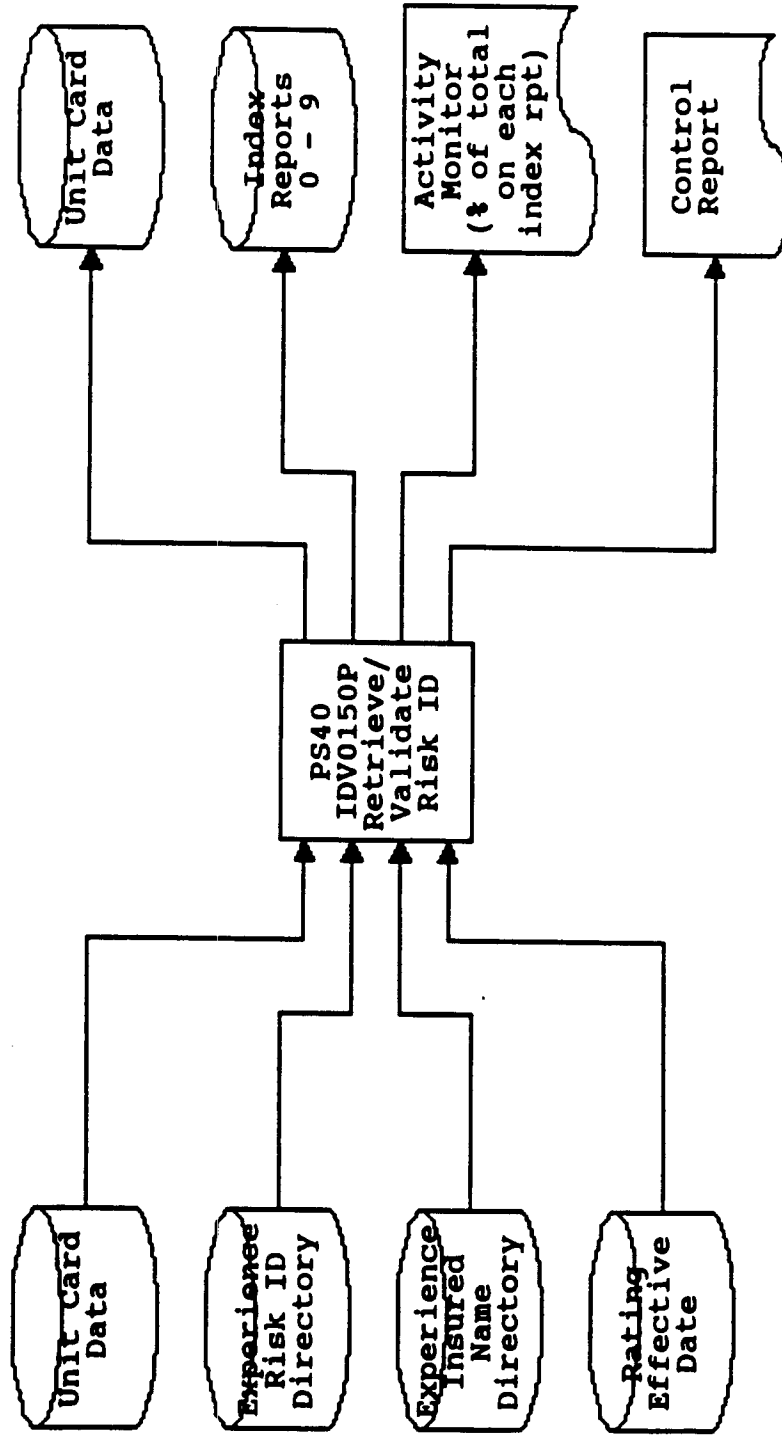


NAIC Examination of NCCI
Unit Card Data Conversion
Carrier Performance Statistics



Unit Card Data Conversion

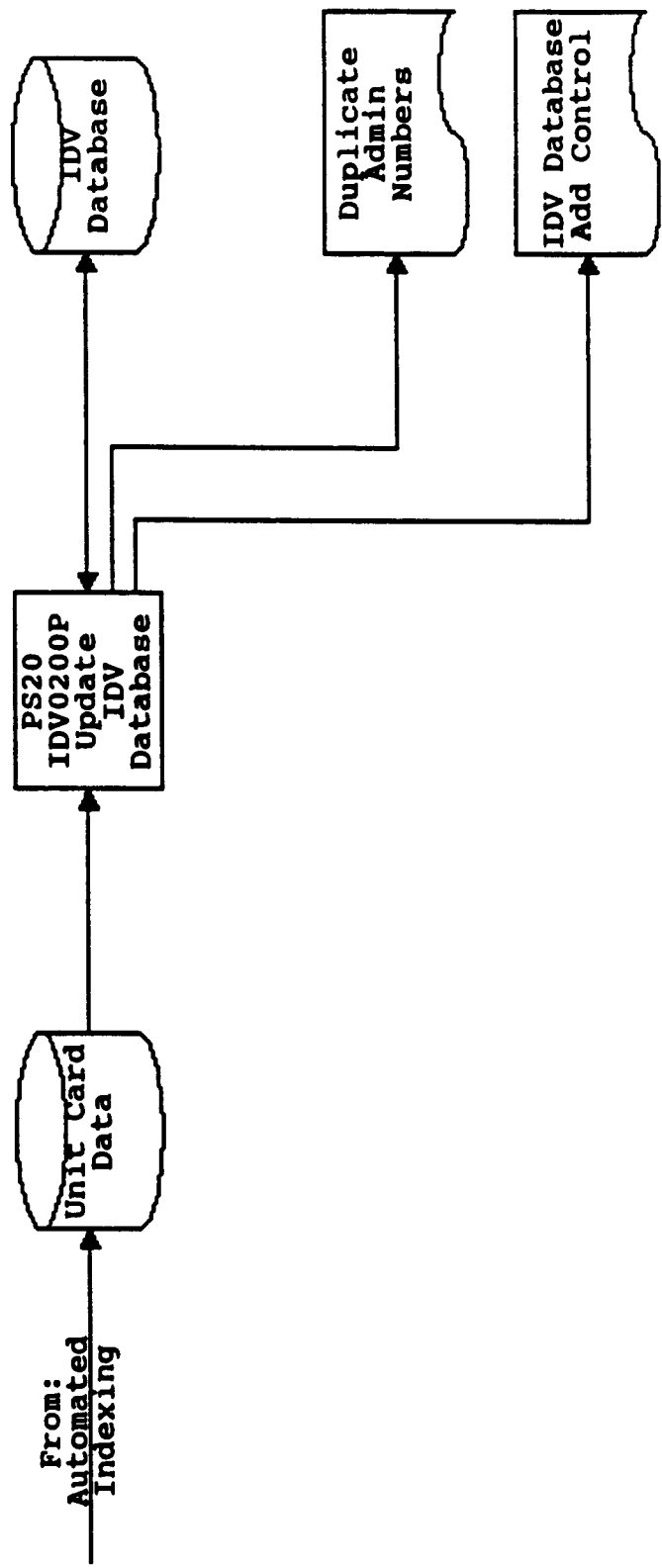
Automated Indexing



NAIC Examination of NCCI

Unit Card Data Conversion

Add Unit Card Data to IDV Database

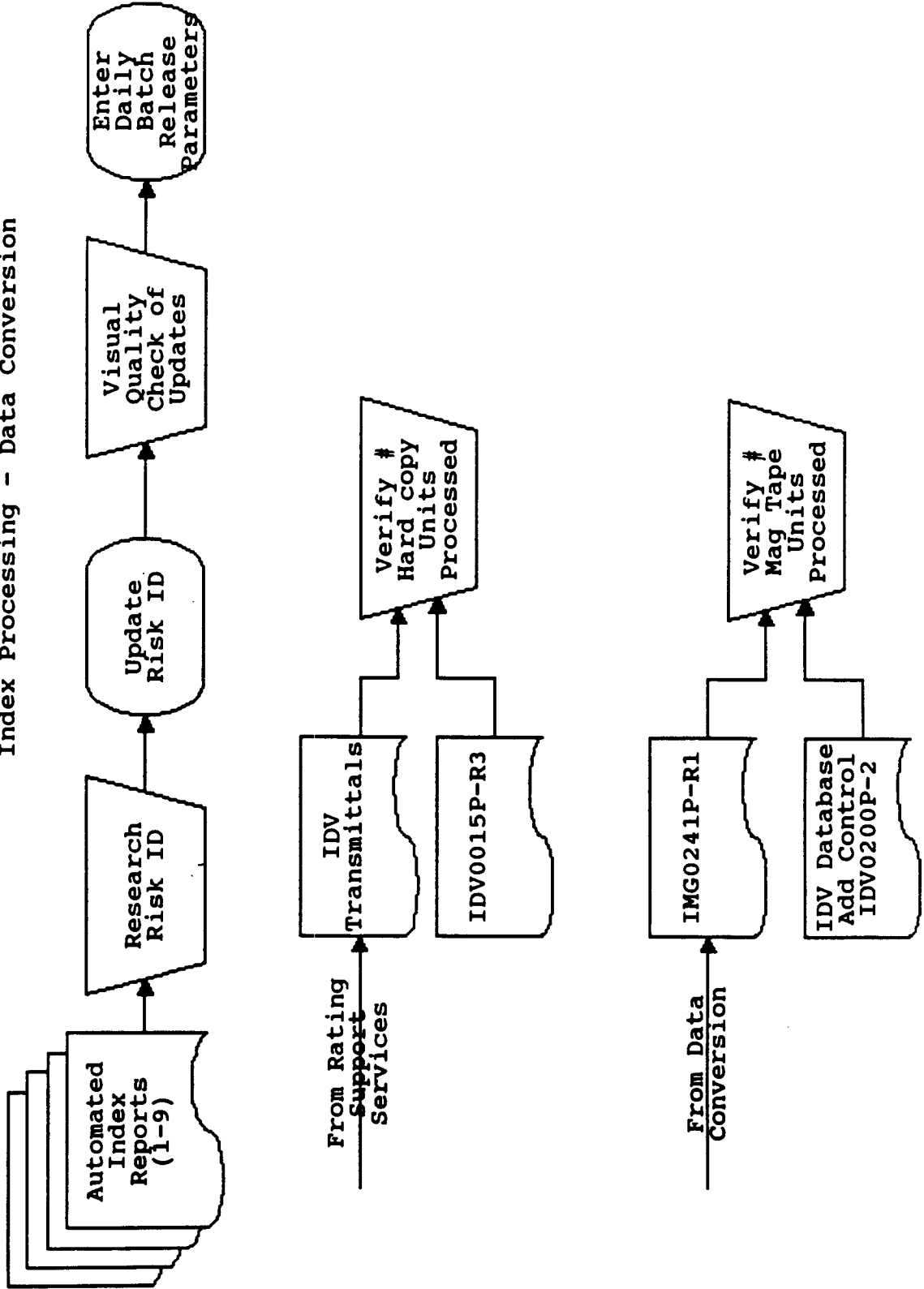


NAIC Examination of NCCI

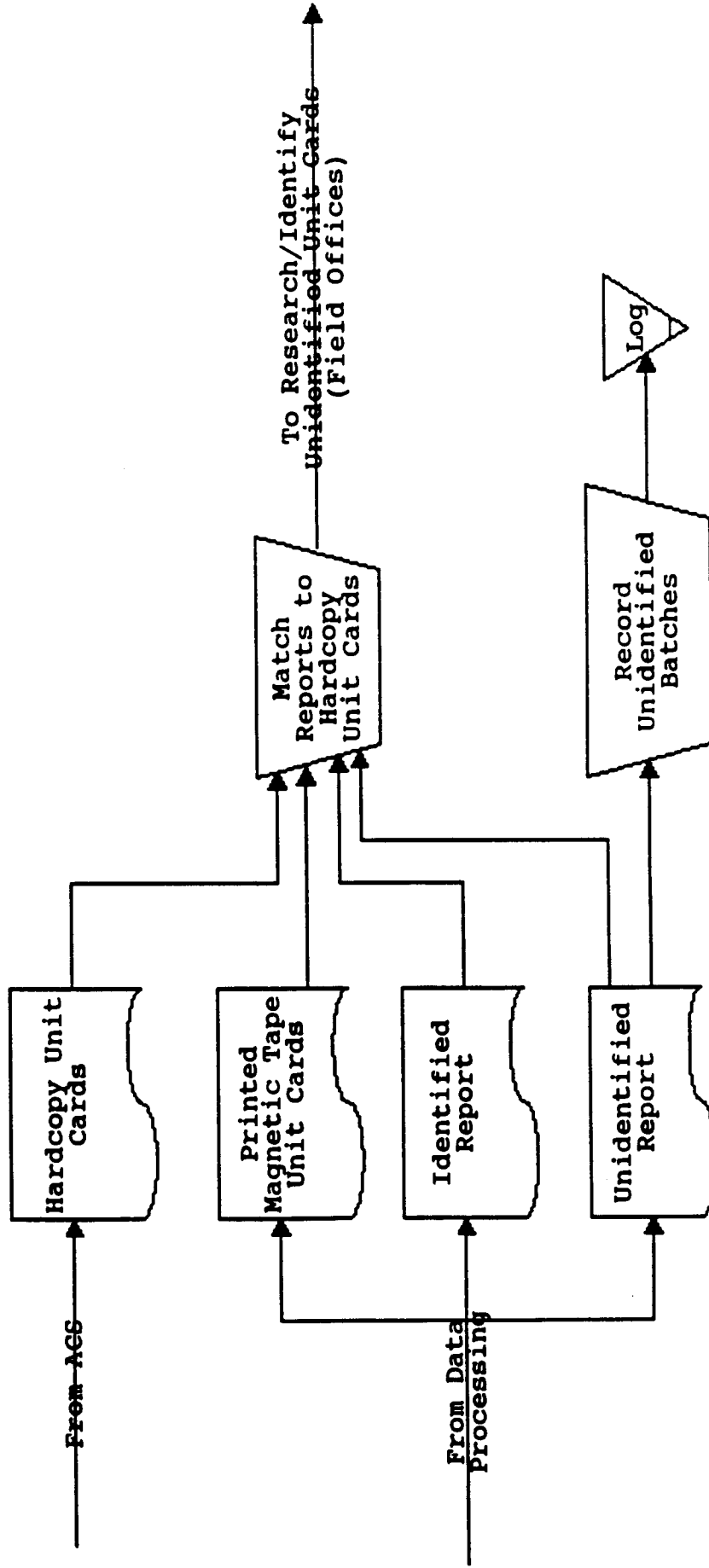
U318

Unit Card Data Conversion

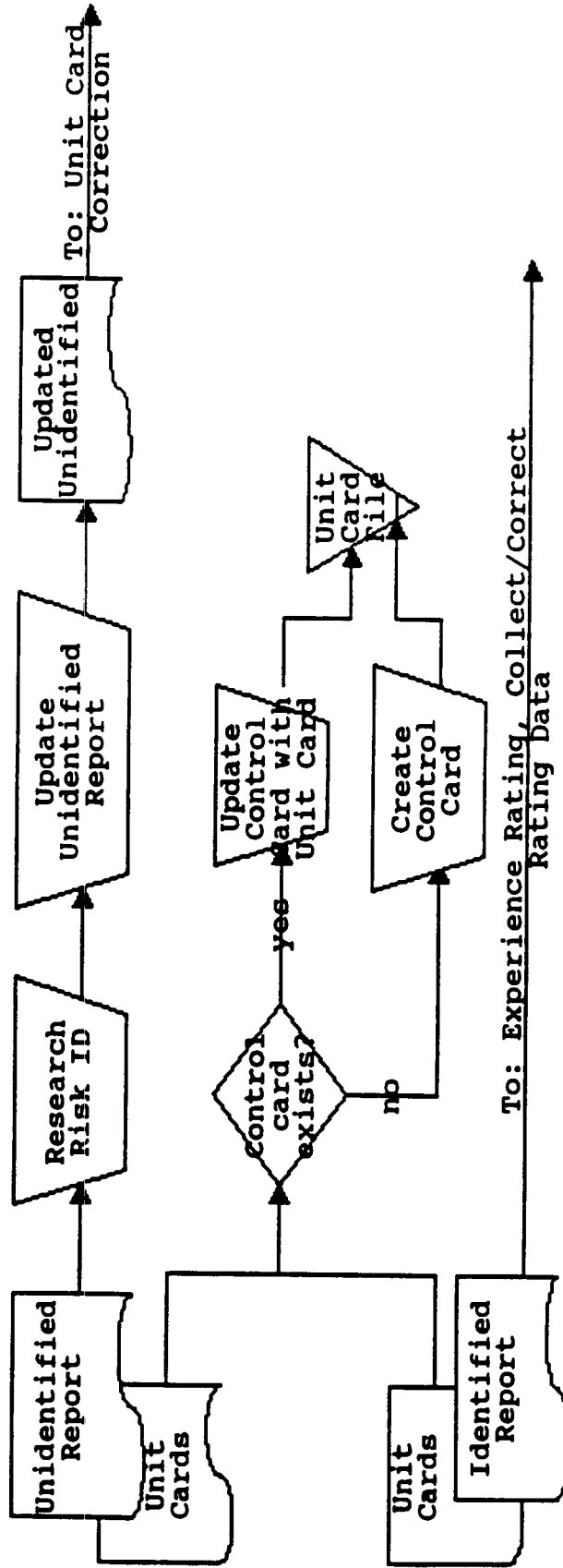
Index Processing - Data Conversion



NAIC Examination of NCCI
Unit Card Data Conversion
Match Reports with Unit Cards



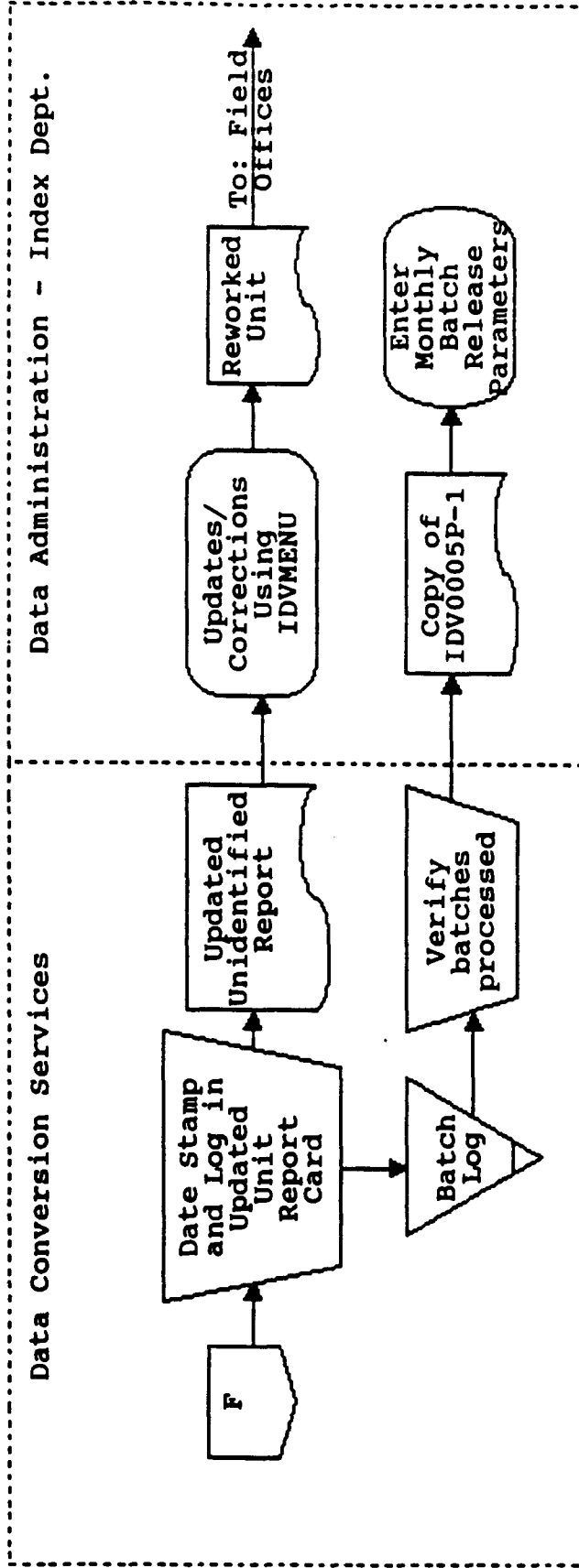
NAIC Examination of NCCI
Unit Card Data Conversion
Field Offices Processing - Data Conversion



NAIC Examination of NCCI

Unit Card Data Conversion

Unit Card Correction

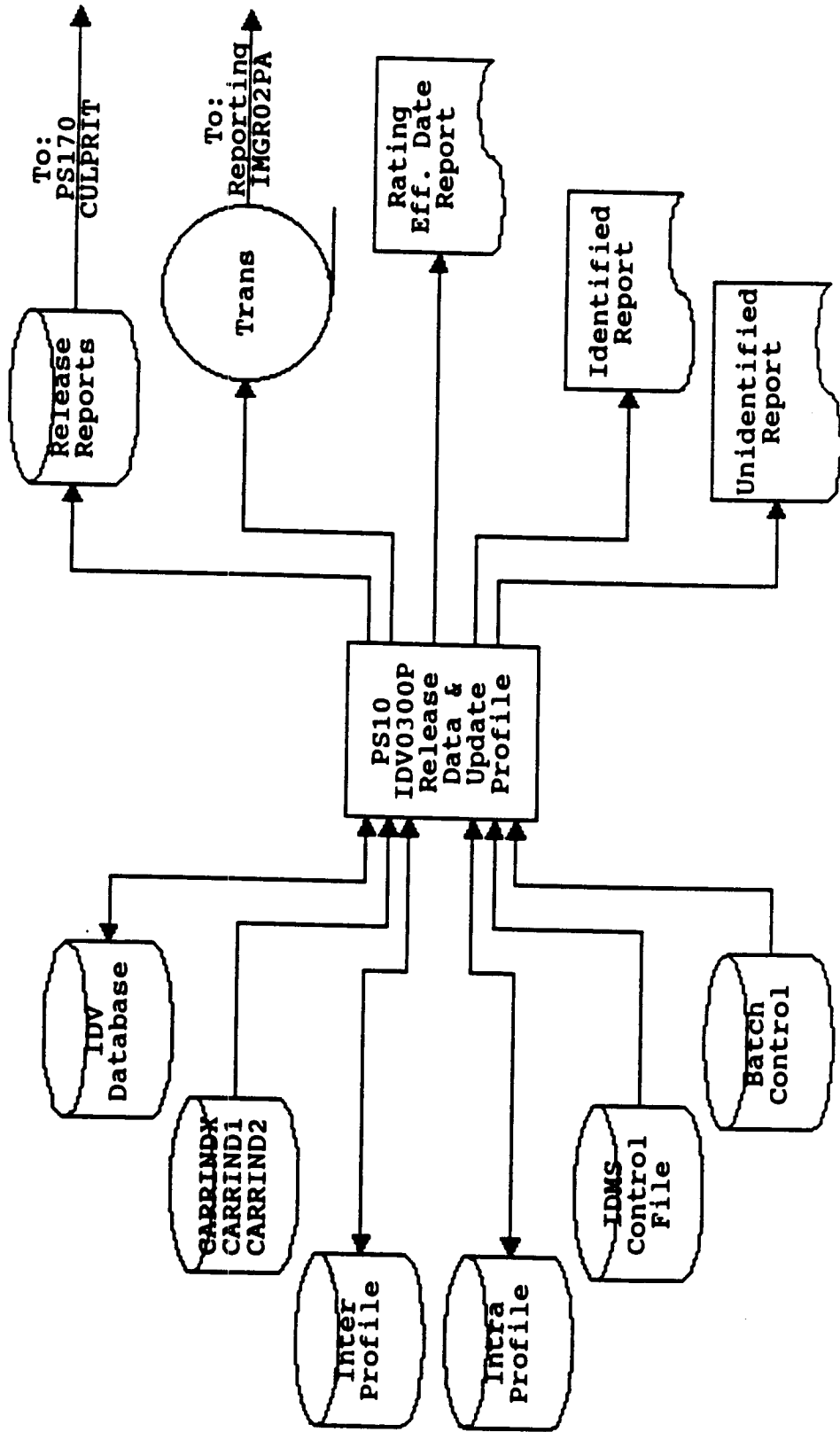


NAIC Examination of NCCI

U326

Unit Card Data Conversion

Release Data & Update Profile

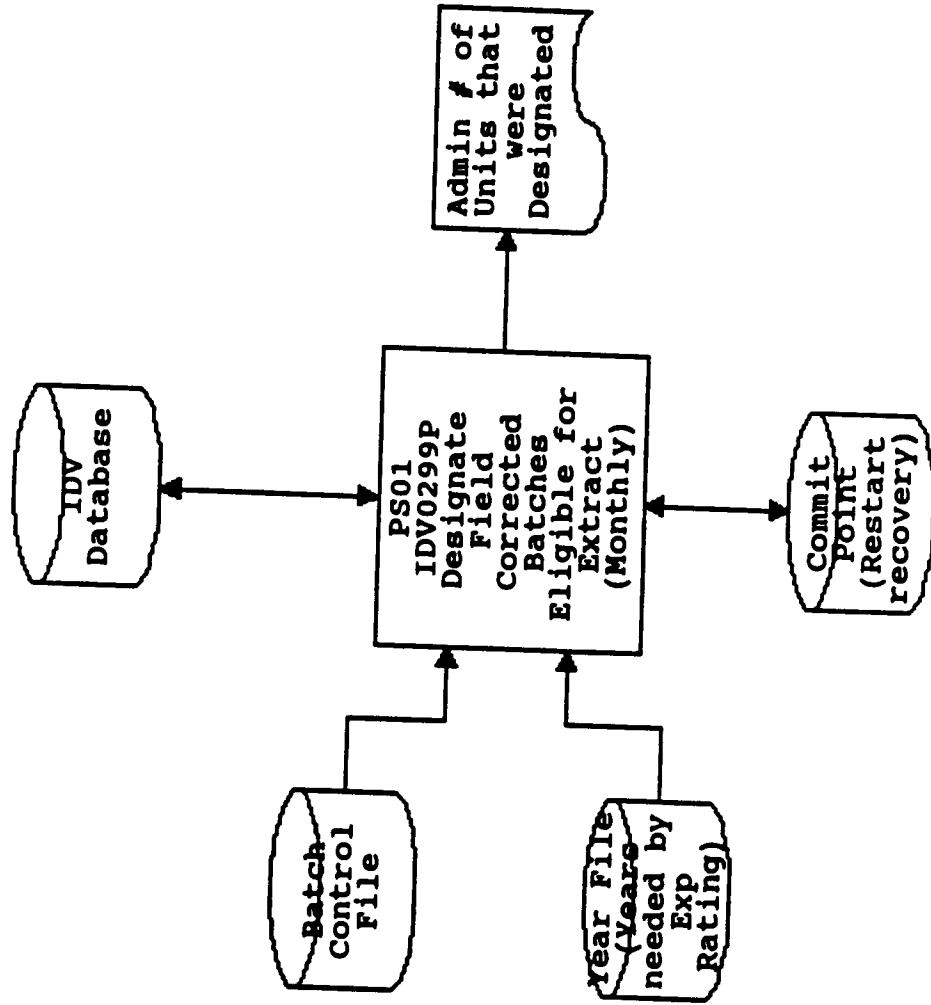


NAIC Examination of NCCI

U328

Unit Card Data Conversion

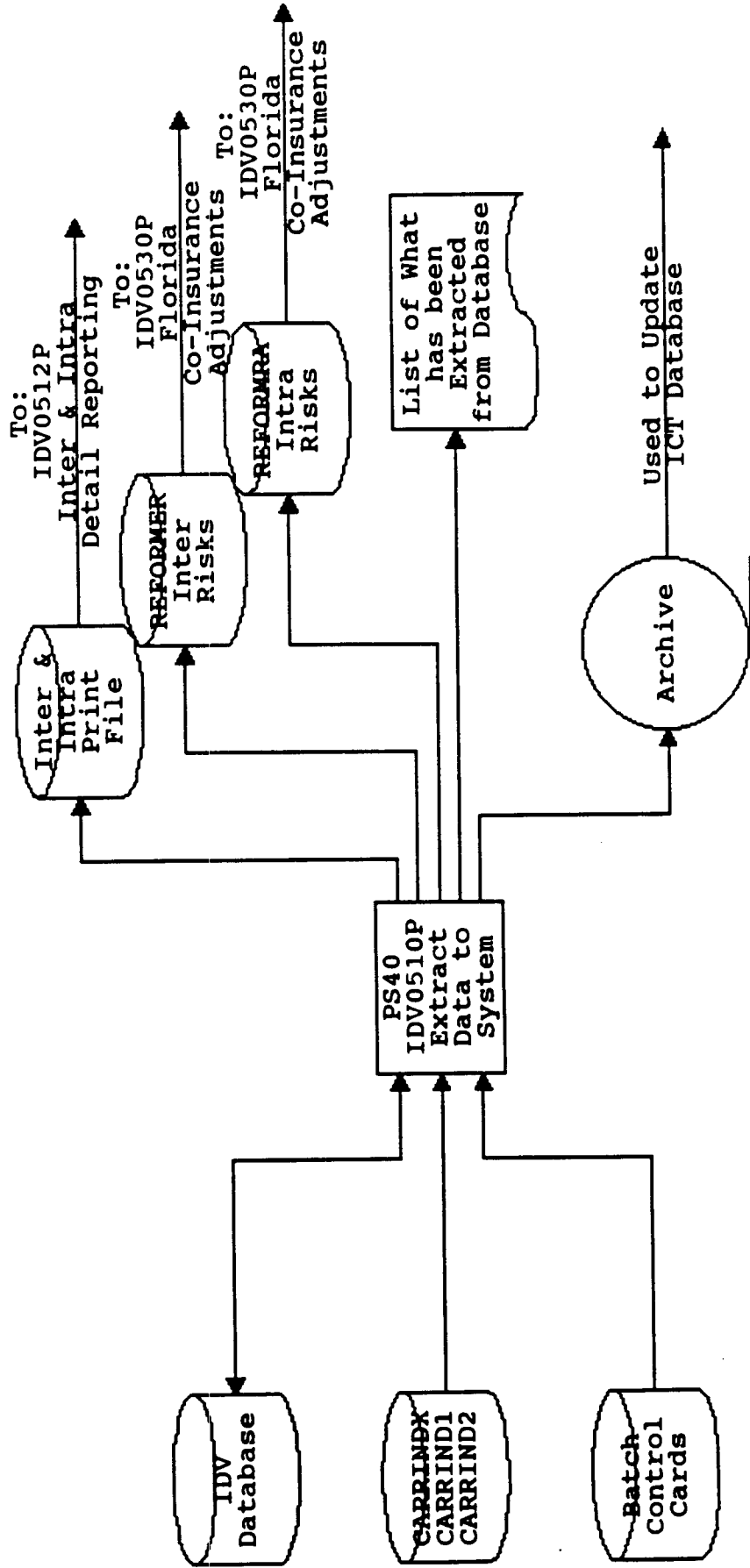
Designate Eligible for Extract



NAIC Examination of NCCI

Unit Card Data Conversion

Extract Data to System

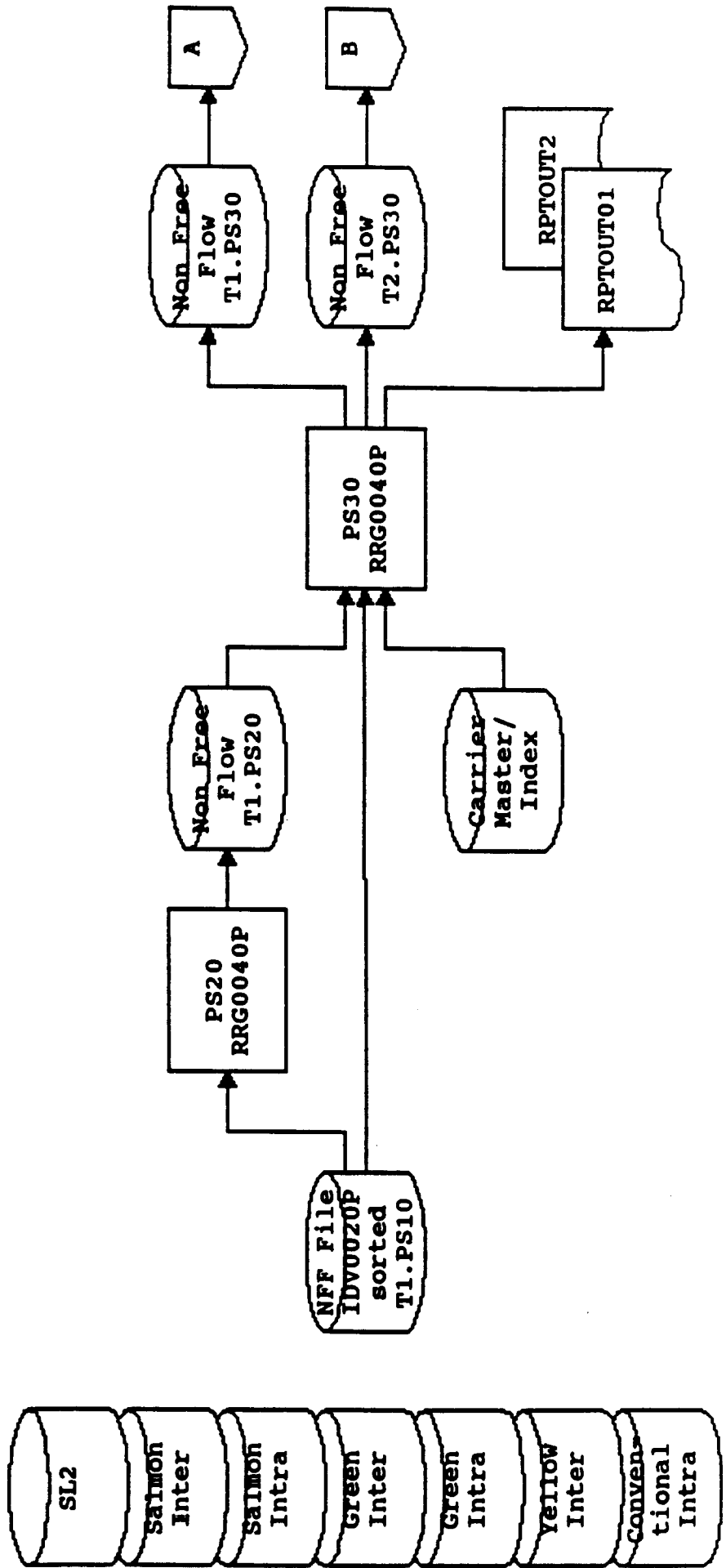


Unit Card Data Conversion

Perform NCBRIDGE Procedures (NCBRIVAL)

From Preprocess Hard Copy Unit Cards

Non Free Flow Files to be Processed ONE at a Time

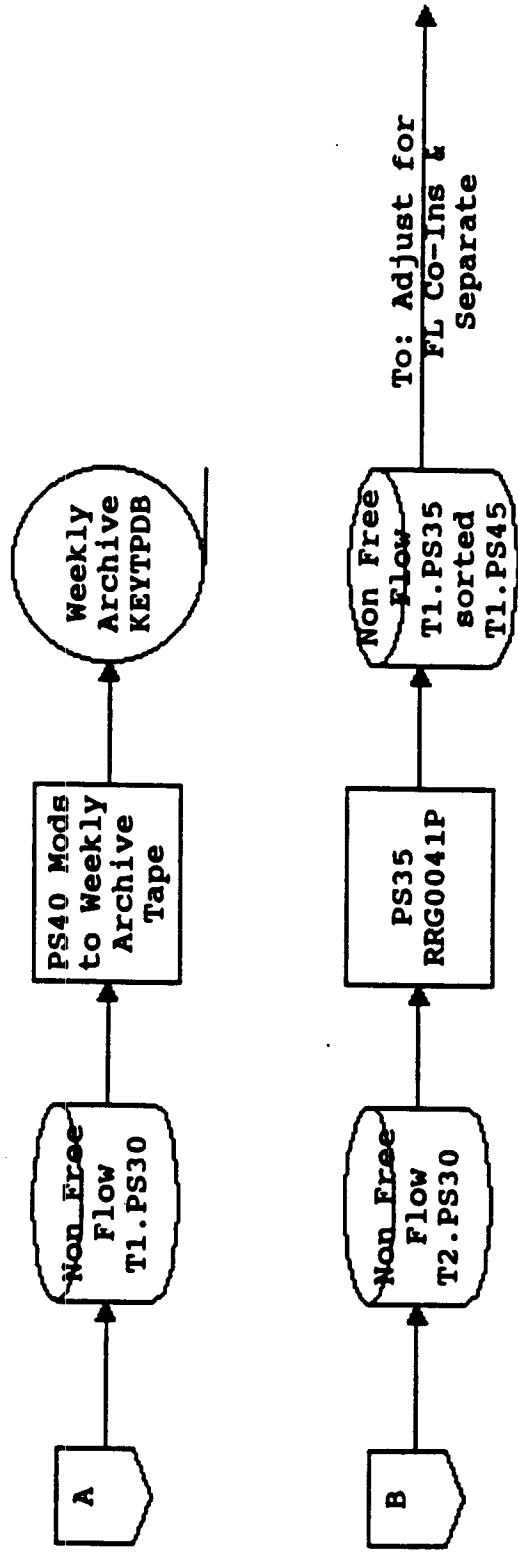


NAIC Examination of NCCI

U332B

Unit Card Data Conversion

Perform NCBRIDGE Procedures (NCBRIVAL)

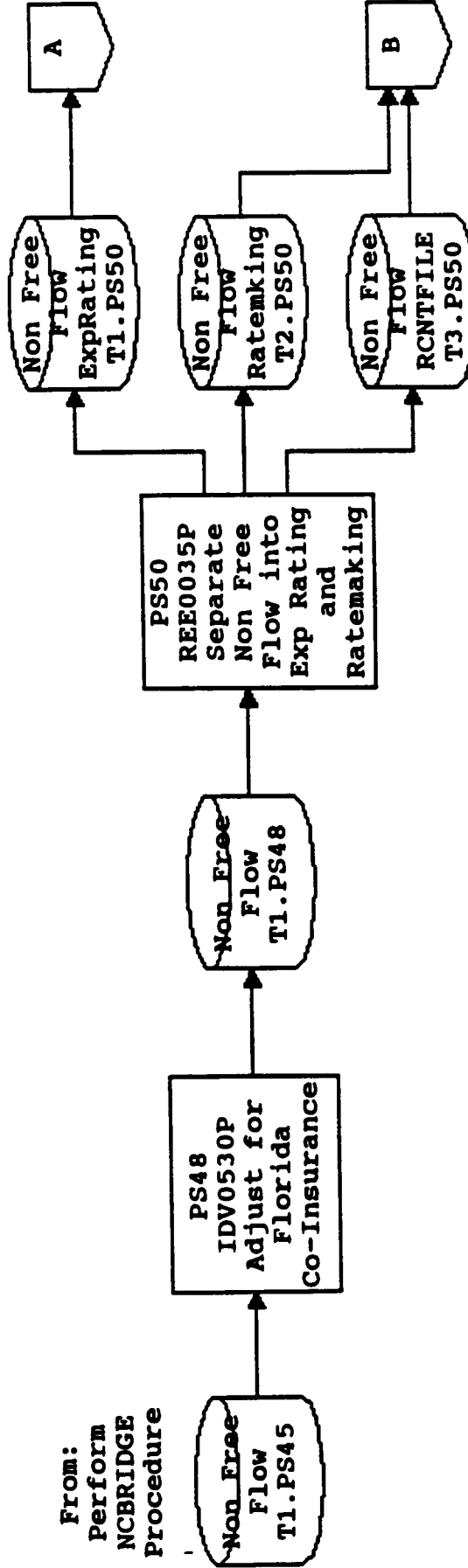


NAIC Examination of NCCI

U334A

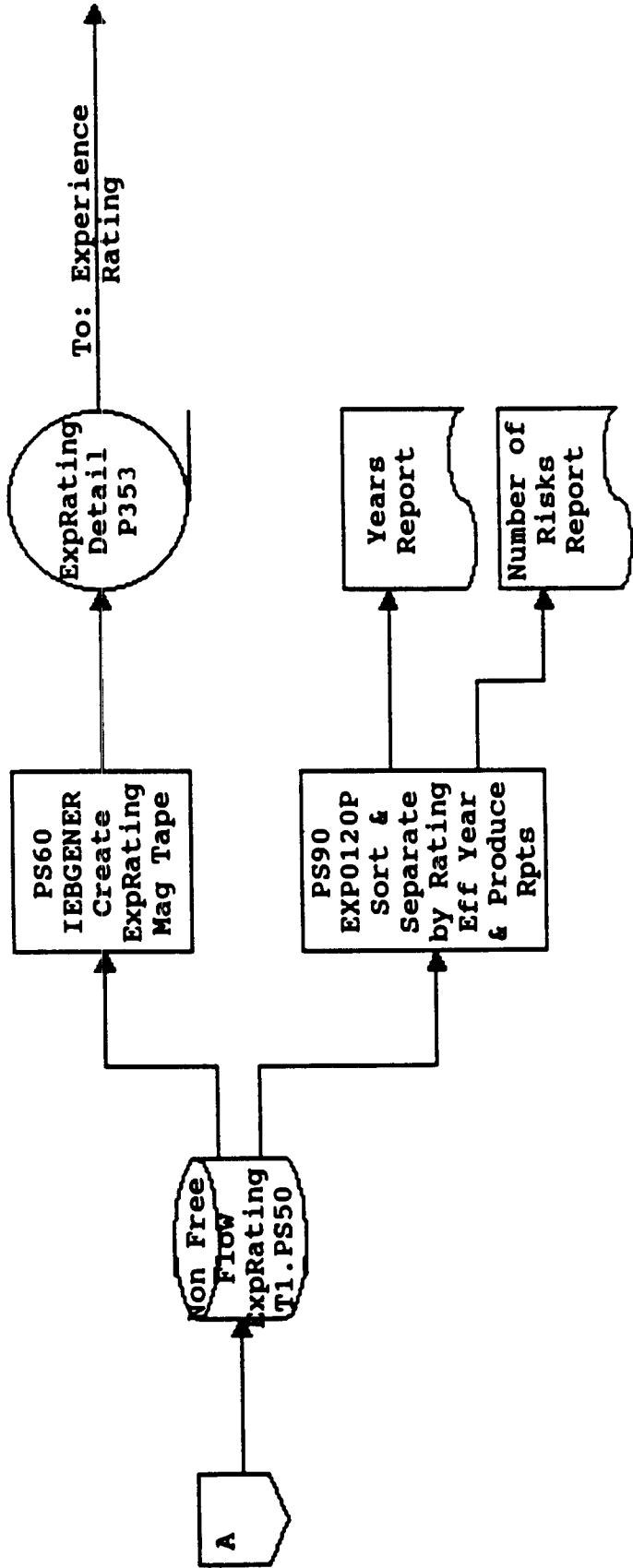
Unit Card Data Conversion

Adjust for FL Co-Ins & Separate (NCBRIVAL)



NAIC Examination of NCCI
Unit Card Data Conversion

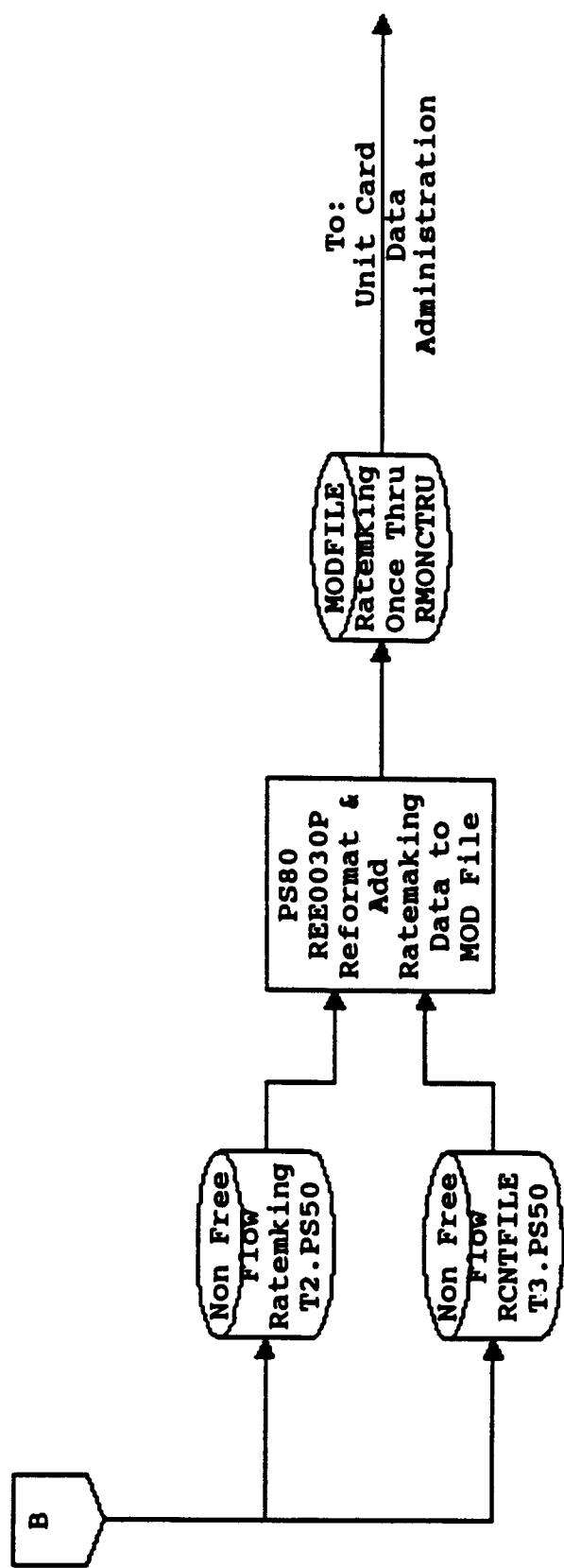
Adjust for FL Co-Ins & Separate (NCBRIVAL)



NAIC Examination of NCCI

Unit Card Data Conversion

Adjust for FL Co-Ins & Separate (NCBRIVAL)

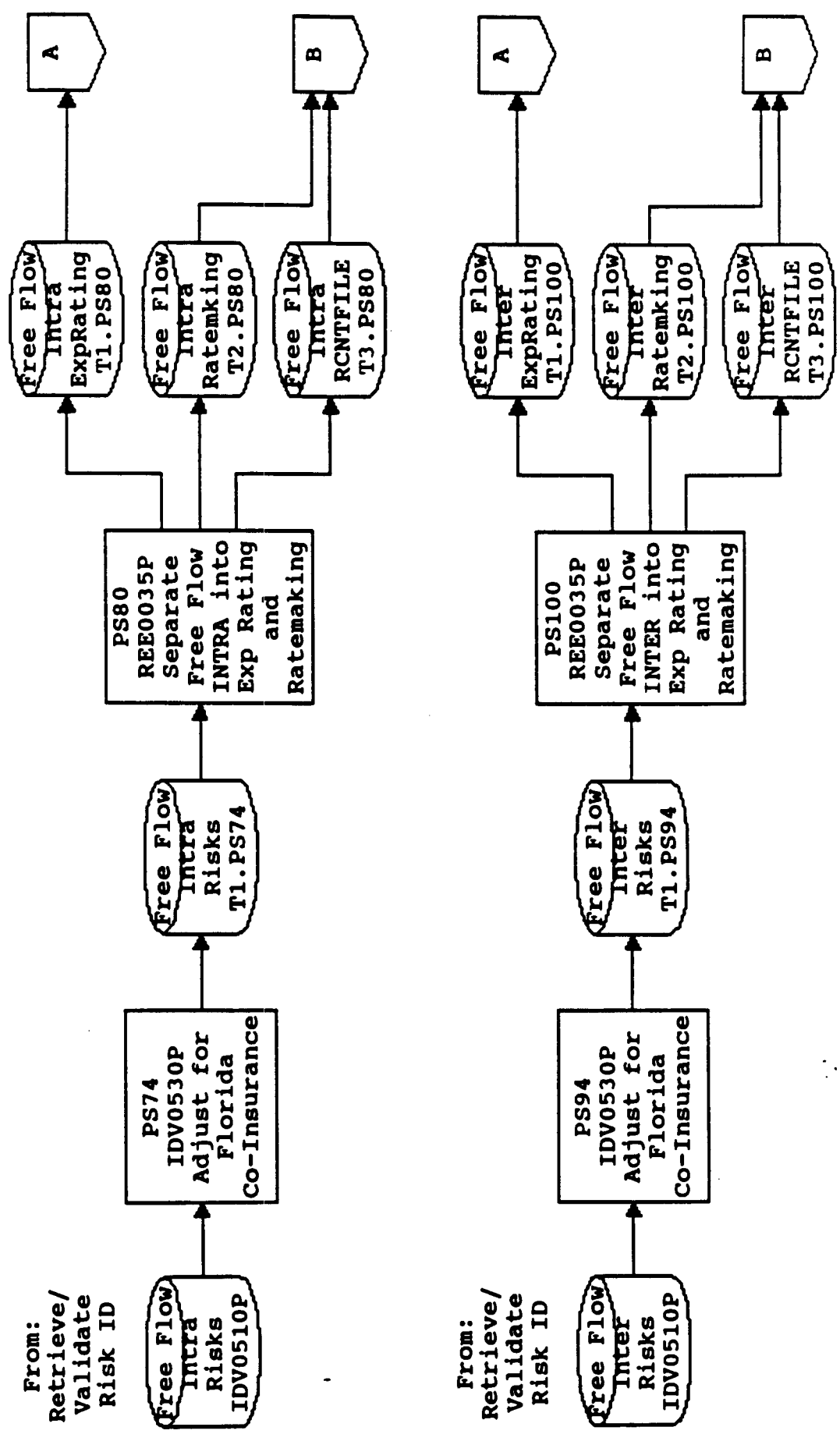


NAIC Examination of NCCI

U336A

Unit Card Data Conversion

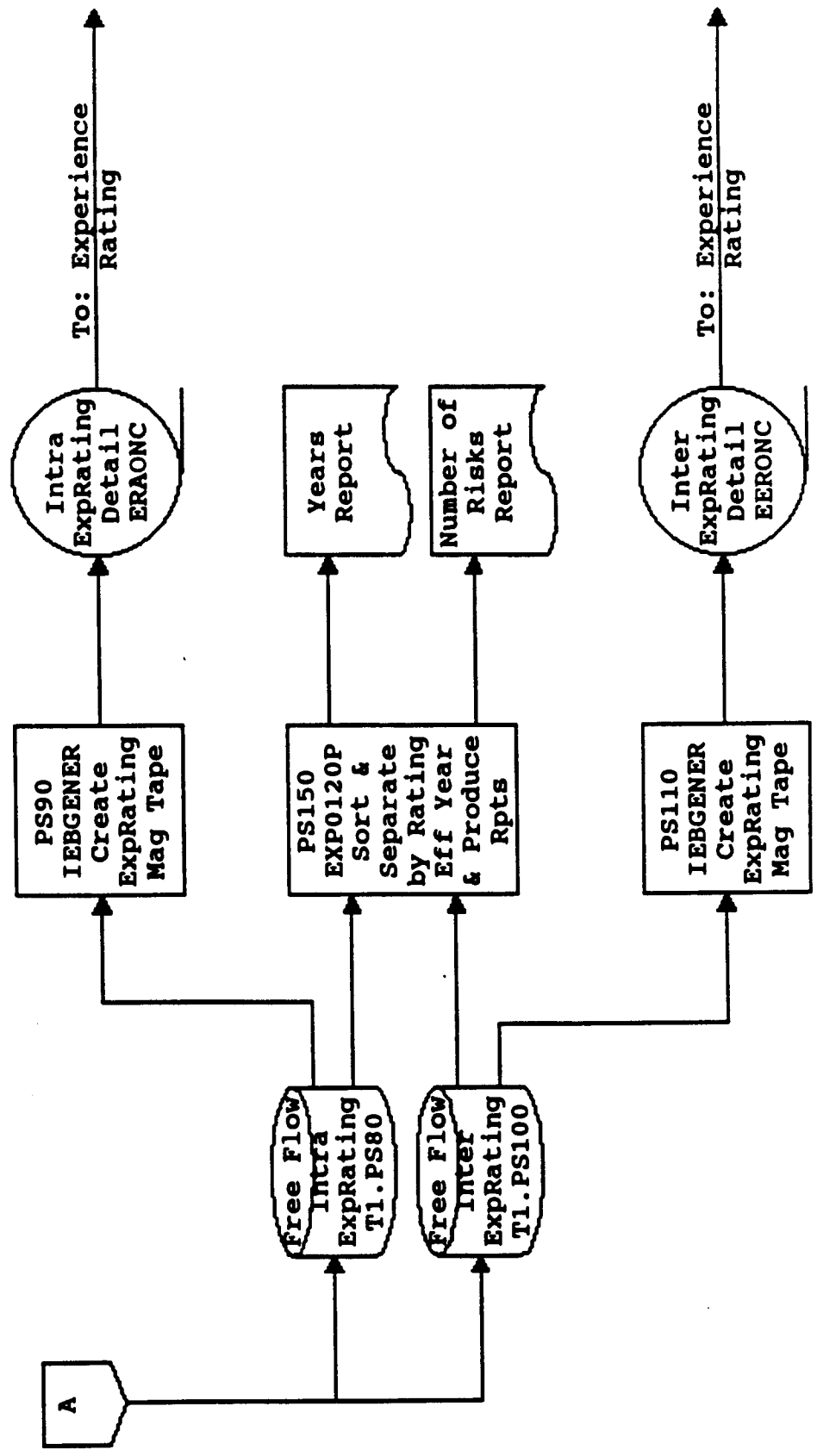
Adjust for FL Co-Ins & Separate (IDVUSPD2)



NAIC Examination of NCCI

Unit Card Data Conversion

Adjust for FL Co-Ins & Separate (IDVUSPD2)

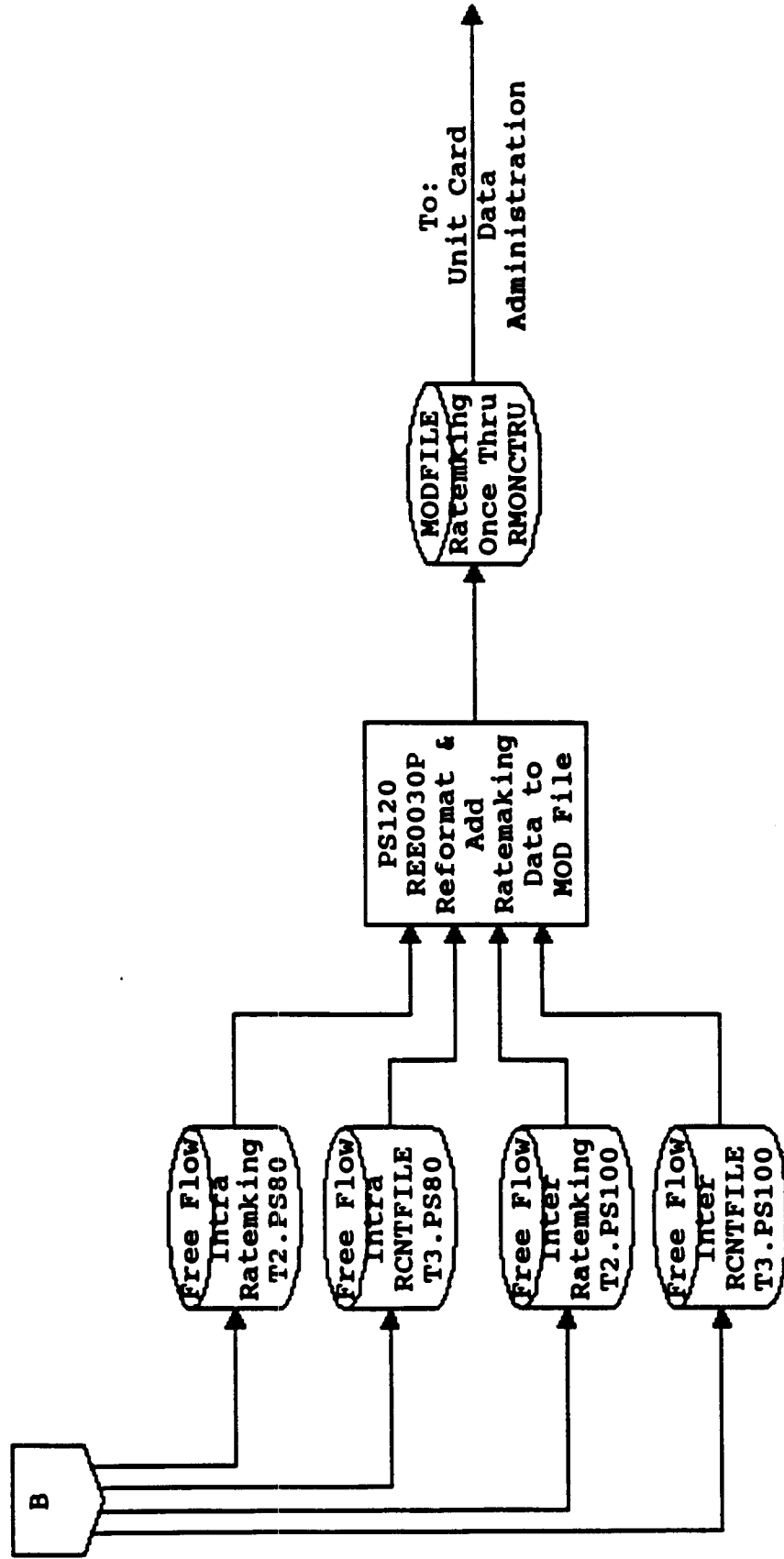


NAIC Examination of NCCI

U336C

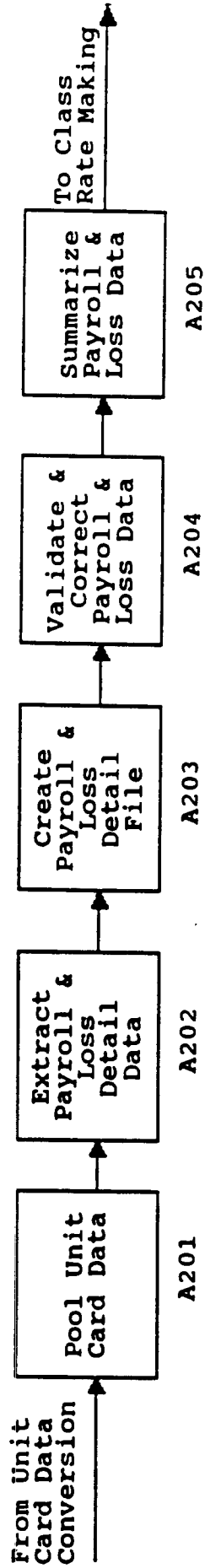
Unit Card Data Conversion

Adjust for FL Co-Ins & Separate (IDVUSPD2)



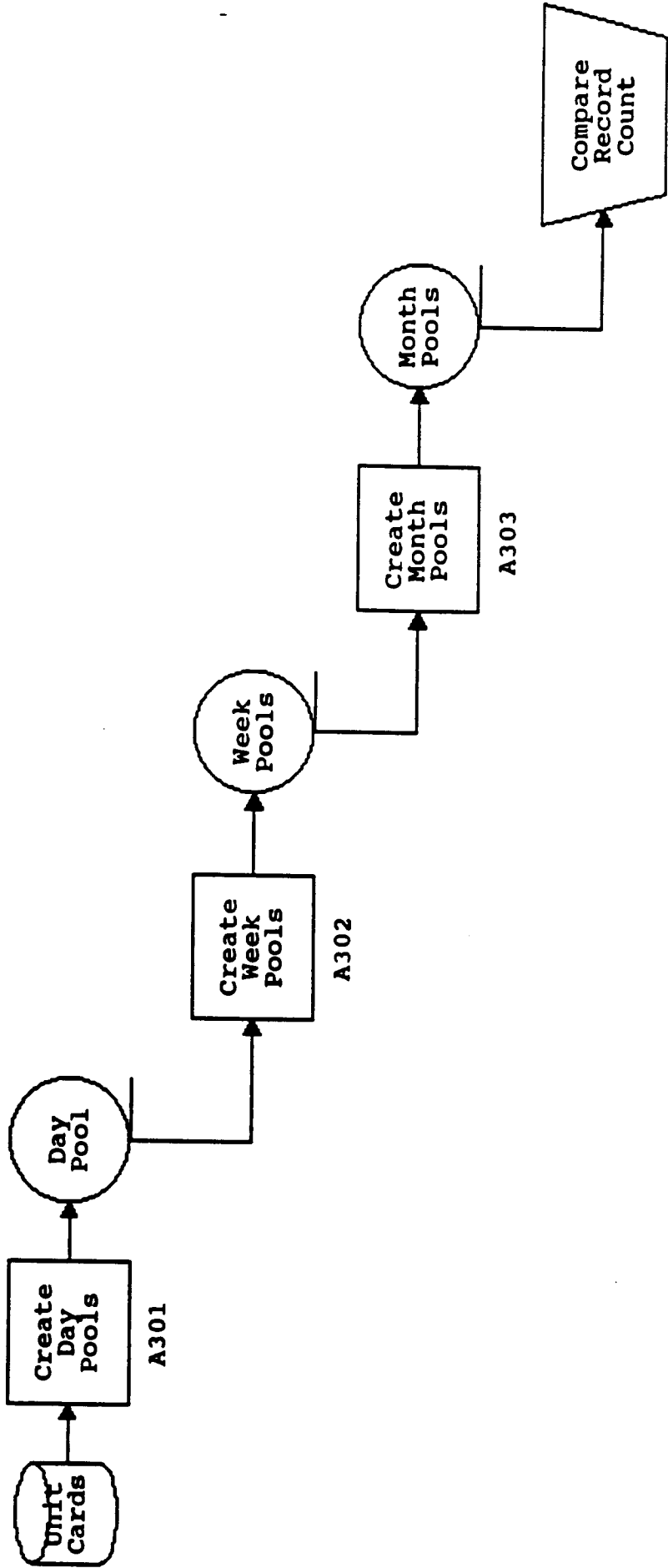
NAIC Examination of NCCI
Unit Card Data Administration
High Level Flow

A101

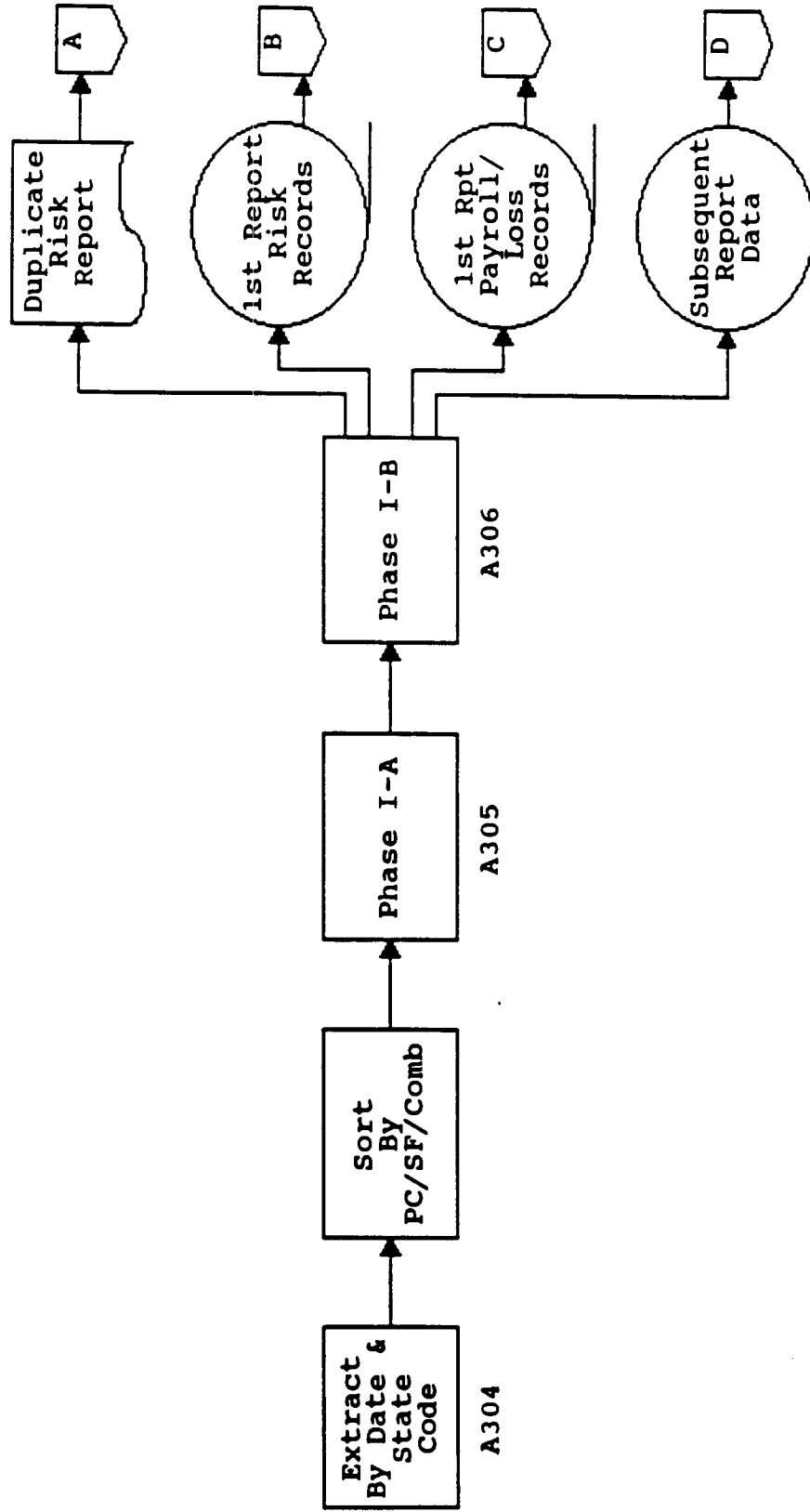


NAIC Examination of NCCI
Unit Card Data Administration
Pool Unit Card Data

A201

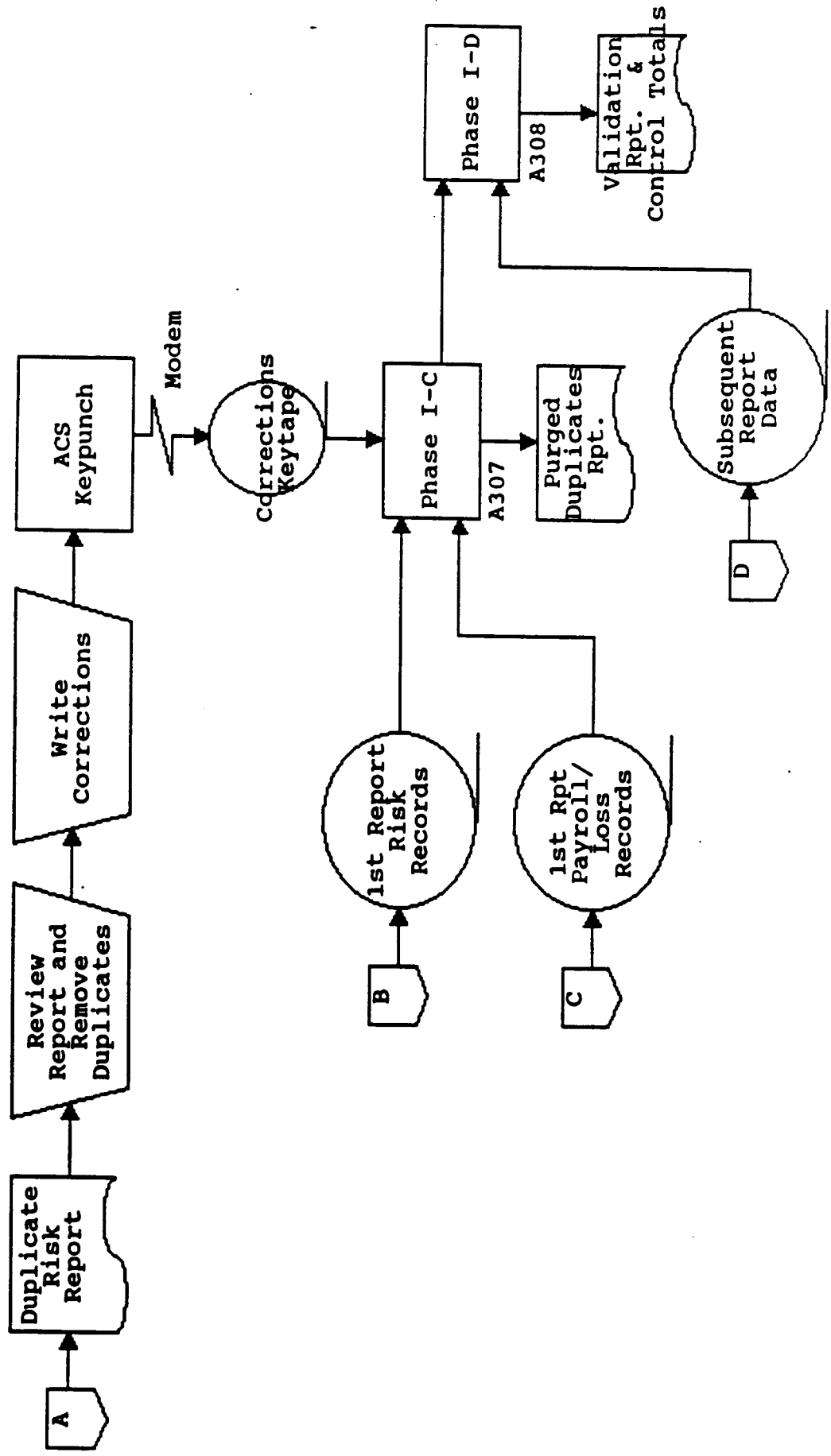


NAIC Examination of NCCI
Unit Card Data Administration
Extract Payroll & Loss Detail Data

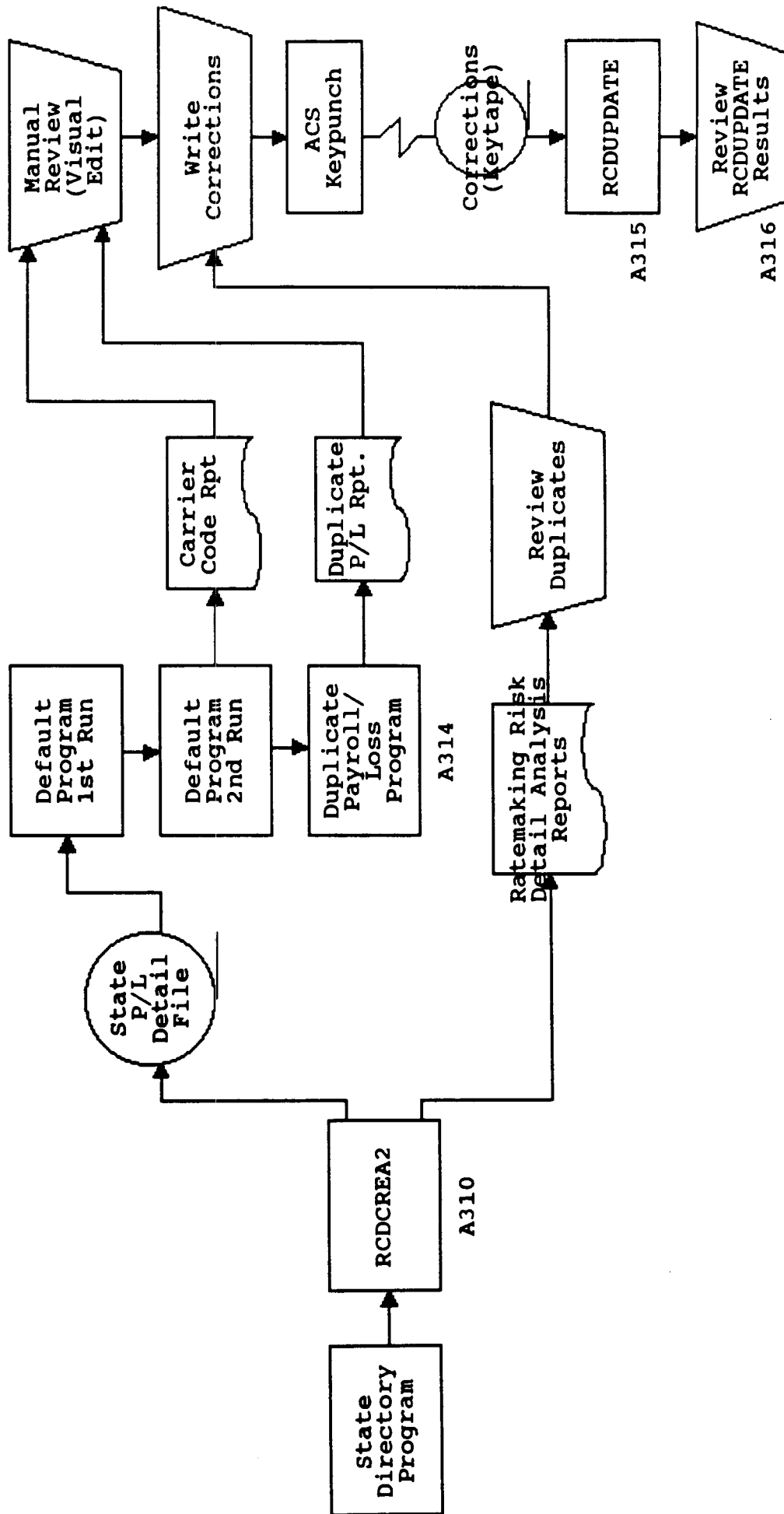


NAIC Examination of NCCI
 Unit Card Data Administration
 Extract Payroll & Loss Detail Data

A202B

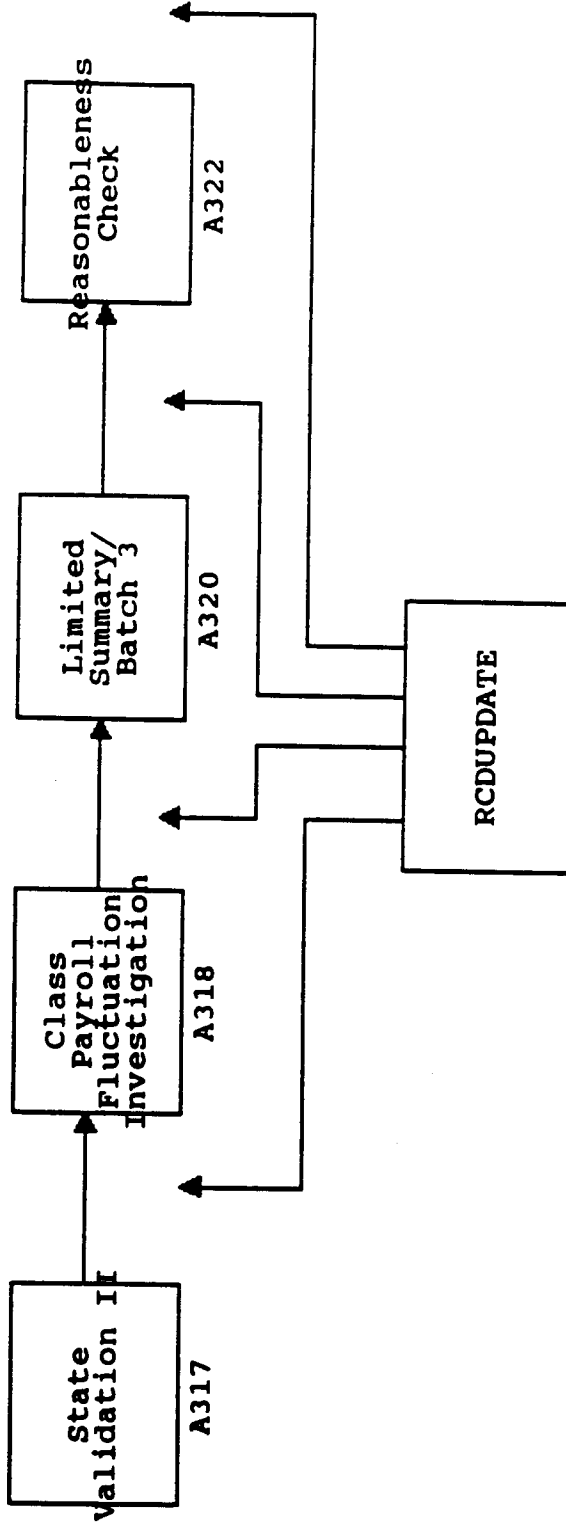


NAIC Examination of NCCI
Unit Card Data Administration
Create Payroll & Loss Detail File

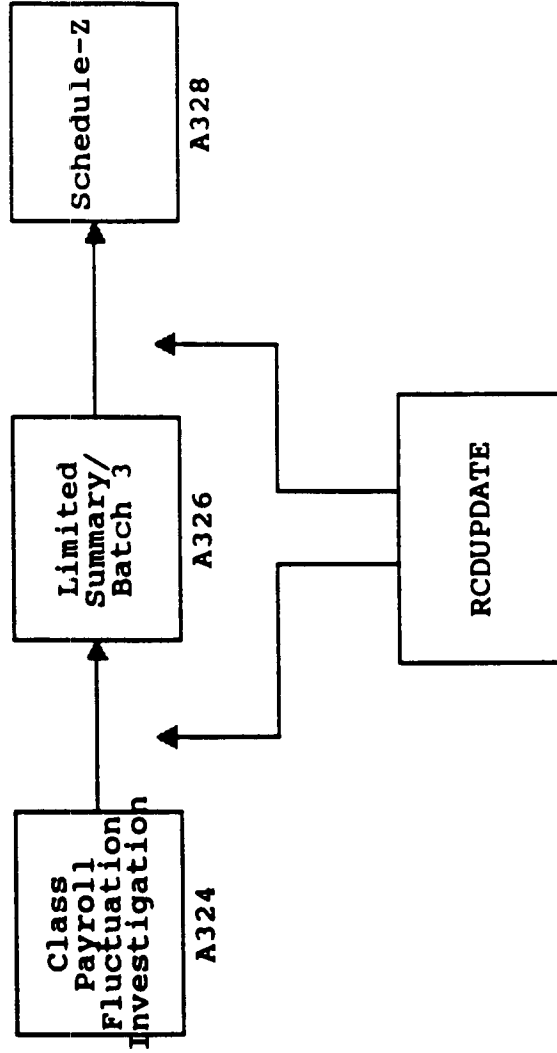


NAIC Examination of NCCI
A204

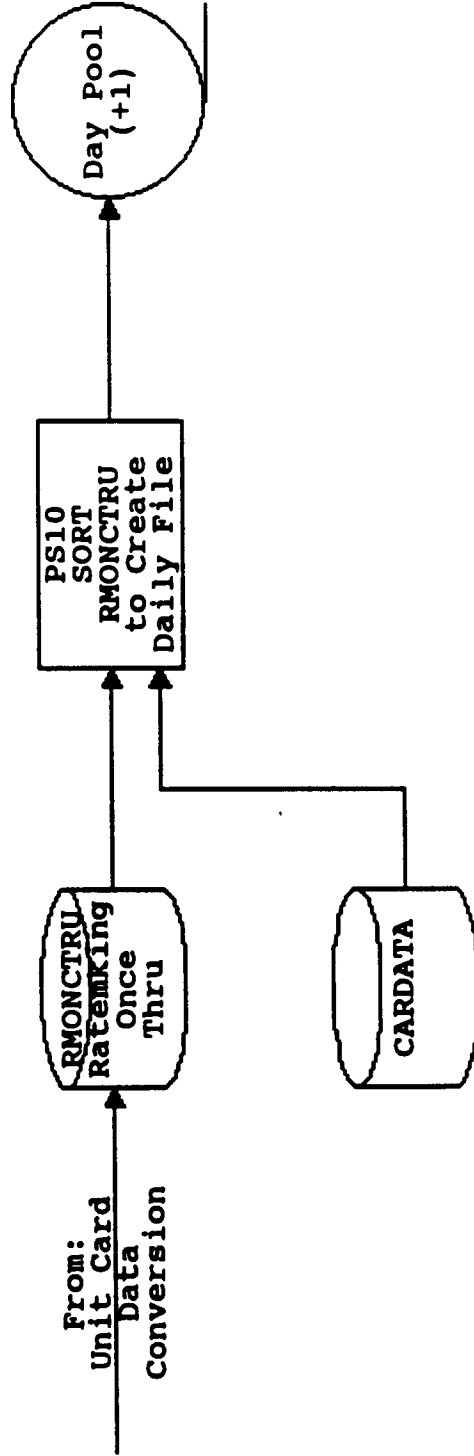
Unit Card Data Administration
Validate & Correct Payroll/Loss Data



NAIC Examination of NCCI
Unit Card Data Administration
Summarize Payroll & Loss Data



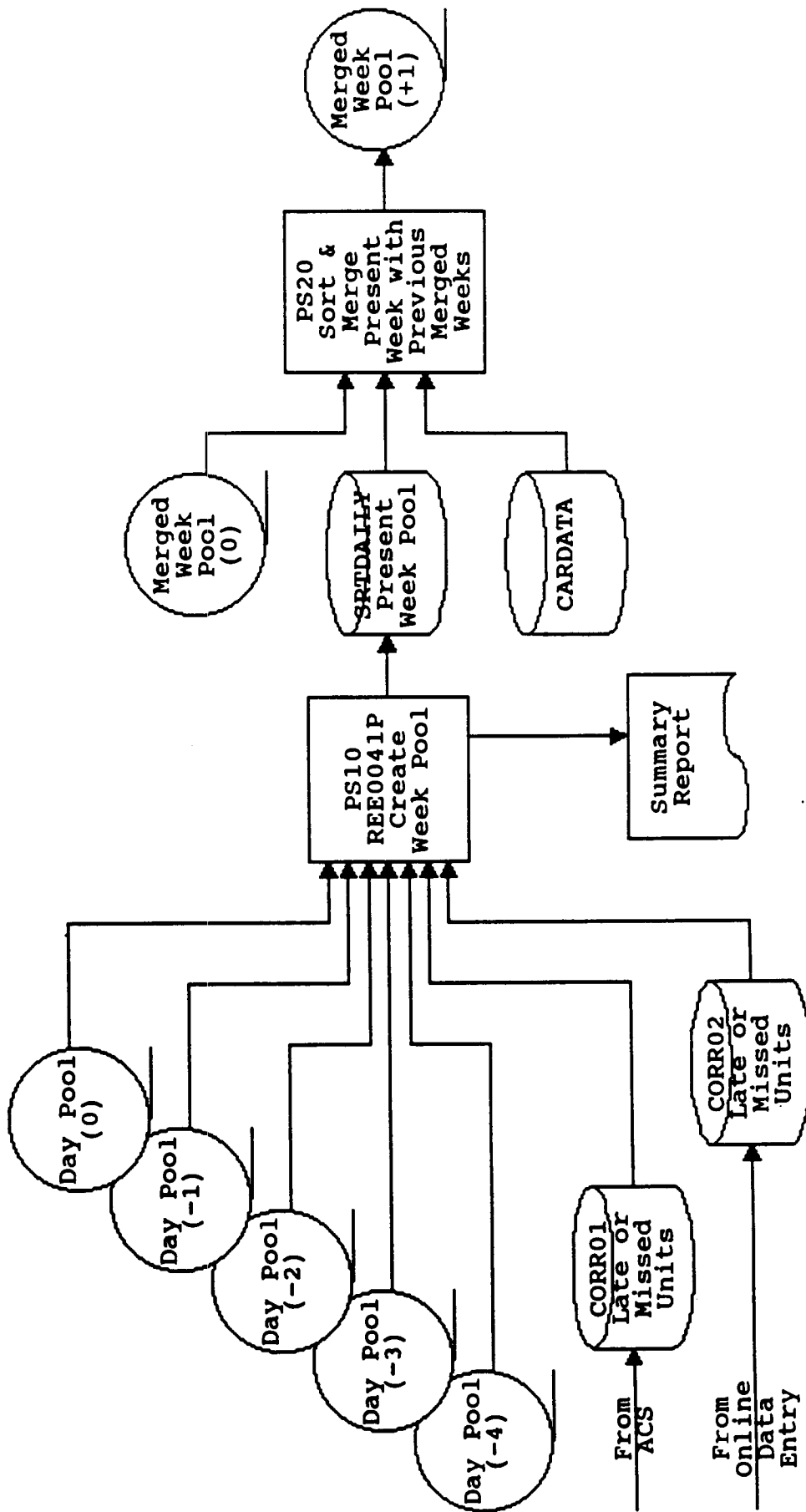
NAIC Examination of NCCI
Unit Card Data Administration
Create Day Pools (RMDAILY)



NAIC Examination of NCCI

Unit Card Data Administration

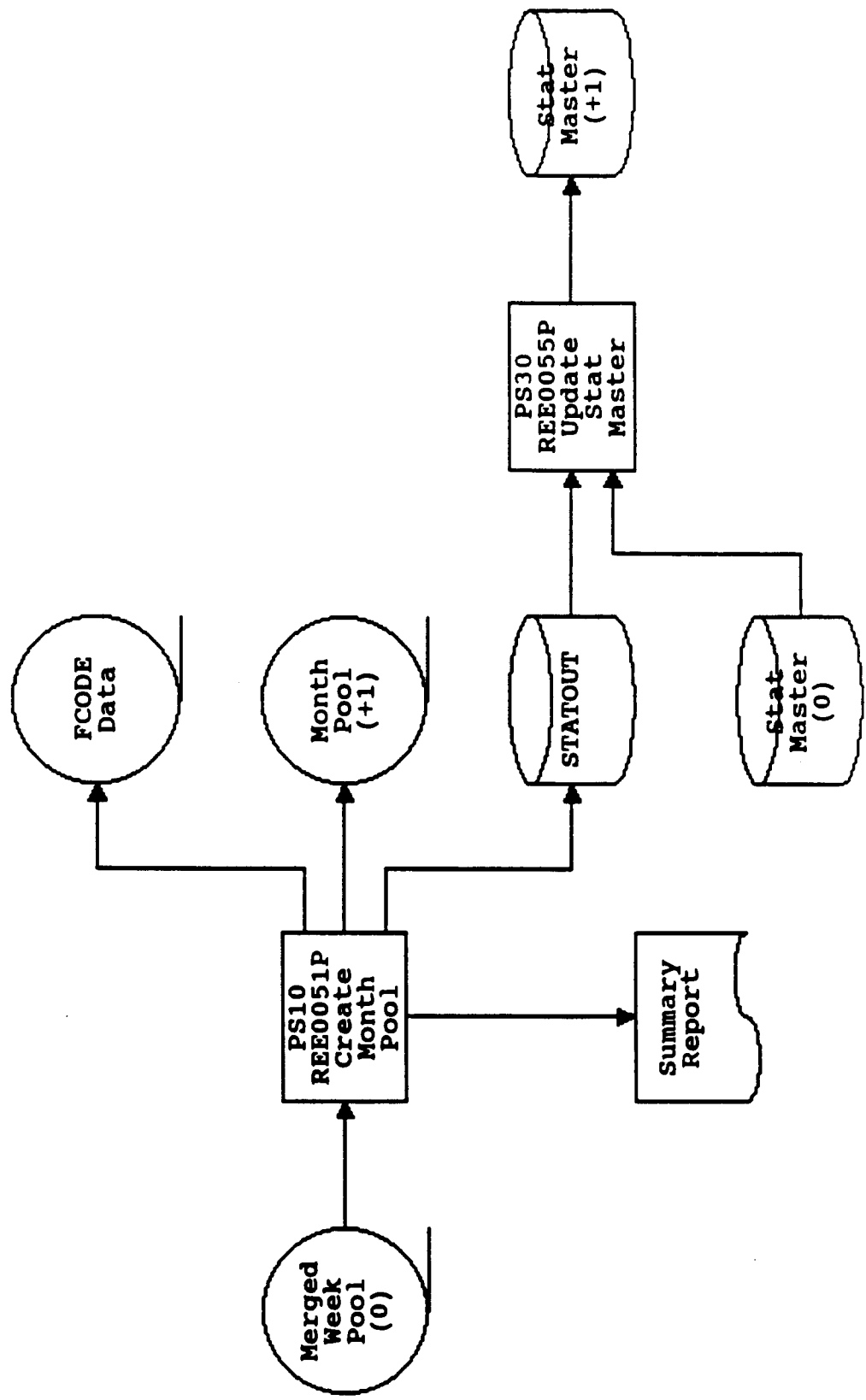
Create Week Pools (WEEKPOOL)



NAIC Examination of NCCI

Unit Card Data Administration

Create Month Pool (MNTHGENR)

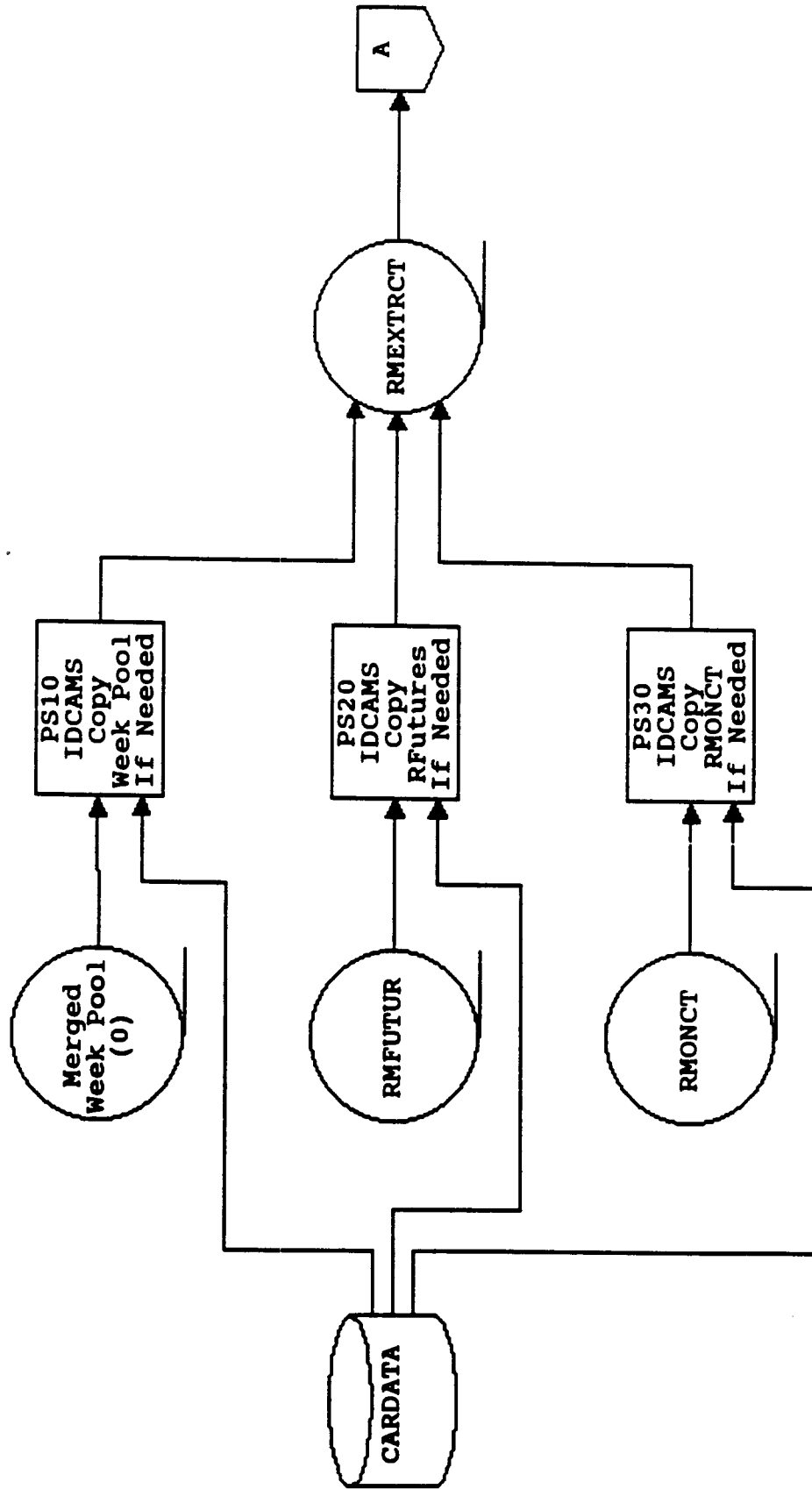


NAIC Examination of NCCI

A304A

Unit Card Data Administration

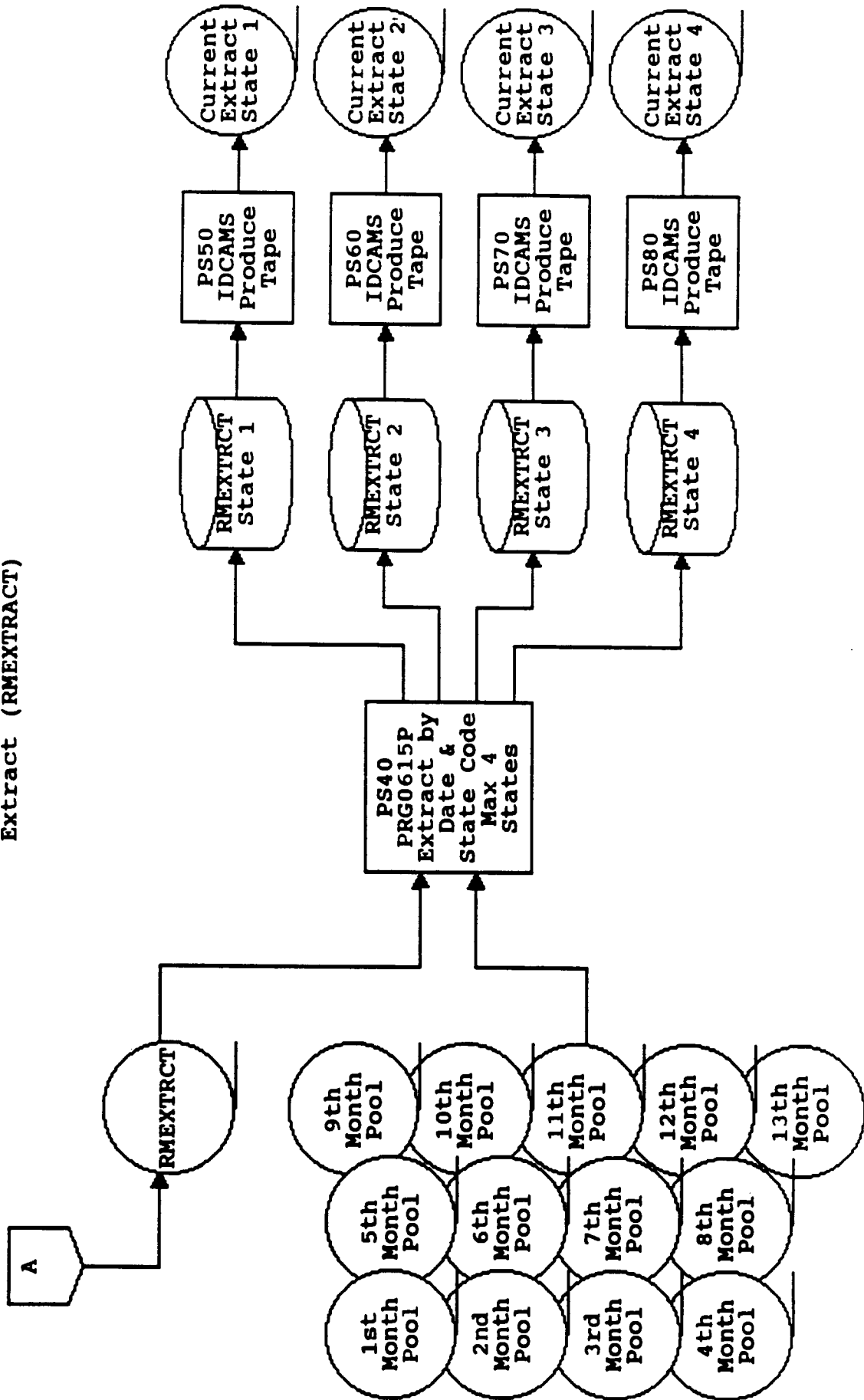
Extract (RMEXTRACT)



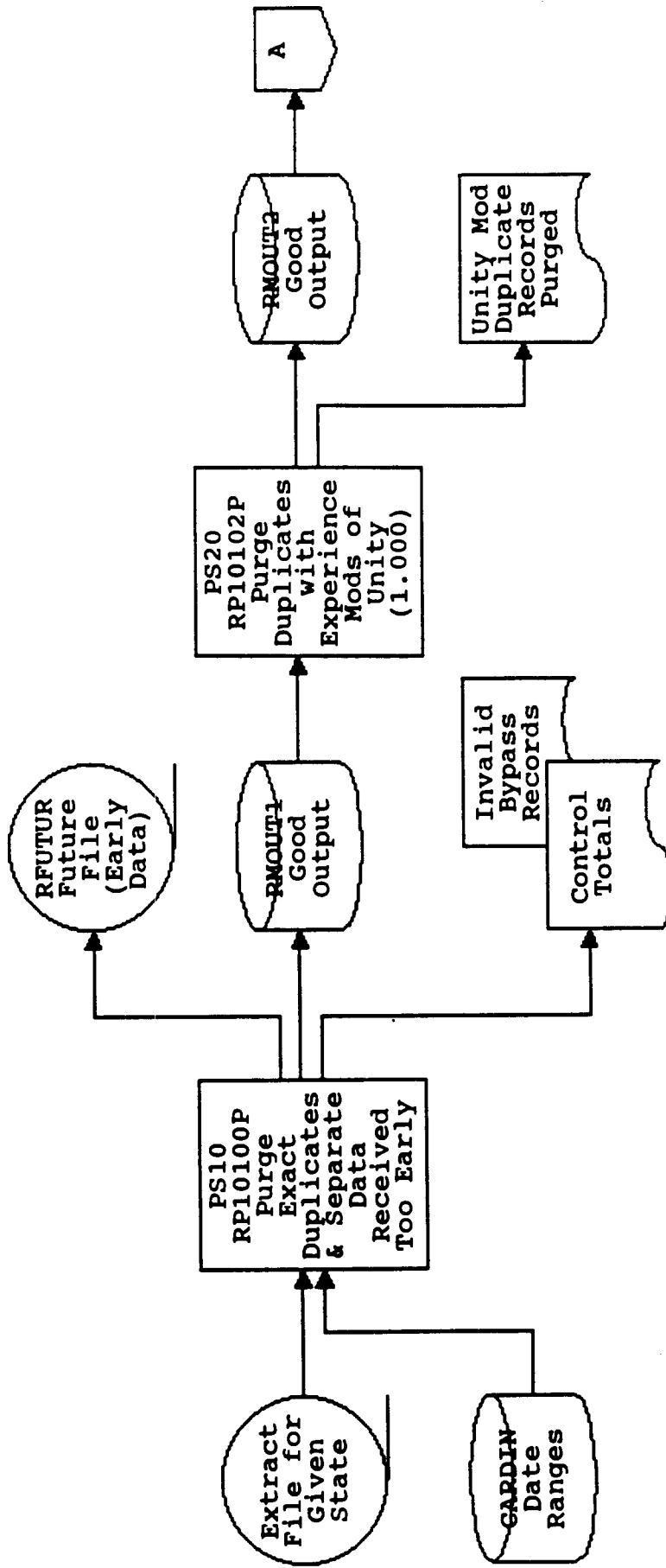
NAIC Examination of NCCI

Unit Card Data Administration

Extract (RMEXTRACT)



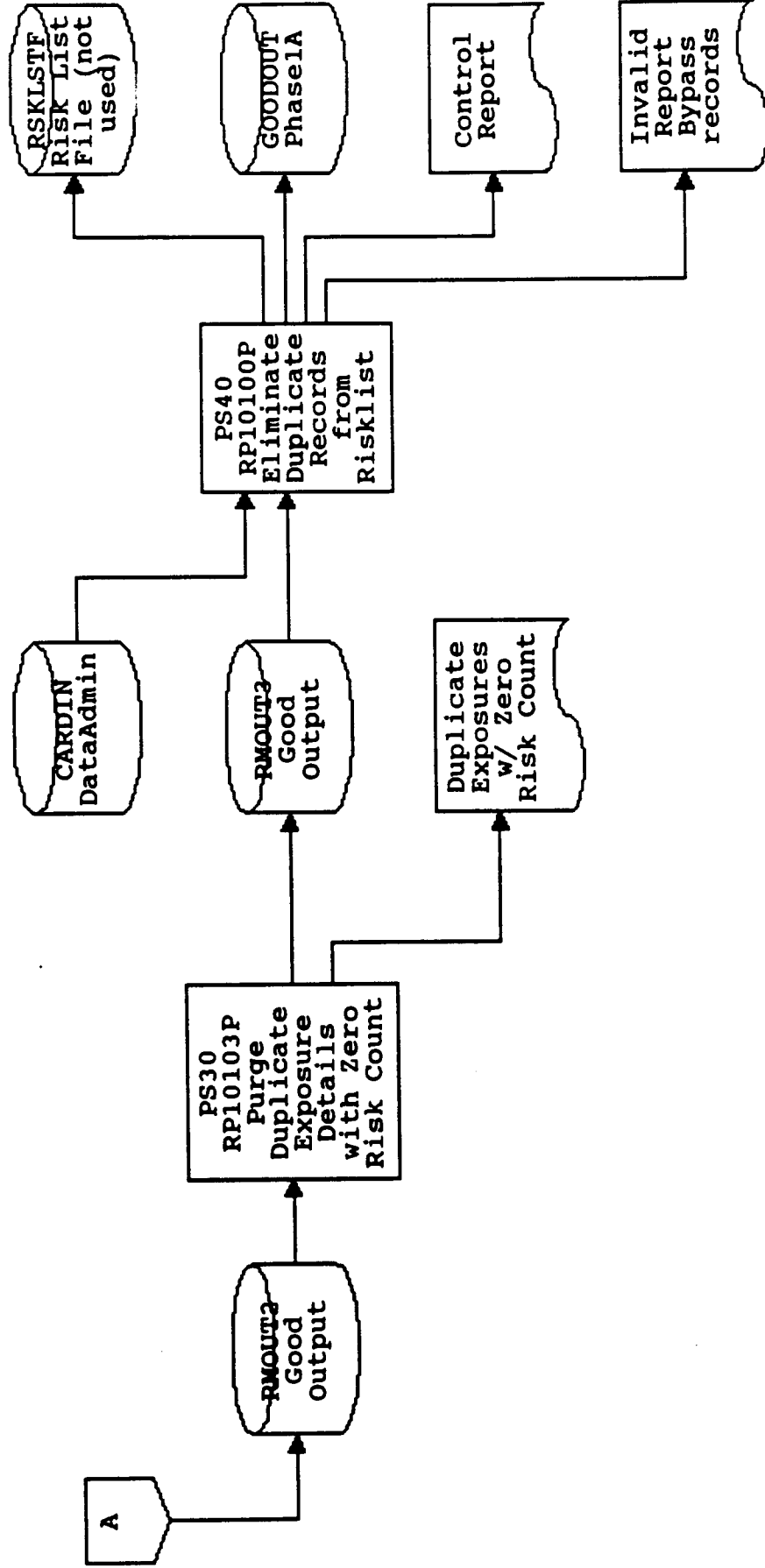
NAIC Examination of NCCI
Unit Card Data Administration
Phase 1-A (PHASE1A)



NAIC Examination of NCCI

Unit Card Data Administration

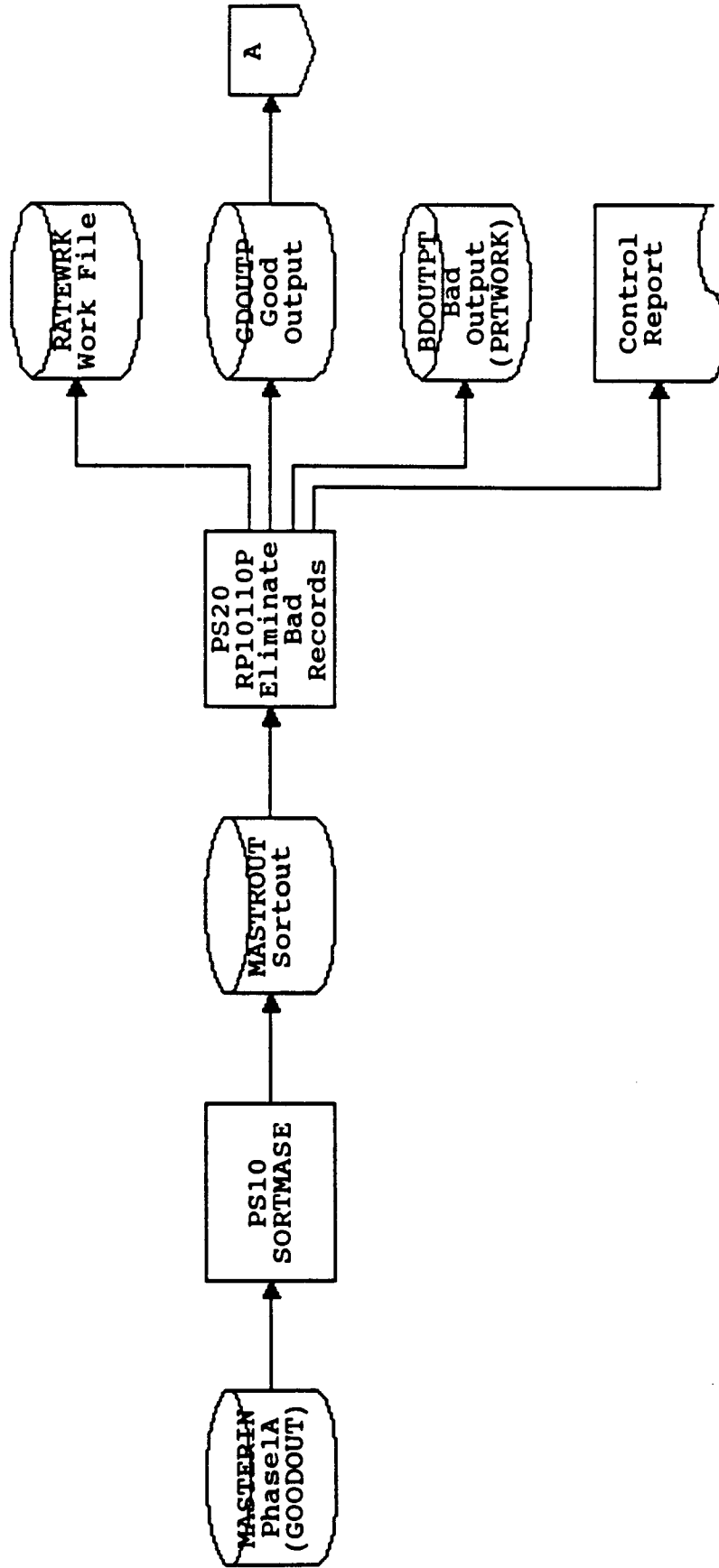
Phase 1-A (PHASE1A)



NAIC Examination of NCCI

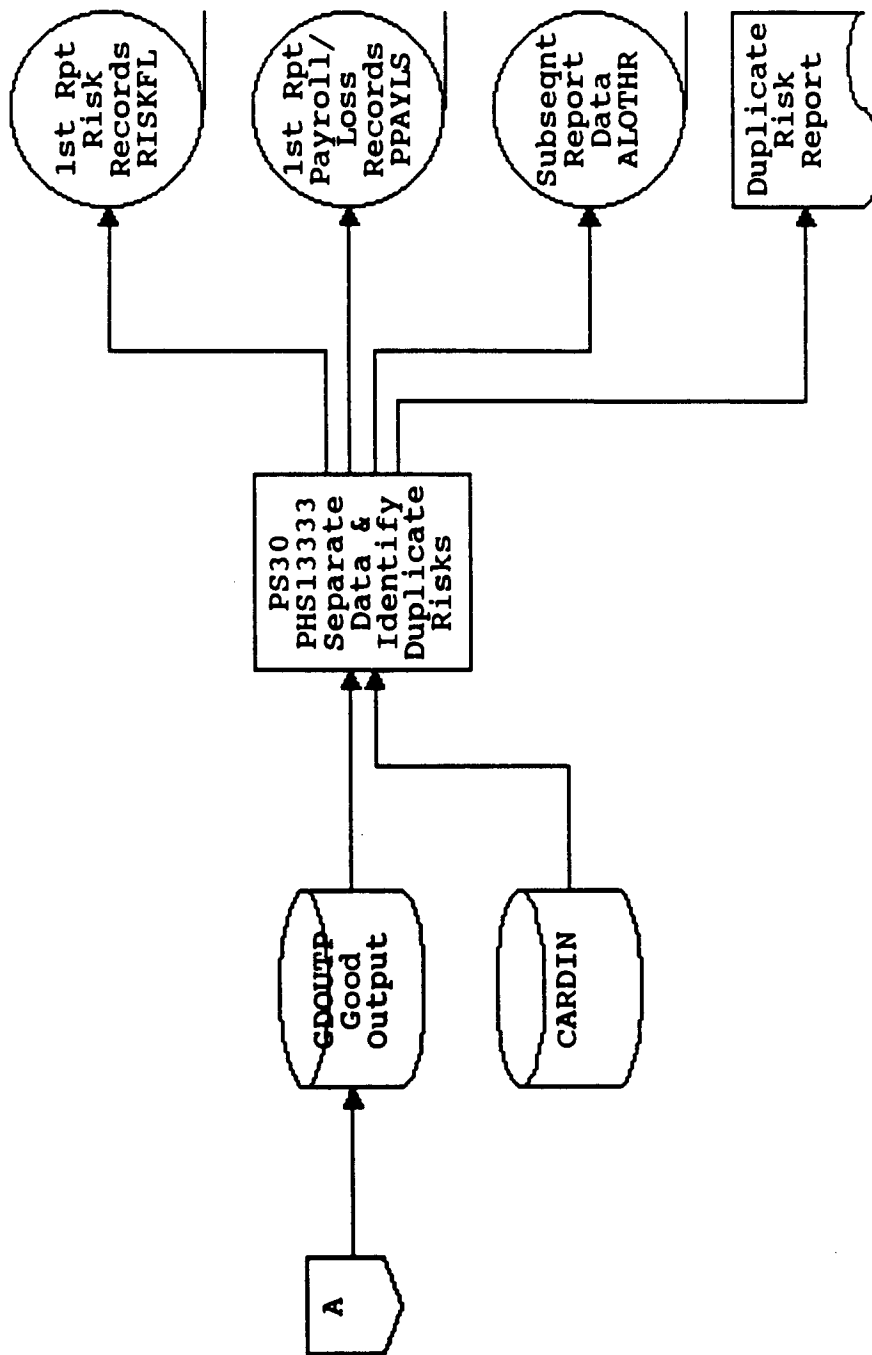
Unit Card Data Administration

Phase 1-B (PHASE1B)



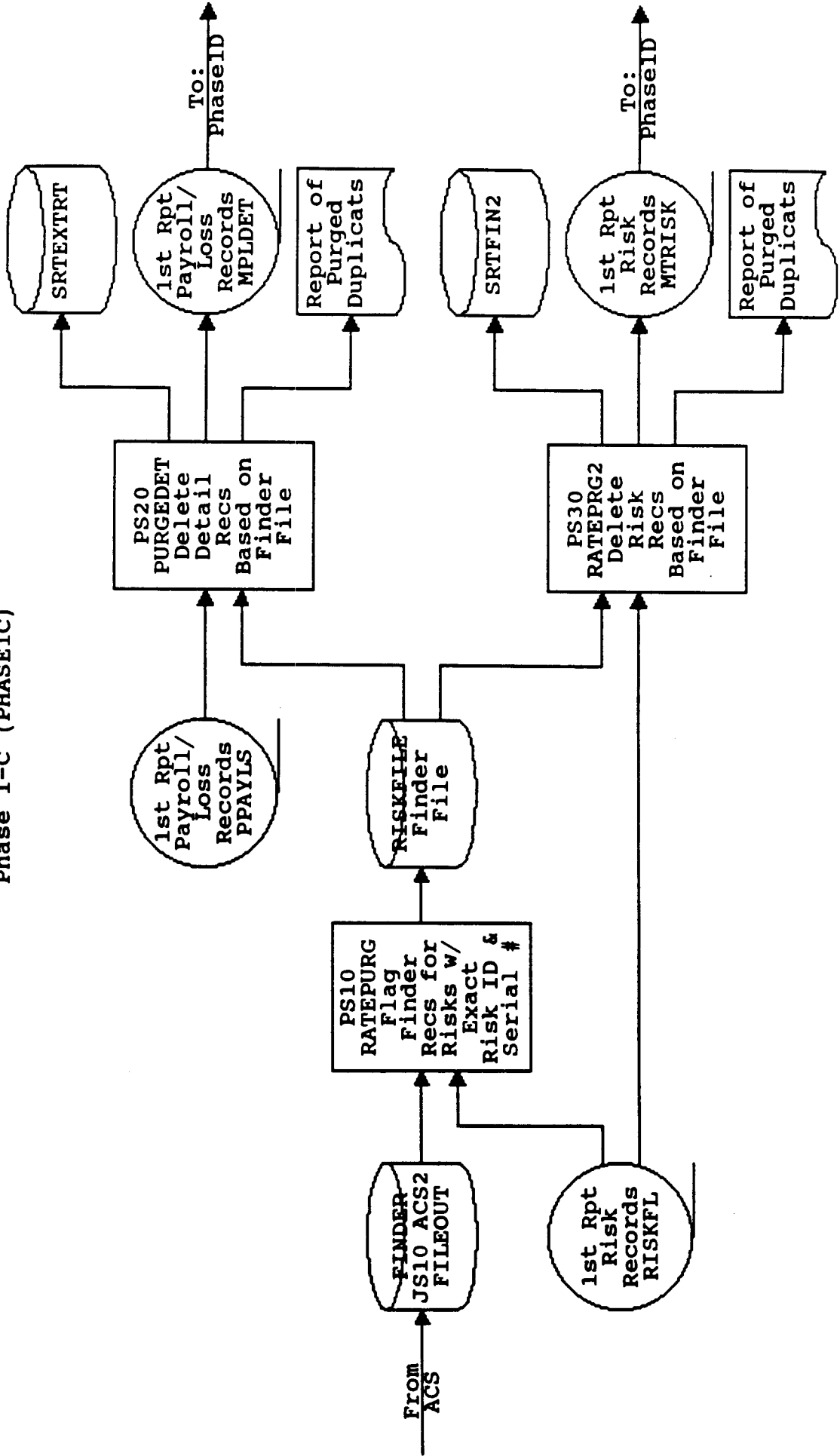
NAIC Examination of NCCI
Unit Card Data Administration

Phase 1-B (PHASE1B)



NAIC Examination of NCCI
Unit Card Data Administration

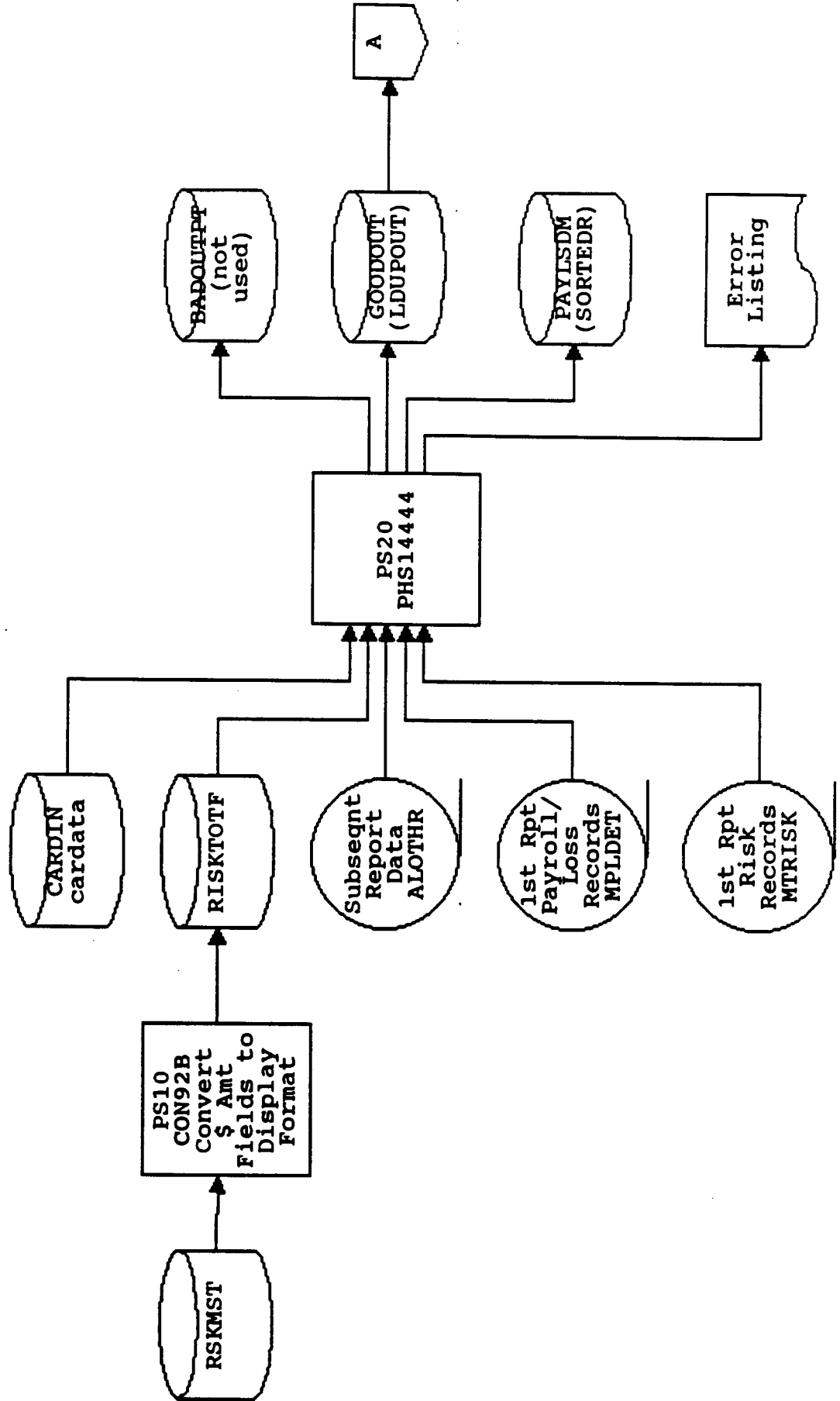
Phase 1-C (PHASE1C)



NAIC Examination of NCCI

Unit Card Data Administration

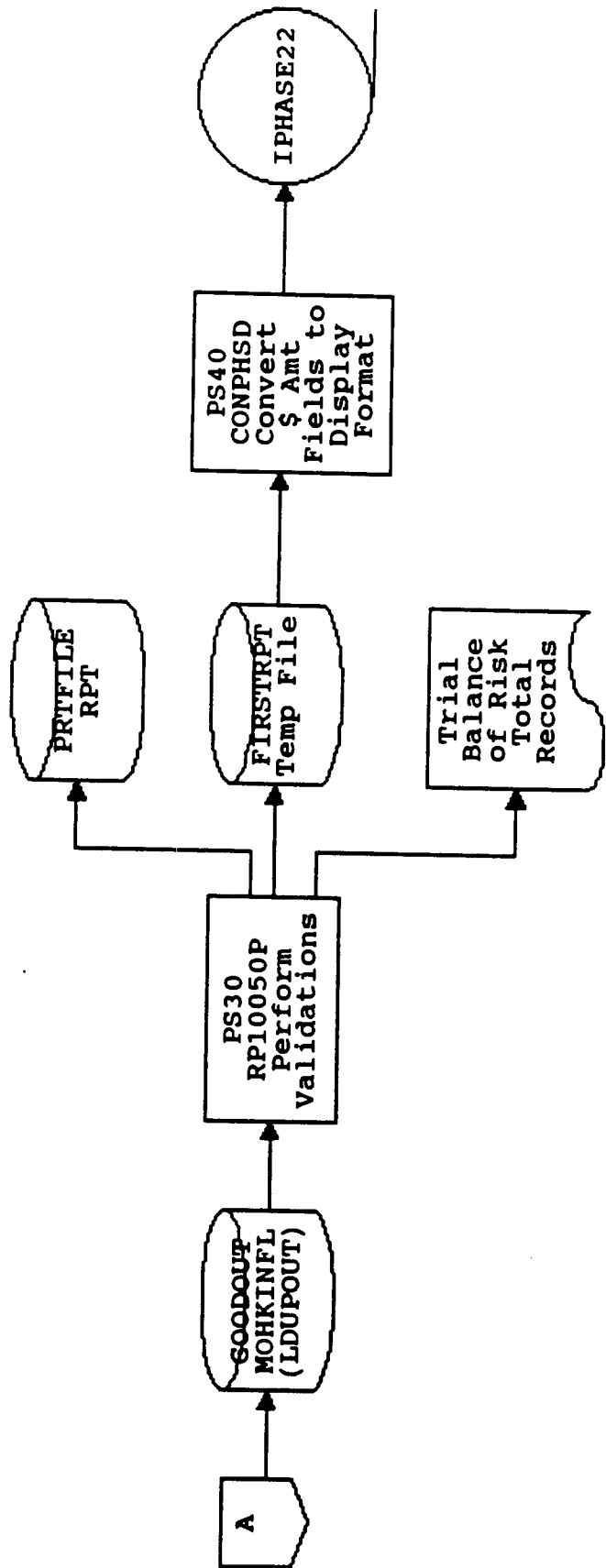
Phase 1-D (PHASE1D)



NAIC Examination of NCCI
Unit Card Data Administration

A308B

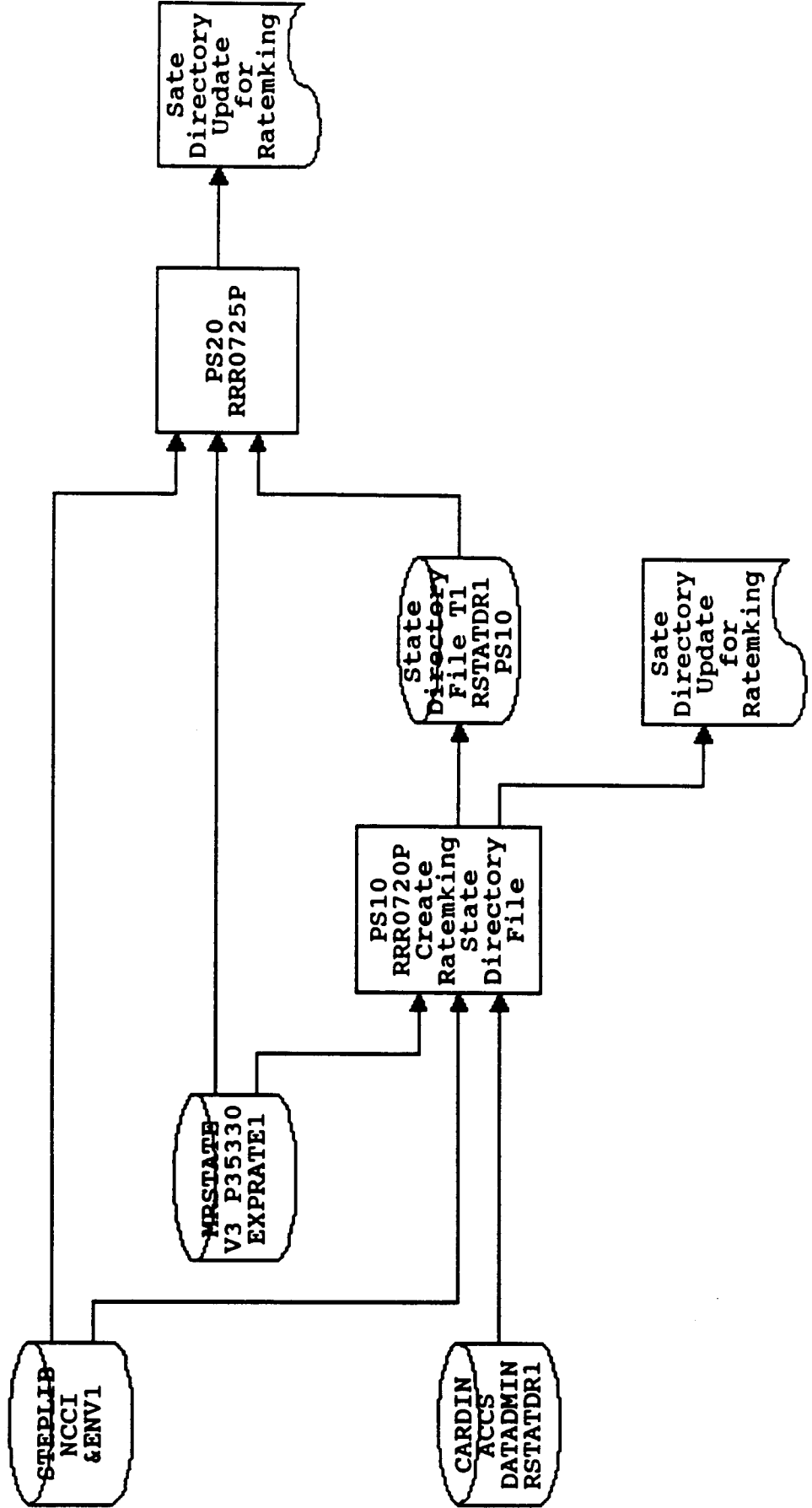
Phase 1-D (PHASE1D)



NAIC Examination of NCCI

Unit Card Data Administration

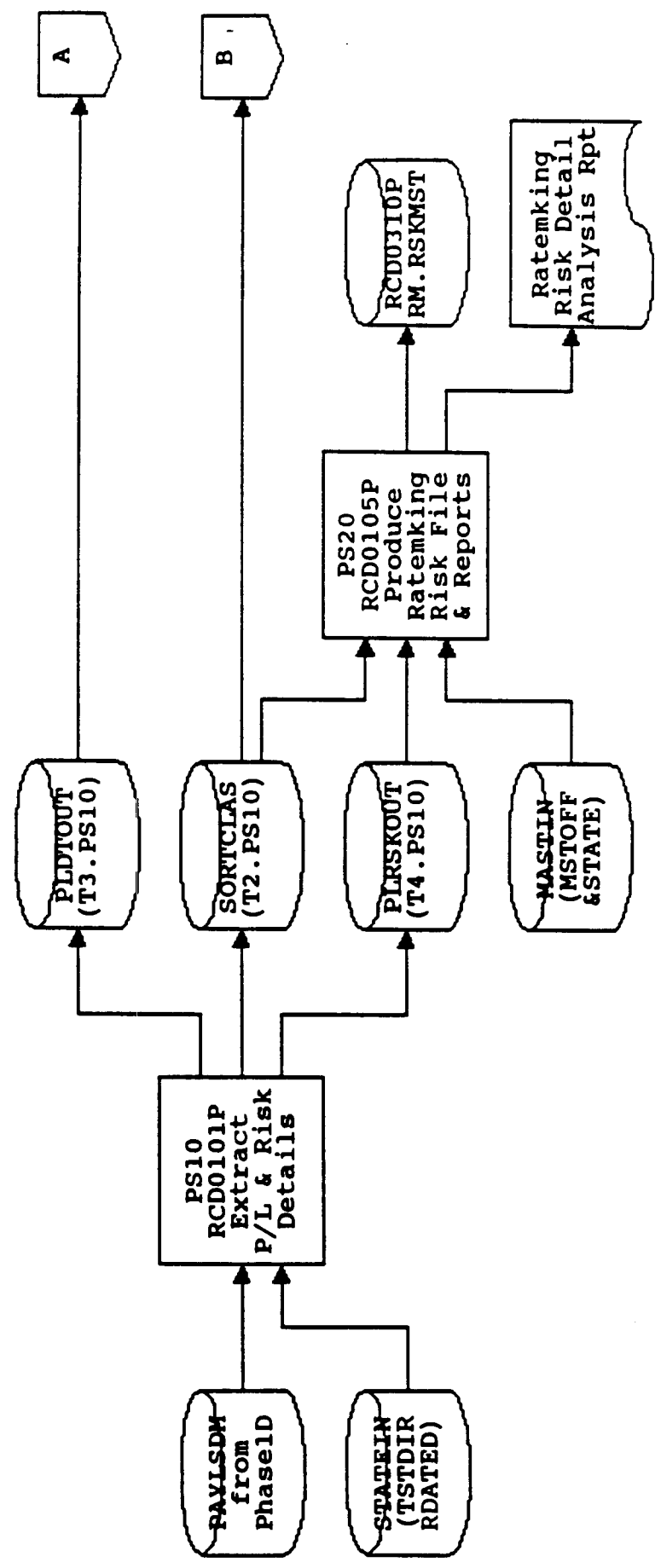
State Directory Program (RSTATDR1)



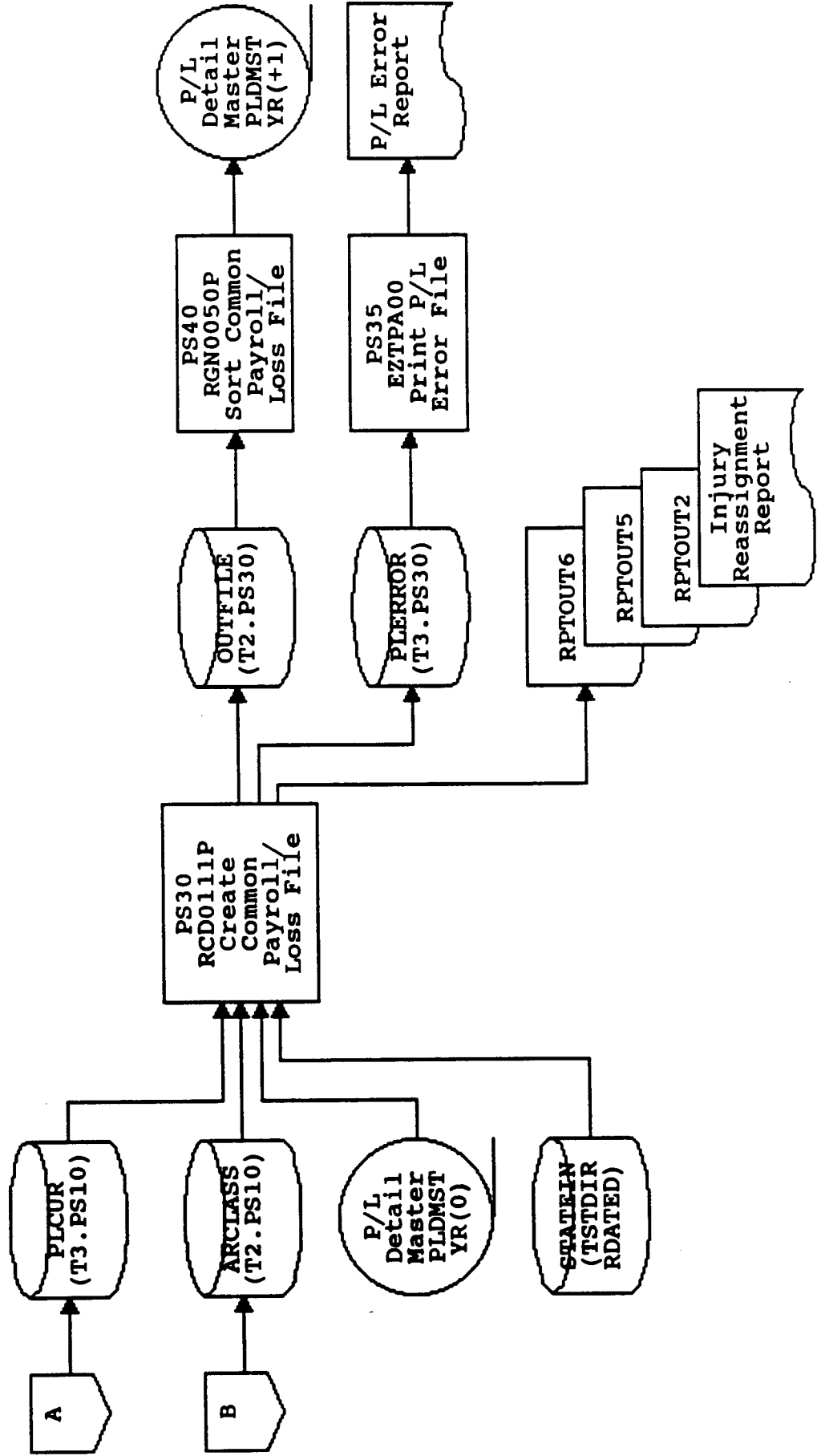
NAIC Examination of NCCI

Unit Card Data Administration

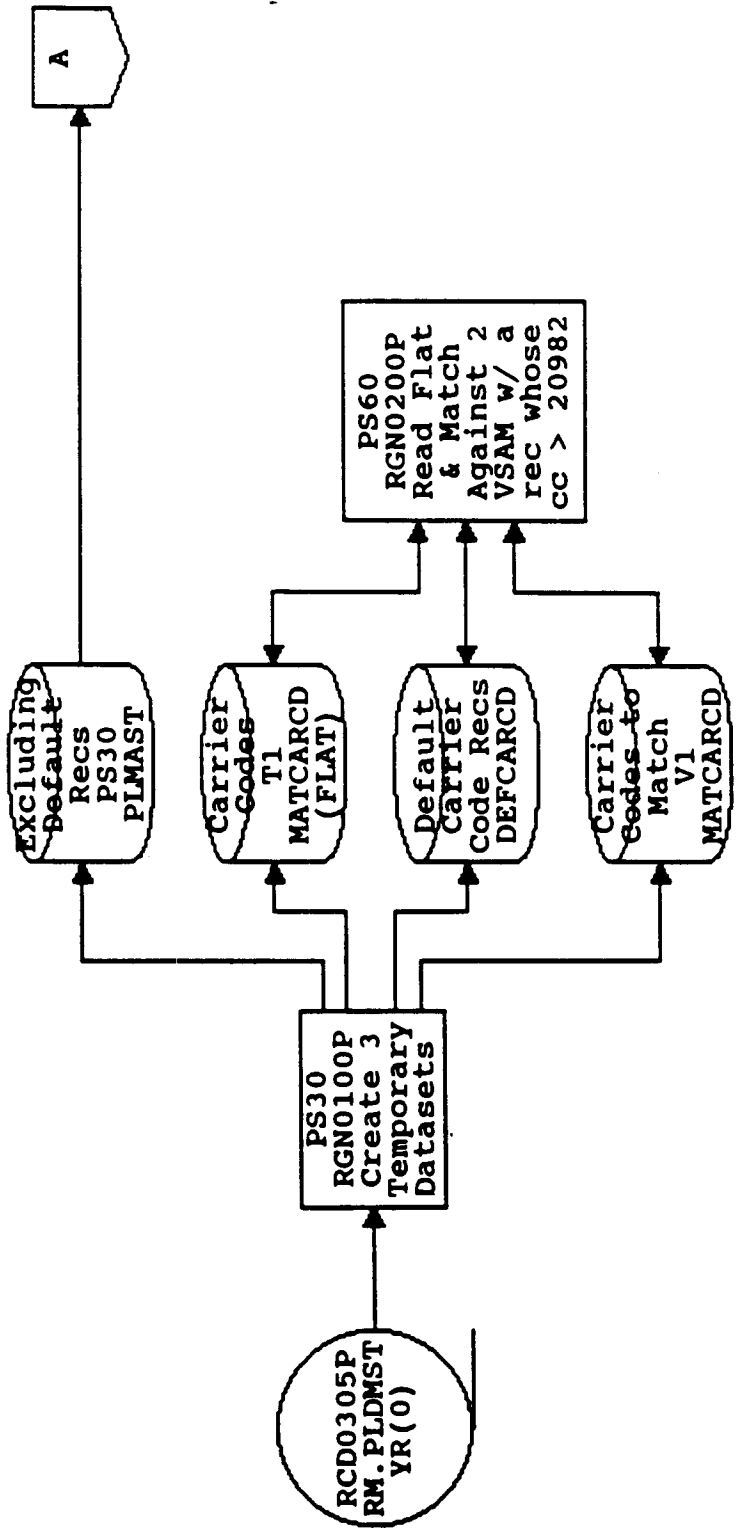
RCDCREA2 (RCDCREA2)



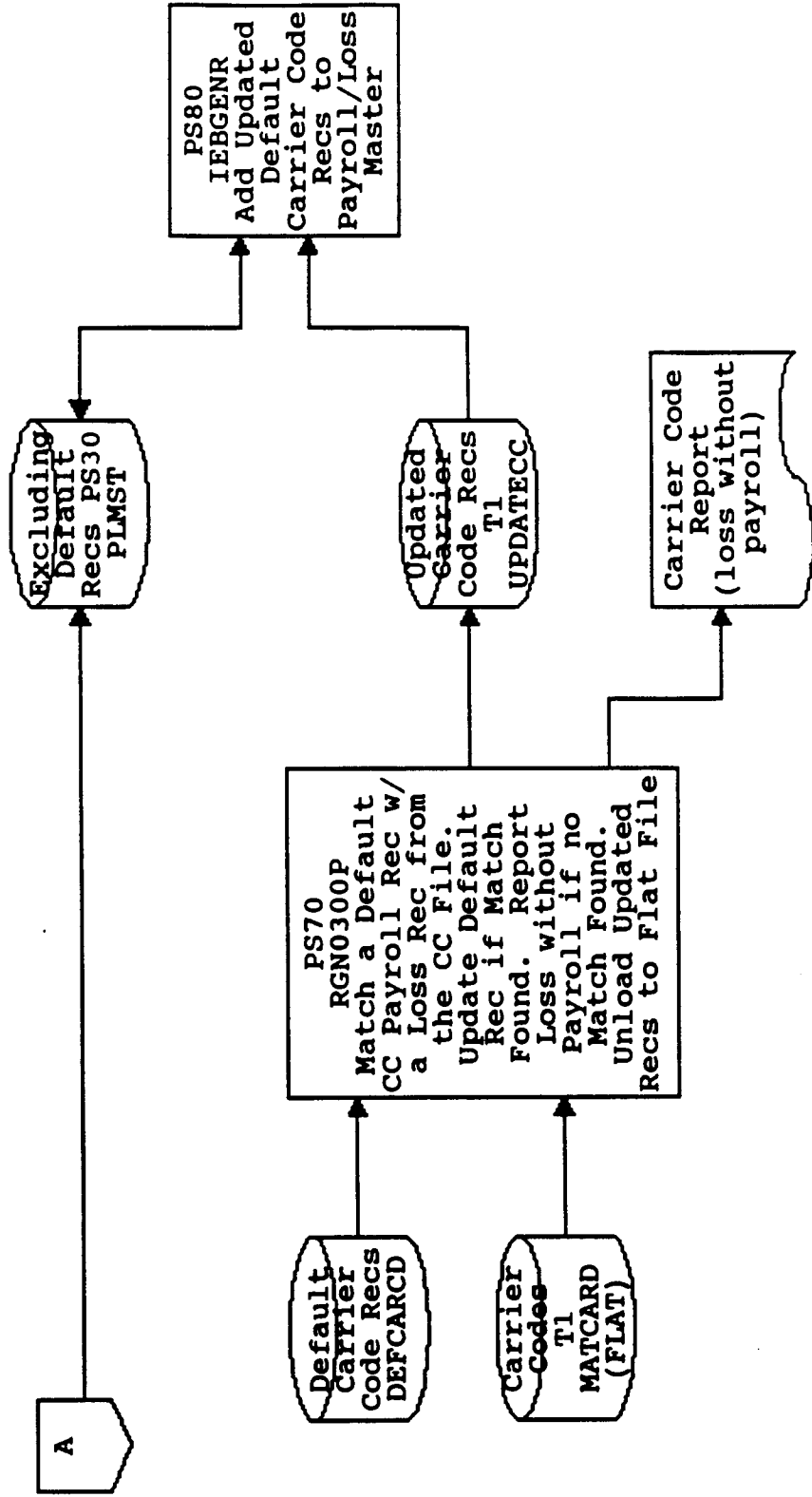
NAIC Examination of NCCI
Unit Card Data Administration
RCDCREA2 (RCDCREA2)



NAIC Examination of NCCI
Unit Card Data Administration
Default Program (RGNR0100)



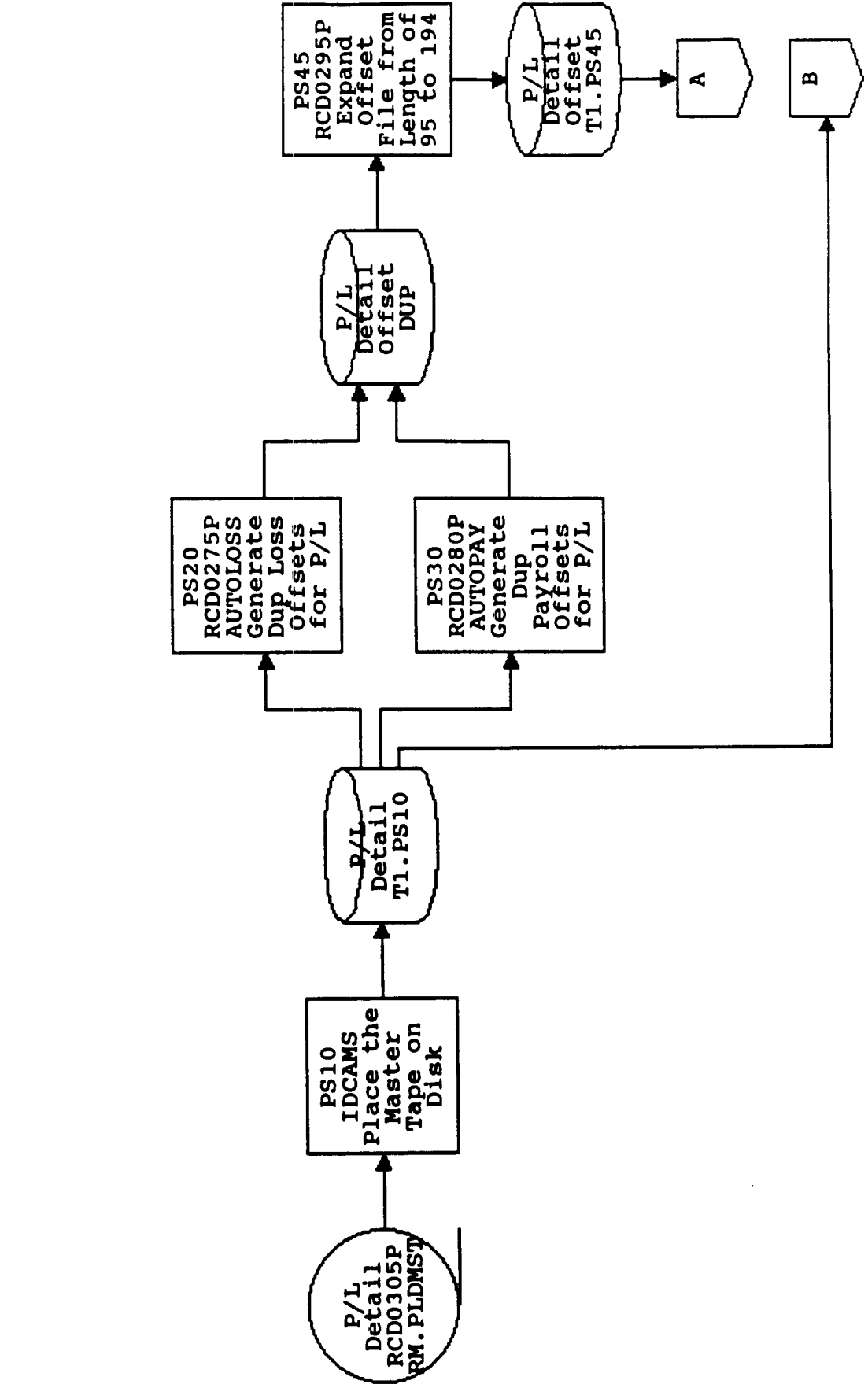
NAIC Examination of NCCI
Unit Card Data Administration
Default Program (RGNR0100)



NAIC Examination of NCCI

Unit Card Data Administration

Duplicate Payroll/Loss Program (RCDUPOFF)

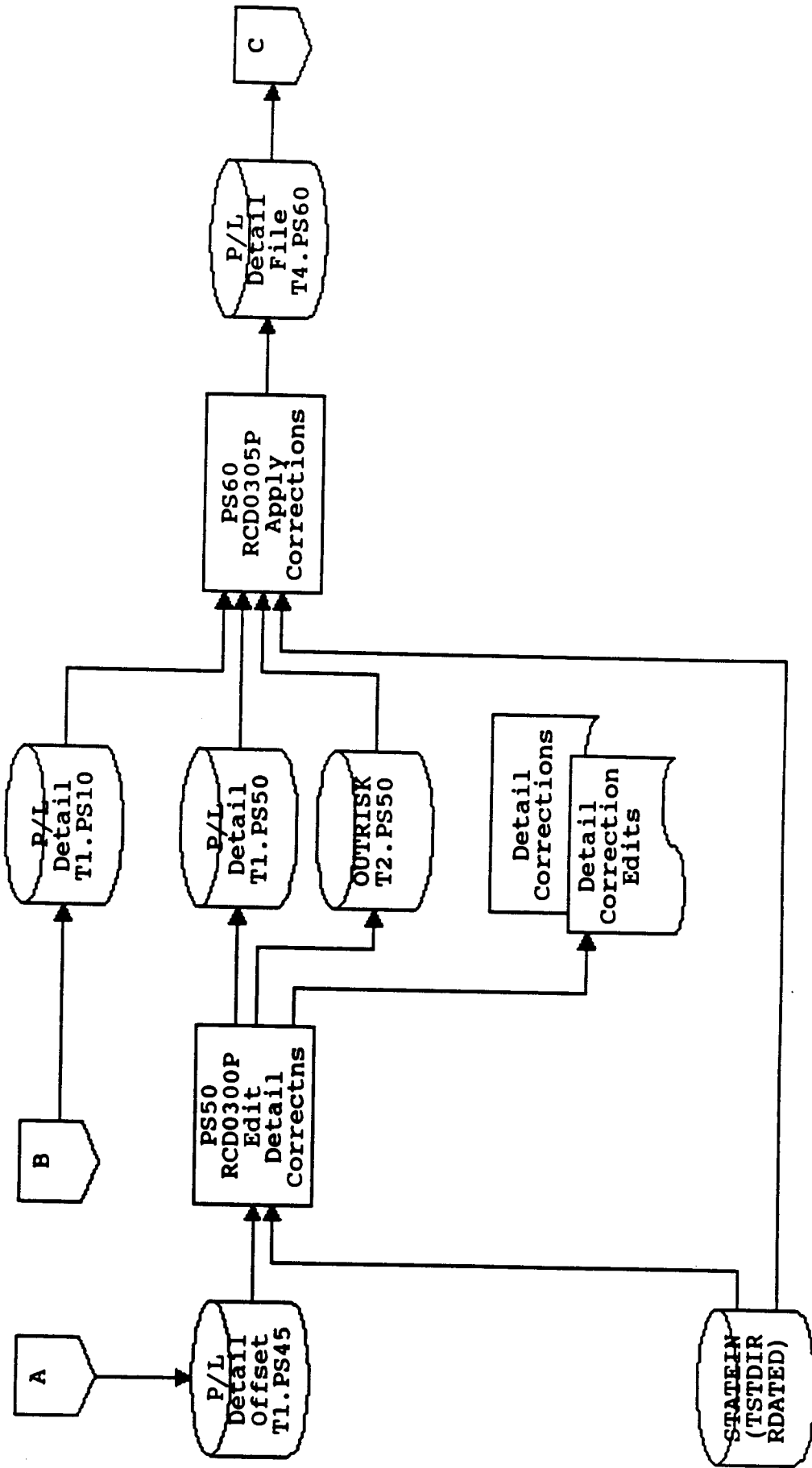


NAIC Examination of NCCI

A314B

Unit Card Data Administration

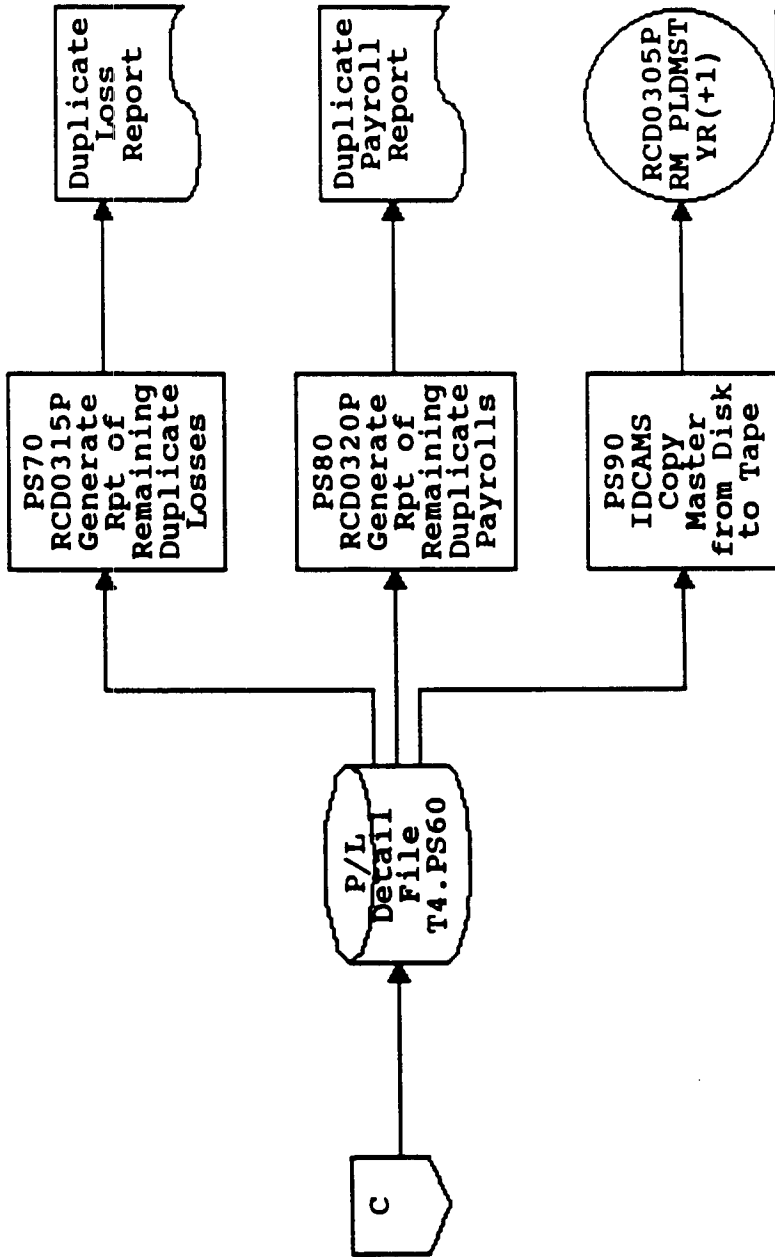
Duplicate Payroll/Loss Program (RCDUPOFF)



NAIC Examination of NCCI

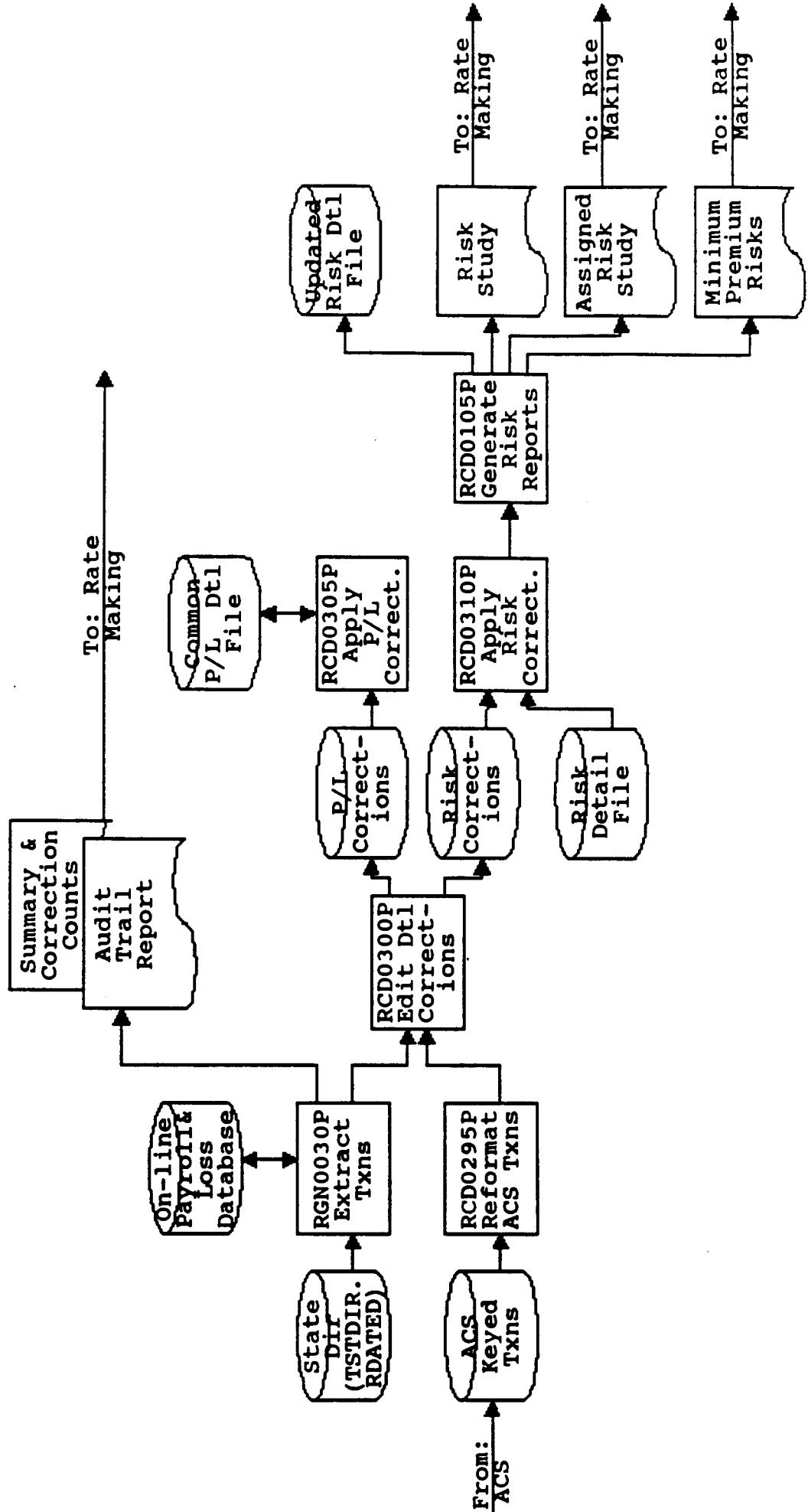
Unit Card Data Administration

Duplicate Payroll/Loss Program (RCDUPOFF)



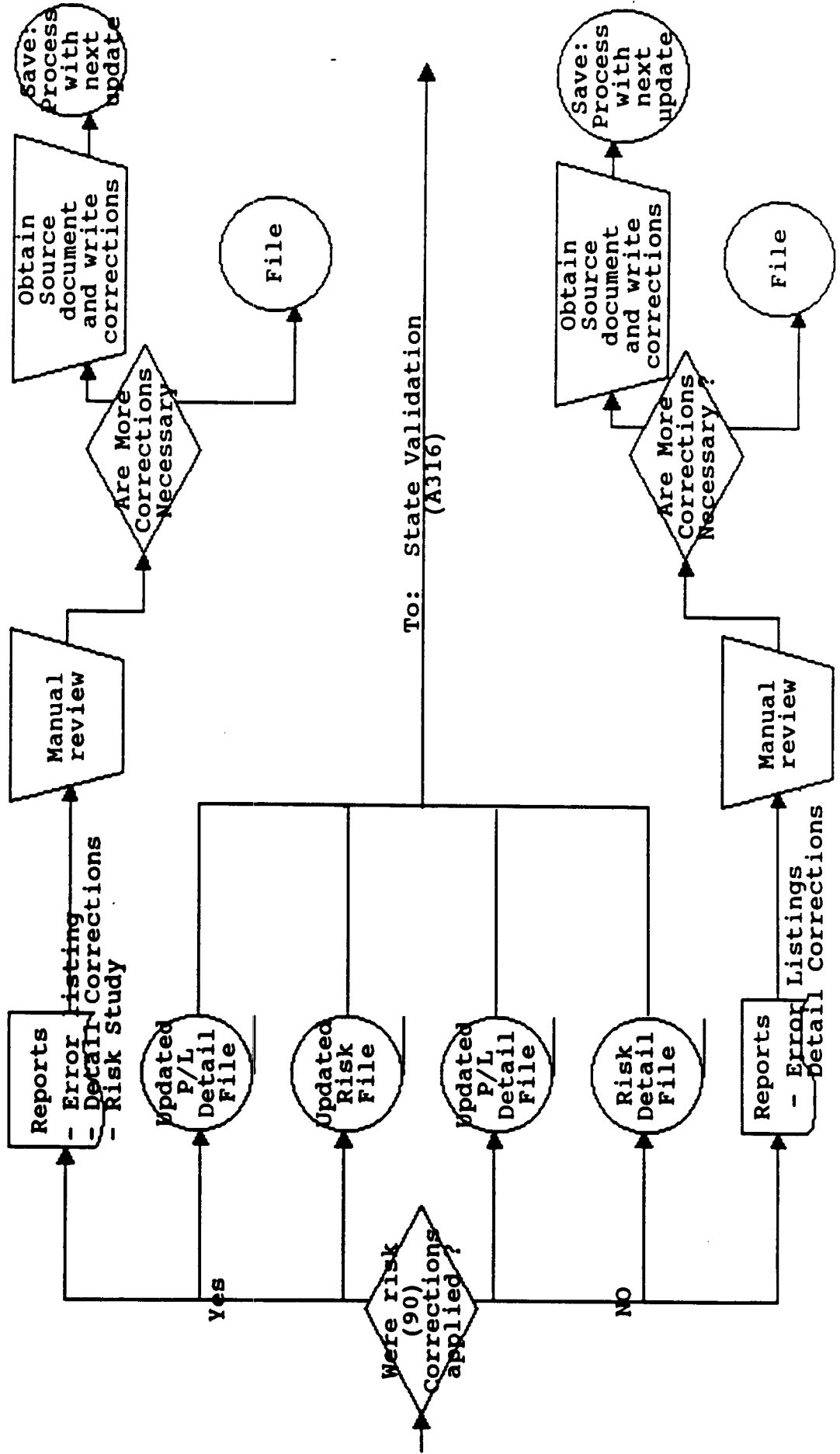
Unit Card Data Administration

RCDUPDATE



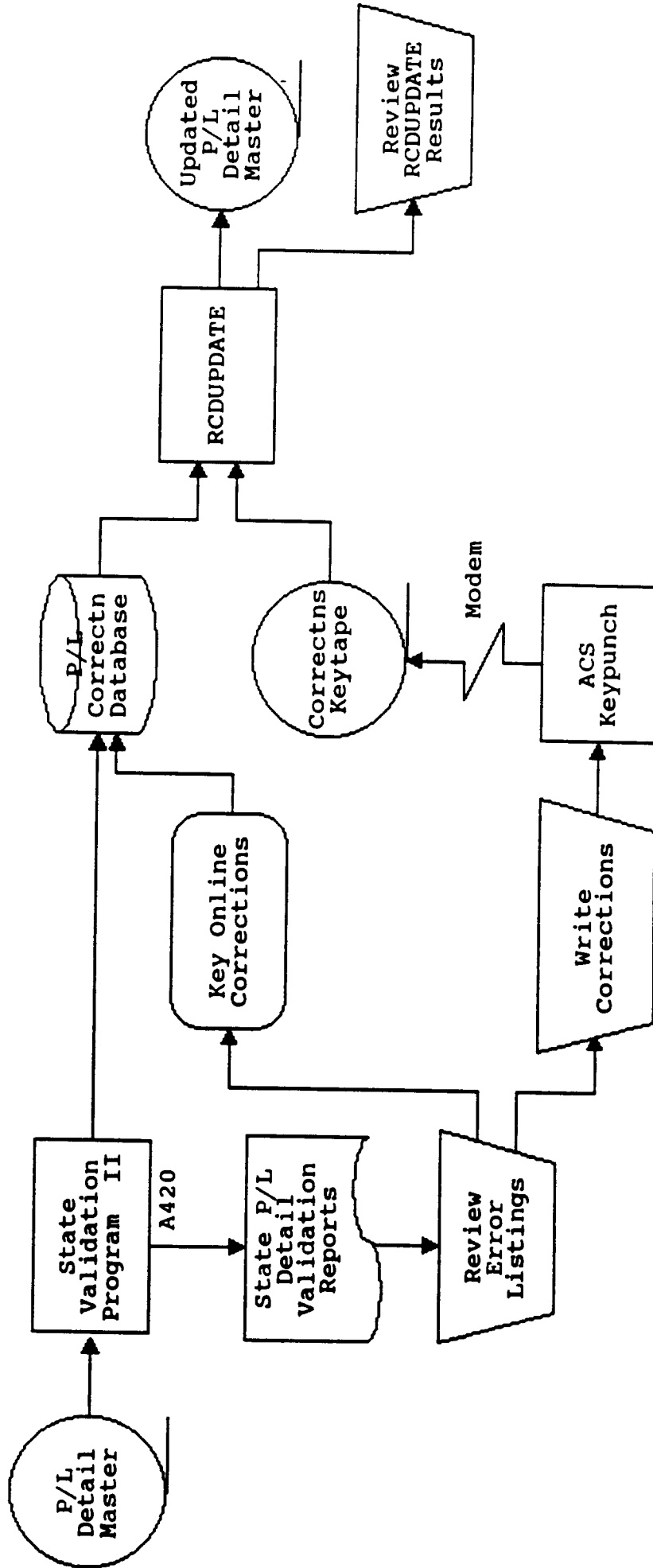
NAIC Examination of NCCI
 Unit Card Data Administration
 RCDUPDATE (Manual Processing)

A316

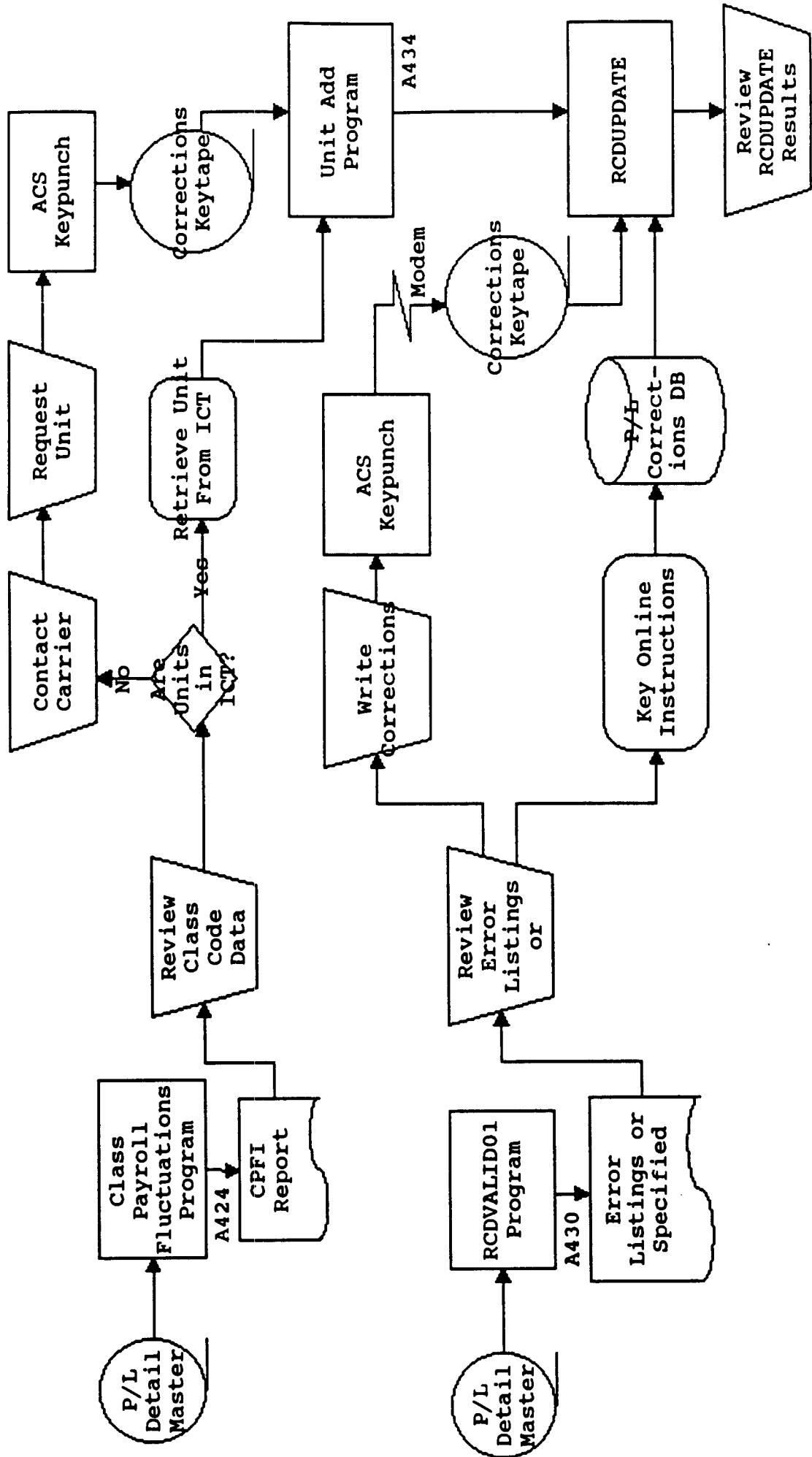


NAIC Examination of NCCI
 Unit Card Data Administration
 State Validation II

A317

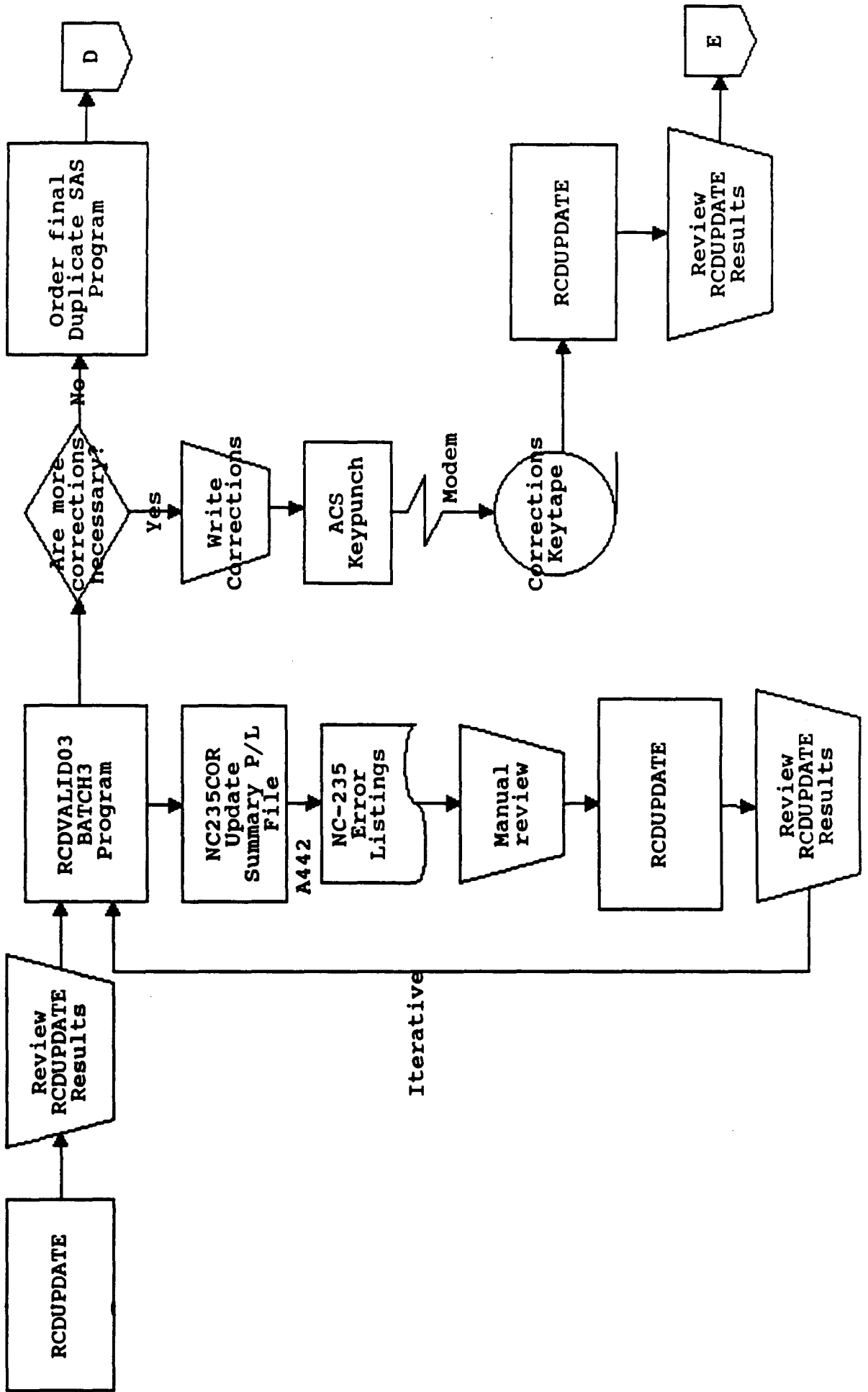


NAIC Examination of NCCI
Unit Card Data Administration
Class Payroll Fluctuation Investigation

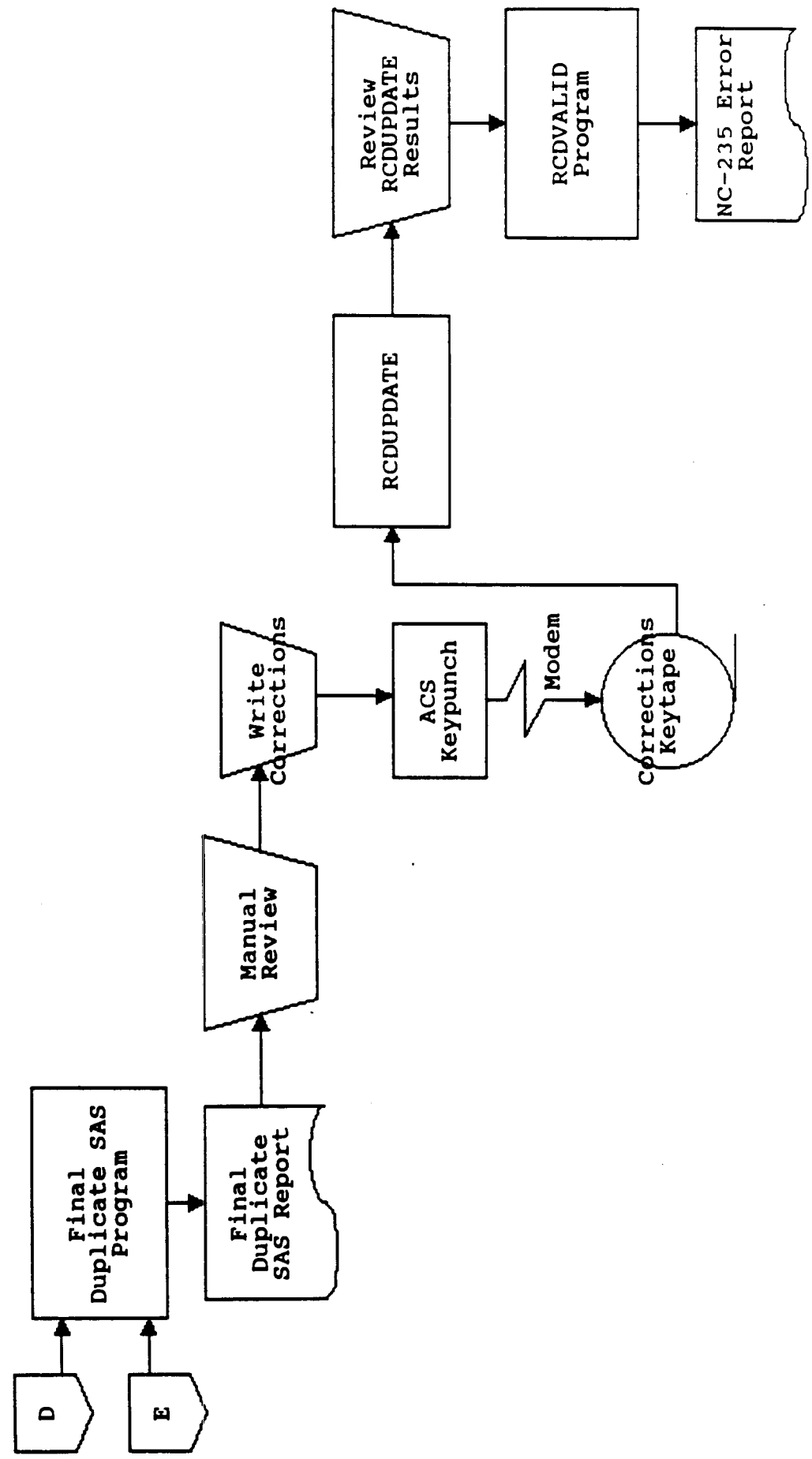


NAIC Examination of MCCI
 Unit Card Data Administration
 Limited Summary/ BATCH 3

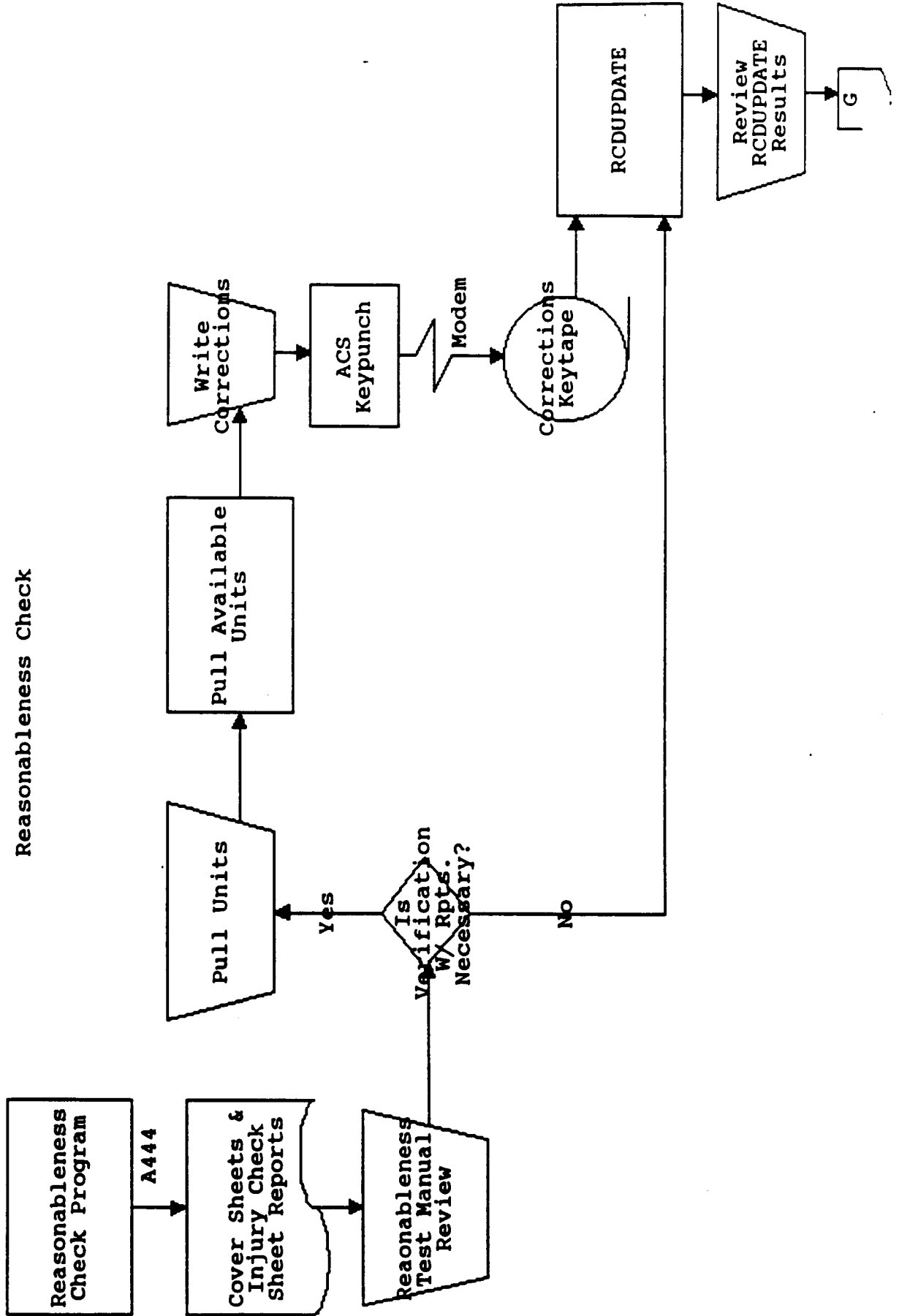
A320A



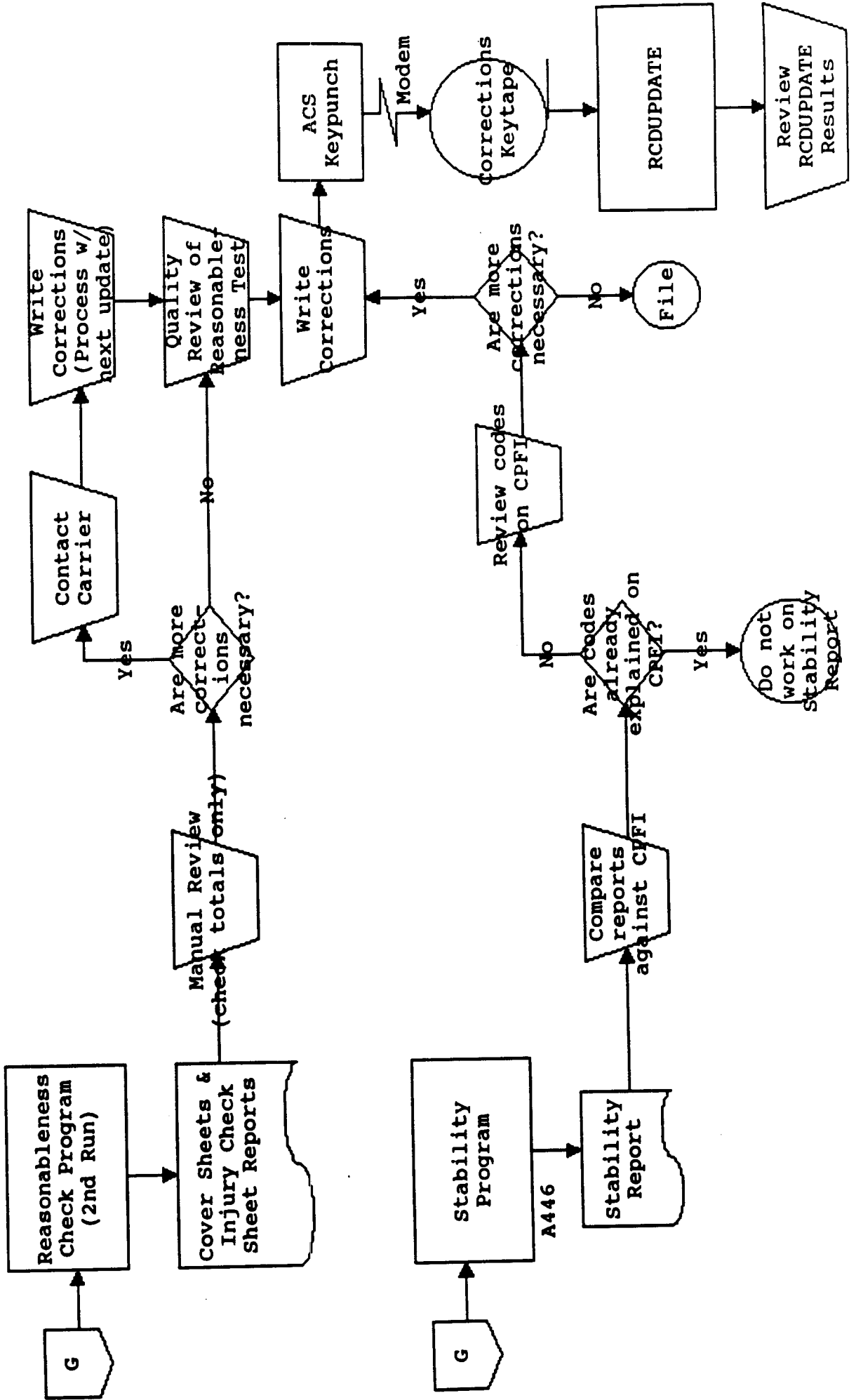
NAIC Examination of NCCI
Unit Card Data Administration
Limited Summary/ BATCH 3



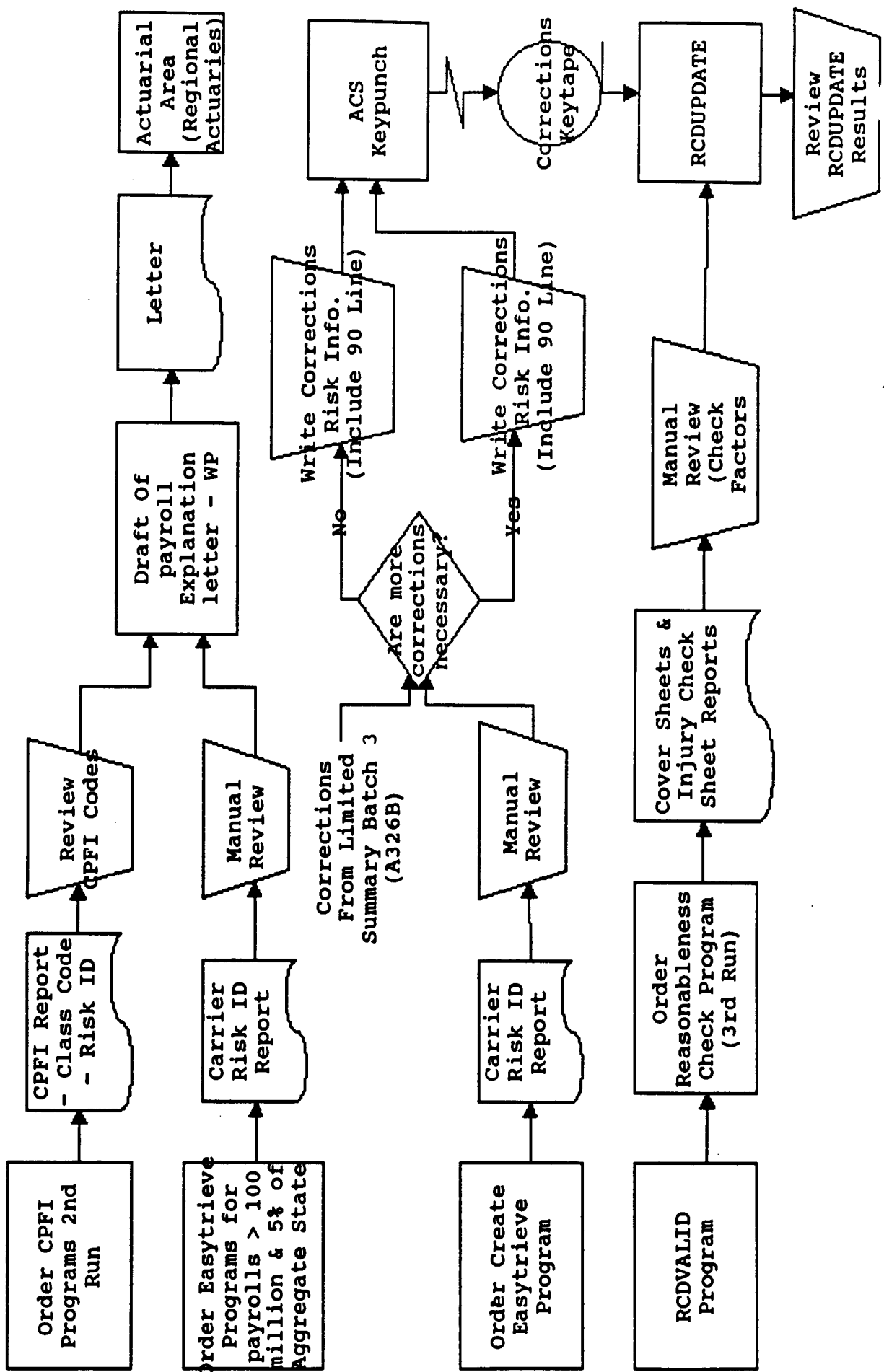
NAIC Examination of NCCI
Unit Card Data Administration
Reasonableness Check



NAIC Examination of NCCI
Unit Card Data Administration
Reasonableness Check

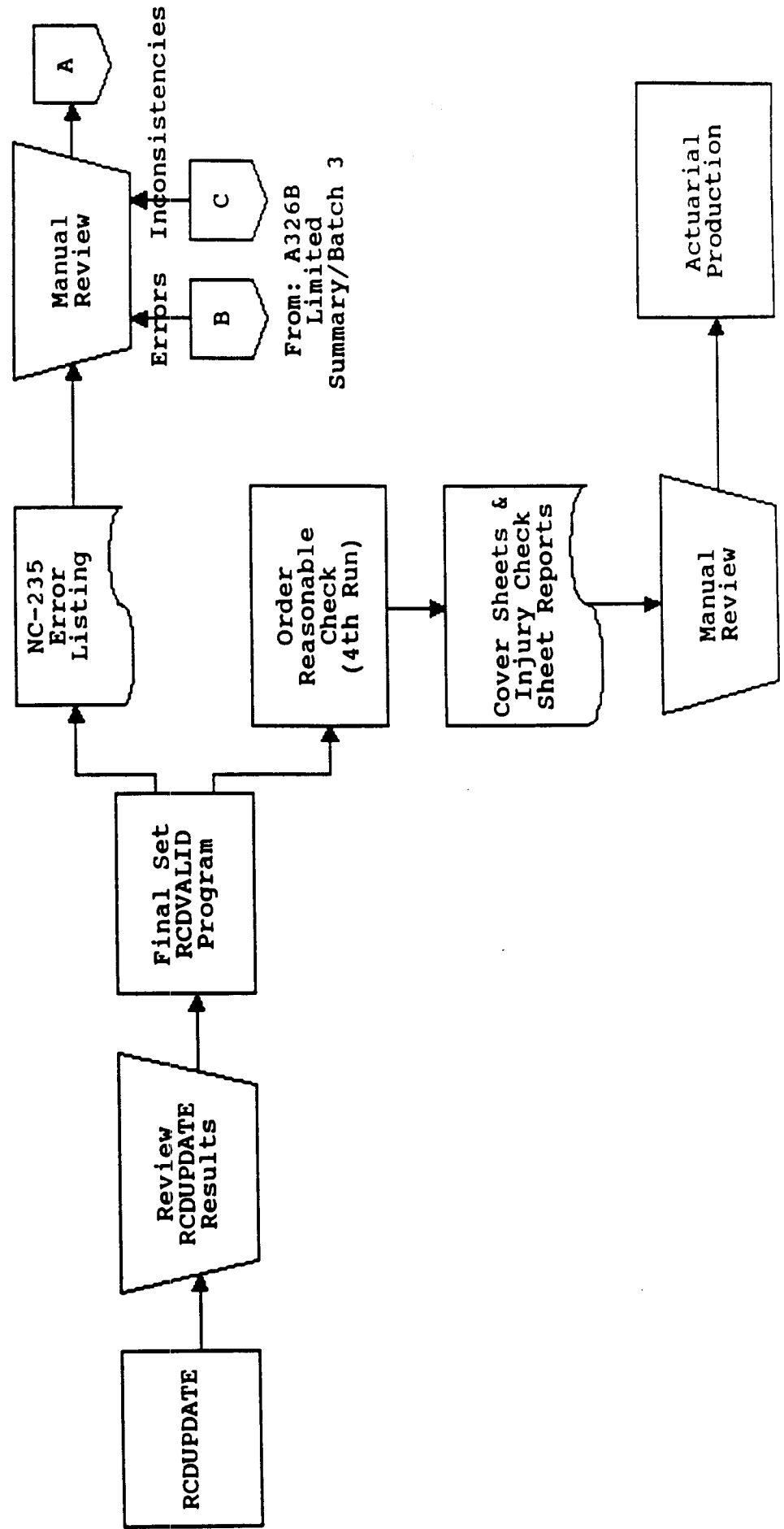


NAIC Examination of NCCI
Unit Card Data Administration
Class Payroll Fluctuation Investigation



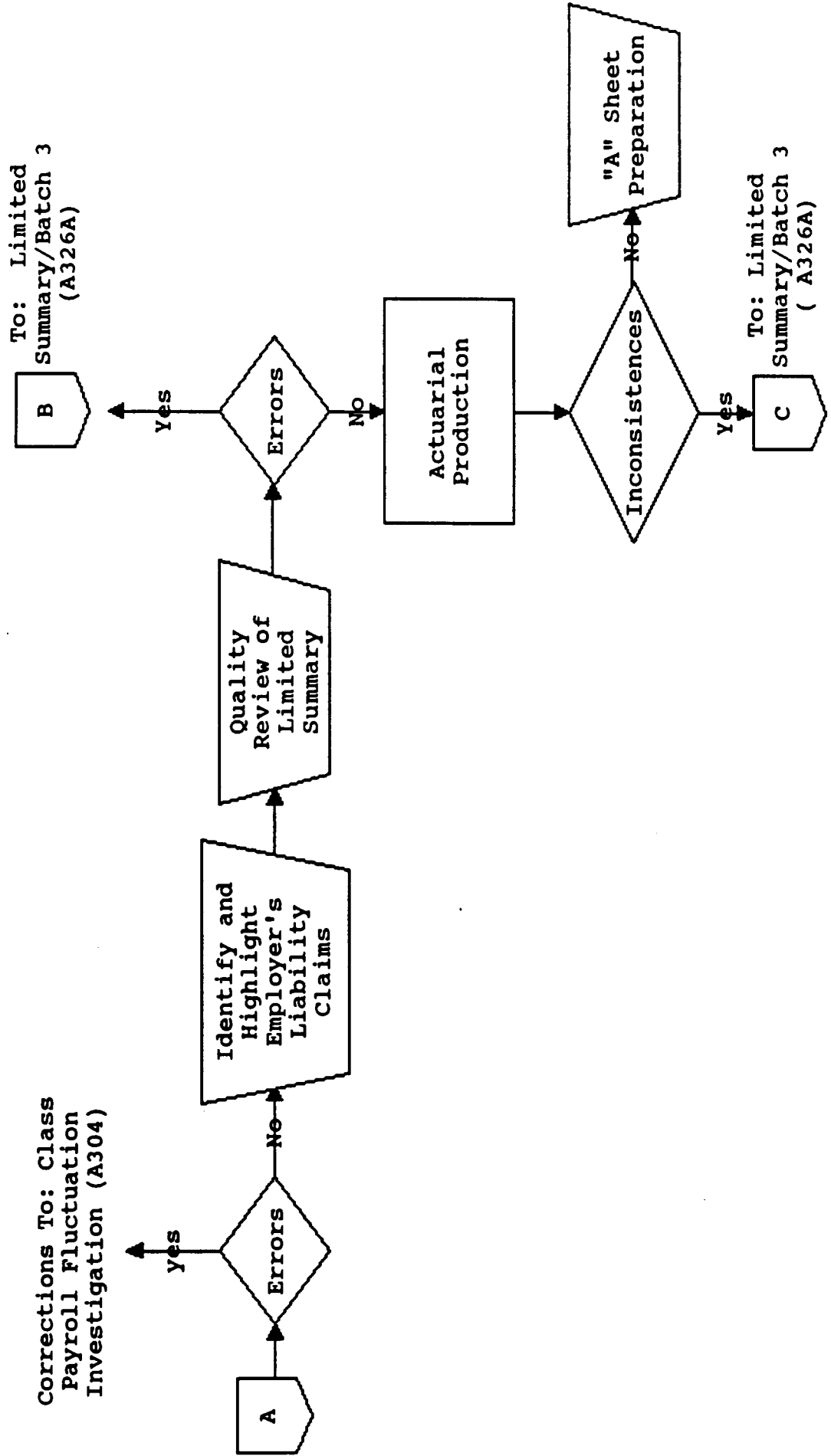
NAIC Examination of NCCI
Unit Card Data Administration
Limited Summary/Batch 3

A326A

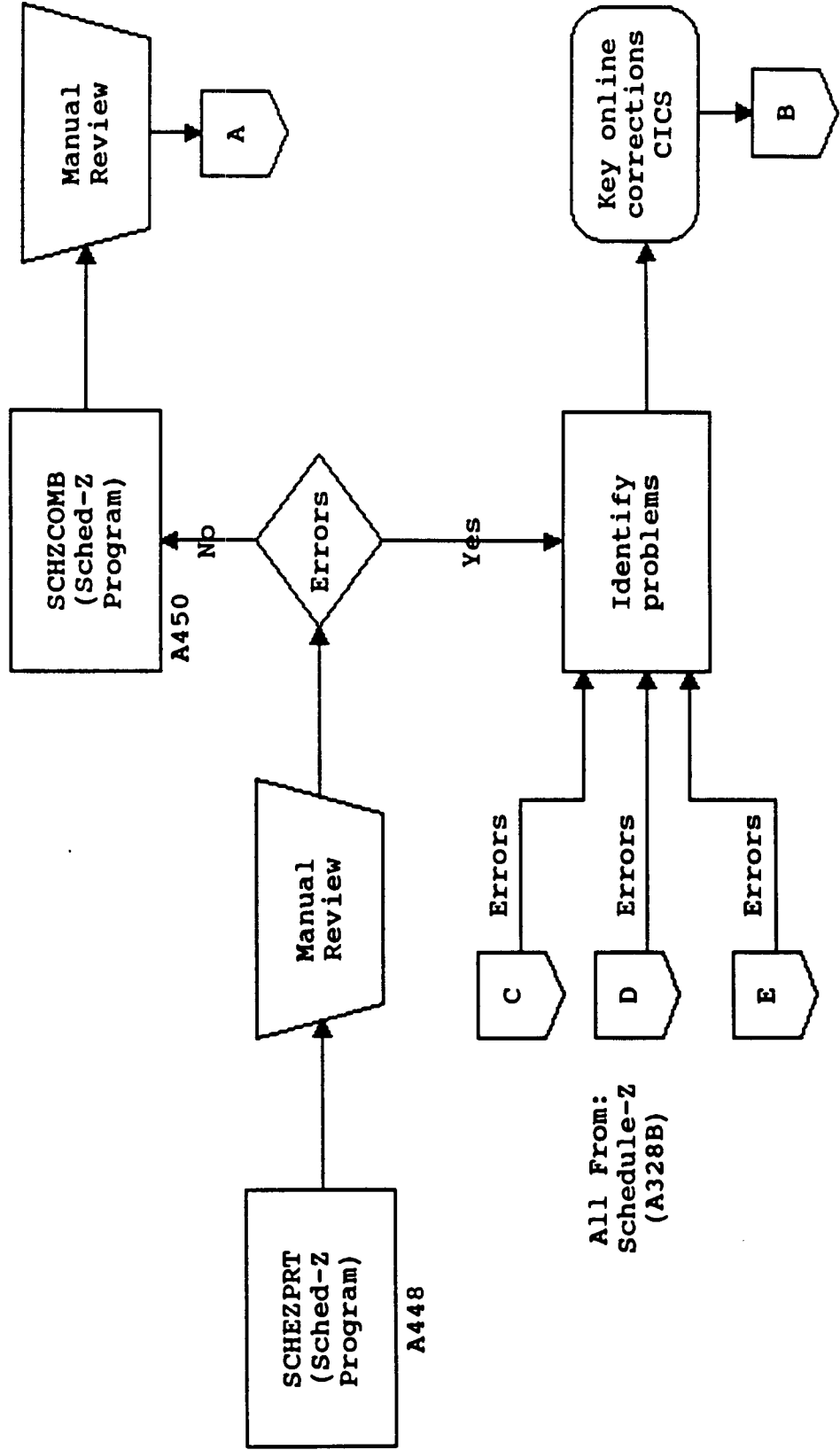


NAIC Examination of NCCI
Unit Card Data Administration
Limited Summary/Batch 3

A326B



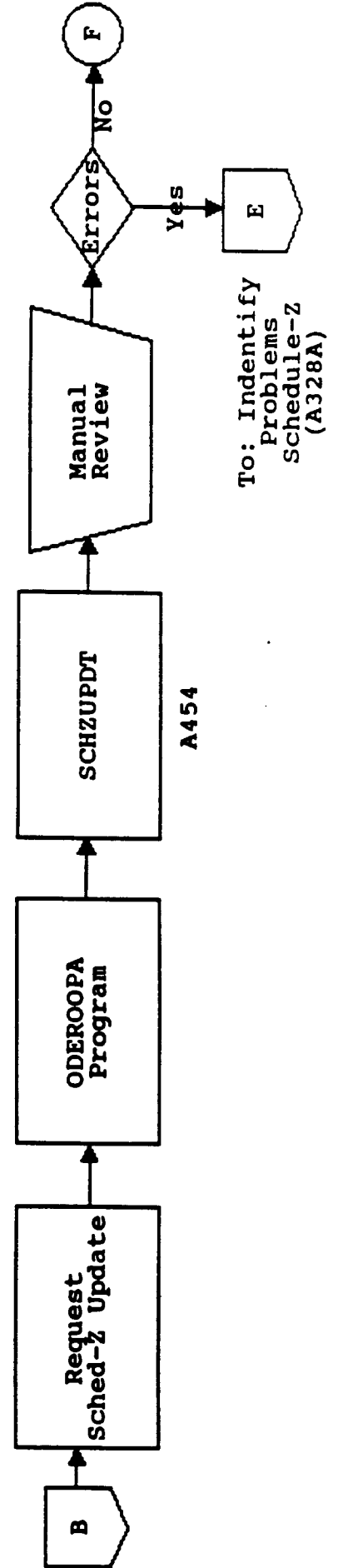
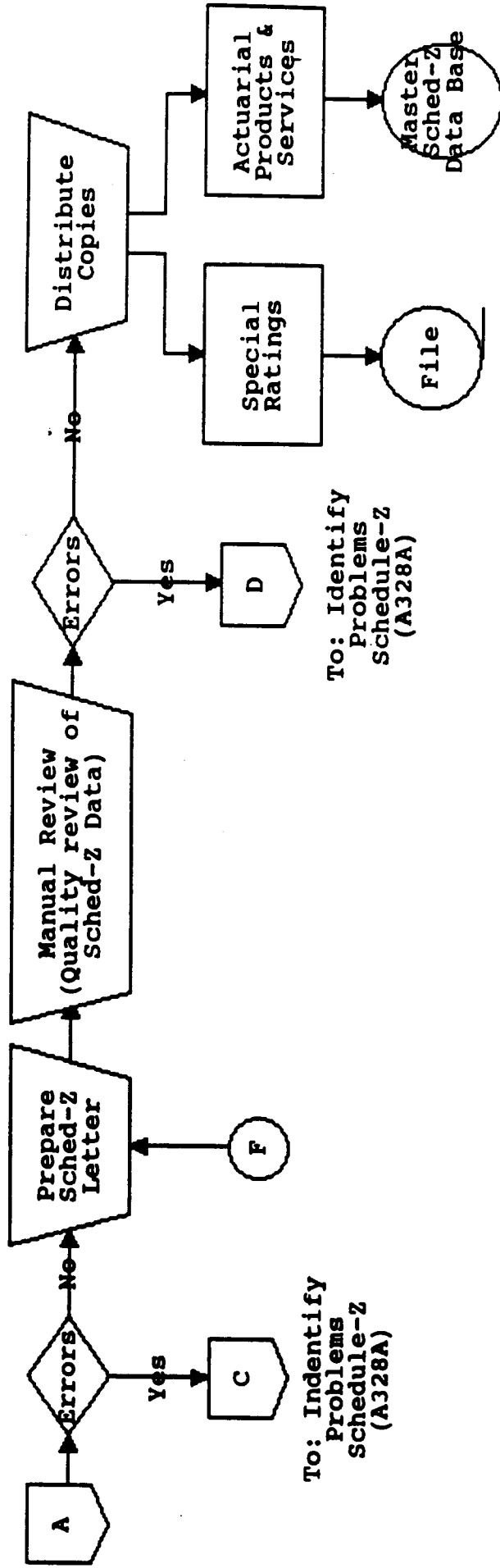
NAIC Examination of NCCI
Unit Card Data Administration
Schedule-Z



All From:
Schedule-Z
(A328B)

NAIC Examination of NCCI
 Unit Card Data Administration
 Schedule-Z

A328B

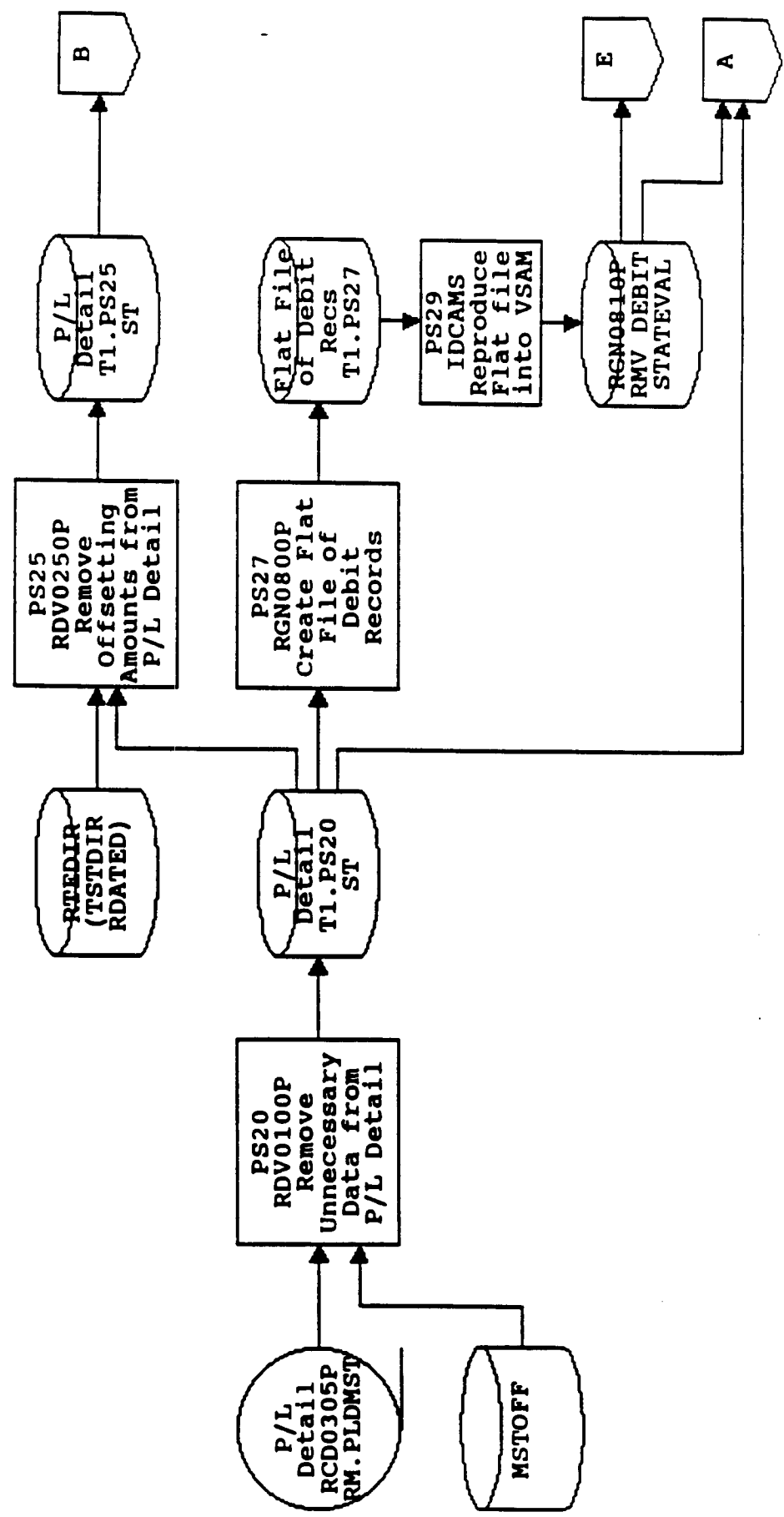


A454

NAIC Examination of NCCI

Unit Card Data Administration

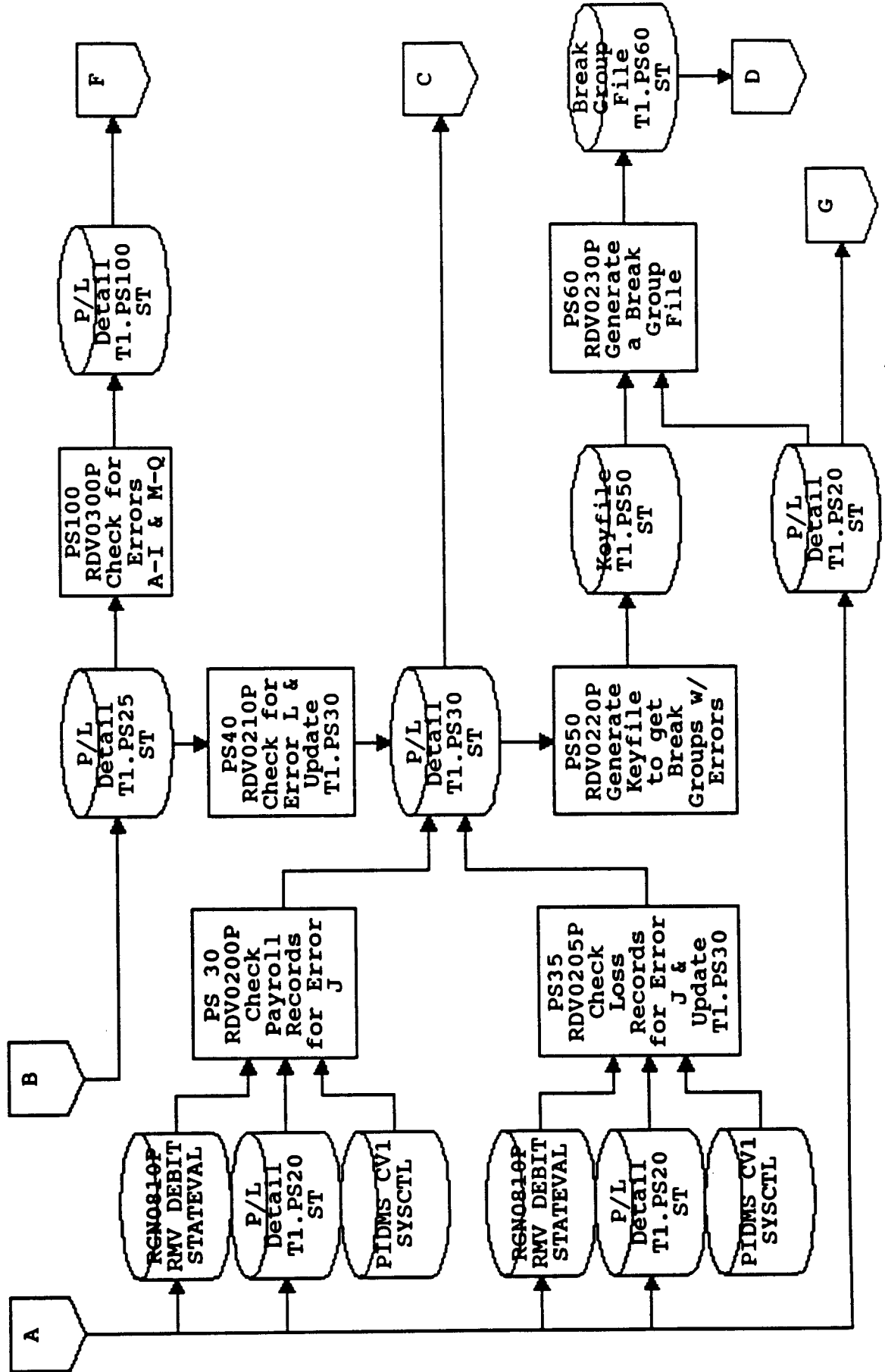
State Validation Program (STATEVAL)



NAIC Examination of NCCI

Unit Card Data Administration

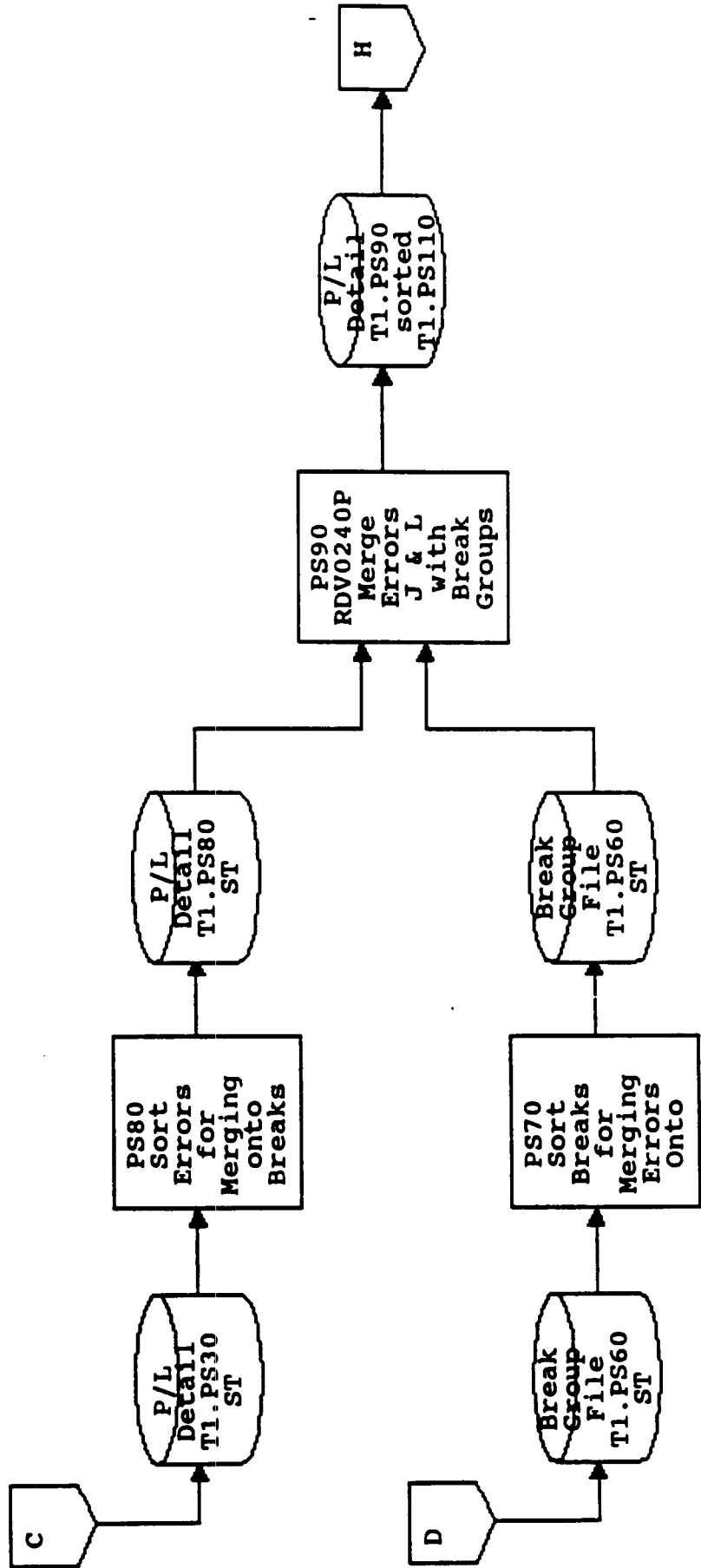
State Validation Program (STATEVAL)



NAIC Examination of NCCI

Unit Card Data Administration

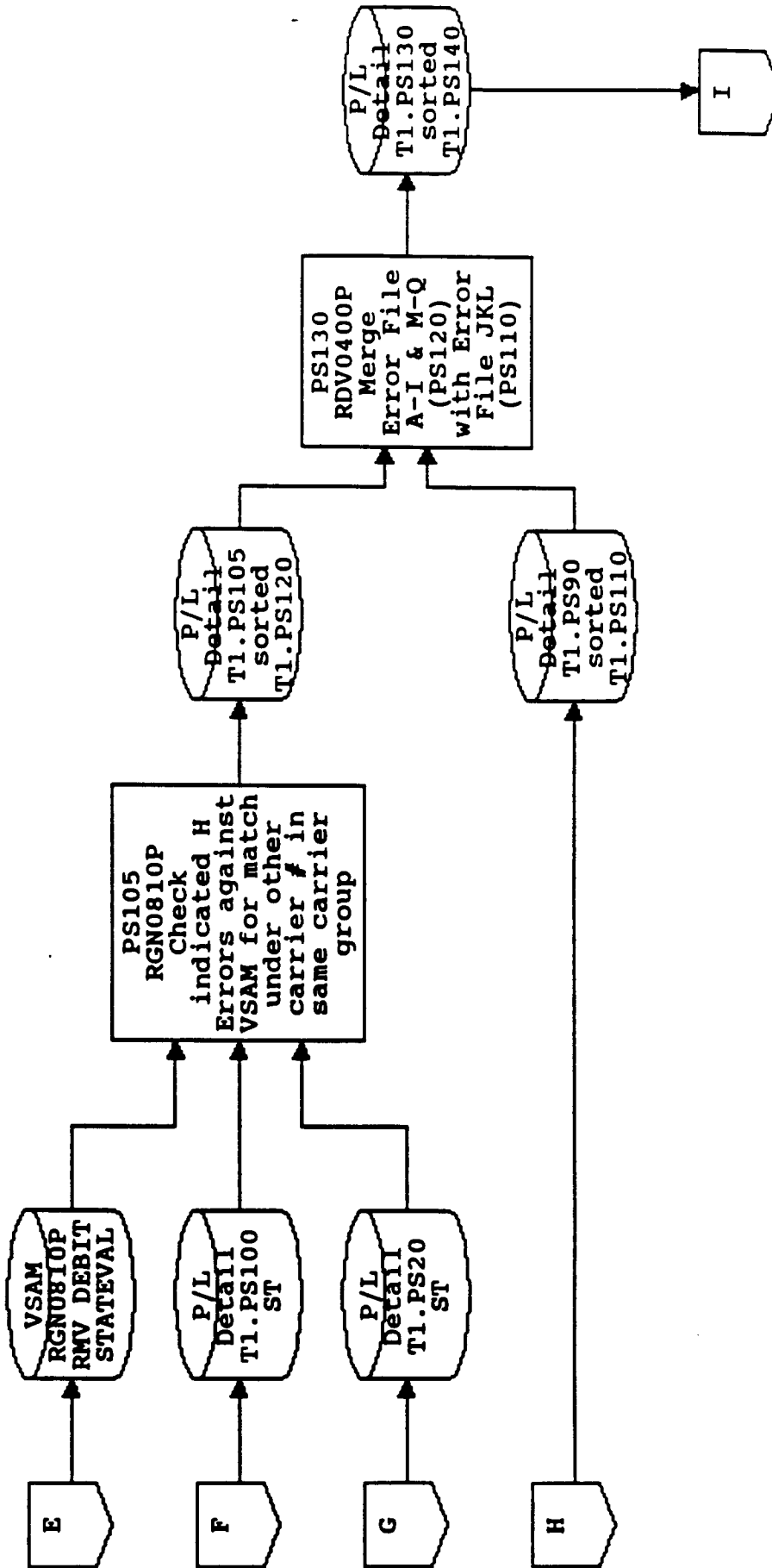
State Validation Program (STATEVAL)



NAIC Examination of NCCI

Unit Card Data Administration

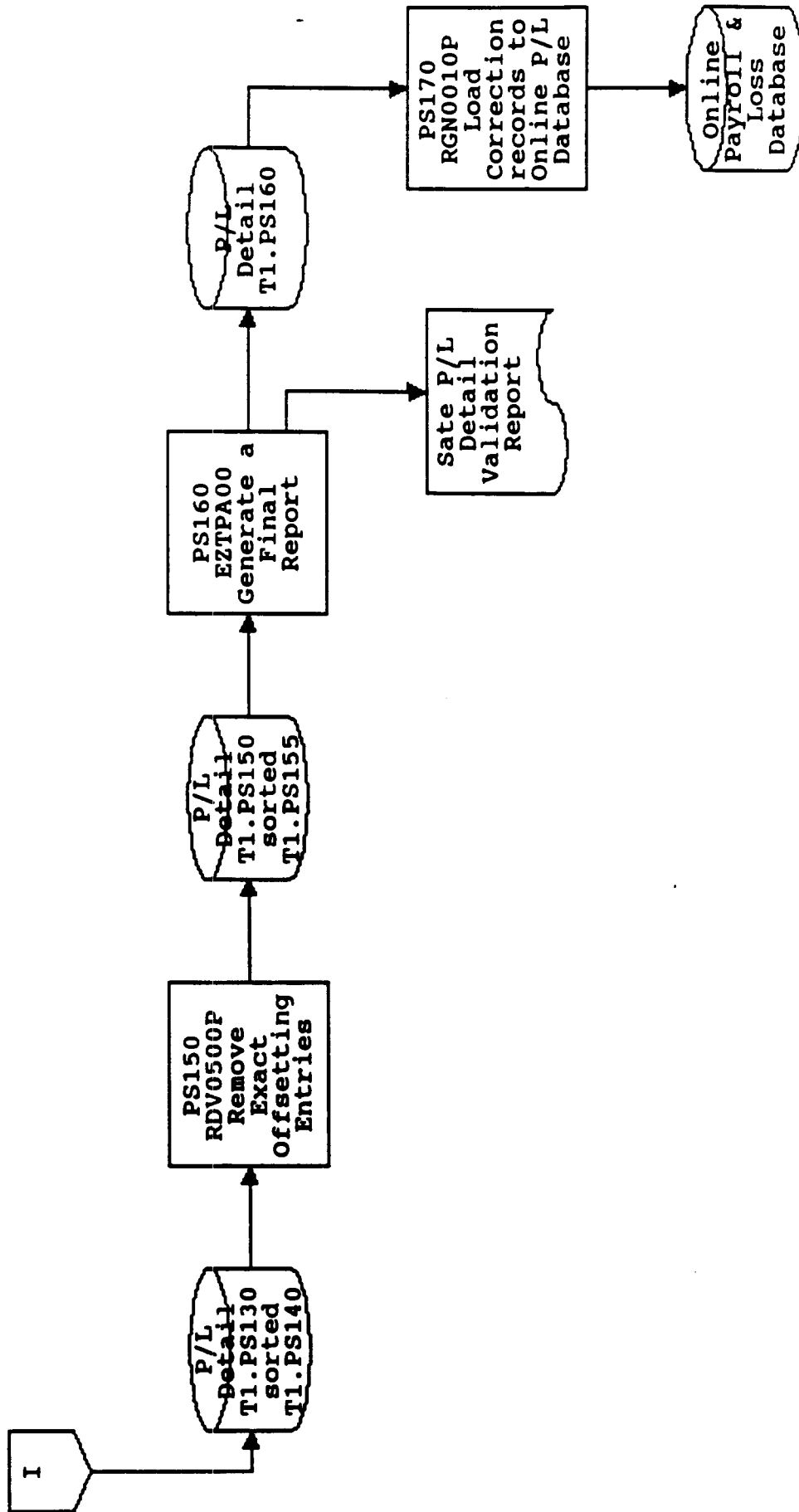
State Validation Program (STATEVAL)



NAIC Examination of NCCI

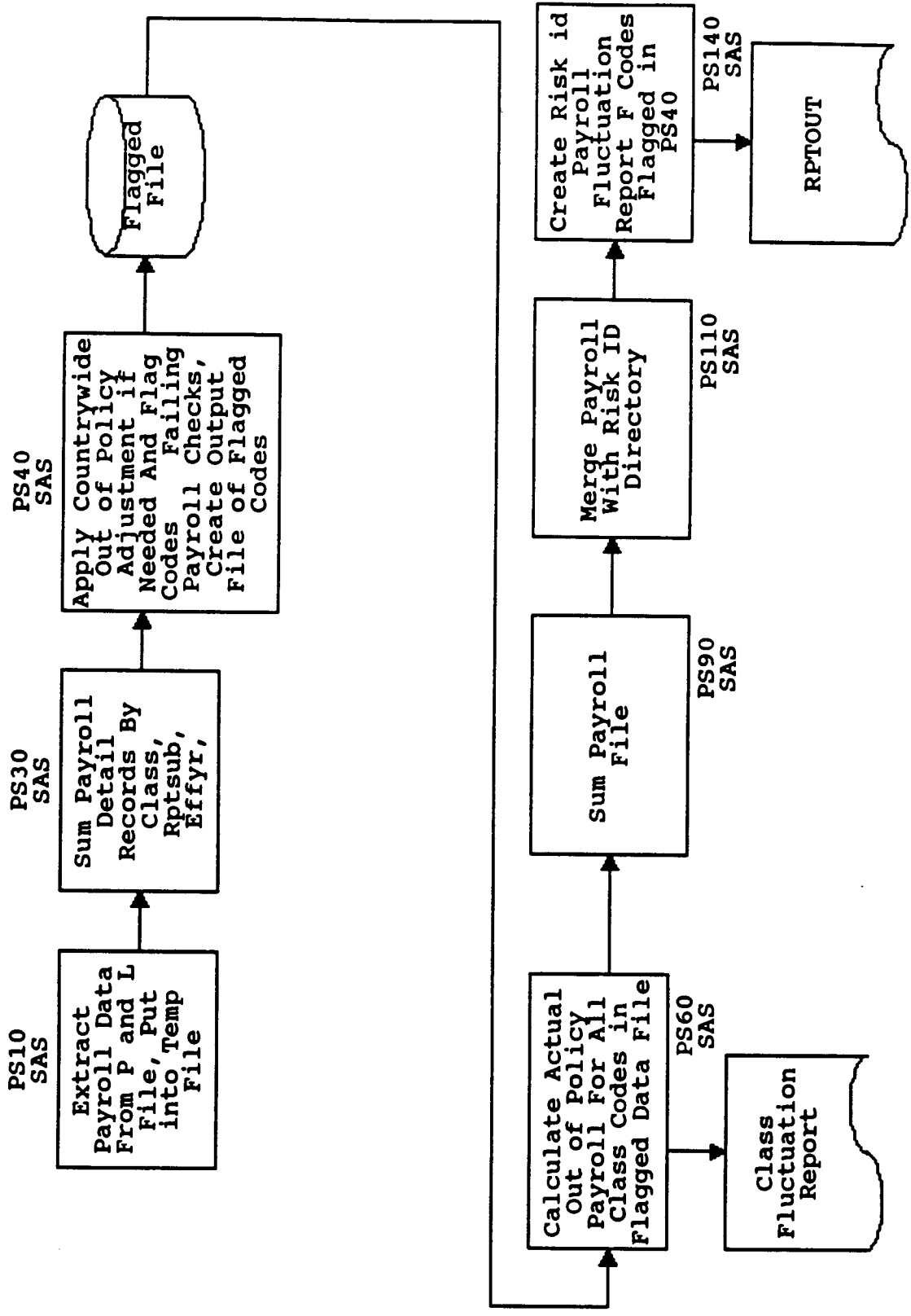
Unit Card Data Administration

State Validation Program (STATEVAL)



NAIC Examination of NCCI
 Unit Card Data Administration
 Class Payroll Fluctuations Program

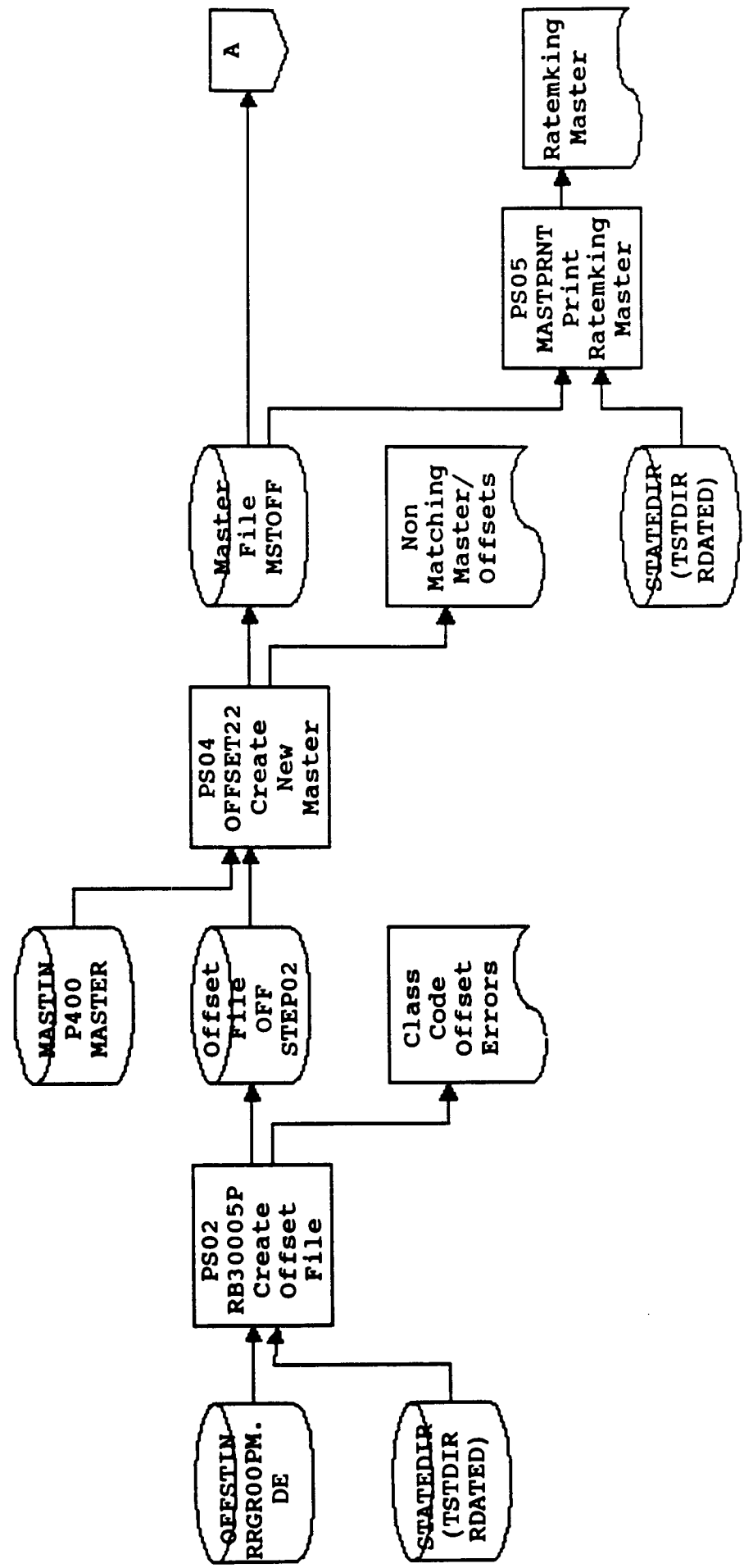
A424



NAIC Examination of NCCI

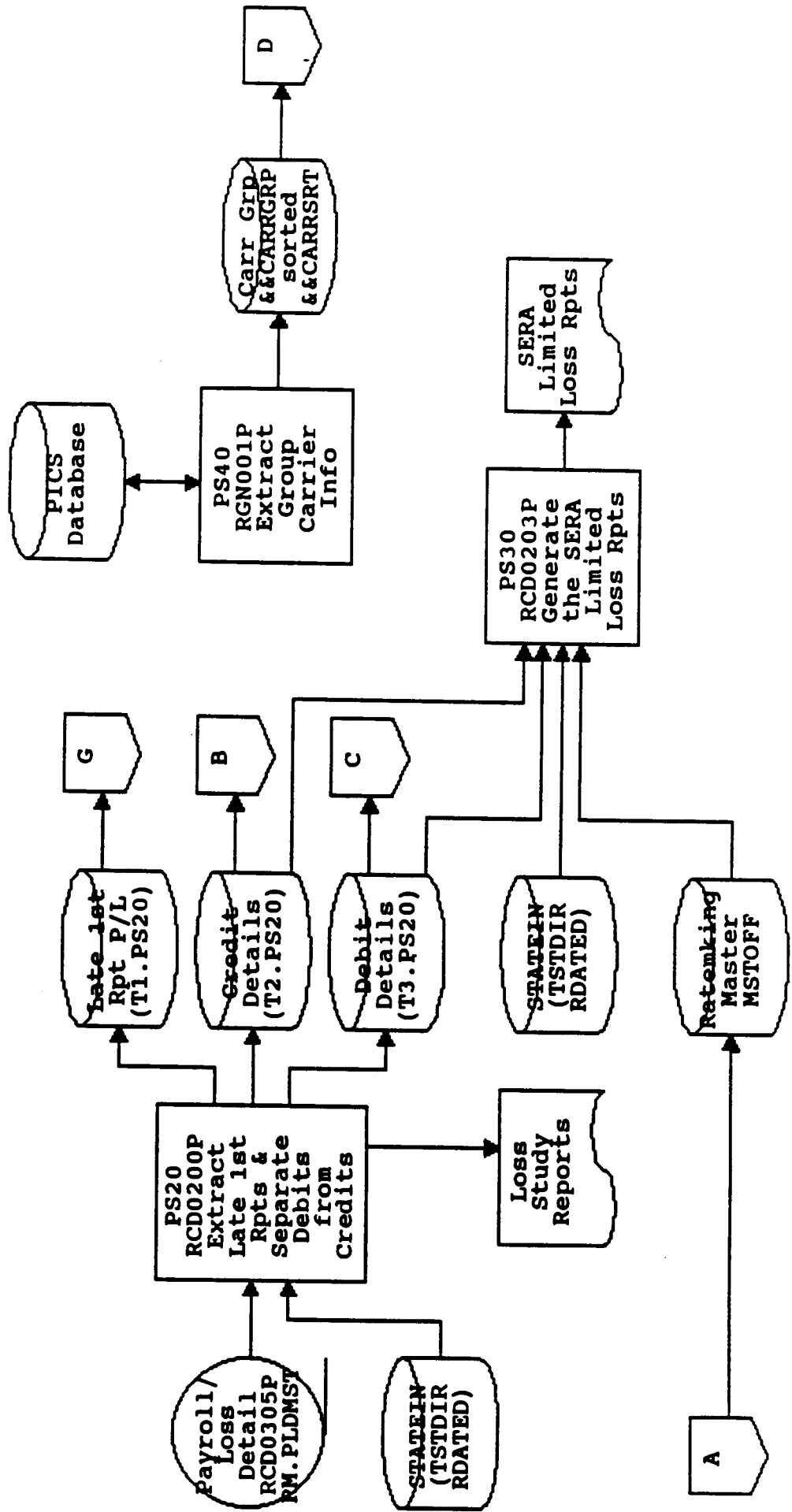
Unit Card Data Administration

RCDVALID



Unit Card Data Administration

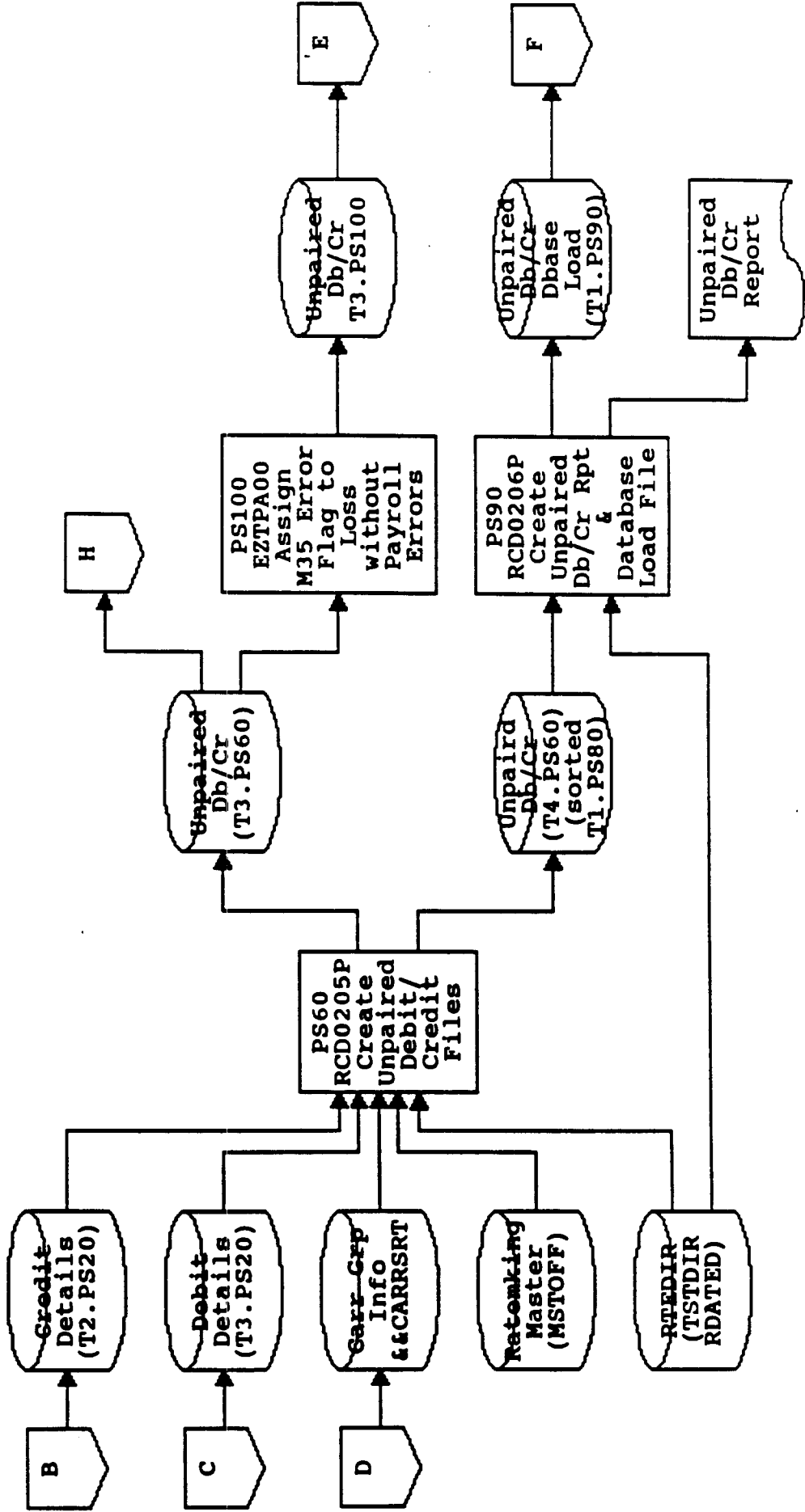
RCDVALID



NAIC Examination of NCCI

Unit Card Data Administration

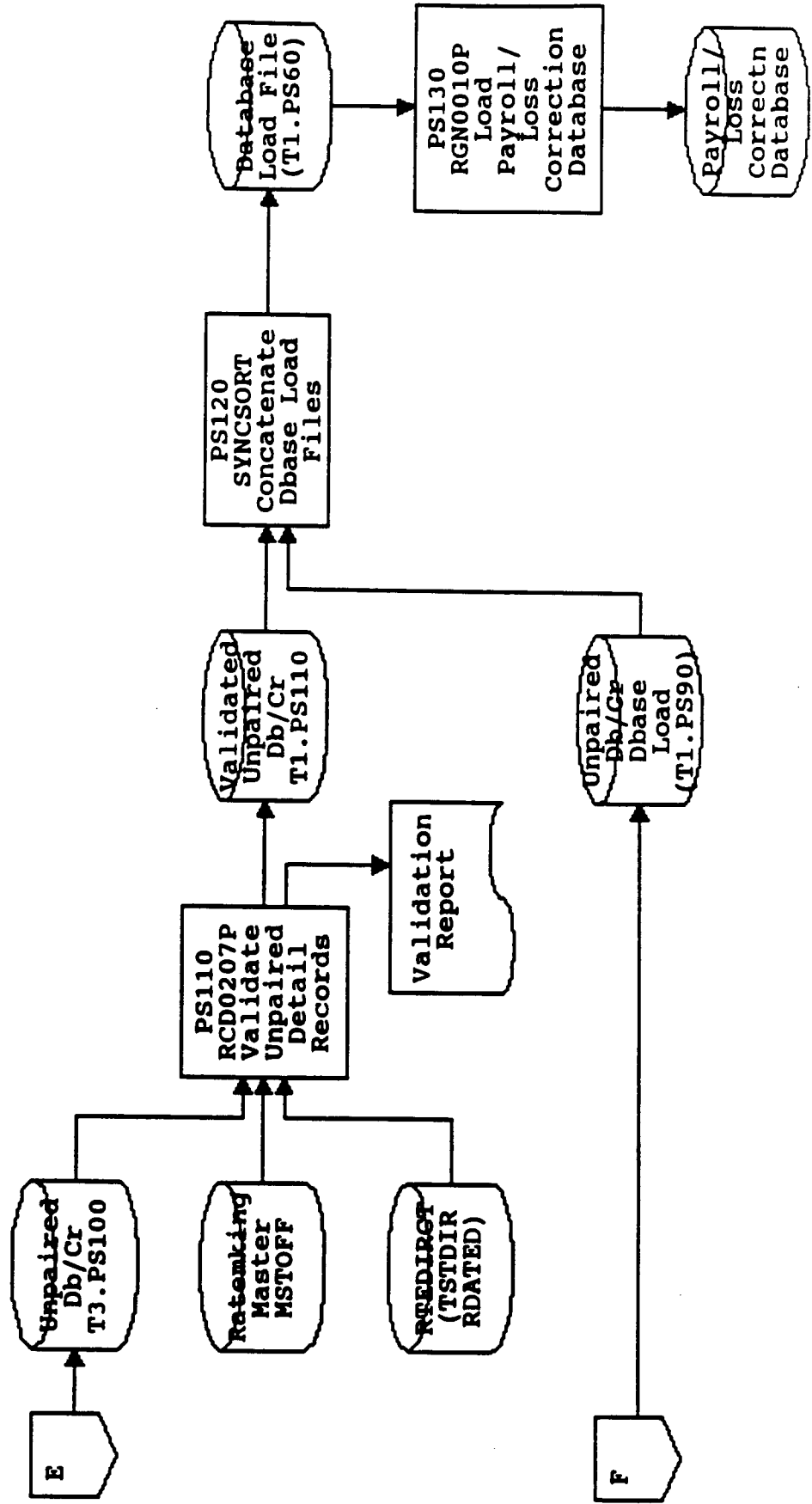
RCDVALID



NAIC Examination of NCCI

Unit Card Data Administration

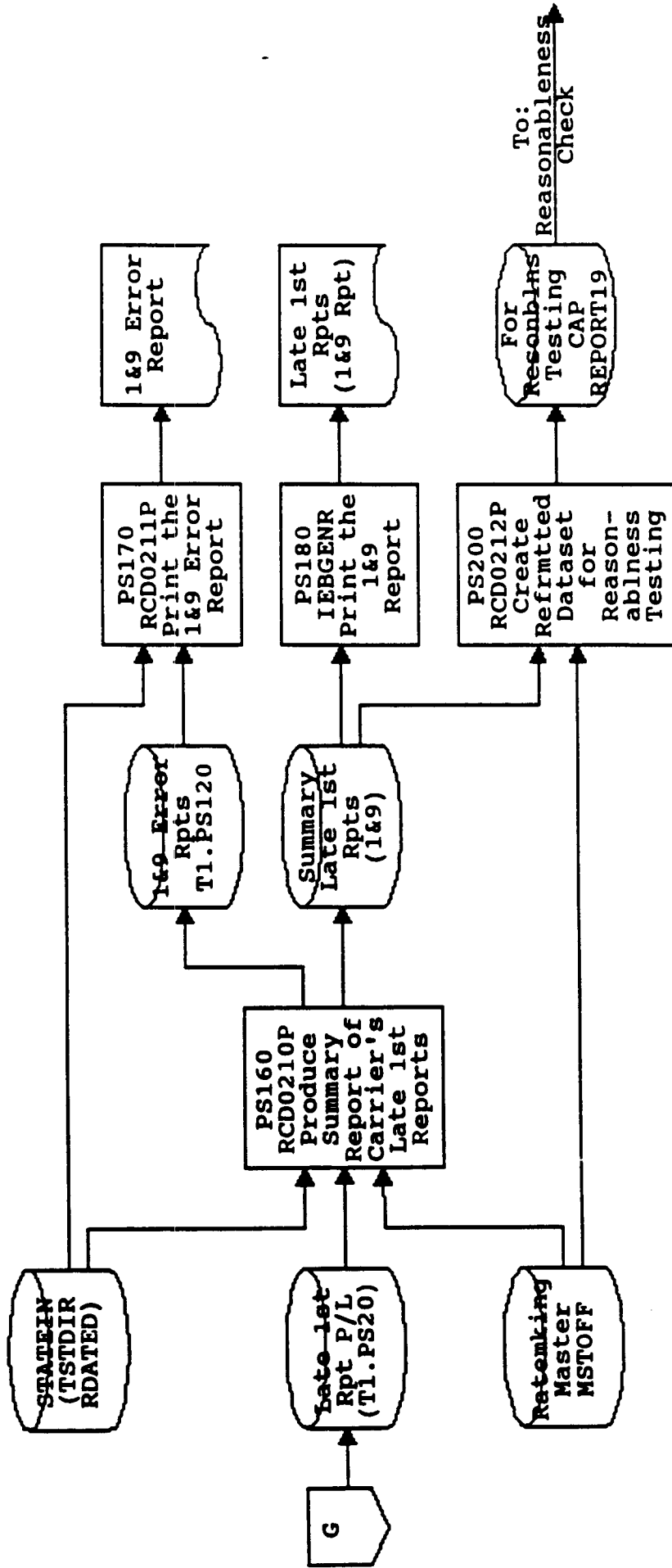
RCDVALID



NAIC Examination of NCCI

Unit Card Data Administration

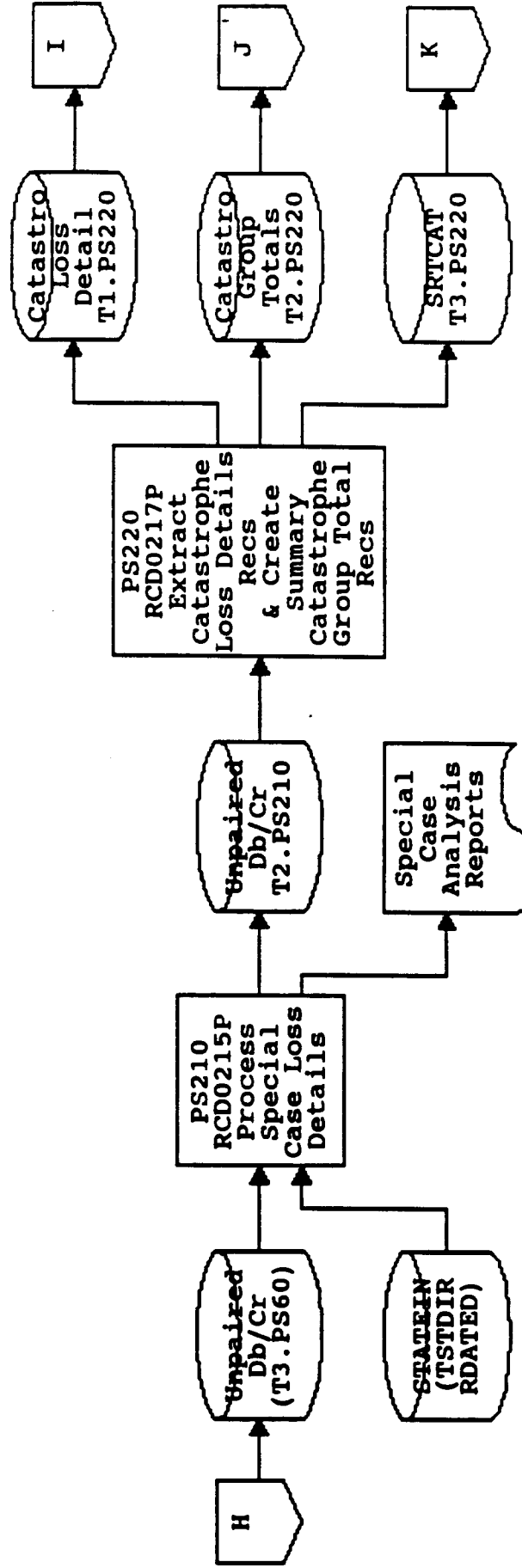
RCDVALID



NAIC Examination of NCCI

Unit Card Data Administration

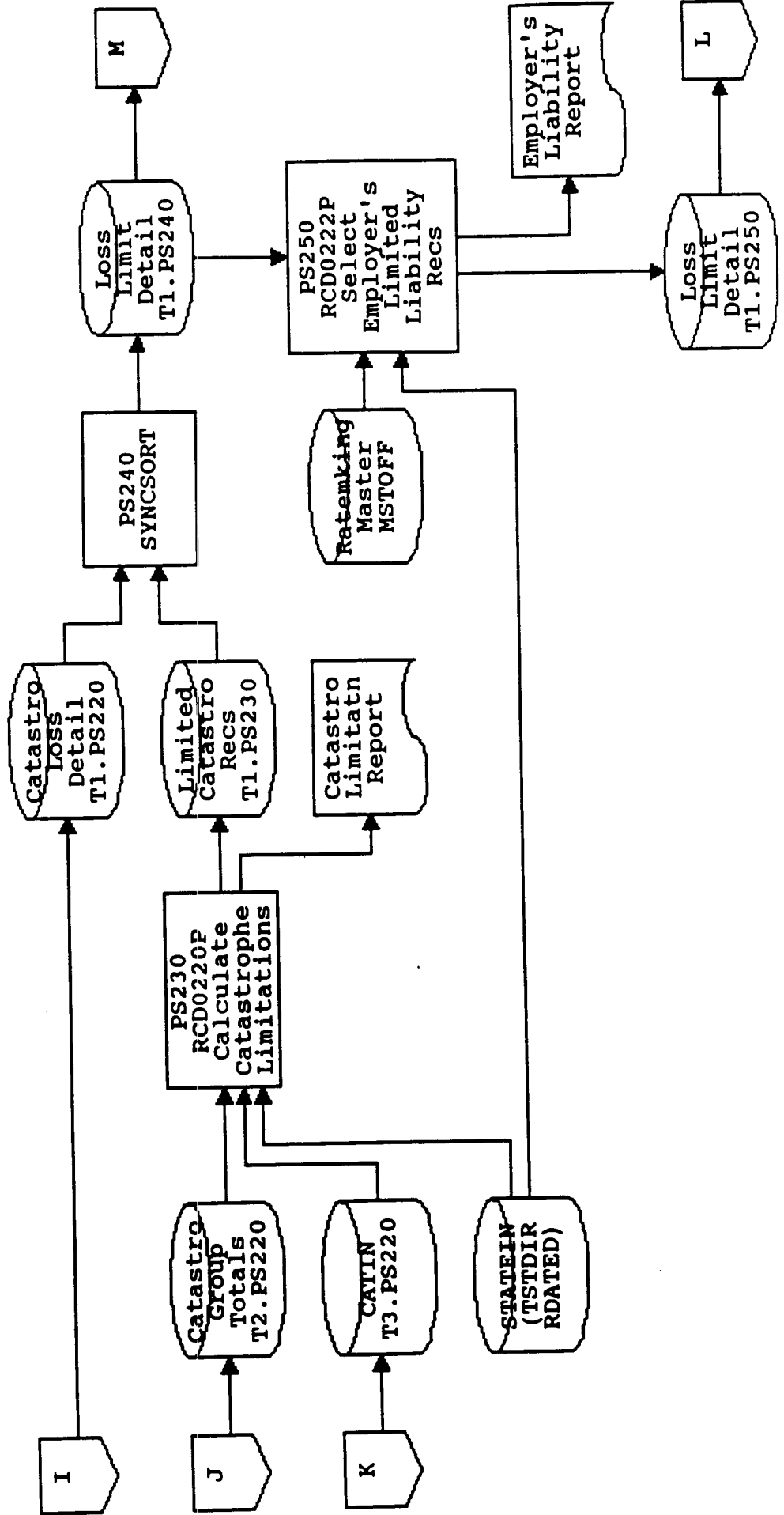
RCDVALID



NAIC Examination of NCCI

Unit Card Data Administration

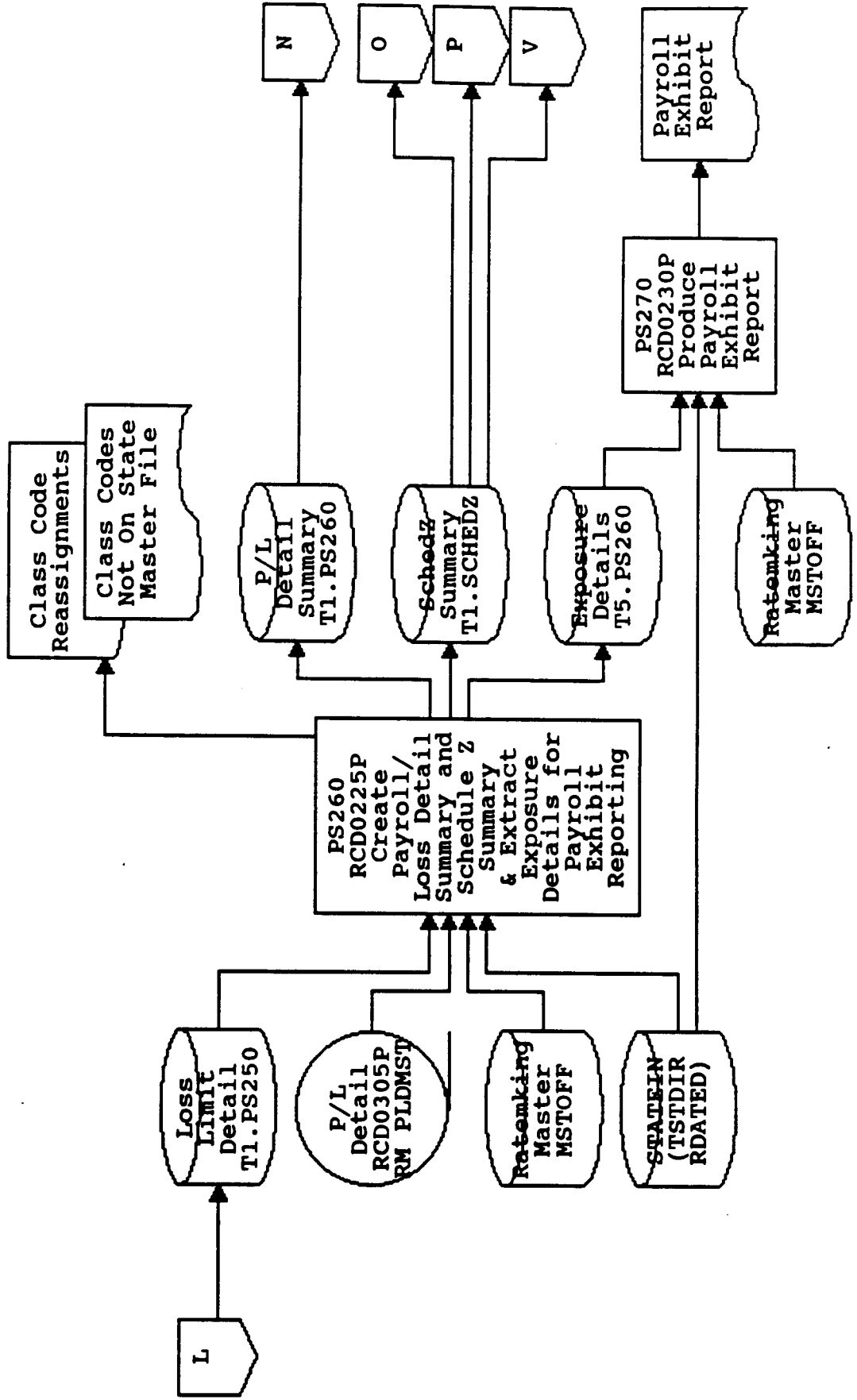
RCDVALID



NAIC Examination of NCCI

Unit Card Data Administration

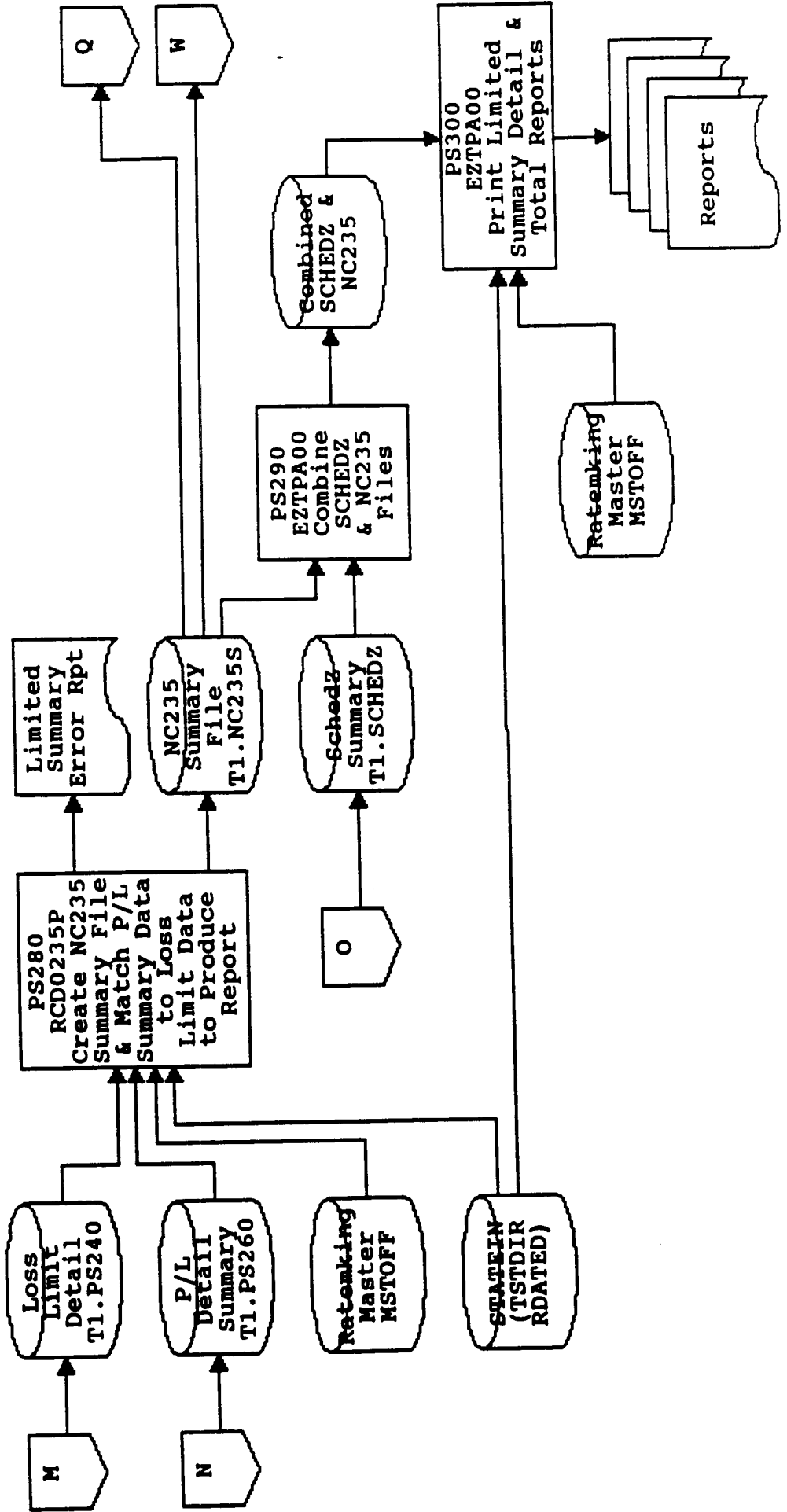
RCDVALID



NAIC Examination of NCCI

Unit Card Data Administration

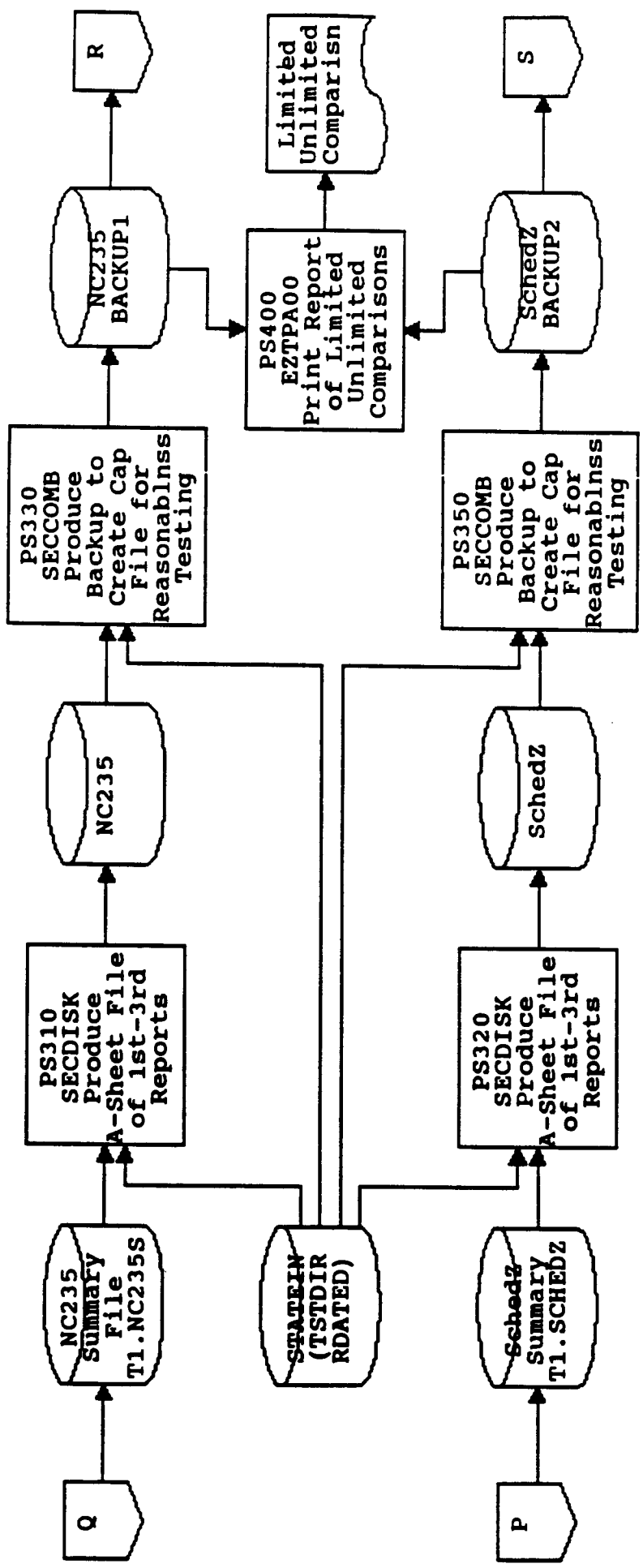
RCDVALID



NAIC Examination of NCCI

Unit Card Data Administration

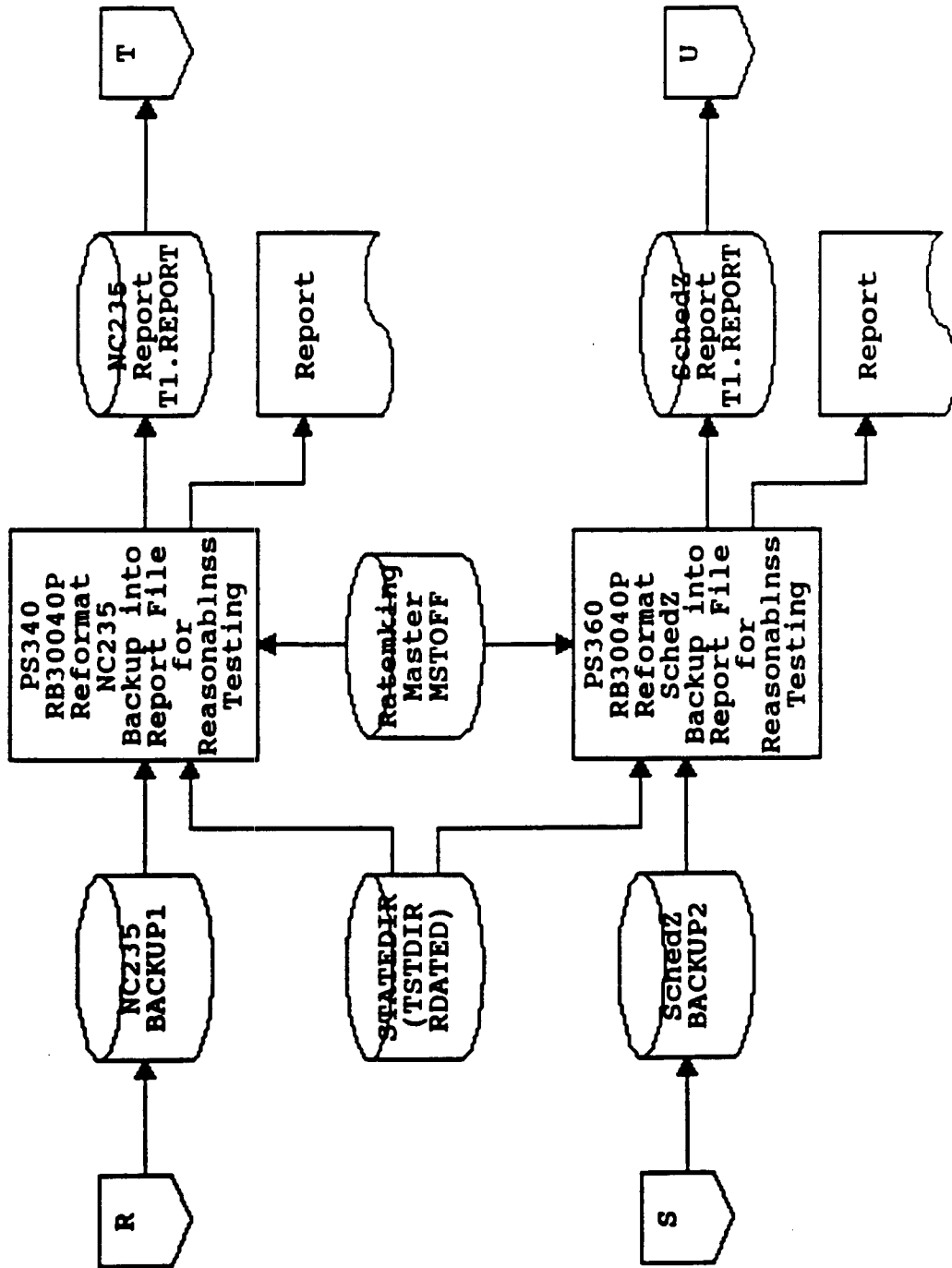
RCDVALID



NAIC Examination of NCCI

Unit Card Data Administration

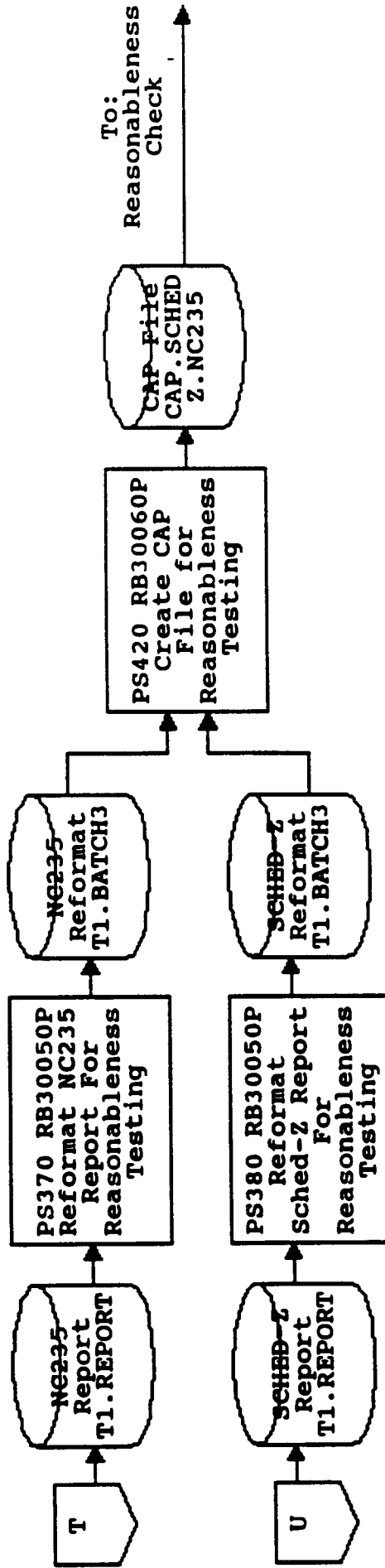
RCDVALID



NAIC Examination of NCCI

Unit Card Data Administration

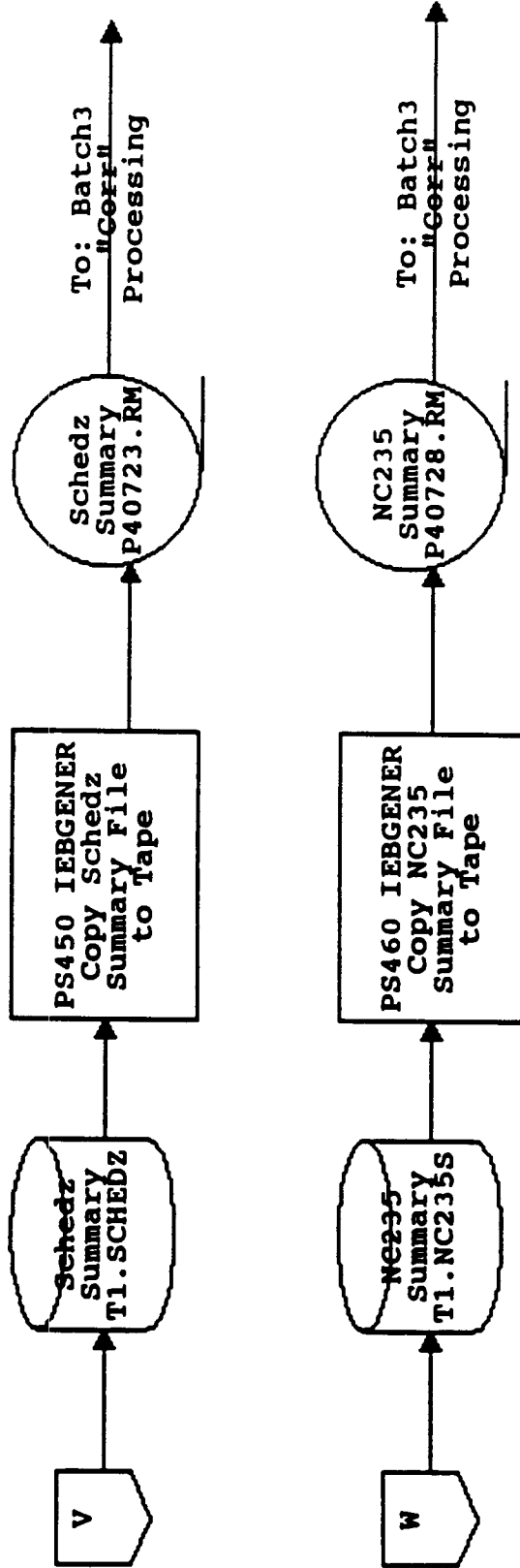
RCDVALID



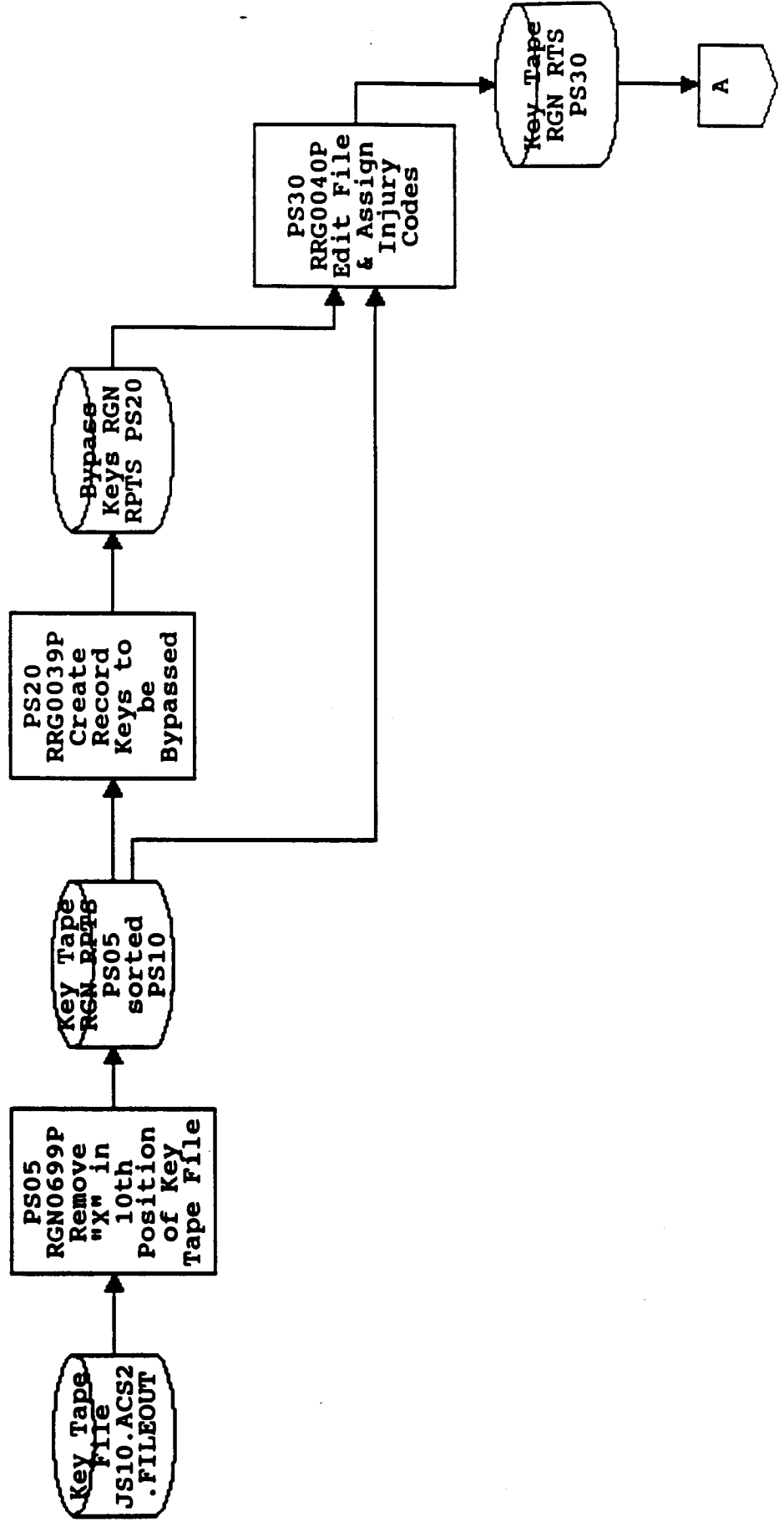
NAIC Examination of NCCI

Unit Card Data Administration

RCDVALID



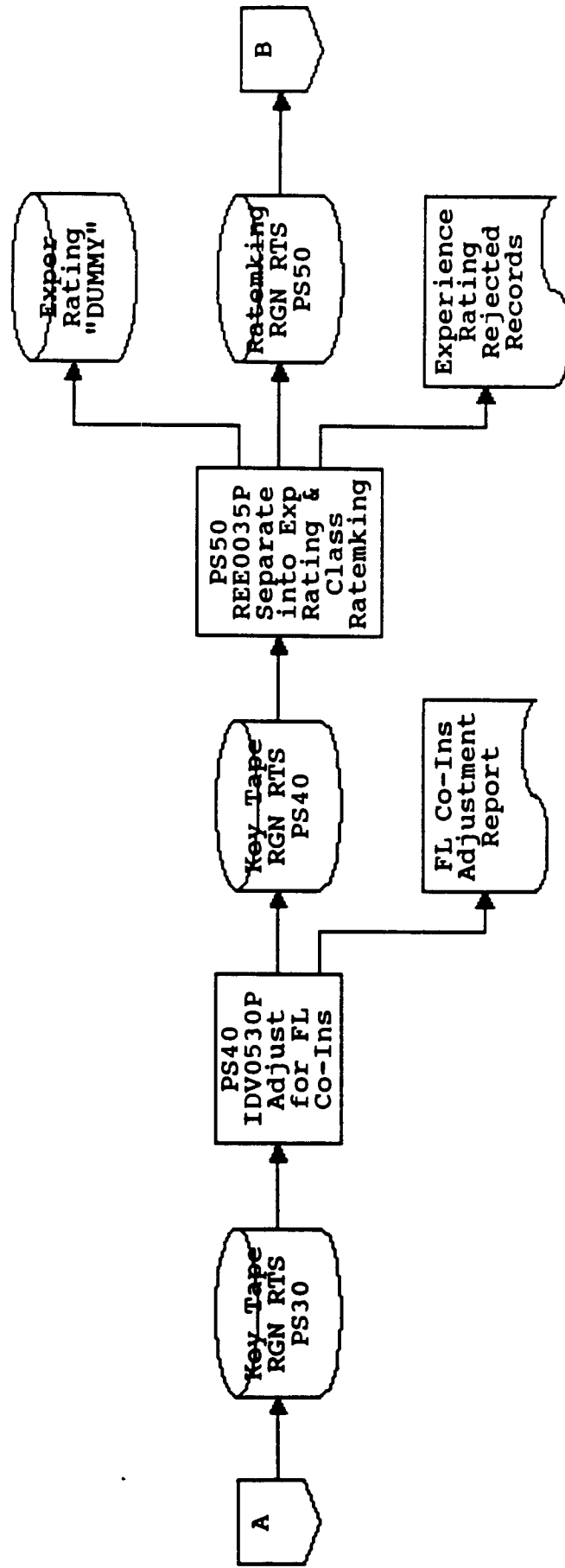
NAIC Examination of NCCI
Unit Card Data Administration
Unit Add Program (RGNR0700)



NAIC Examination of NCCI

Unit Card Data Administration

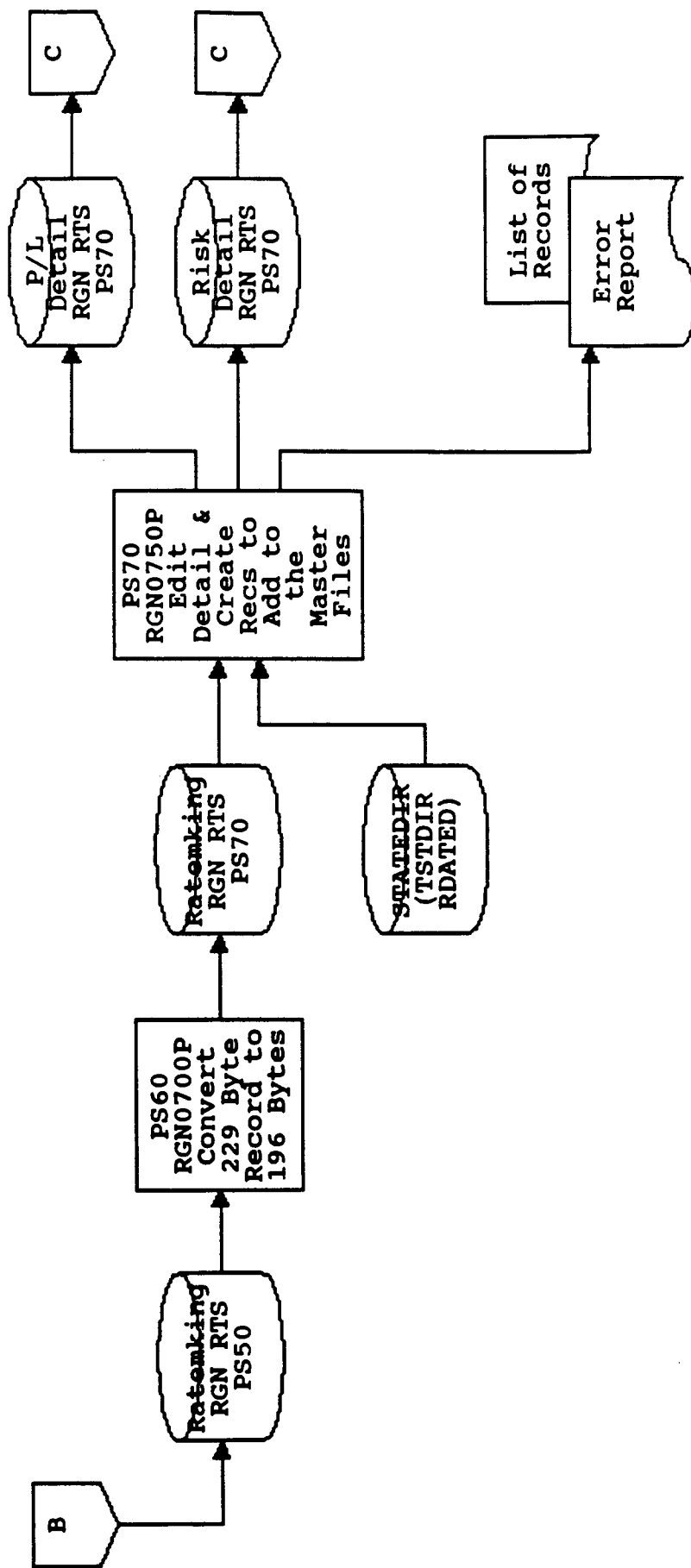
Unit Add Program (RGNR0700)



NAIC Examination of NCCI

Unit Card Data Administration

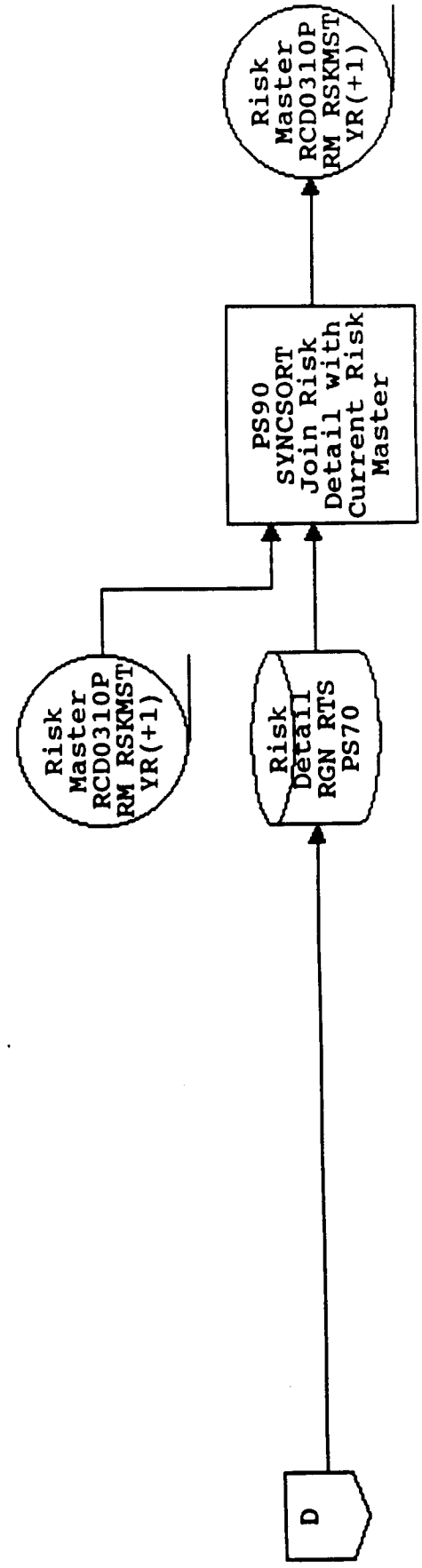
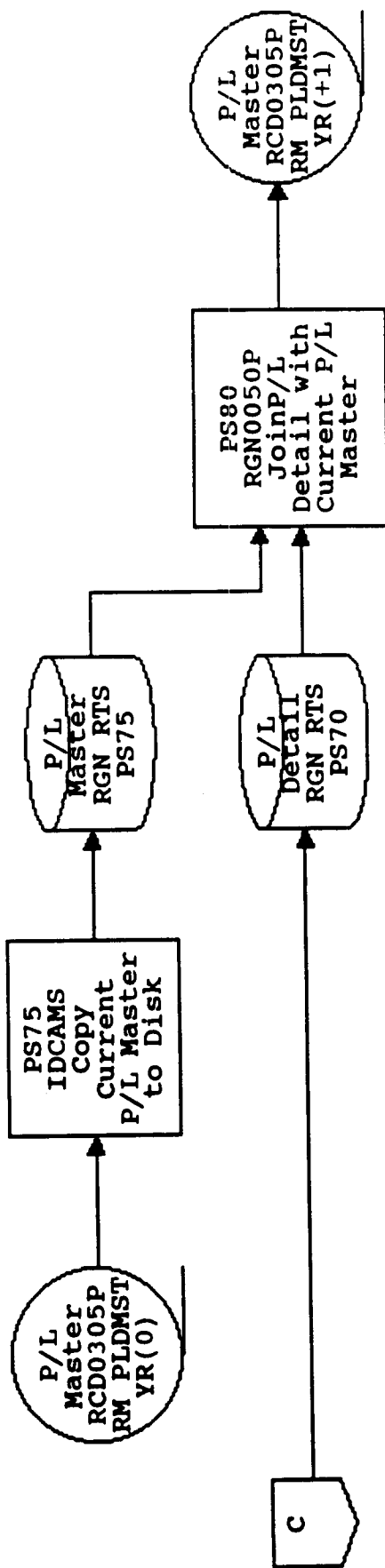
Unit Add Program (RGNR0700)



NAIC Examination of NCCI

Unit Card Data Administration

Unit Add Program (RGNR0700)

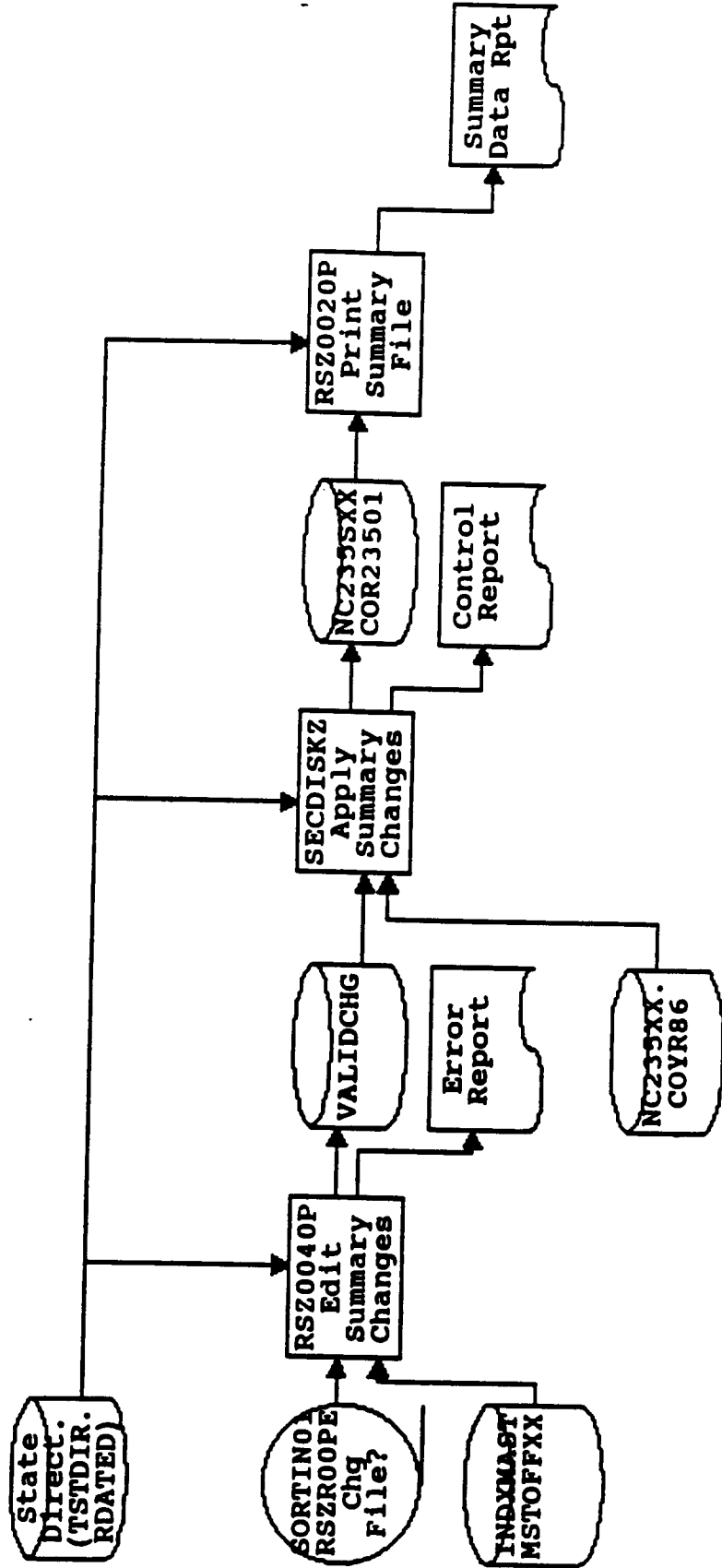


NAIC Examination of NCCI

A442

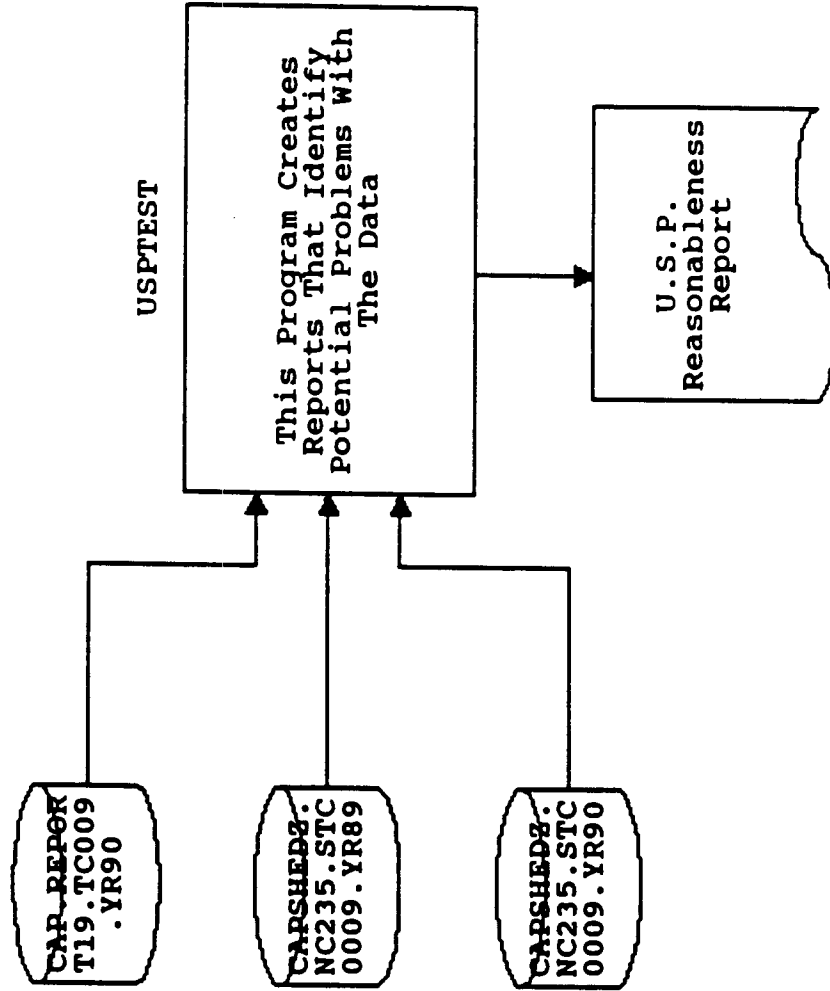
Unit Card Data Administration

NC235COR - Update Summary Payroll & Loss File



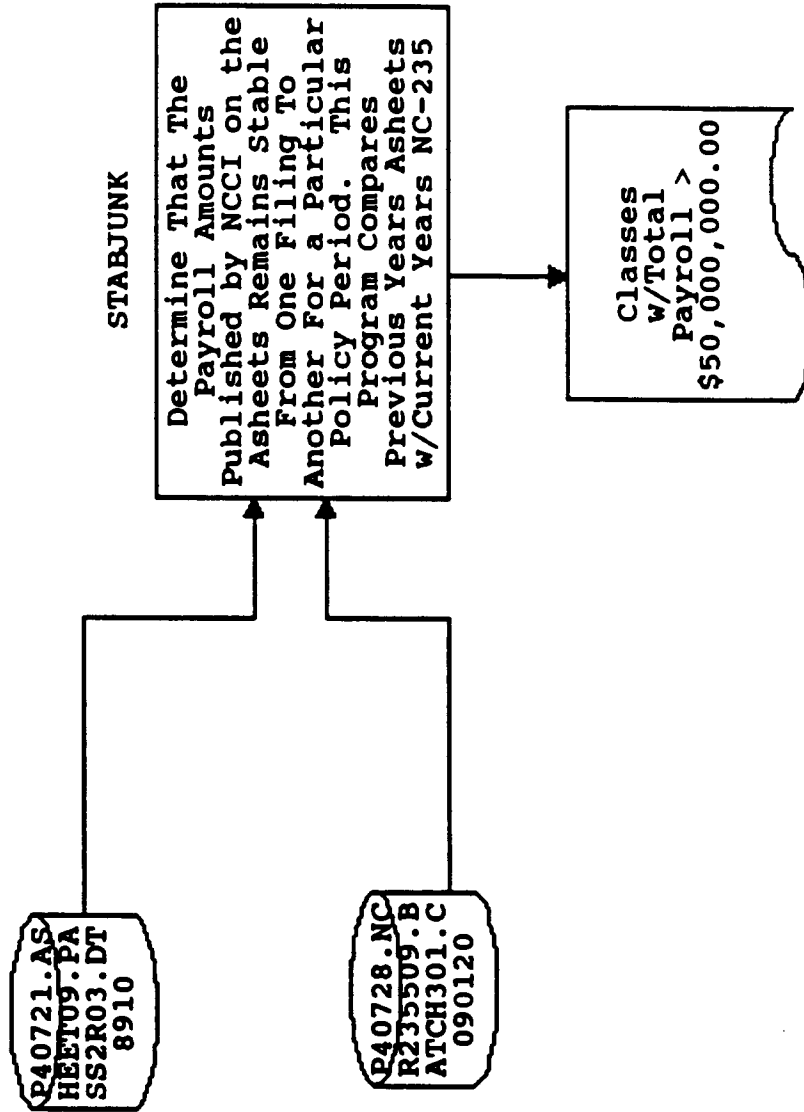
NAIC Examination of NCCI
Unit Card Data Administration
Reasonableness Check

A444



NAIC Examination of NCCI
Unit Card Data Administration
Stability Program

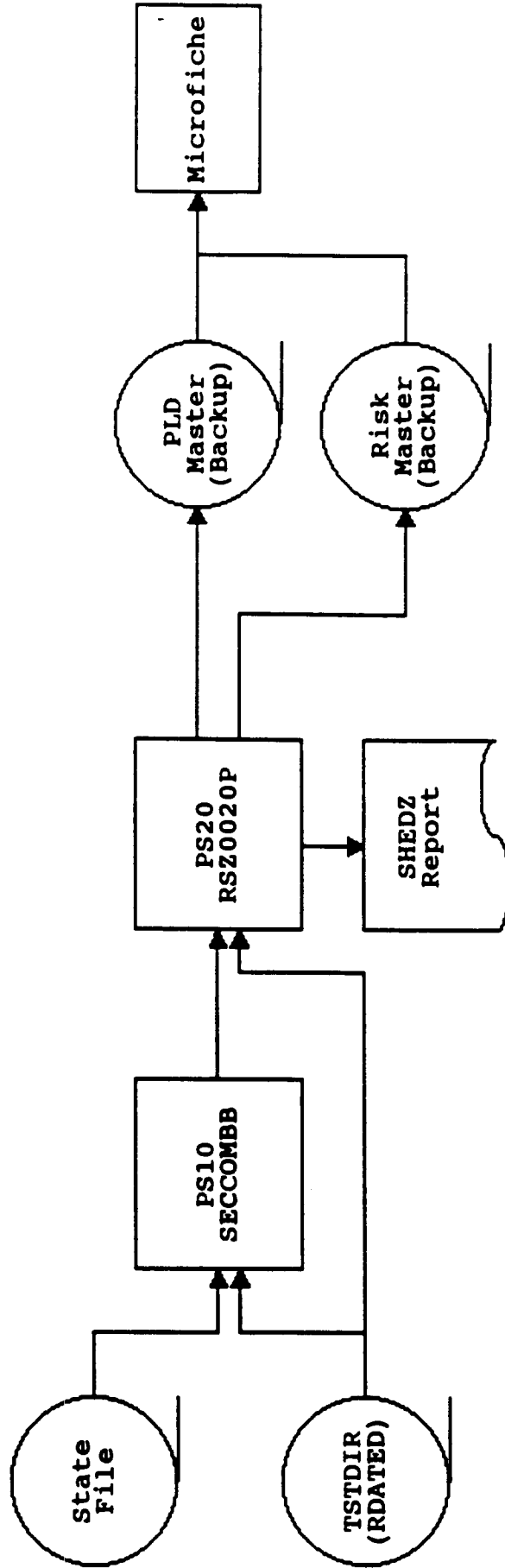
A446



NAIC Examination of NCCI
Unit Card Data Administration
SCHEZPRT

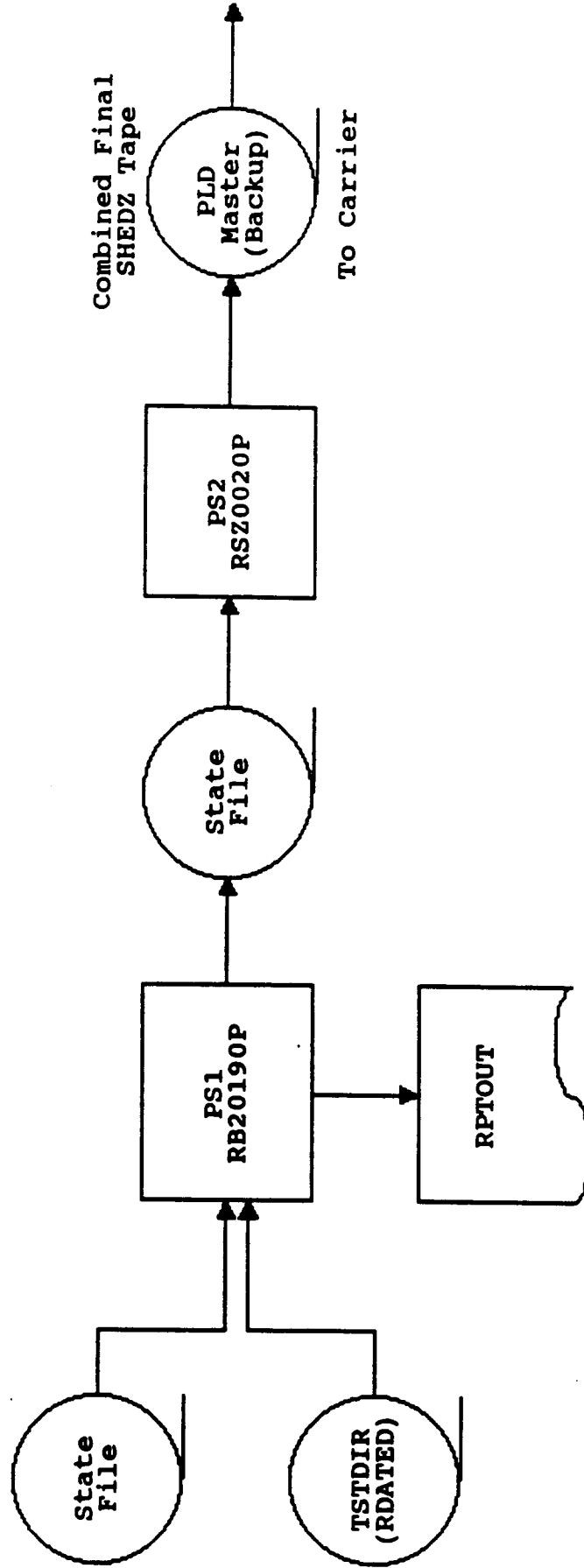
A448

Run By
Online
Submission



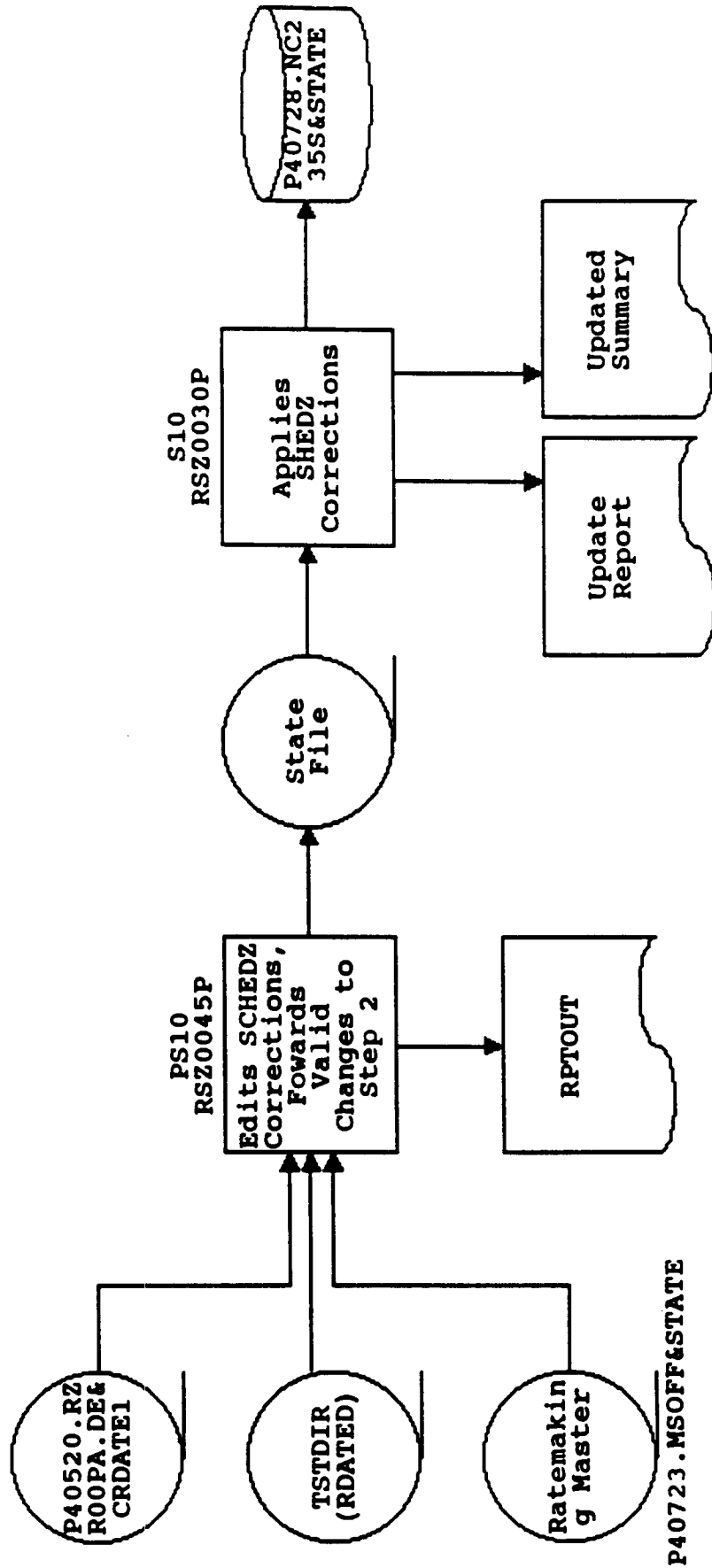
NAIC Examination of NCCI
Unit Card Data Administration
SCHZCOMB

A450

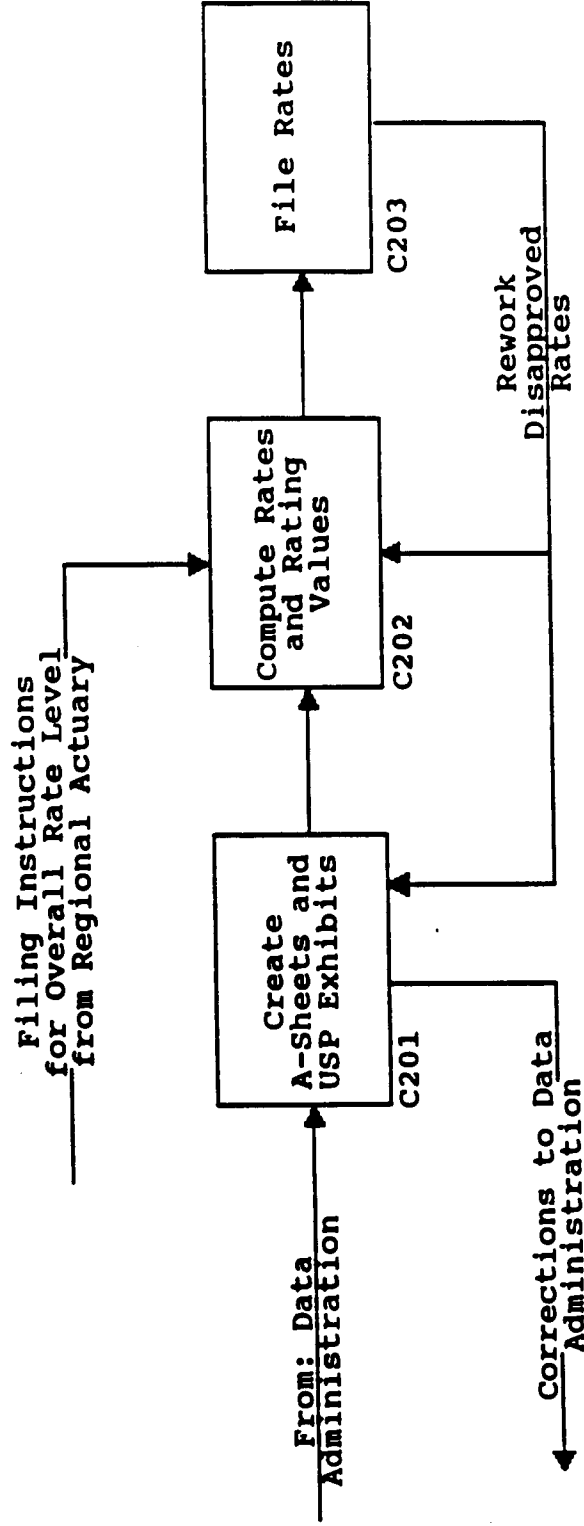


NAIC Examination of NCCI
Unit Card Data Administration
SCHZUPDT

A454



NAIC Examination of NCCI
Class Ratemaking
High Level Flow

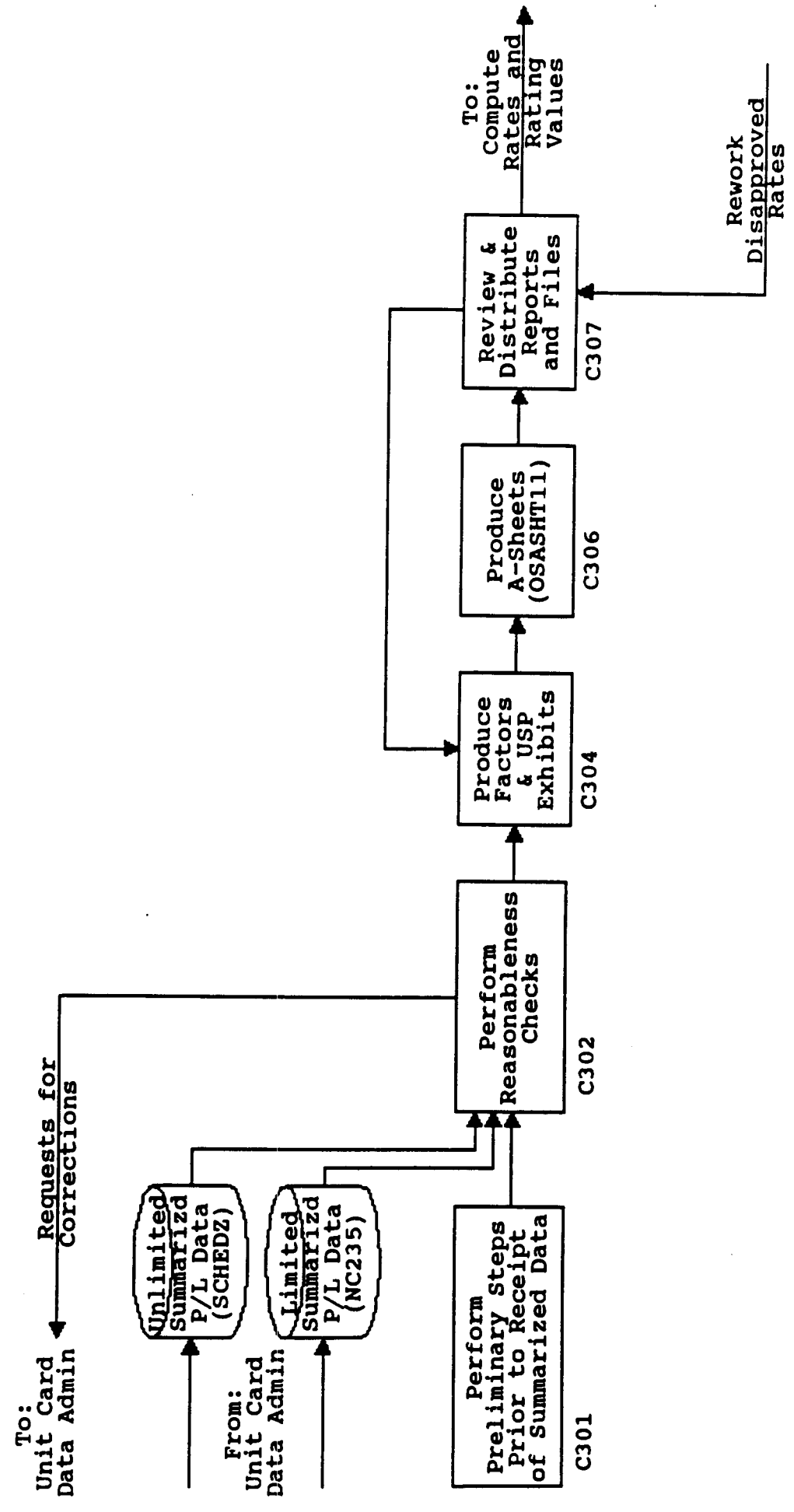


NAIC Examination of NCCI

C201

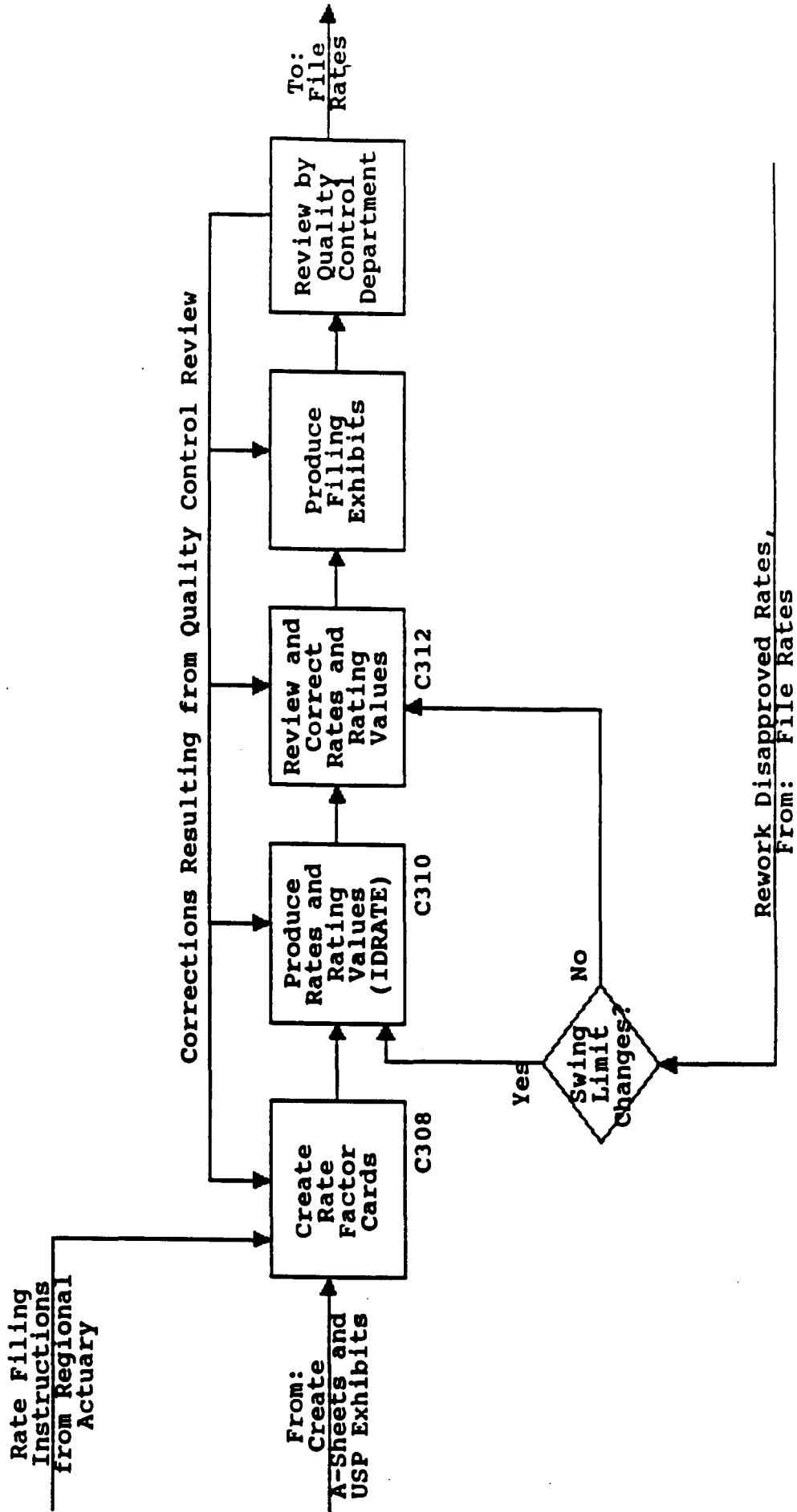
Class Ratemaking

Create A-Sheets and USP Exhibits



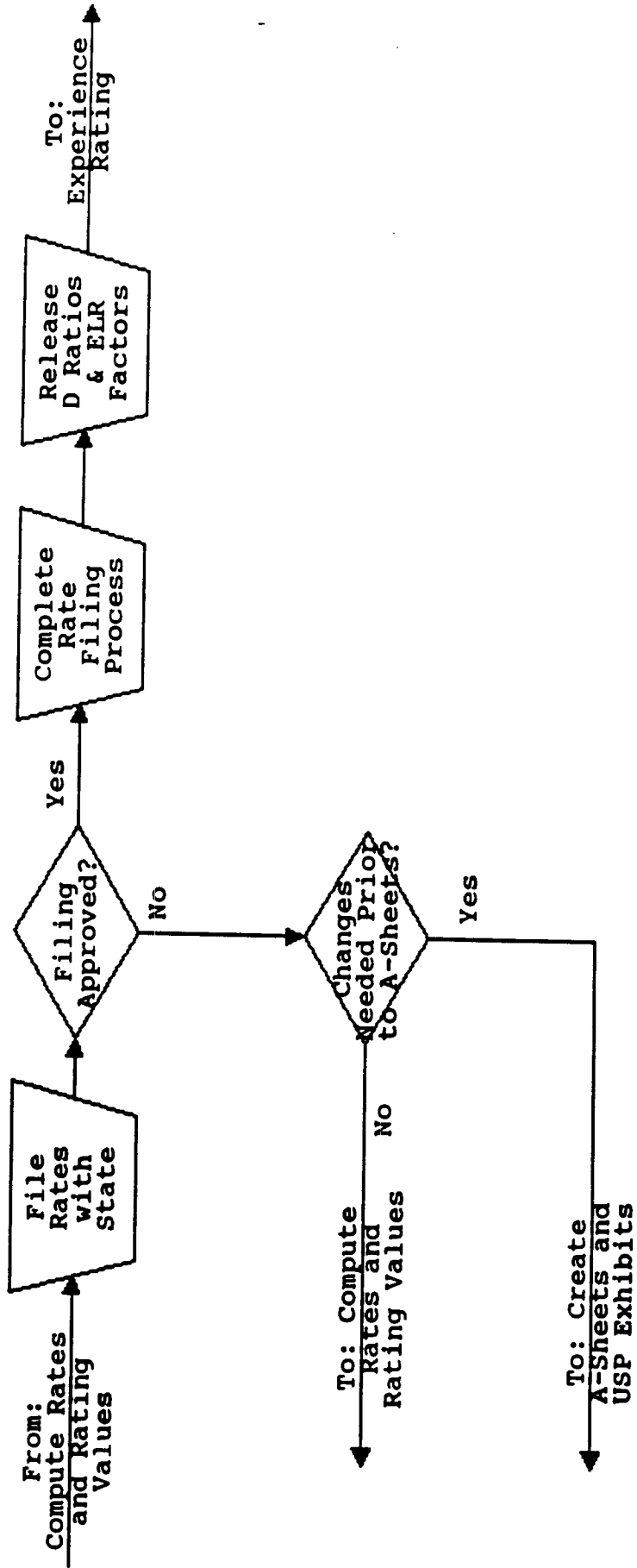
From:
File Rates

NAIC Examination of NCCI
Class Ratemaking
Compute Rates and Rating Values



NAIC Examination of NCCI
Class Ratemaking
File Rates

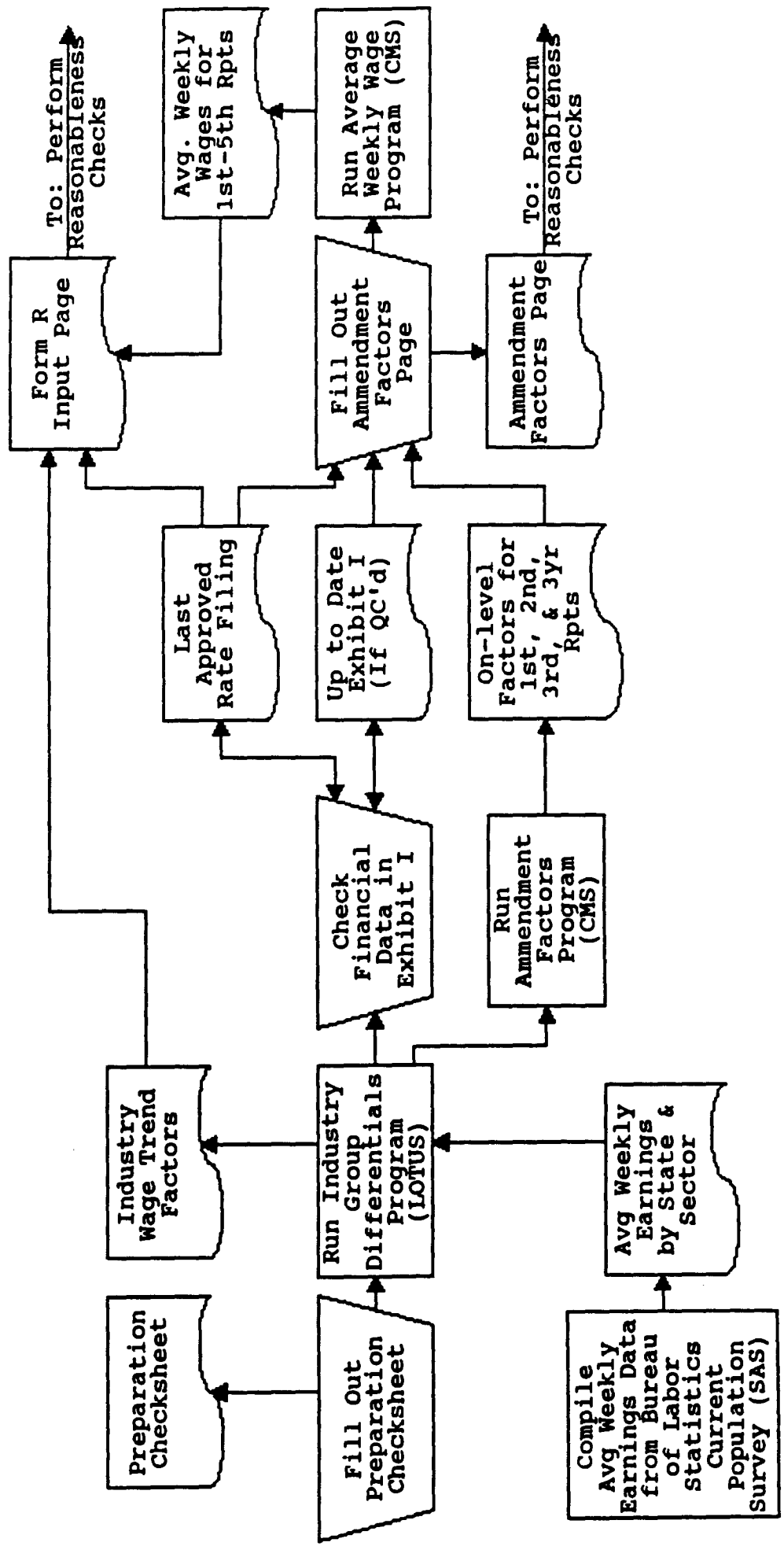
C203



NAIC Examination of NCCI
Class Ratemaking

C301

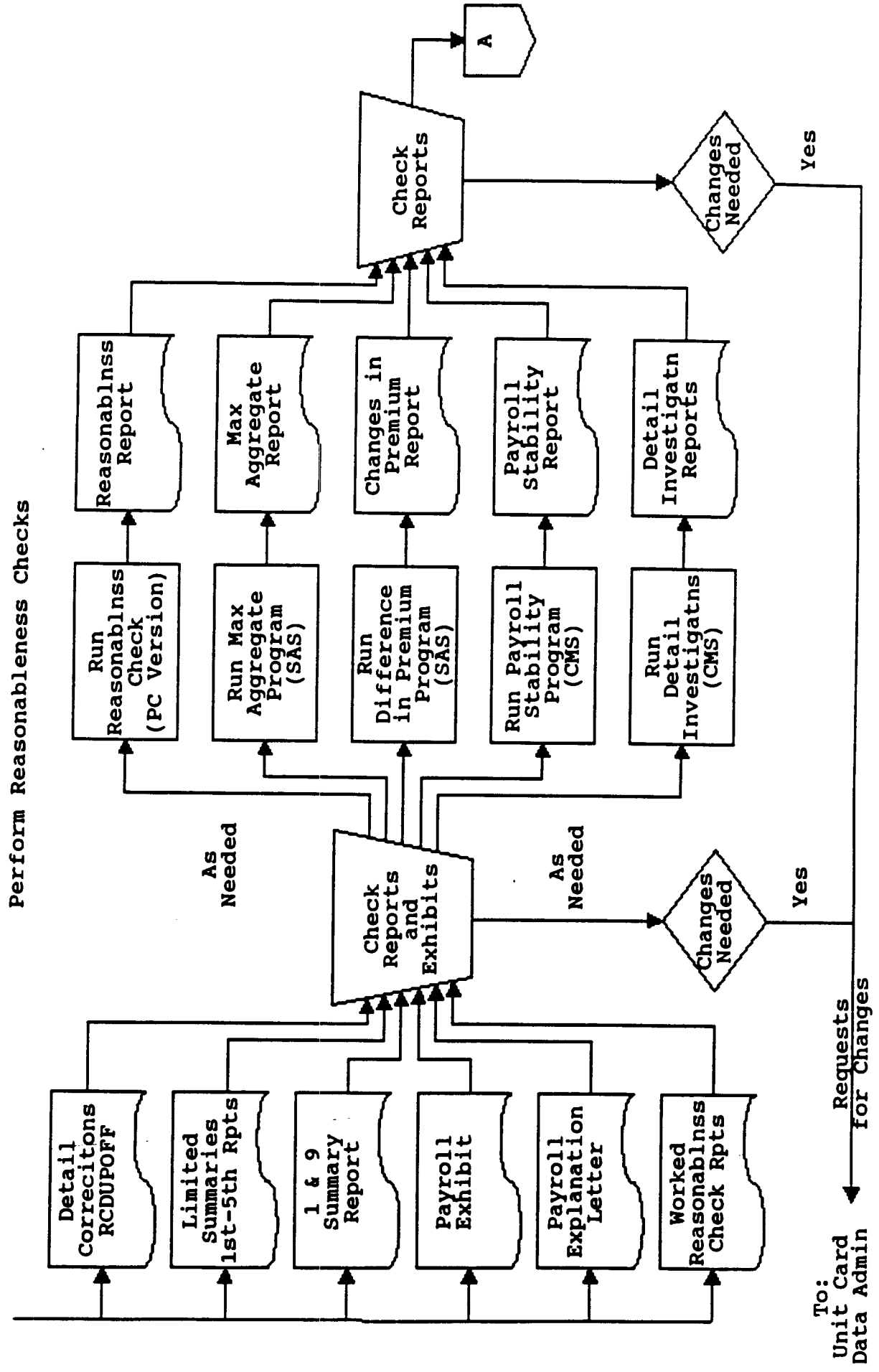
Perform Preliminary Steps Prior to Receipt of Summarized Data



From:
Unit Card
Data Admin

NAIC Examination of NCCI
Class Ratemaking

C302A

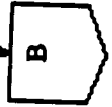
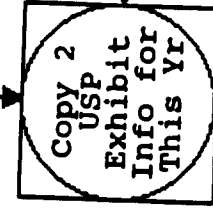
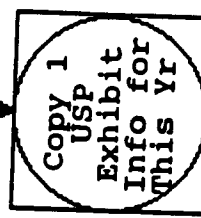
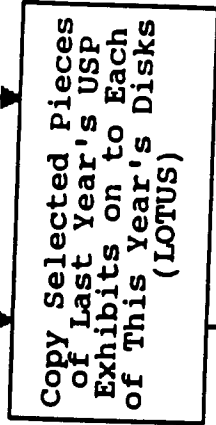
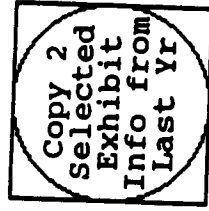
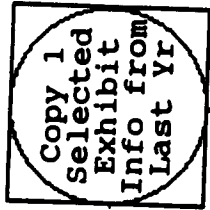
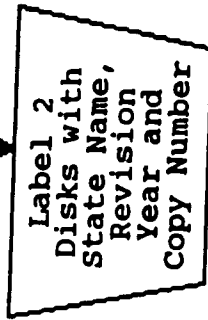


To:
Unit Card
Data Admin

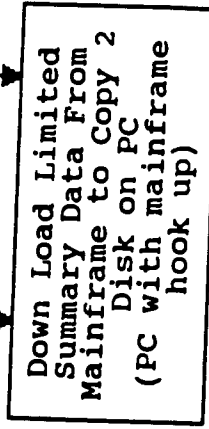
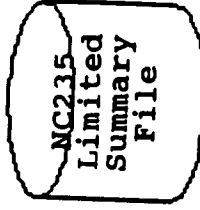
NAIC Examination of NCCI
Class Ratemaking
Perform Reasonableness Checks

C302B

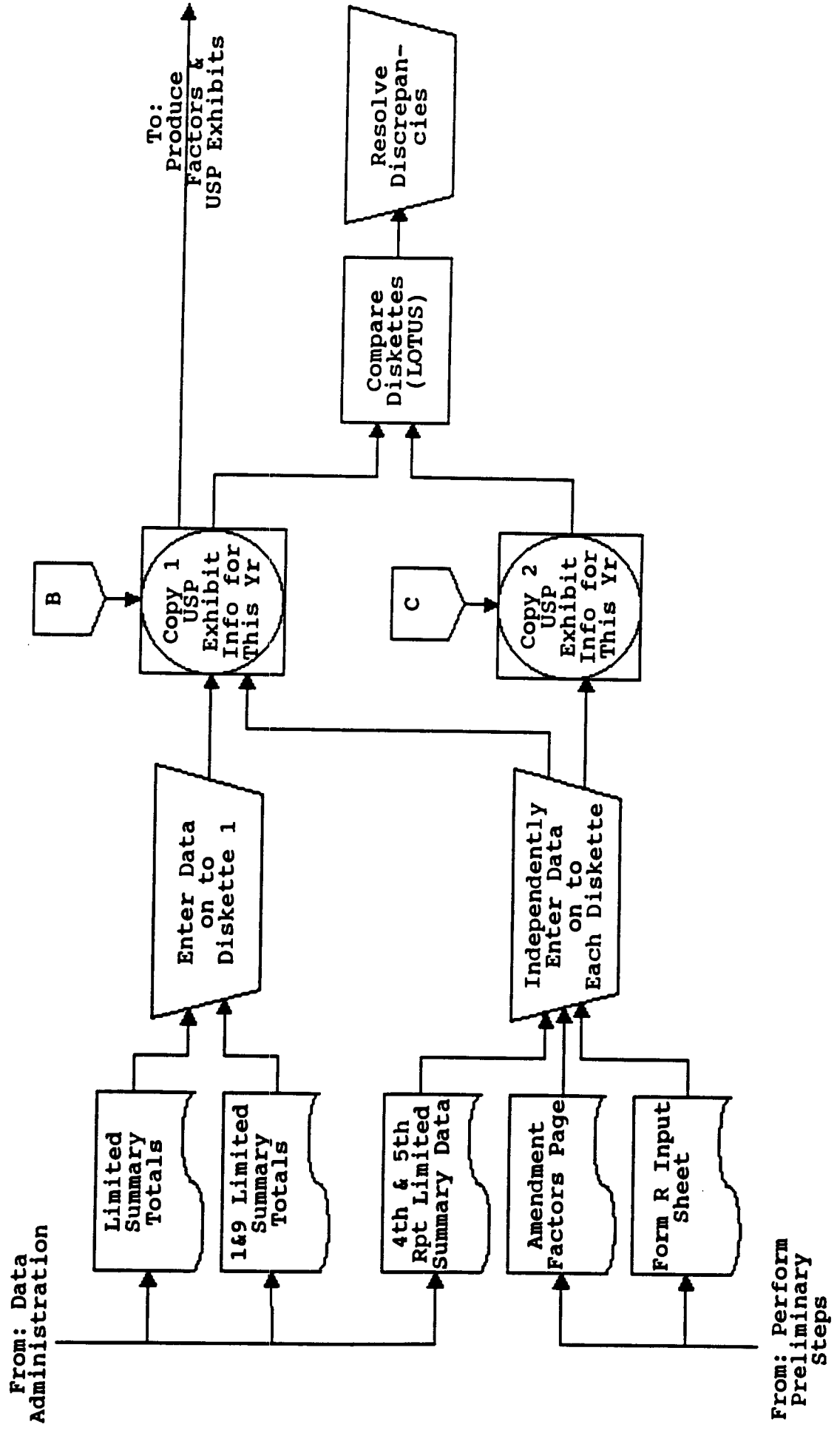
From
Check Reports



From: Data Administration



NAIC Examination of NCCI
Class Ratemaking
Perform Reasonableness Checks

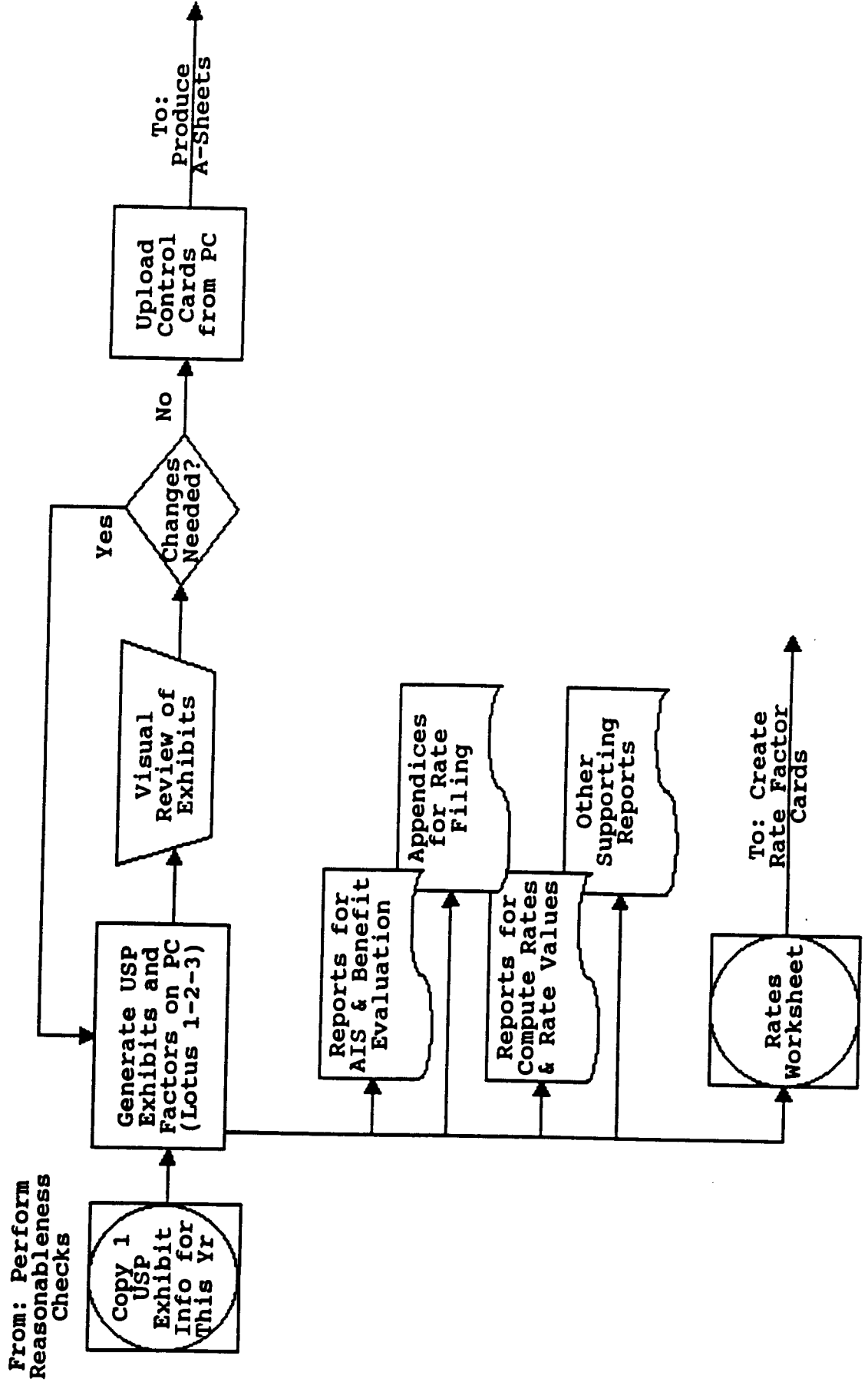


NAIC Examination of NCCI

C304

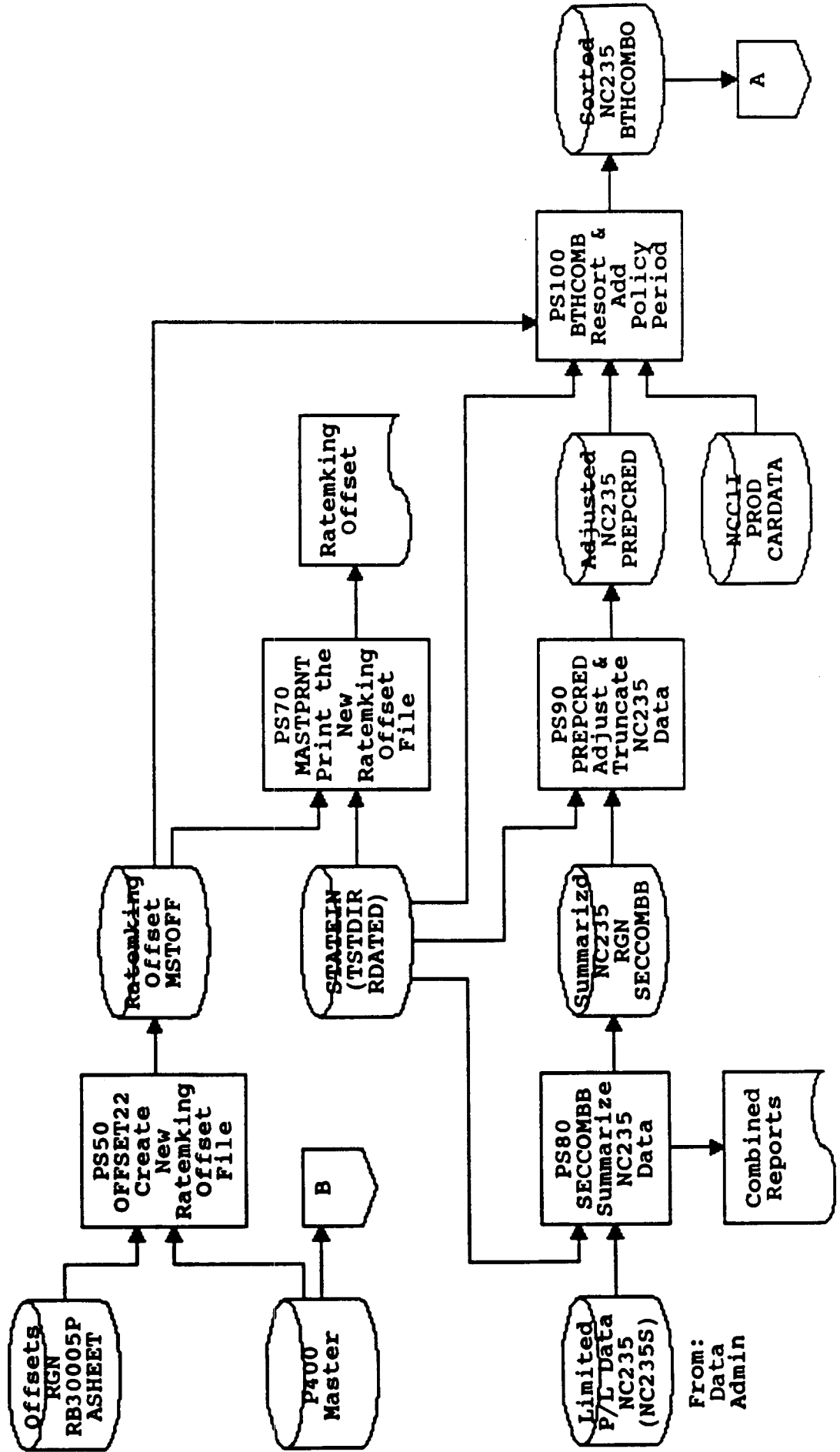
Class Ratemaking

Produce Factors and USP Exhibits



NAIC Examination of NCCI
 Class Ratemaking
 Produce A-Sheets (OSASHT11)

C306A

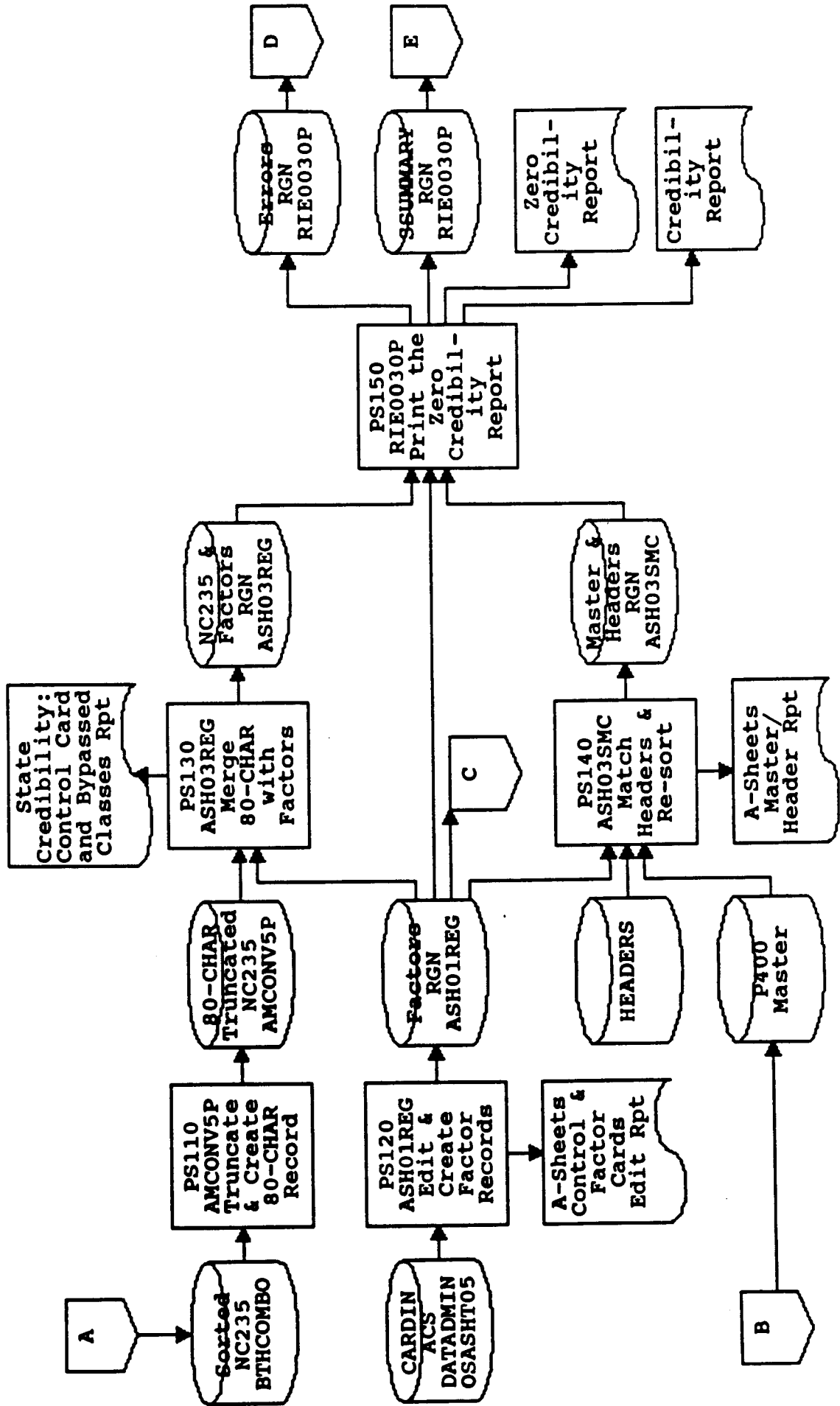


NAIC Examination of NCCI

C306B

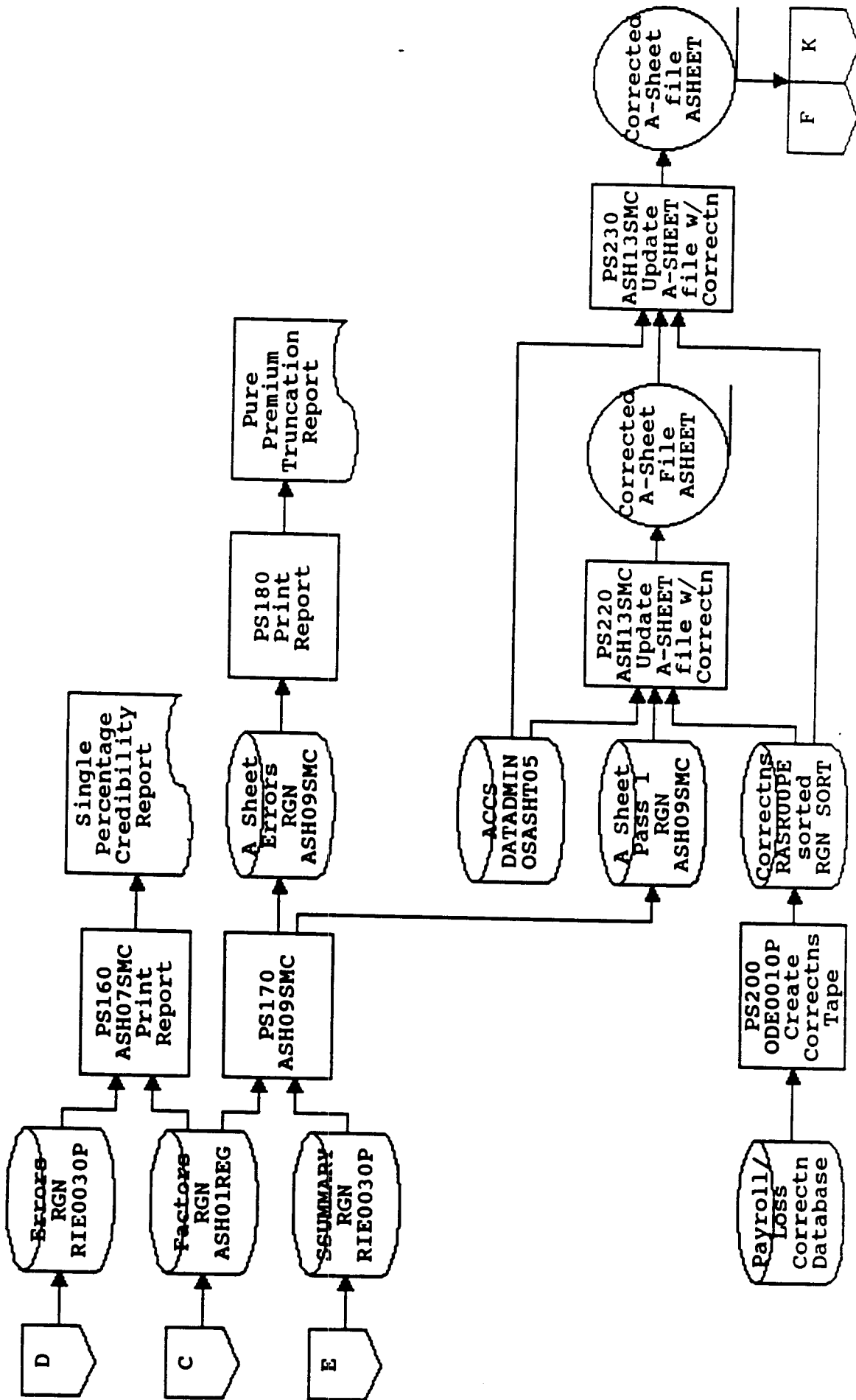
Class Ratemaking

Produce A-Sheets (OSASHT11)

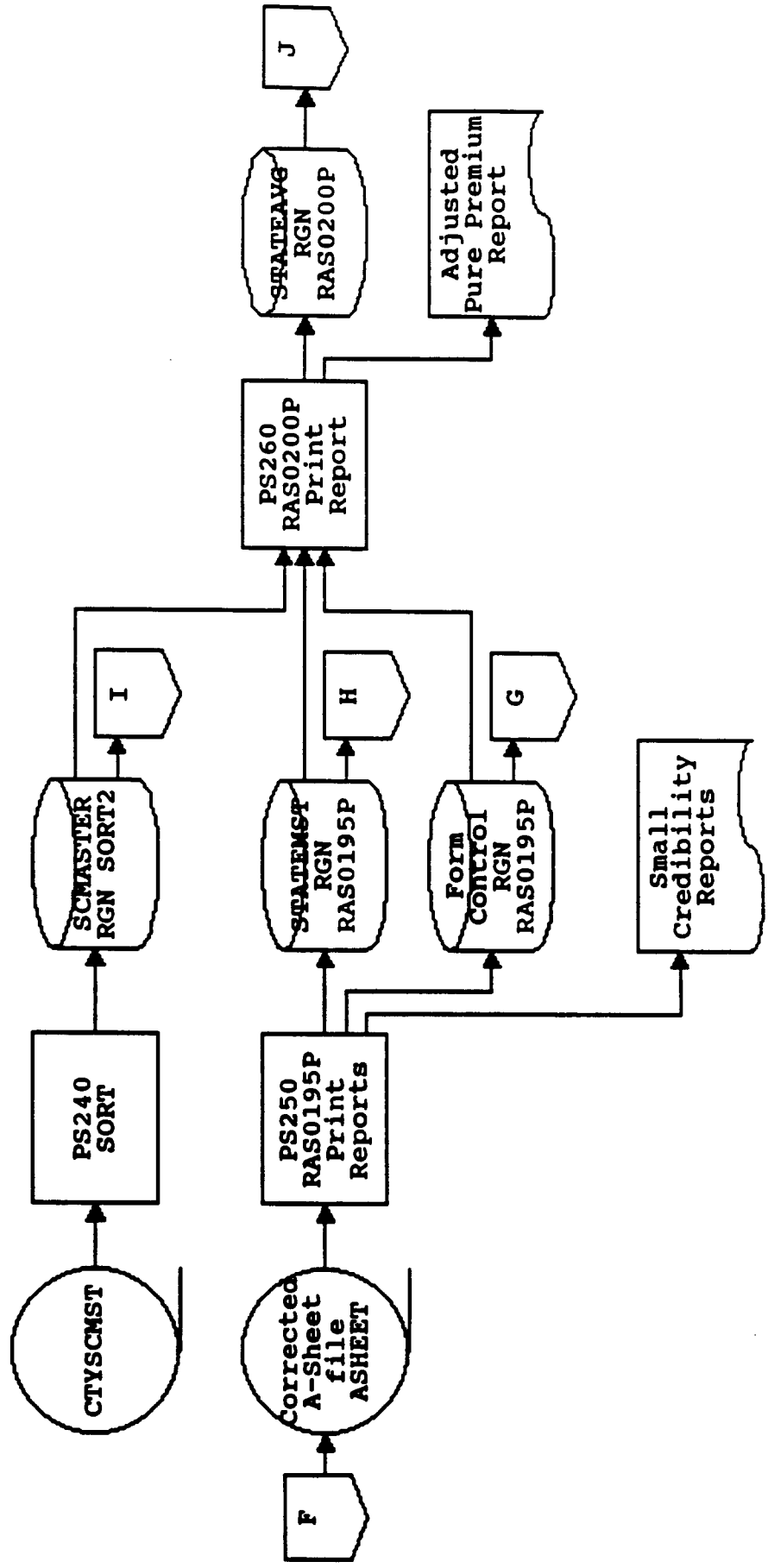


NAIC Examination of NCCI
 Class Ratemaking
 Produce A-Sheets (OSASHT11)

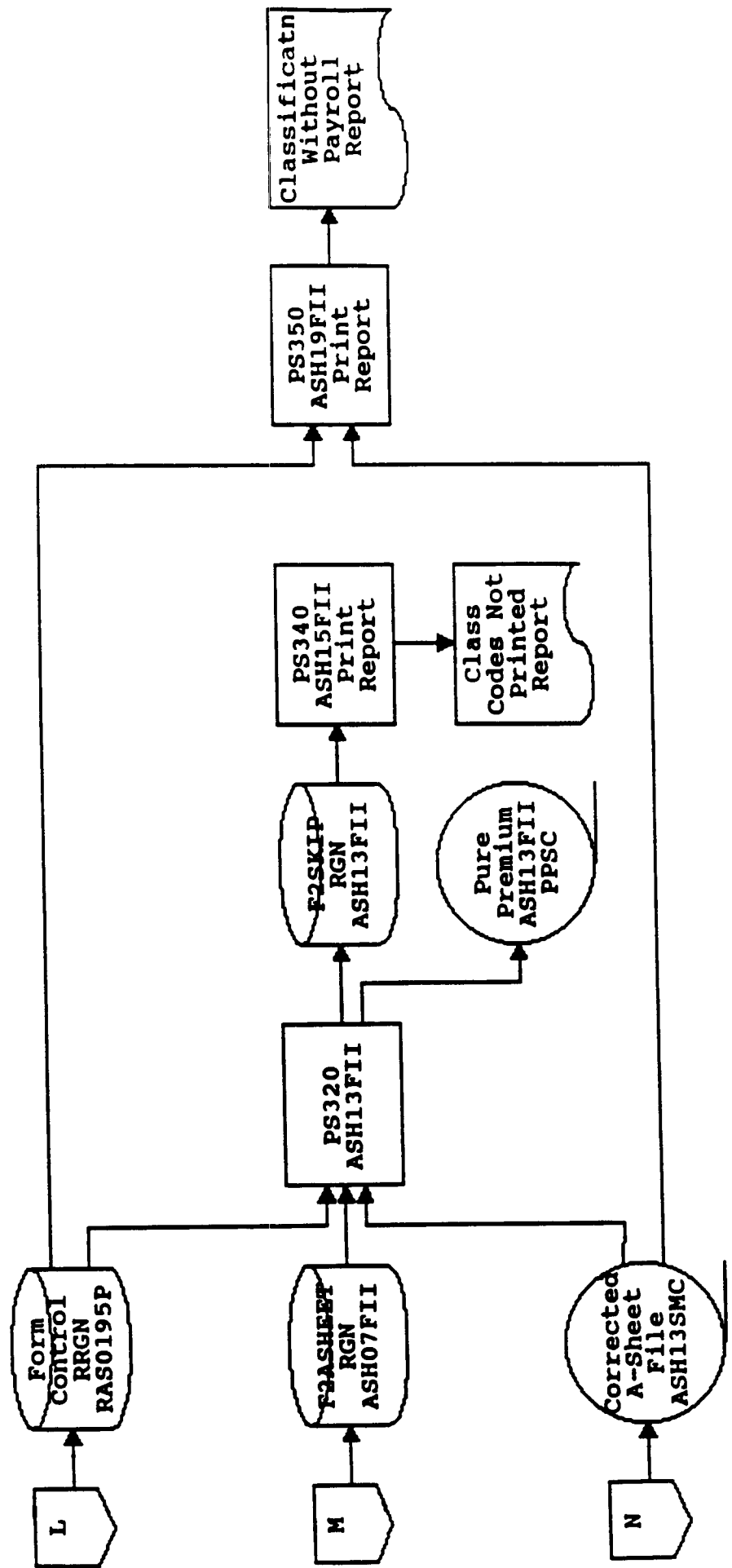
C306C



NAIC Examination of NCCI
Class Ratemaking
Produce A-Sheets (OSASHT11)



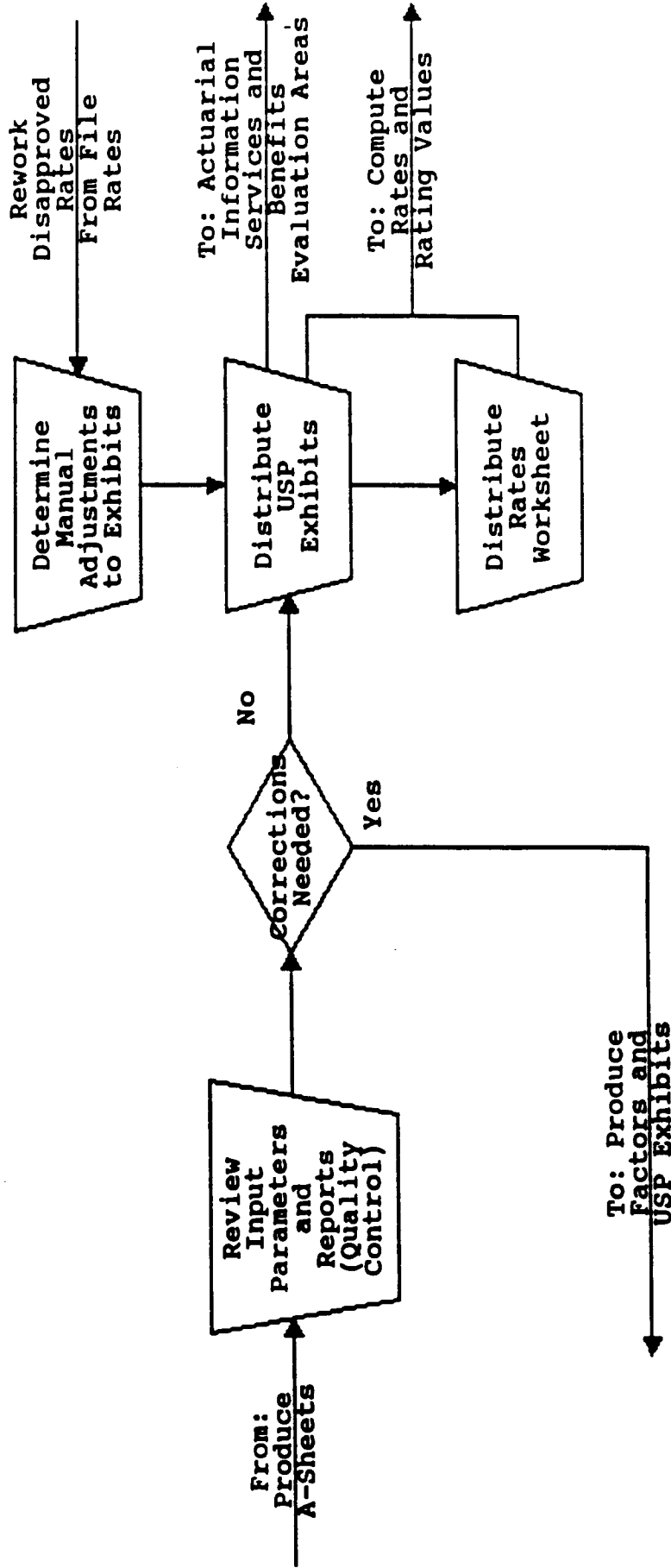
NAIC Examination of NCCI
Class Ratemaking
Produce A-Sheets (OSASHT11)



NAIC Examination of NCCI
Class Ratemaking

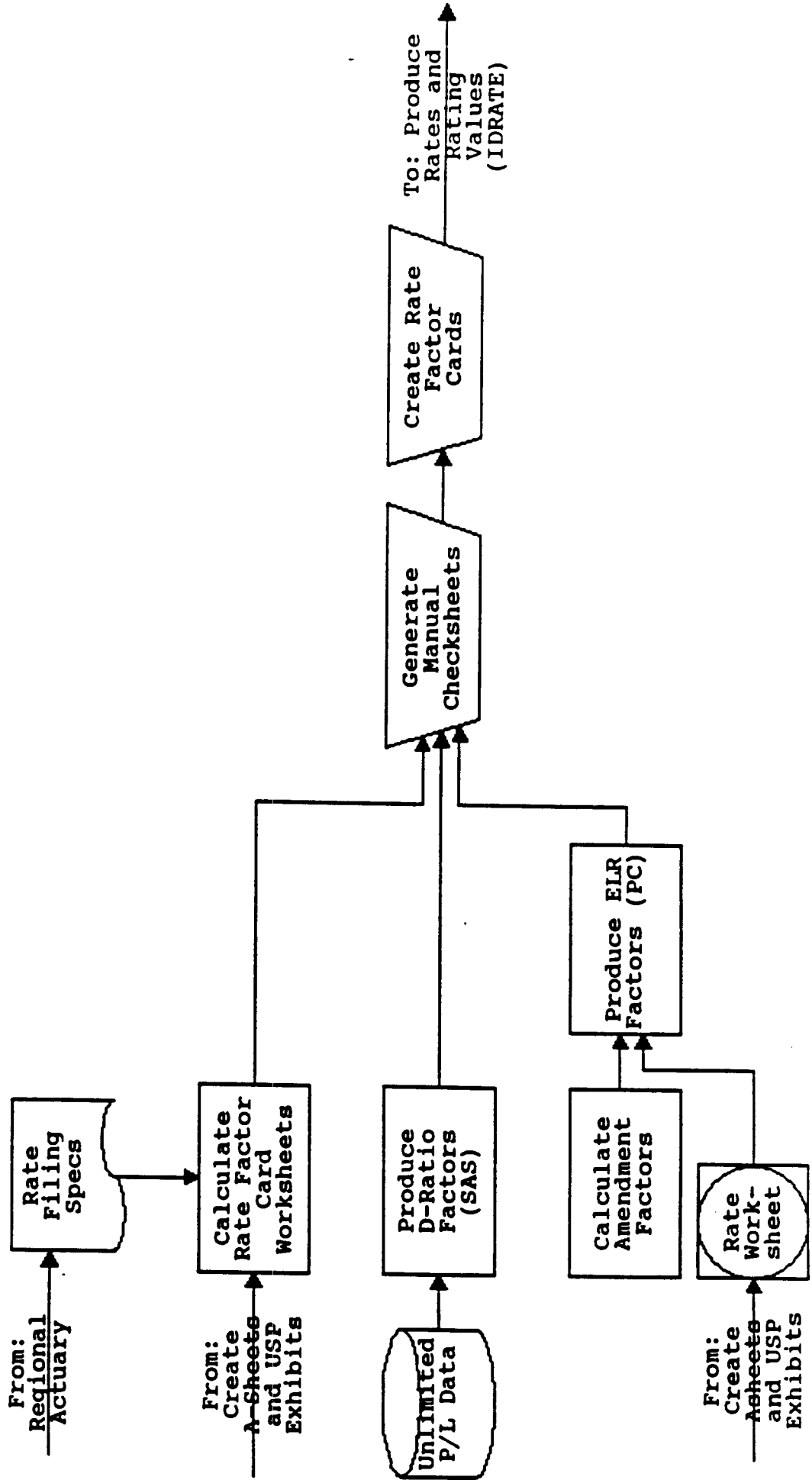
C307

Review and Distribute Reports and Files



NAIC Examination of NCCI
Compute Rates and Rating Values
Create Rate Factor Cards

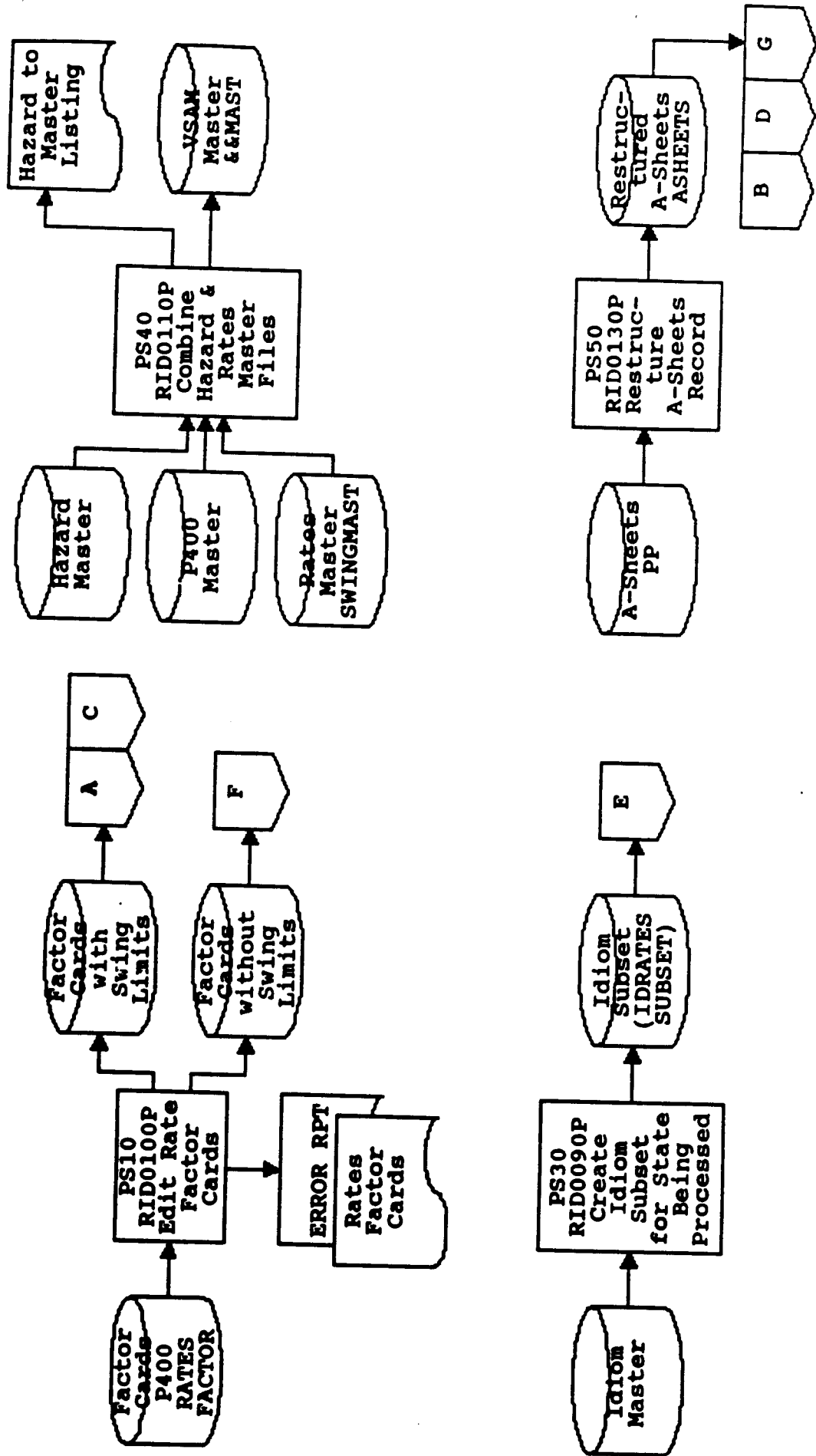
C308



NAIC Examination of NCCI
Class Ratingmaking

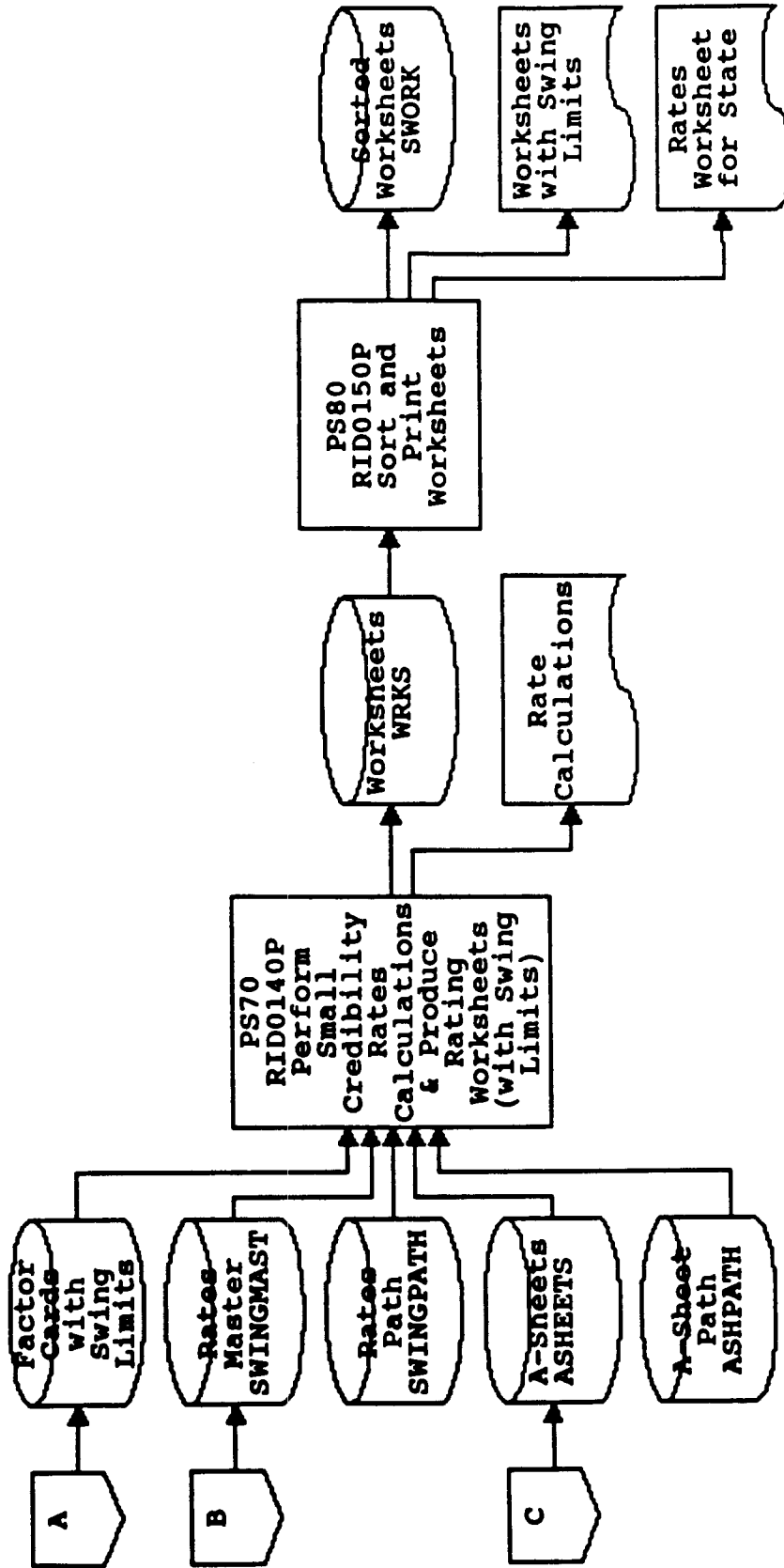
C310A

Produce Rates and Rating Values (IDRATE)



NAIC Examination of NCCI
Class Ratemaking

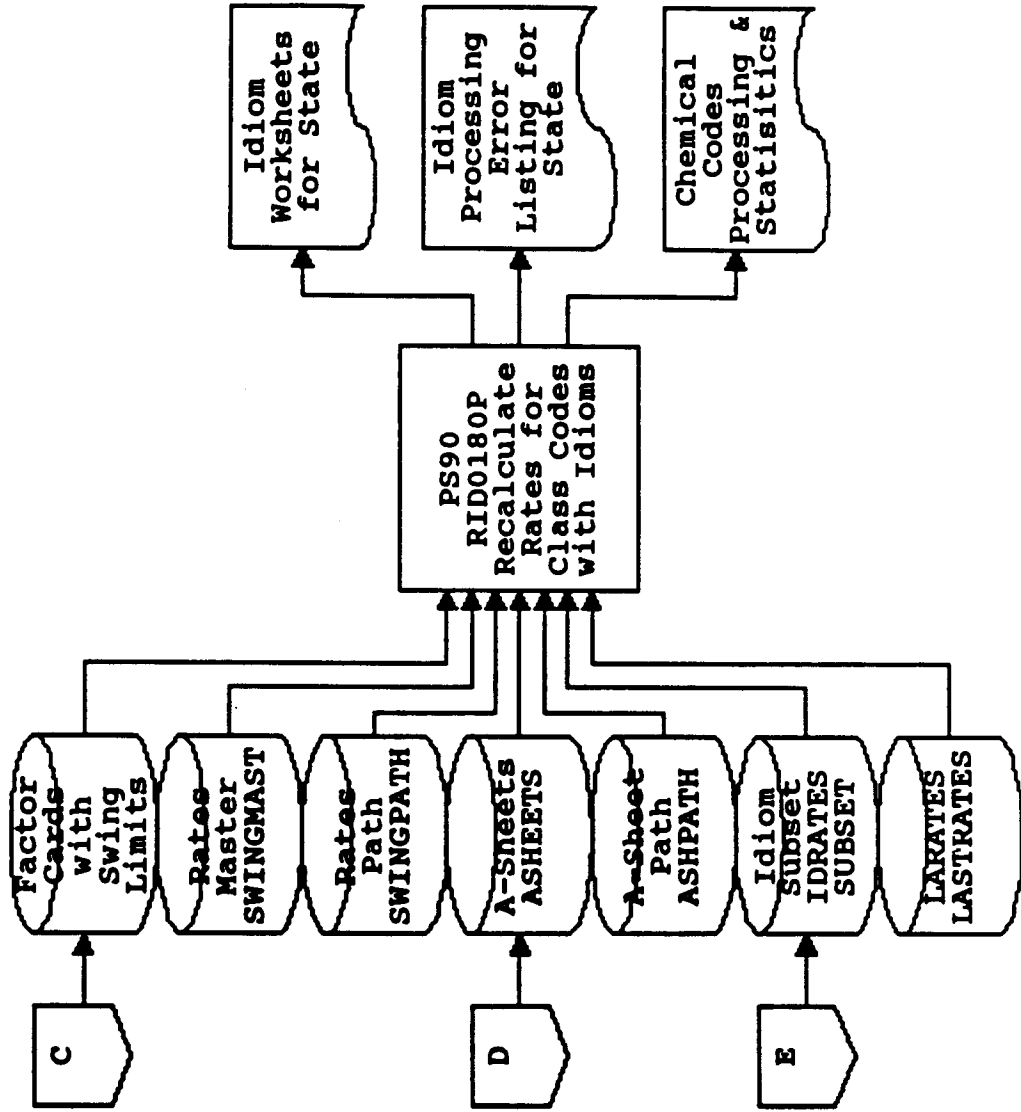
Produce Rates and Rating Values (IDRATE)



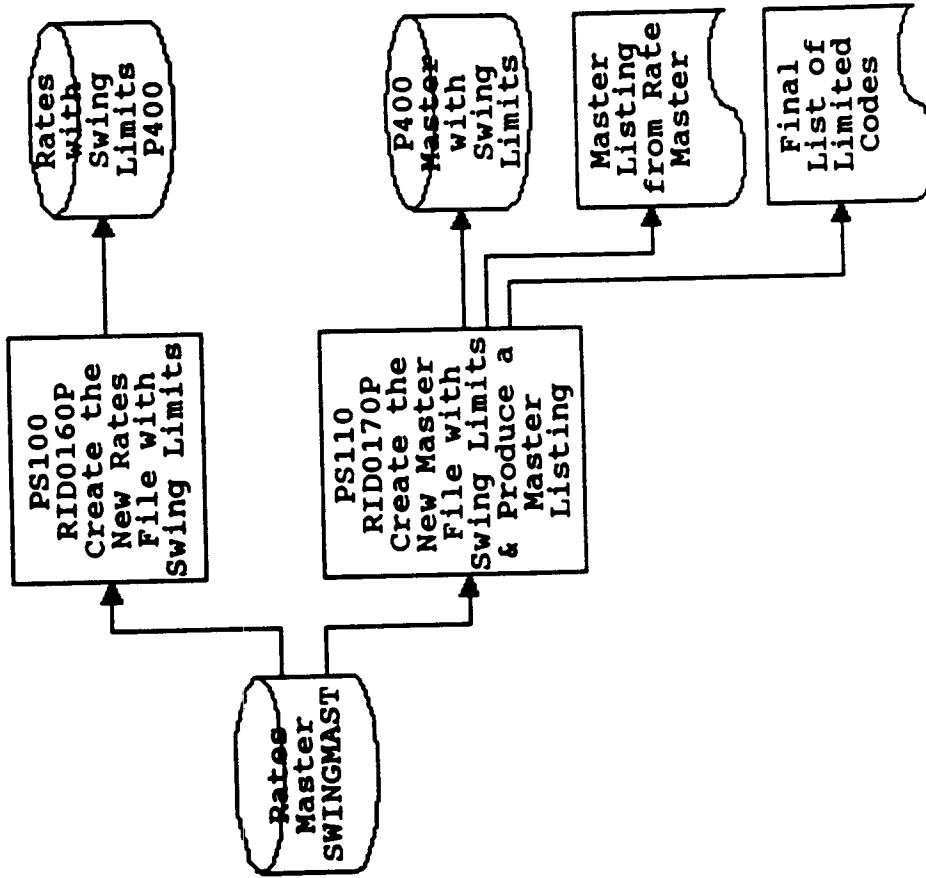
NAIC Examination of NCCI
Class Ratemaking

C310C

Produce Rates and Rating Values (IDRATE)



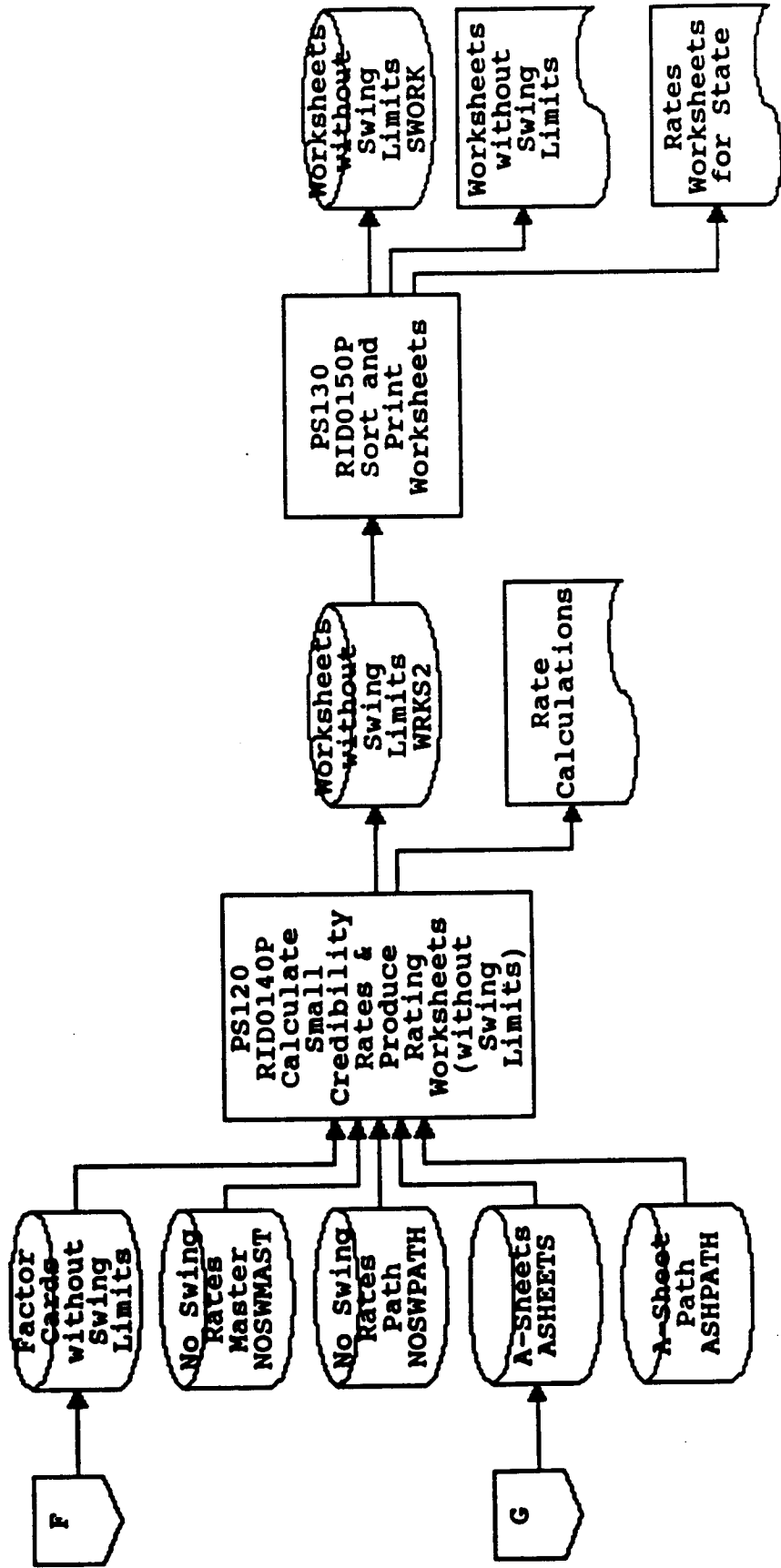
NAIC Examination of NCCI
Class Ratemaking
Produce Rates and Rating Values (IDRATE)



NAIC Examination of NCCI

Class Ratingmaking

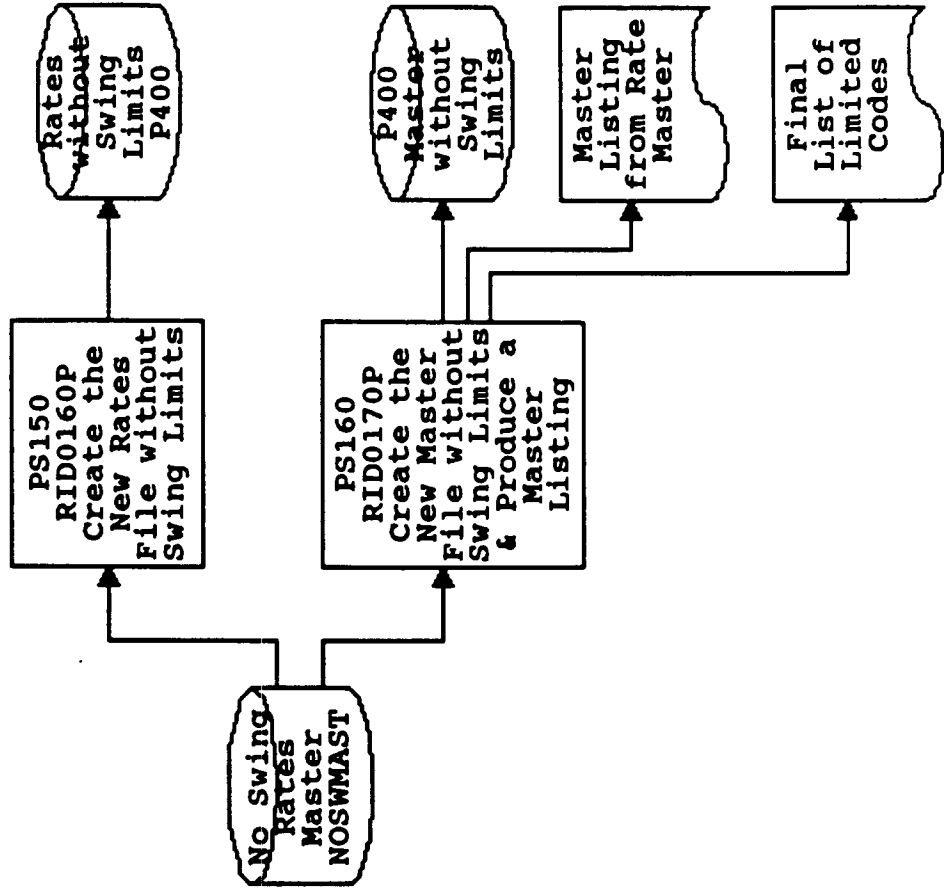
Produce Rates and Rating Values (IDRATE)



NAIC Examination of NCCI
Class Ratemaking

C310F

Produce Rates and Rating Values (IDRATE)

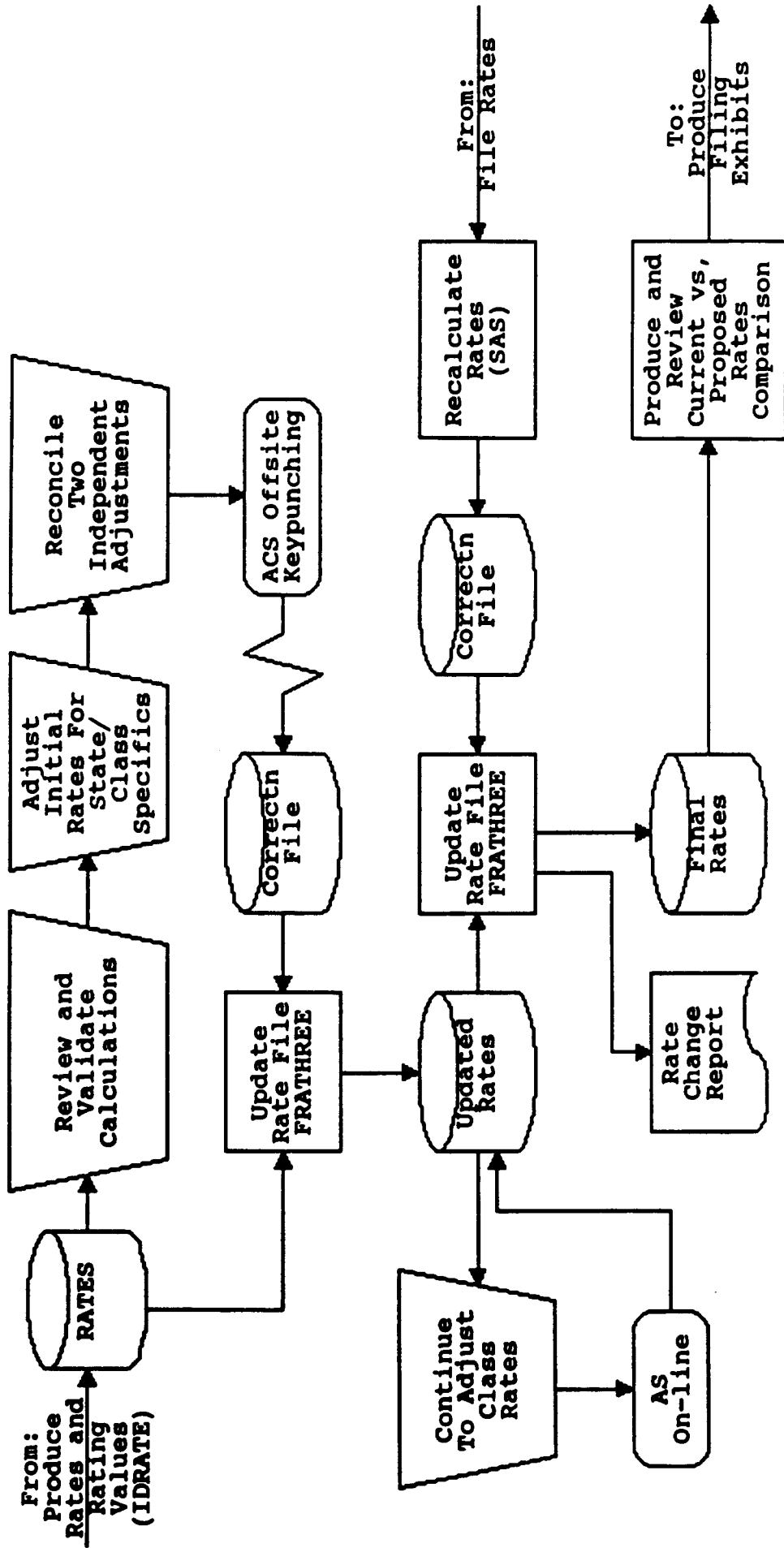


NAIC Examination of NCCI

C312

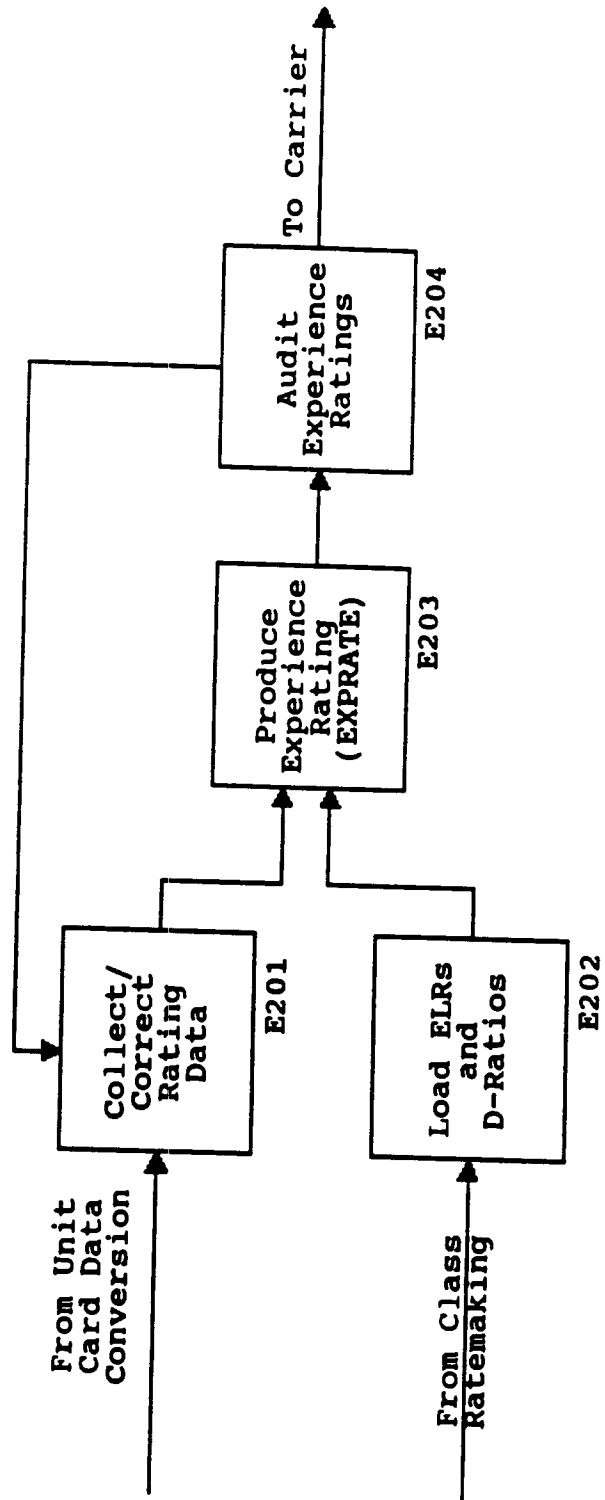
Compute Rates and Rating Values

Review and Correct Rates and Rating Values



NAIC Examination of NCCI
Experience Rating
High Level Flow

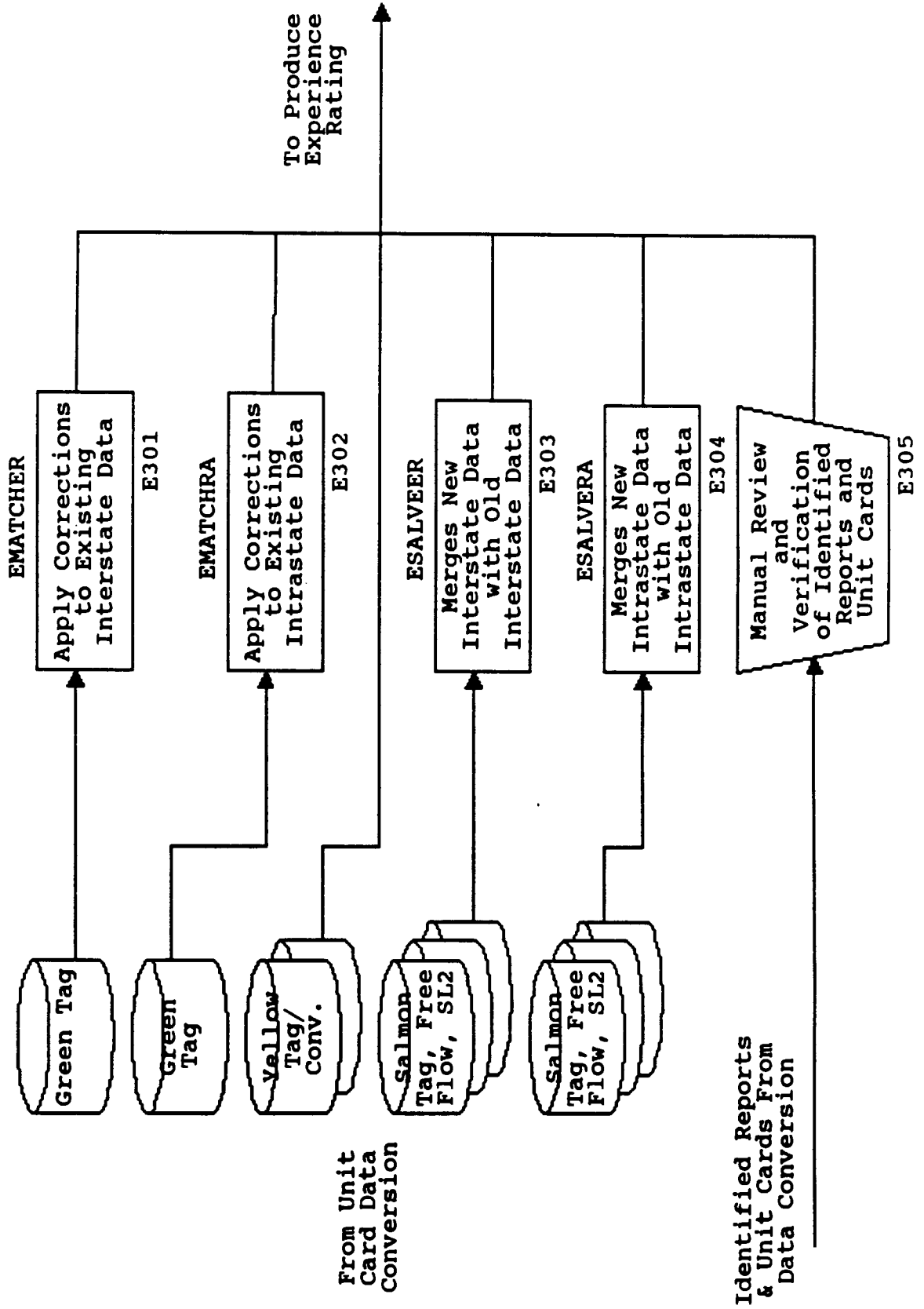
E101



NAIC Examination of NCCI
Experience Rating

E201

Collect/Correct Rating Data

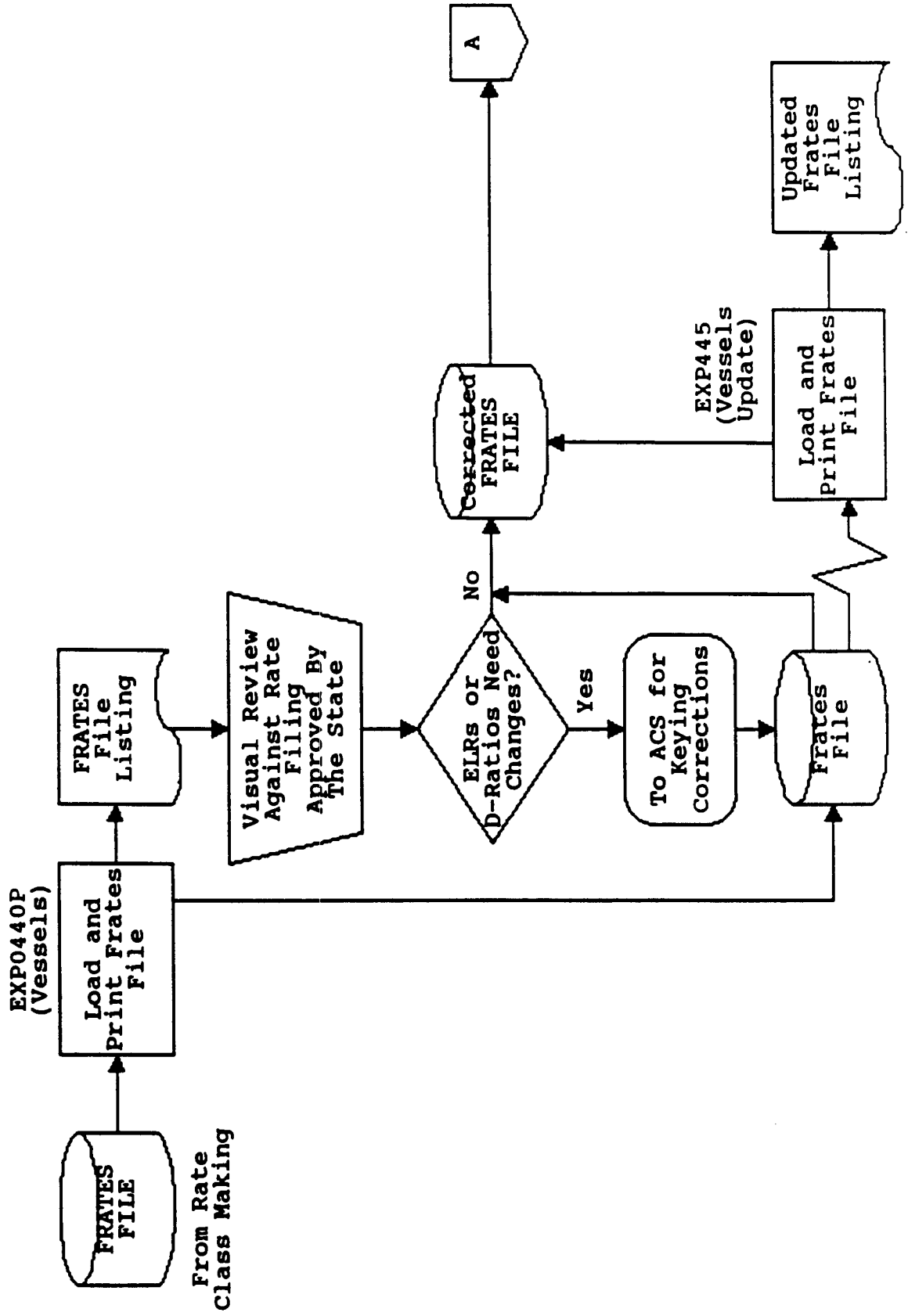


From Unit
Card Data
Conversion

Identified Reports
& Unit Cards From
Data Conversion

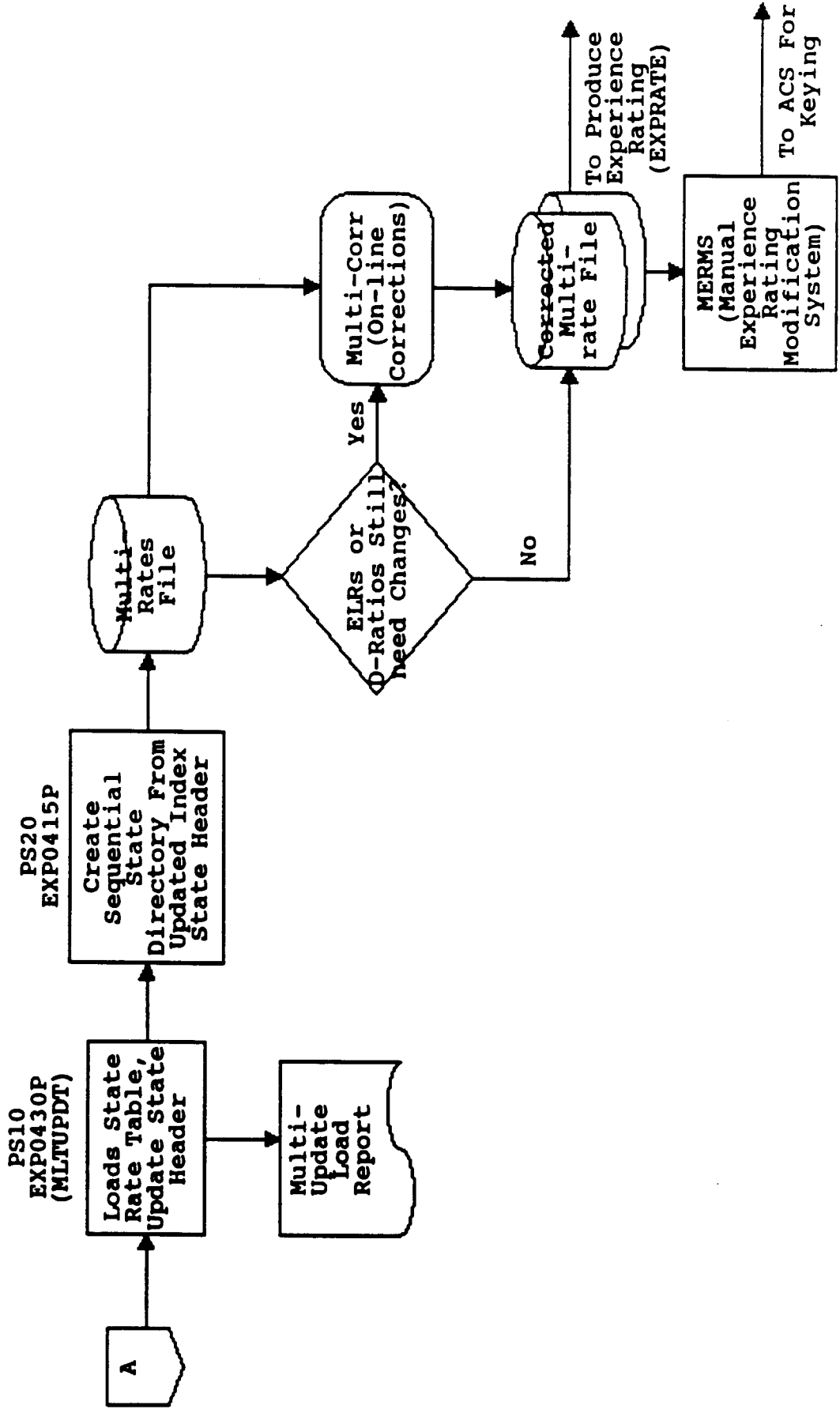
NAIC Examination of NCCI
Experience Rating
Load ELRs and D-Ratios

E202A



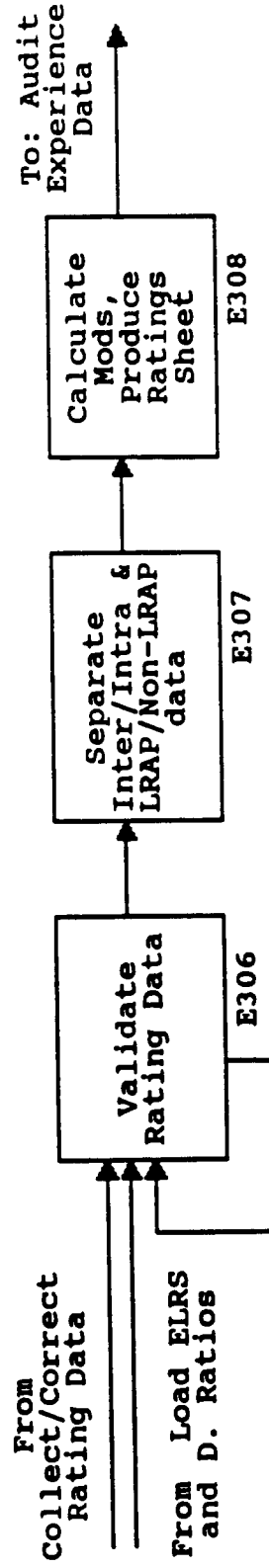
NAIC Examination of NCCI
 Experience Rating
 Load ELRs and D-Ratios

E202B



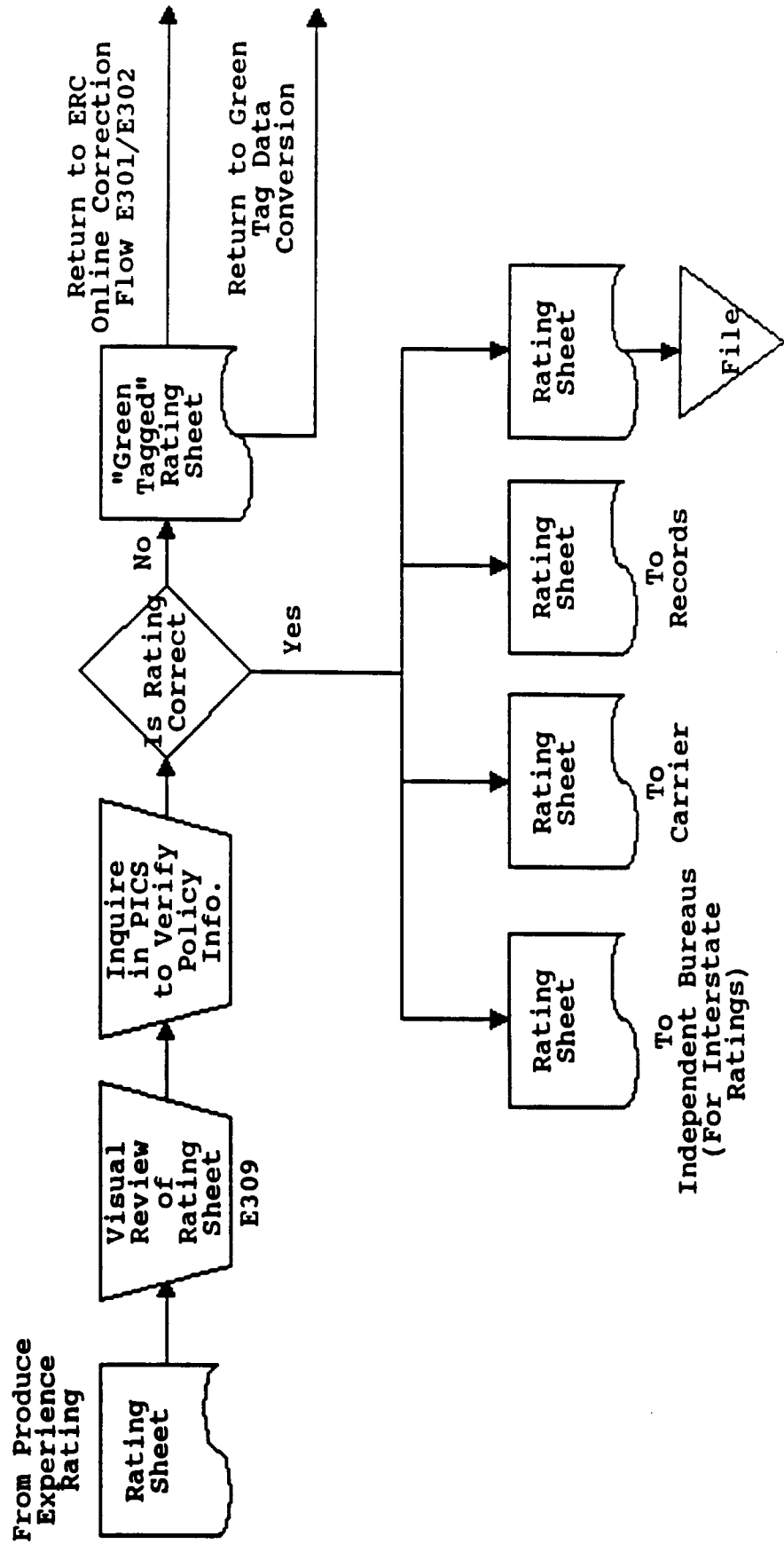
NAIC Examination of NCCI
Experience Rating
Produce Experience Rating (EXPRATE)

E203



NAIC Examination of NCCI
 Experience Rating
 Audit Experience Ratings

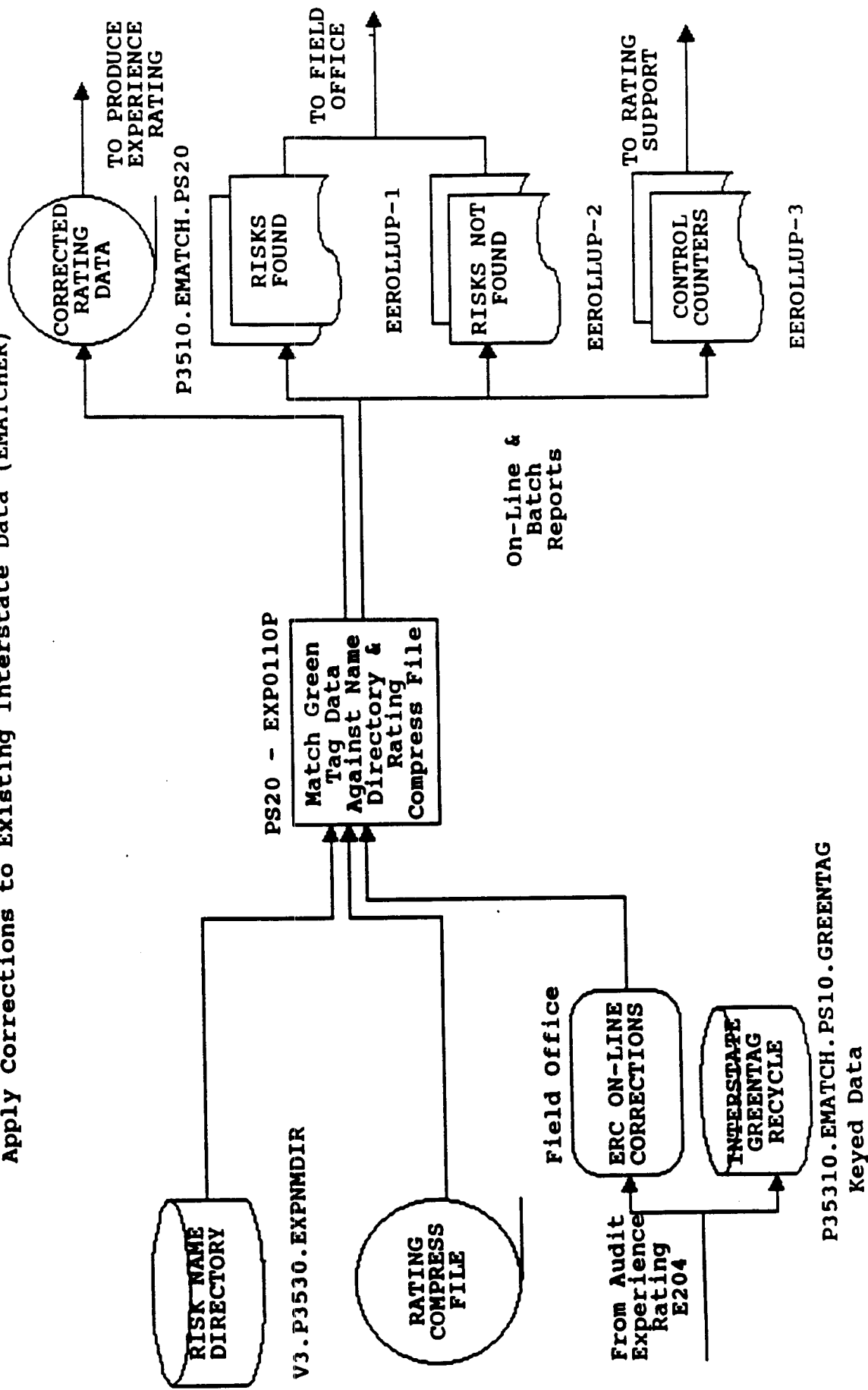
E204



NAIC Examination of NCCI
Experience Rating

E301

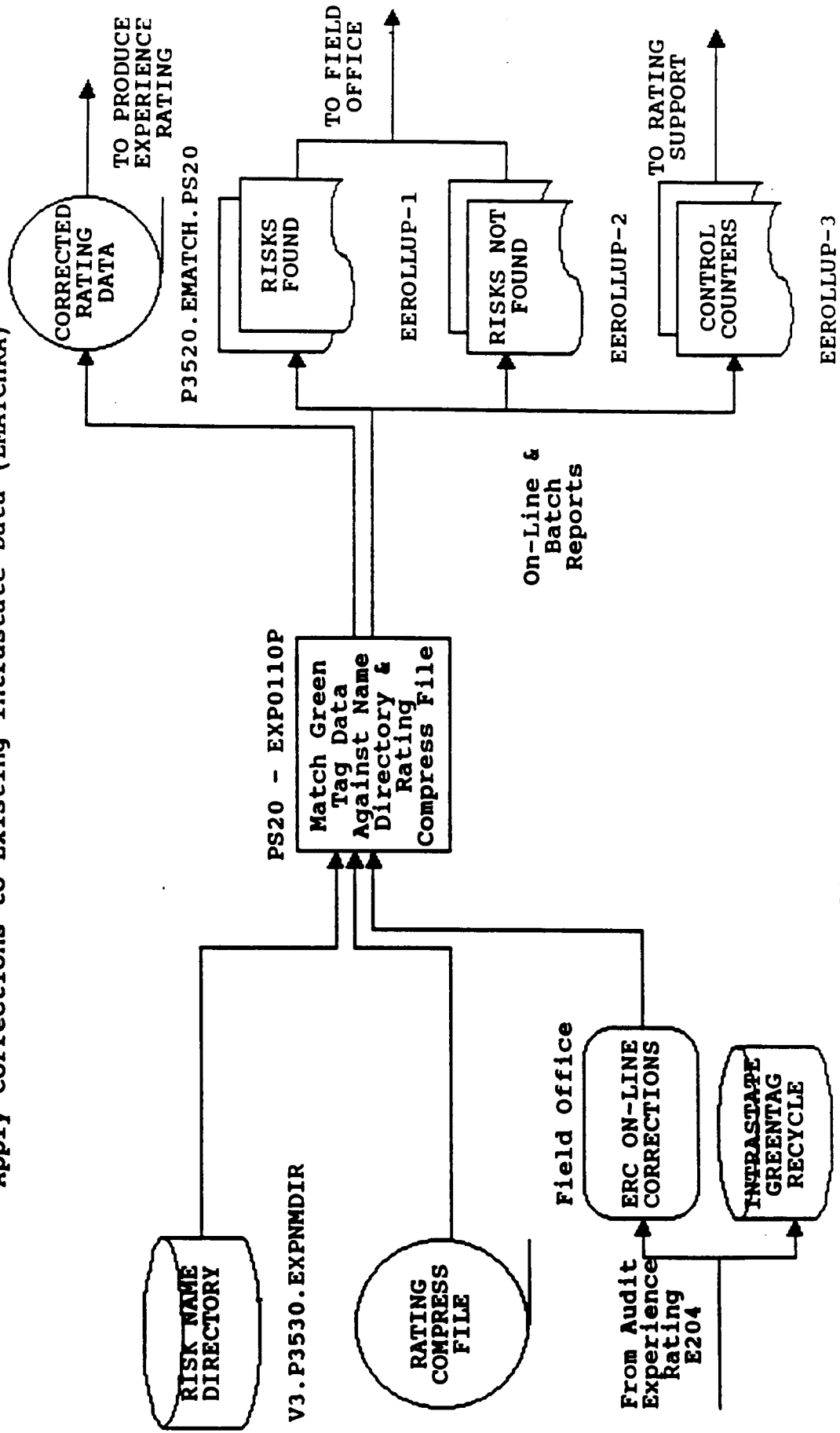
Apply Corrections to Existing Interstate Data (EMATCHER)



NAIC Examination of NCCI
Experience Rating

E302

Apply Corrections to Existing Intrastate Data (EMATCHRA)

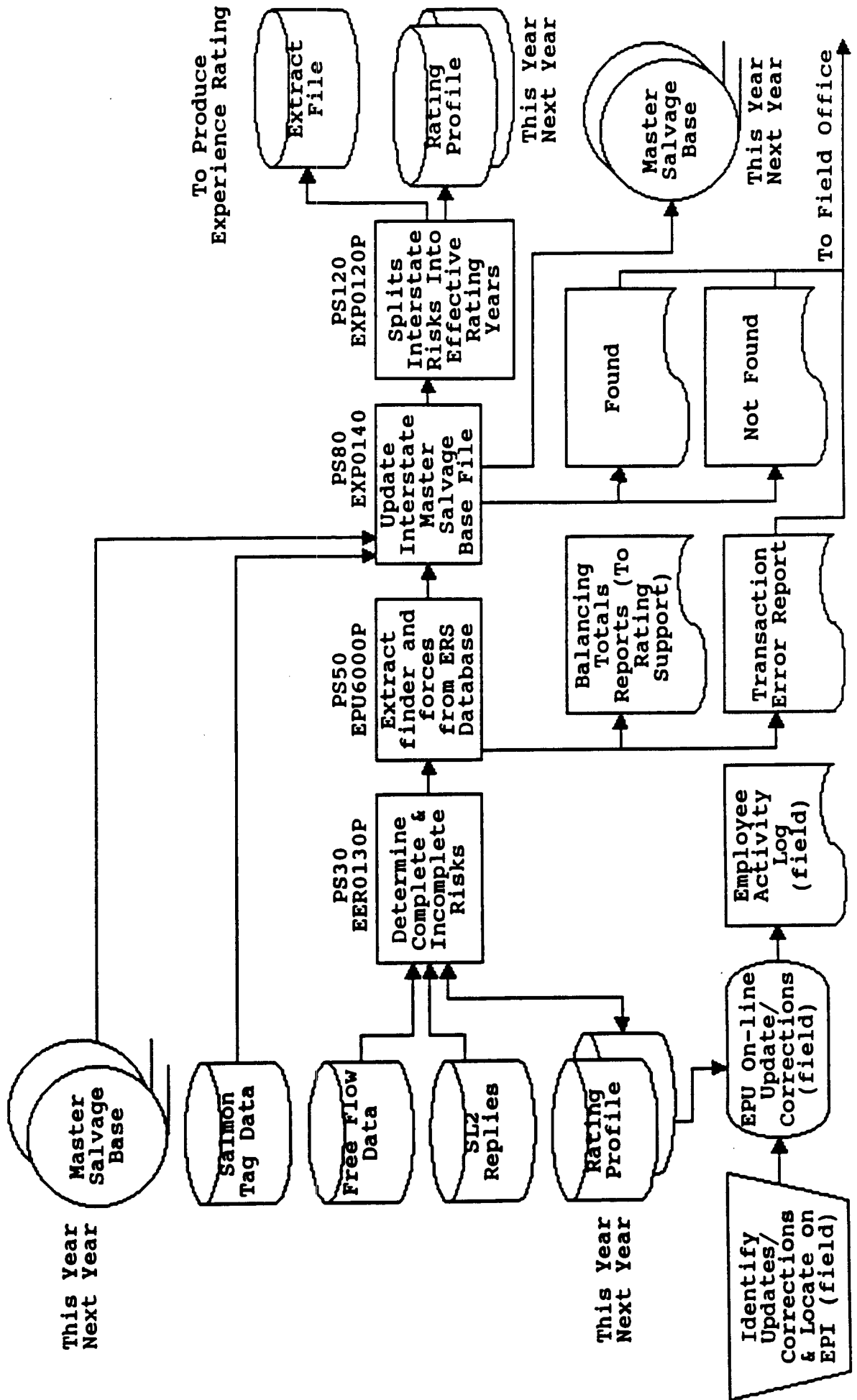


P35320.EMATCH.PS10.GREENTAG
Keyed Data

NAIC Examination of NCCI
Experience Rating

E303

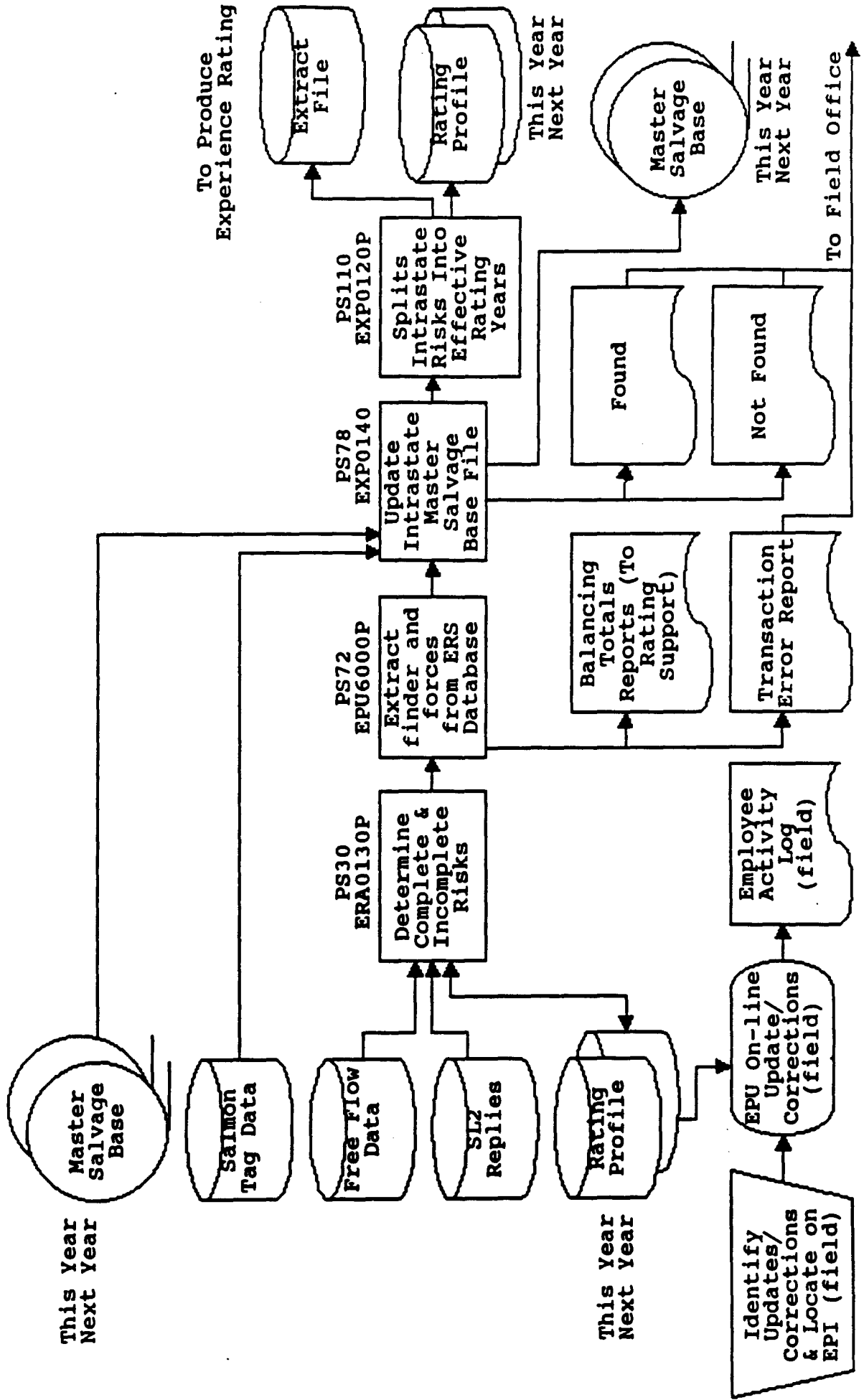
Merge New Interstate Data w/old Interstate Data (ESALVEER)



NAIC Examination of NCCI
Experience Rating

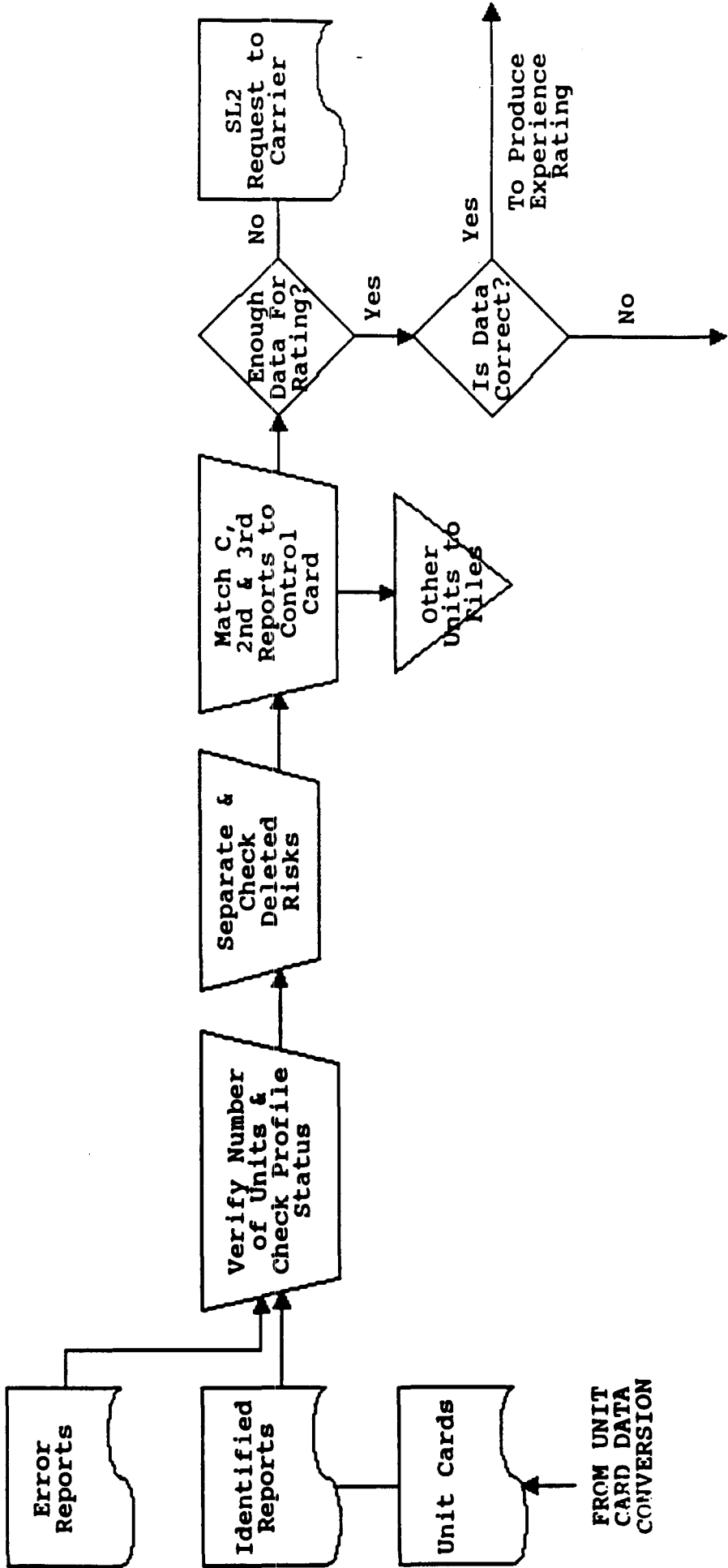
E304

Merge New Intrastate Data w/old Intrastate Data (ESALVERA)



NAIC Examination of NCCI
 Experience Rating
 Manual Review & Investigation

E305



Return To "Preprocess
 Hardcopy Unit Cards" of Unit
 Card Data Conversion Flow
 Diagram U201.4 For Keying In
 Corrections

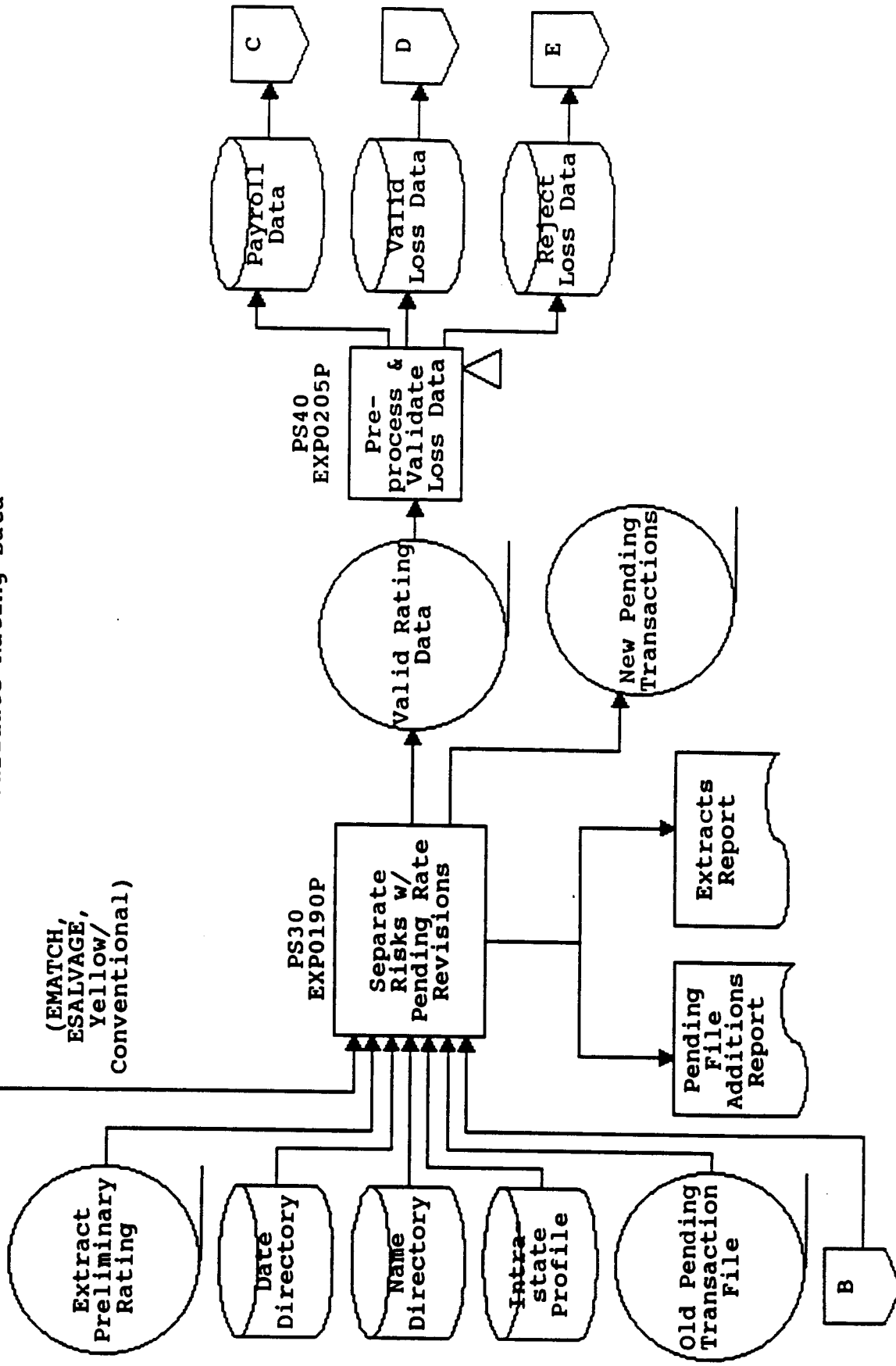
NAIC Examination of NCCI

Experience Rating

Validate Rating Data

E306A

From Collect/
Correct Rating Data

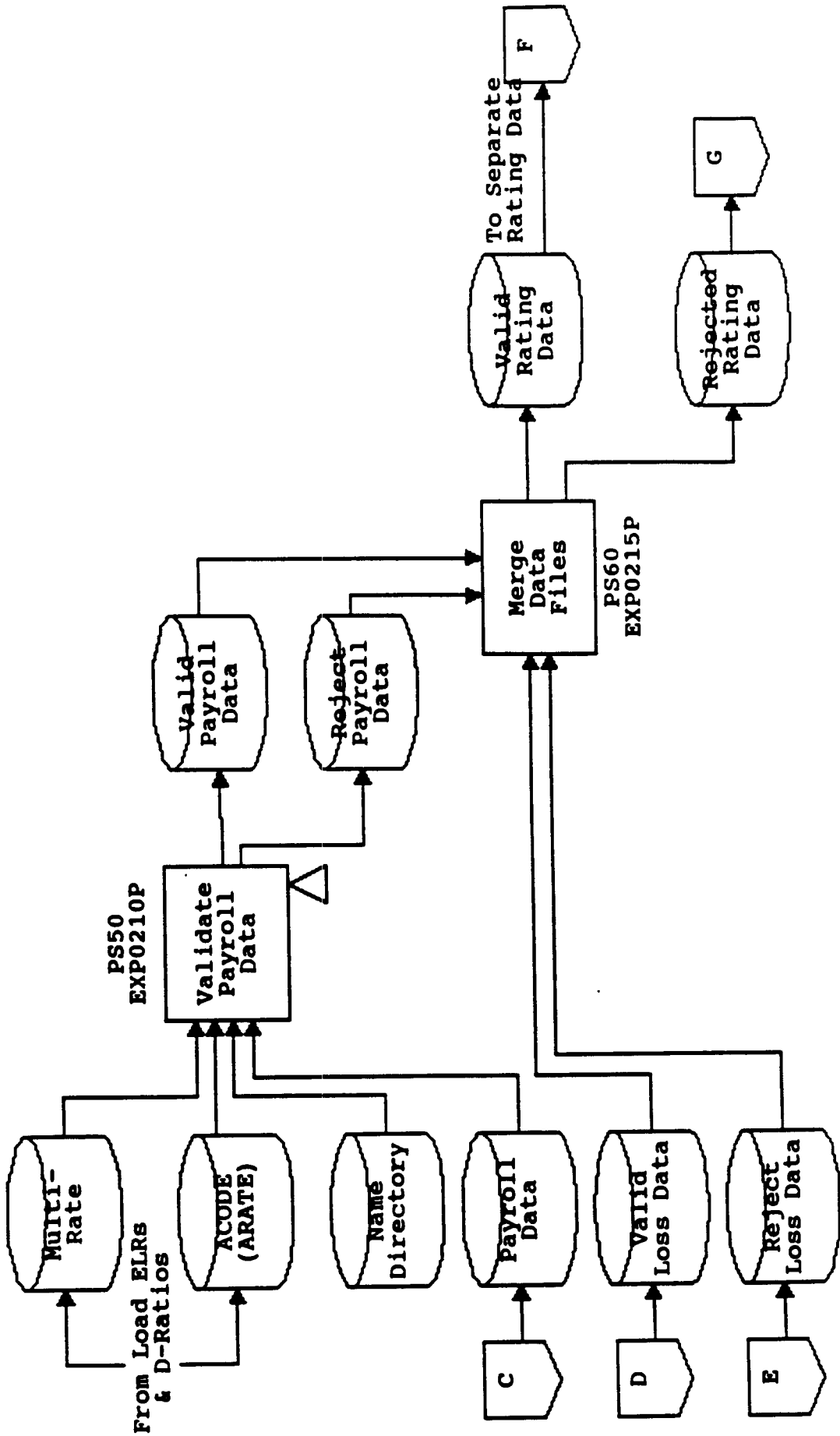


(EMATCH,
ESALVAGE,
Yellow/
Conventional)

Reclaimables
E306C

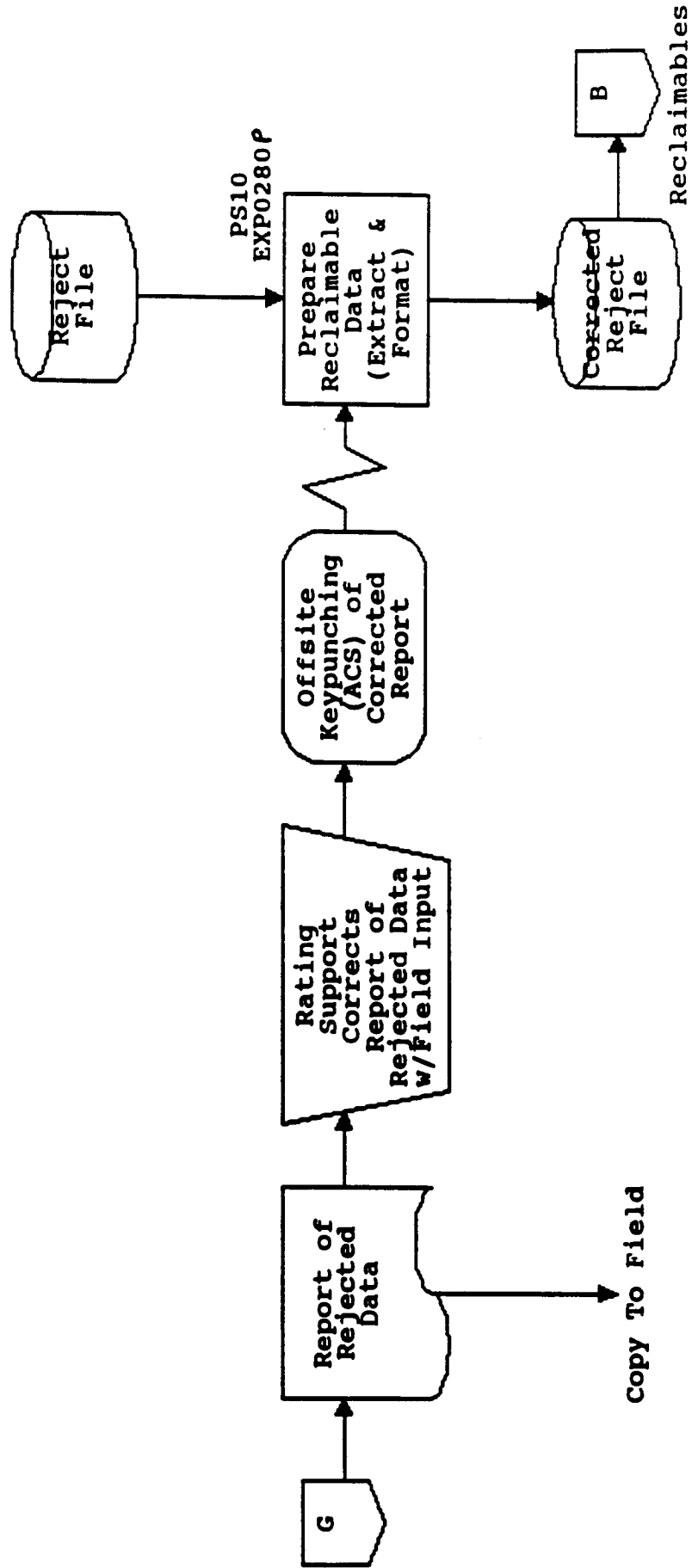
NAIC Examination of NCCI
Experience Rating
Validate Rating Data

E306B



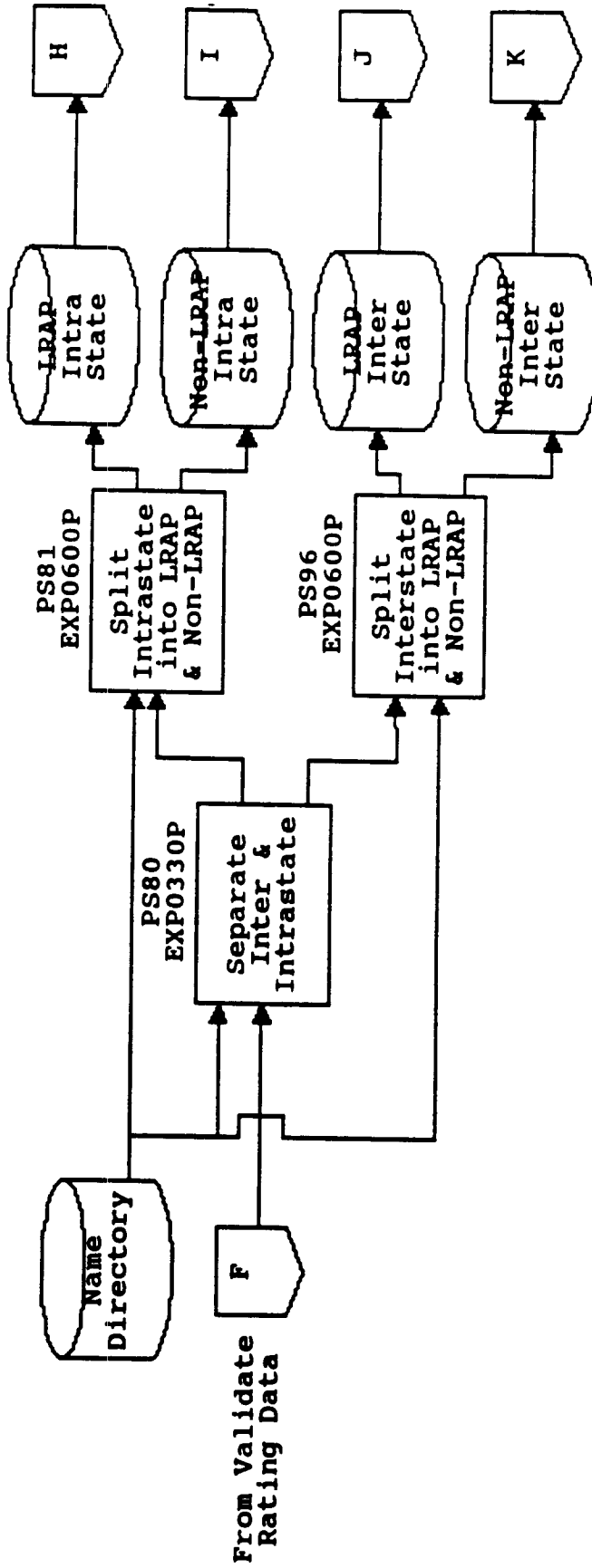
NAIC Examination of NCCI
Experience Rating
Validate Rating Data

E306C



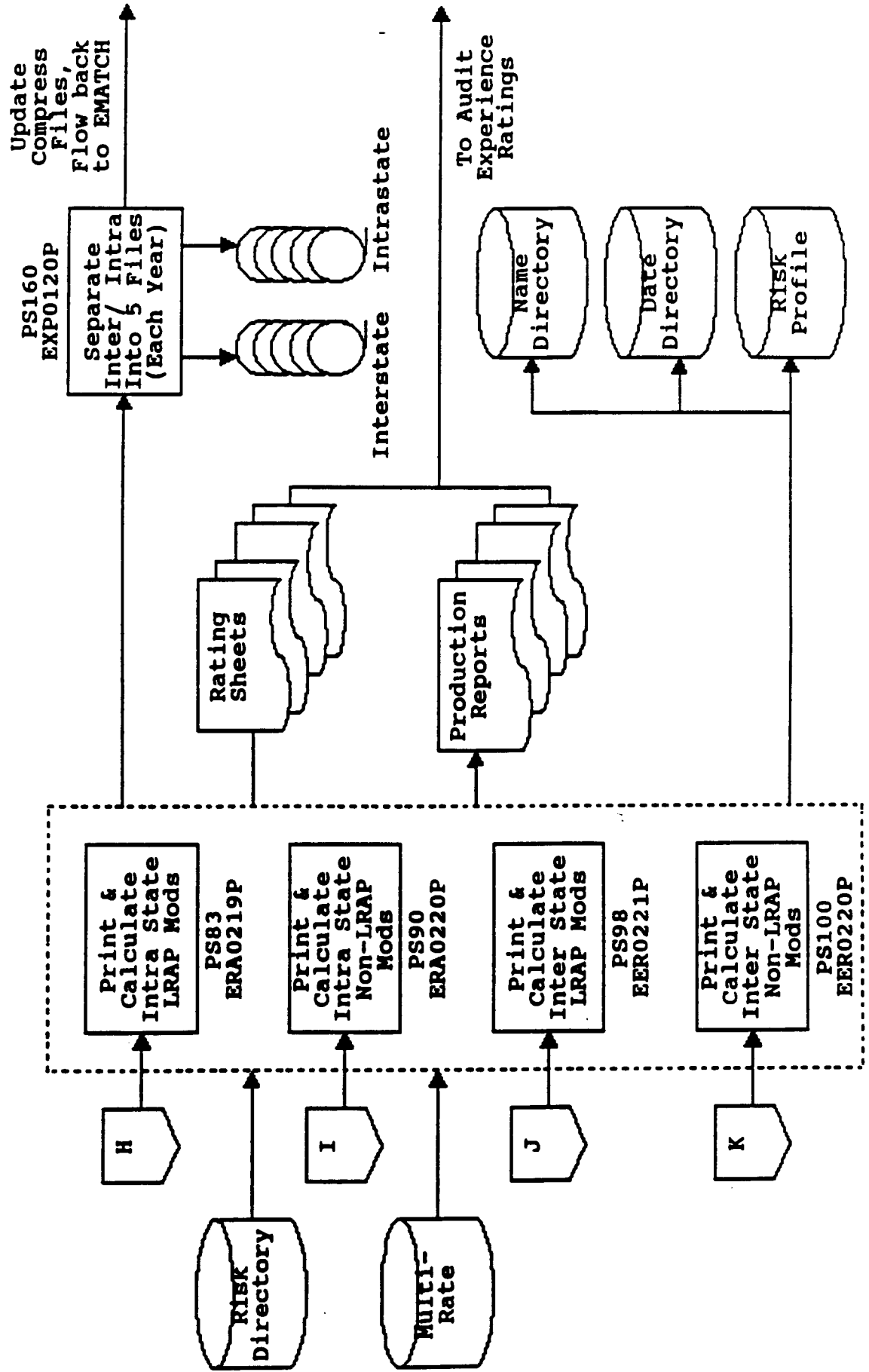
NAIC Examination of NCCI
Experience Rating
Separate Rating Data

E307



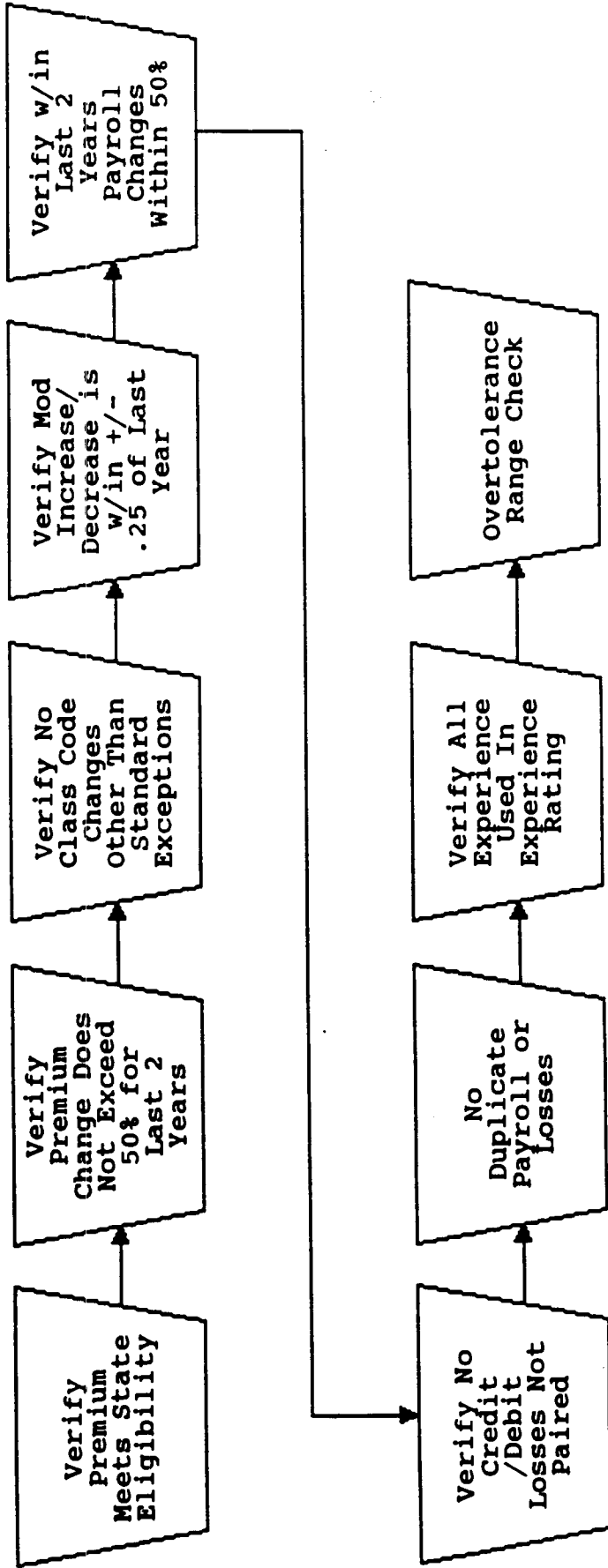
NAIC Examination of NCCI
 Experience Rating
 Calculate Mods

E308



NAIC Examination of NCCI
Experience Rating
Manual Review of Rating Sheets

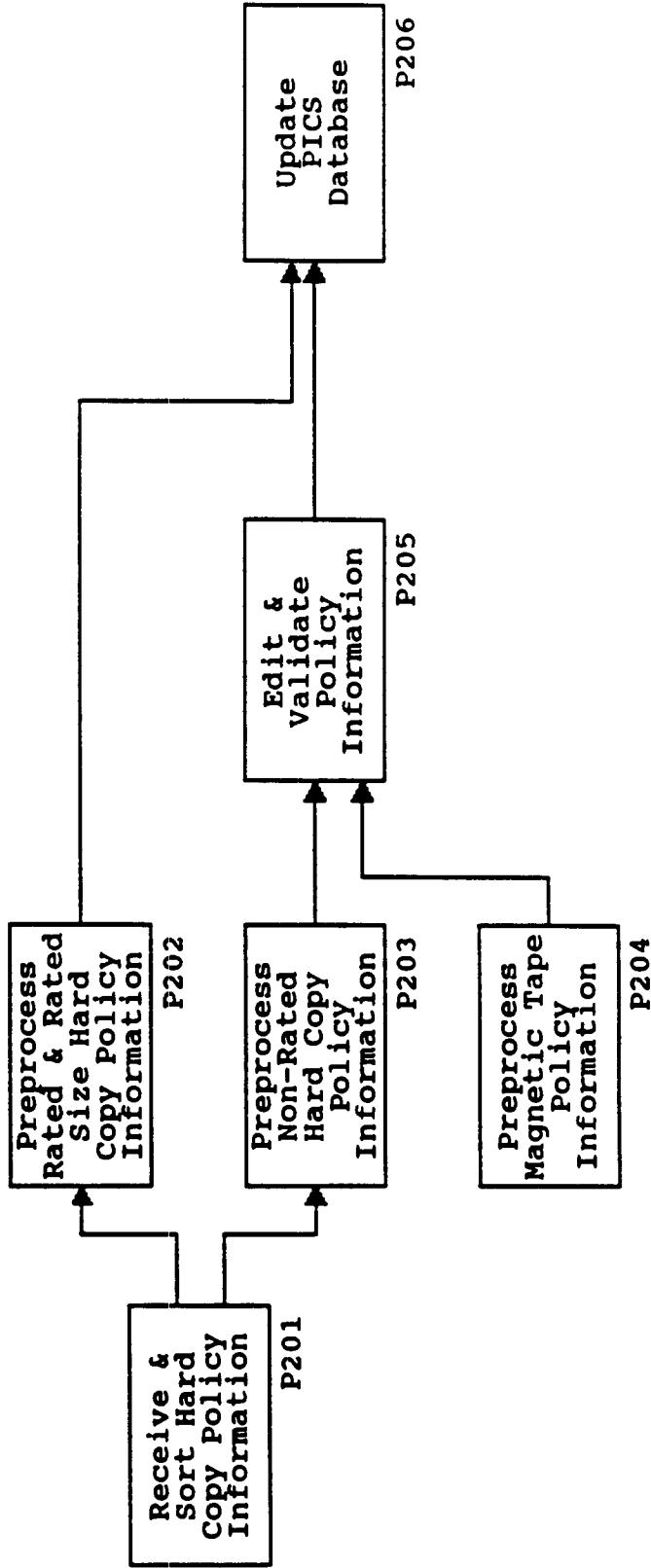
E309



NAIC Examination of NCCI

PICS Processing

High Level Flow

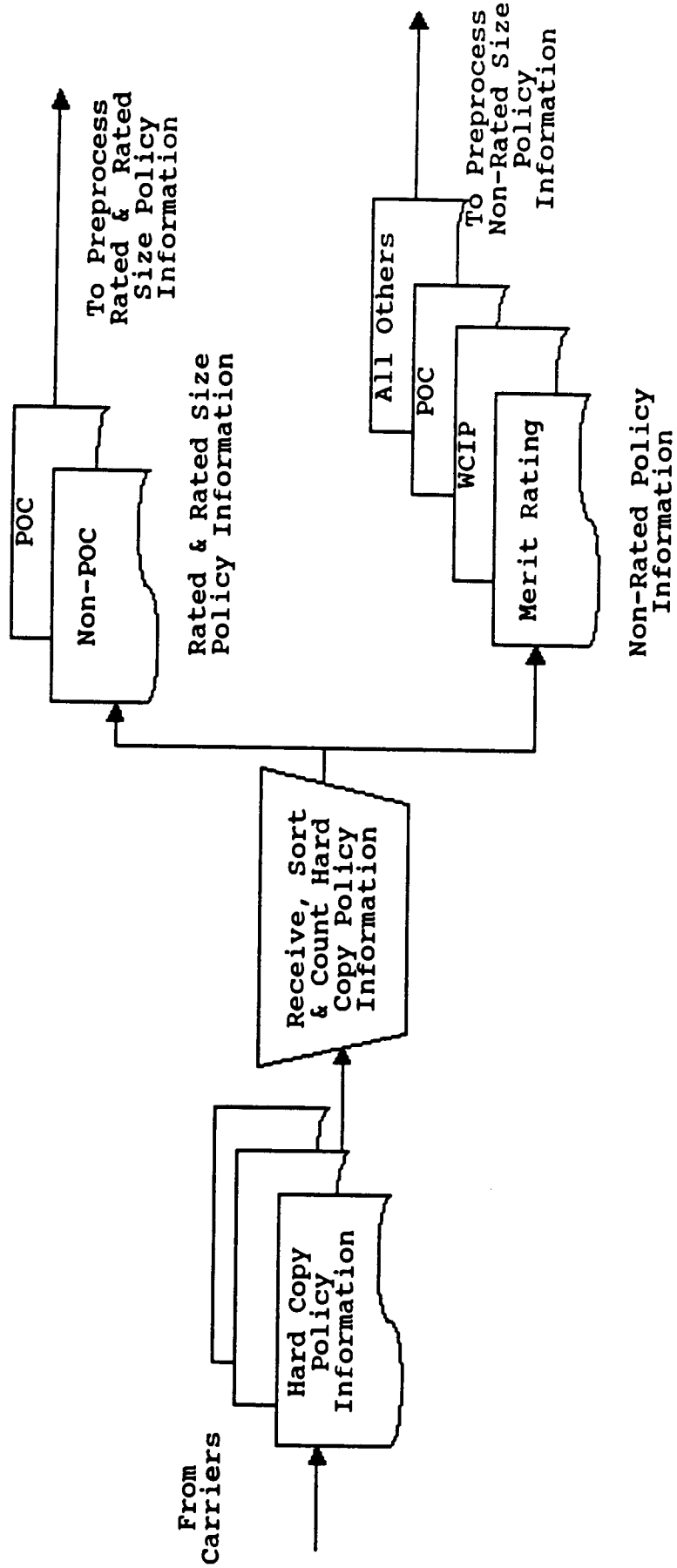


NAIC Examination of NCCI

P201

PICS Processing

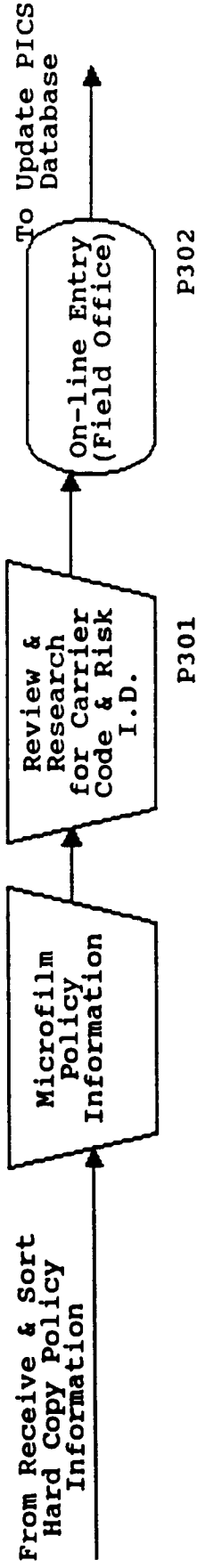
Receive & Sort Hard Copy Policy Information



NAIC Examination of NCCI

PICS Processing

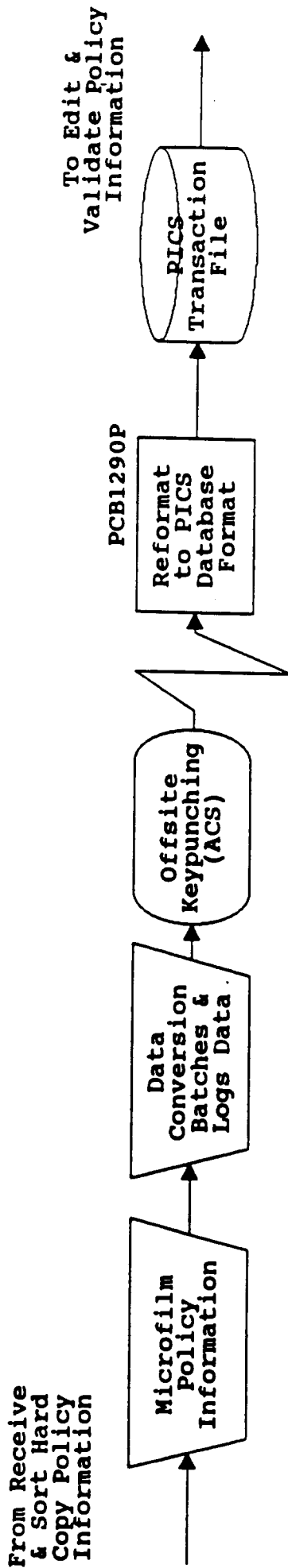
Preprocess Rated & Rated Size Hard Copy Policy Information



NAIC Examination of NCCI

PICS Processing

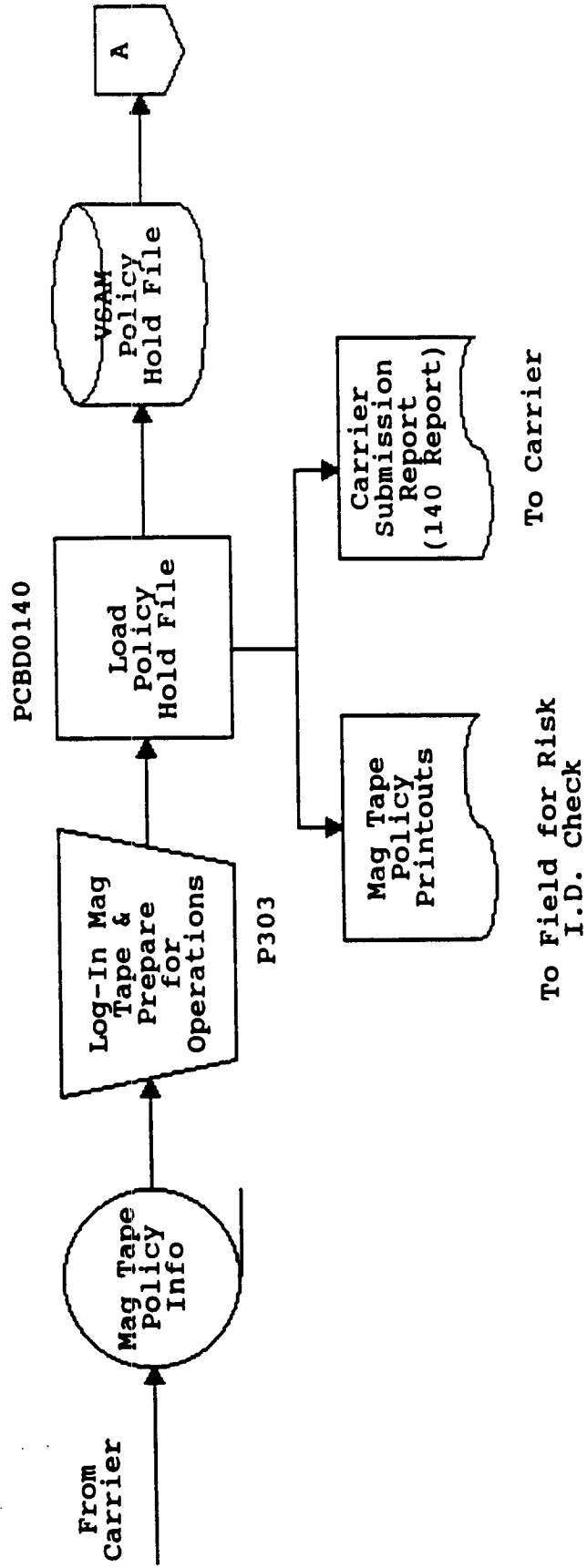
Preprocess Non-Rated Size Hard Copy Policy Information



NAIC Examination of NCCI

PICS Processing

Preprocess Magnetic Tape Policy Information

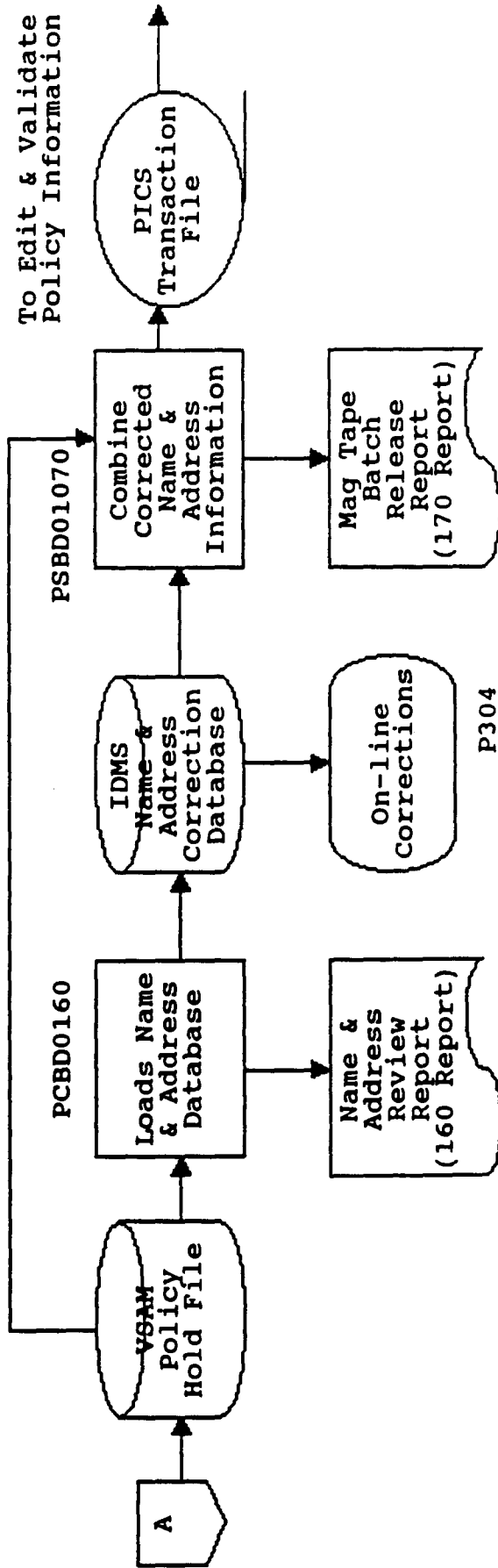


NAIC Examination of NCCI

P204B

PICS Processing

Preprocess Magnetic Tape Policy Information



To Atlantic Division
for Reformatting

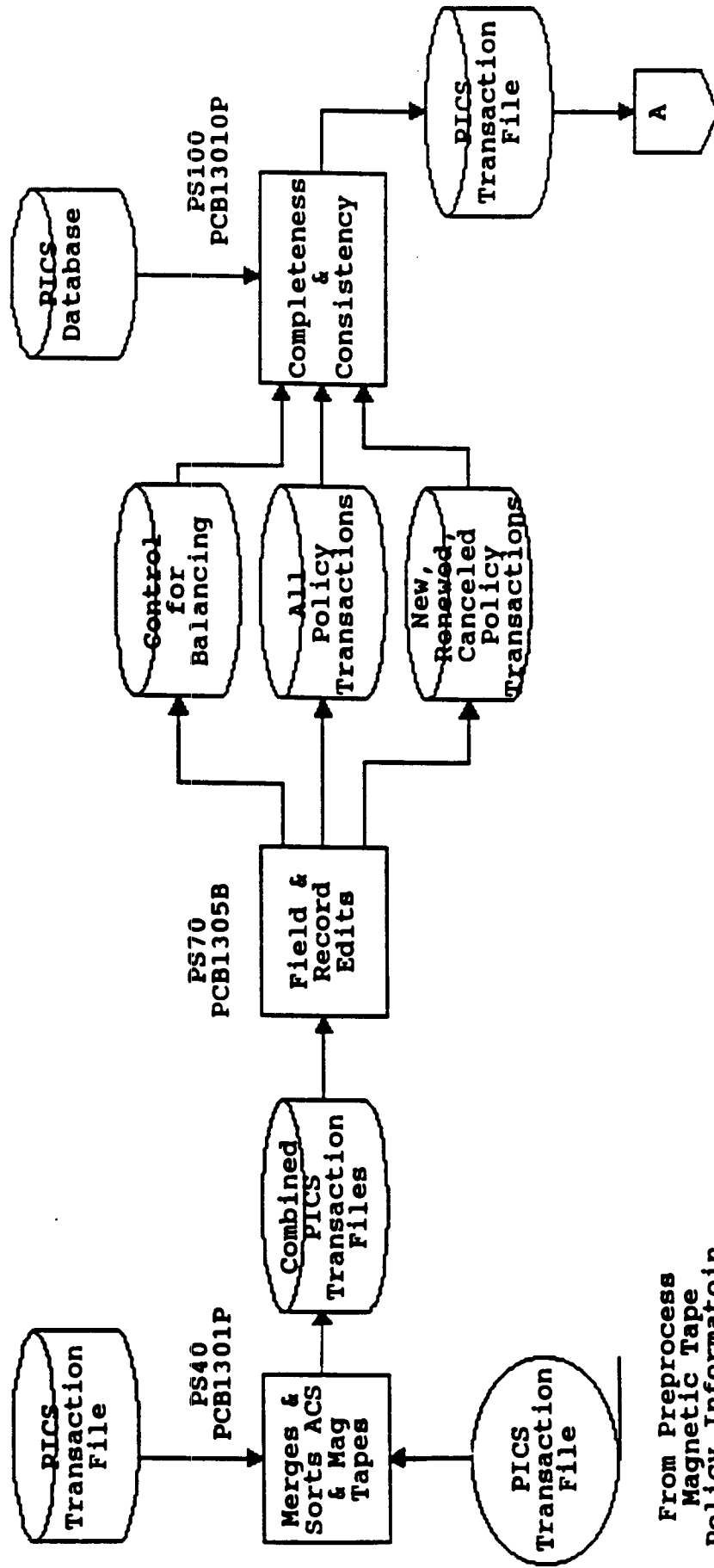
NAIC Examination of NCCI

P205A

PICS Processing

Edit & Validate Policy Information

From Preprocess
Non-Rated Size Hard
Copy Policy



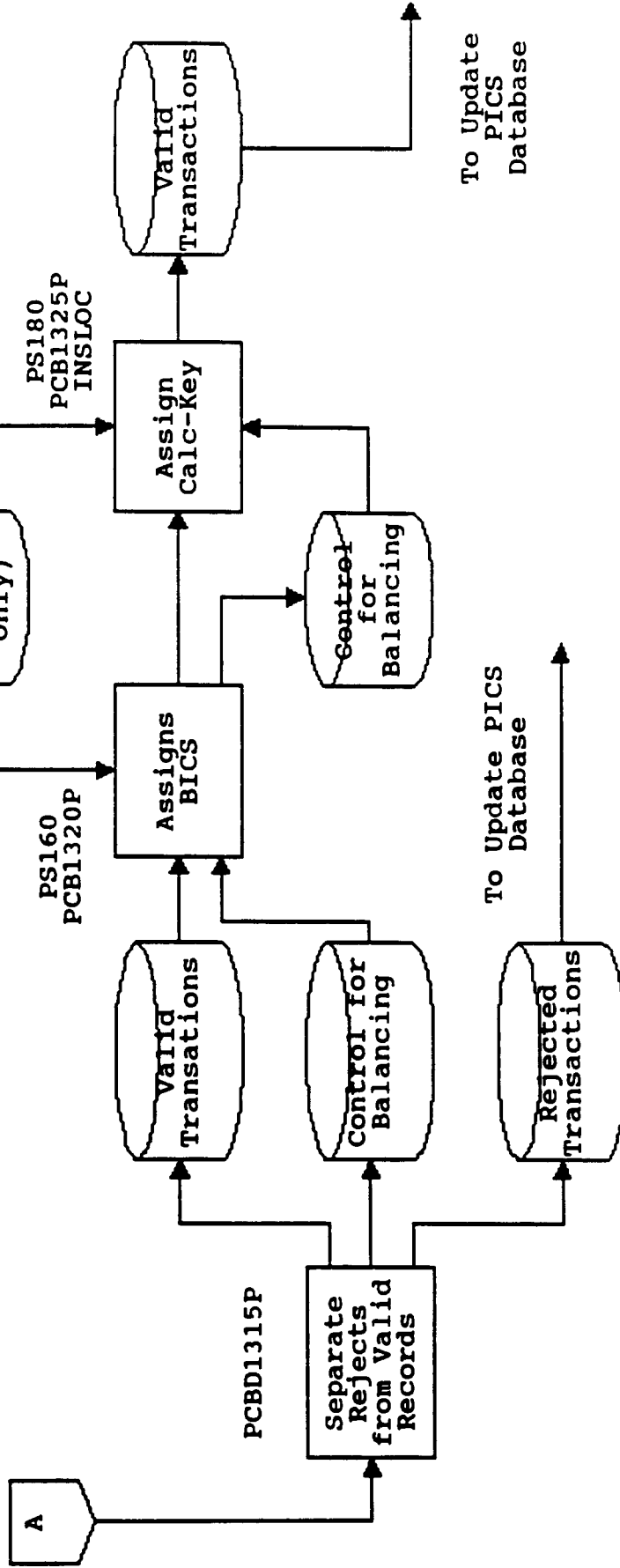
From Preprocess
Magnetic Tape
Policy Information

NAIC Examination of NCCI

PICS Processing

Edit & Validate Policy Information

PICS Transaction File after Completeness Consistency Check

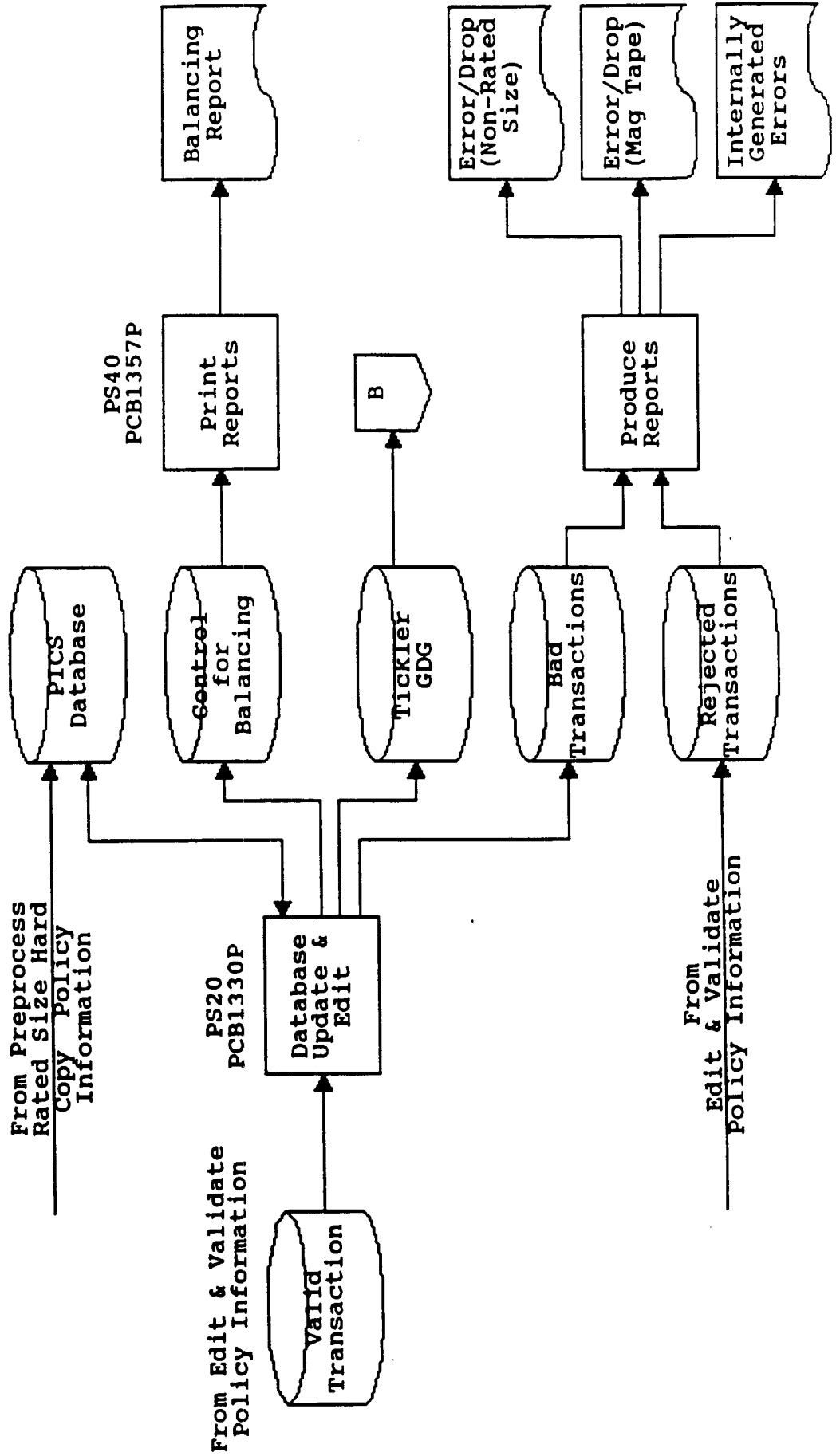


NAIC Examination of NCCI

P206A

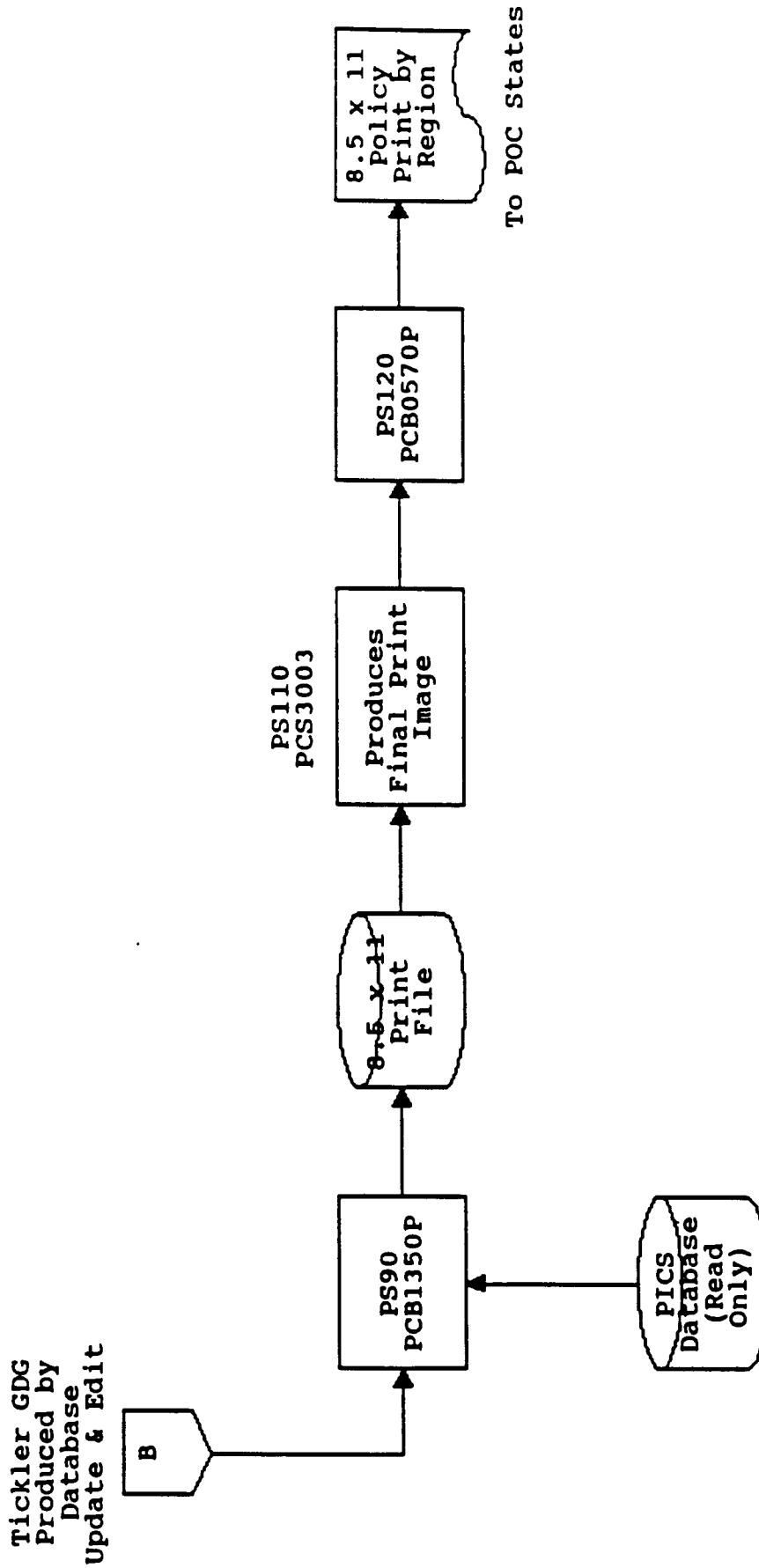
PICS Processing

Update PICS Database



PICS Processing

Update PICS Database

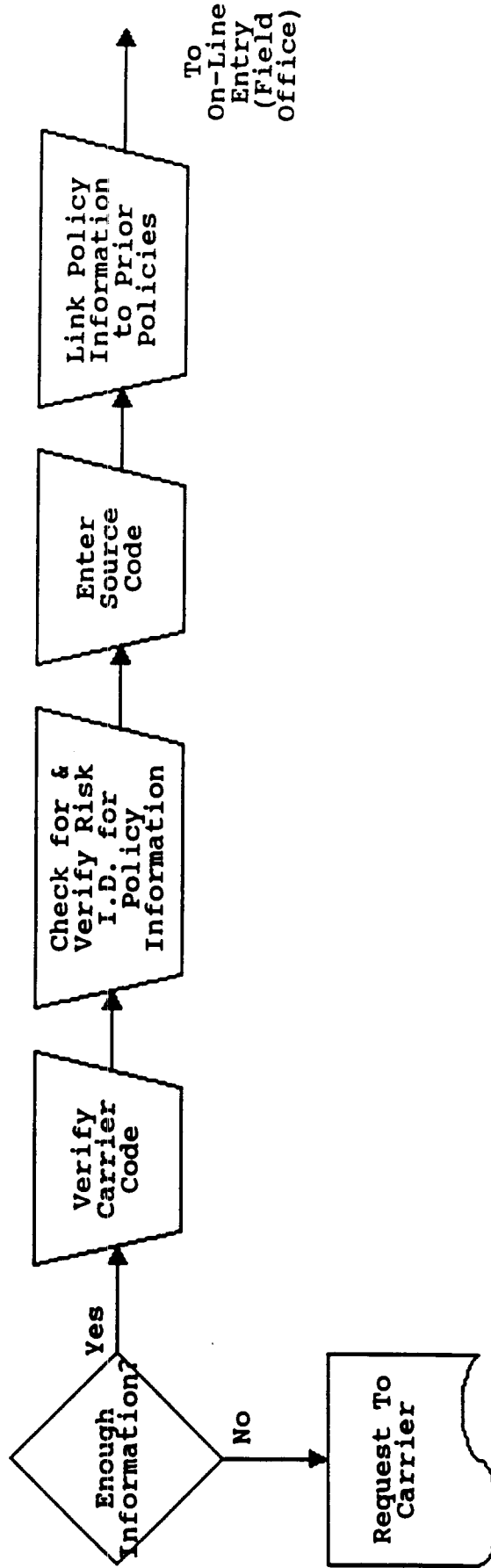


NAIC Examination of NCCI

Policy Information

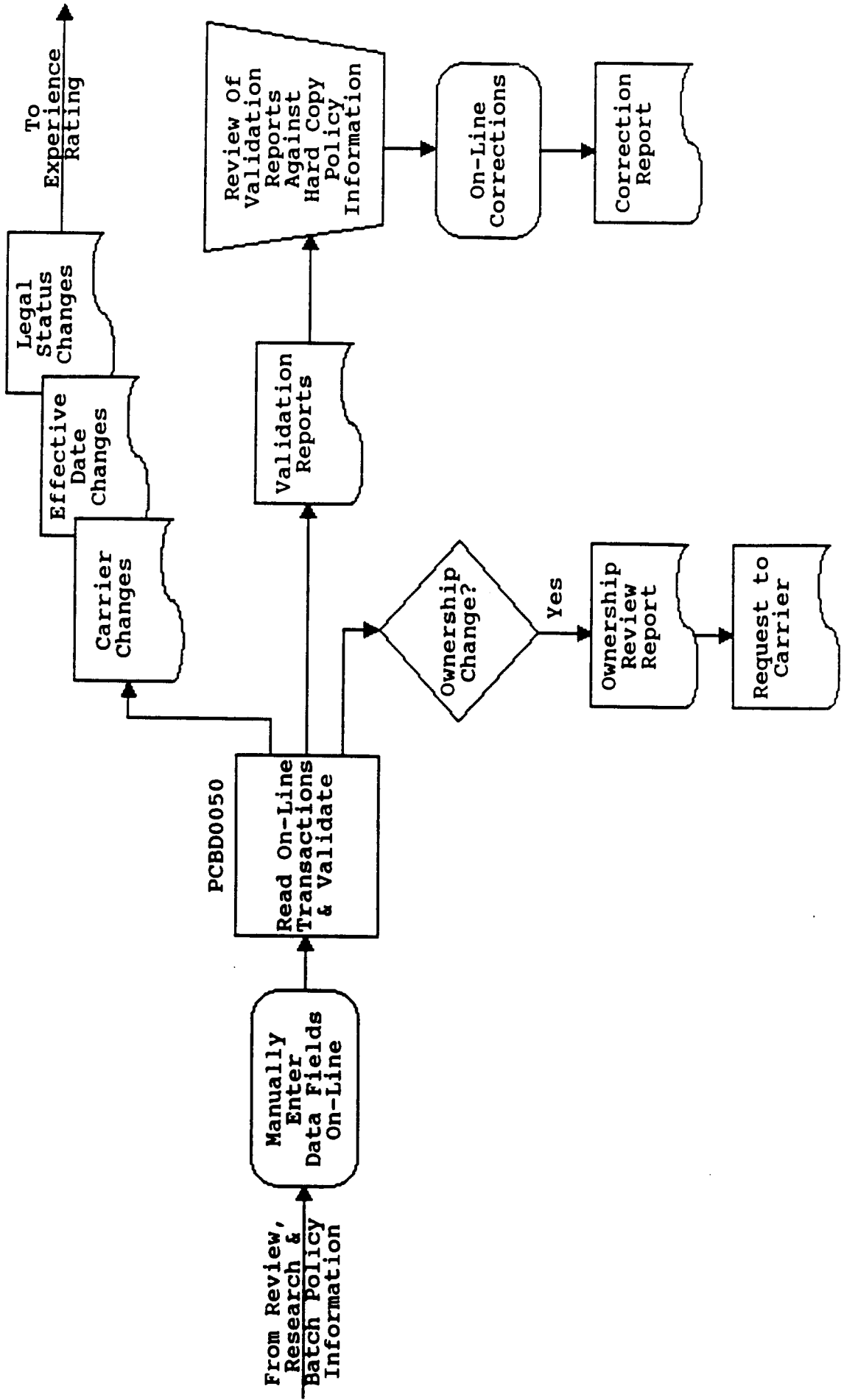
Review & Research for Carrier Code & Risk I.D.

P301



NAIC Examination of NCCI
Policy Information
On-Line Entry (Field Office)

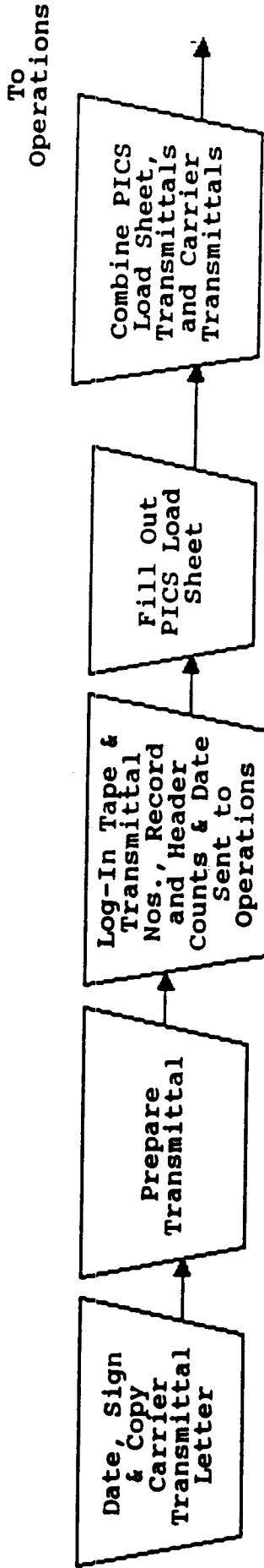
P302



NAIC Examination of NCCI
Policy Information

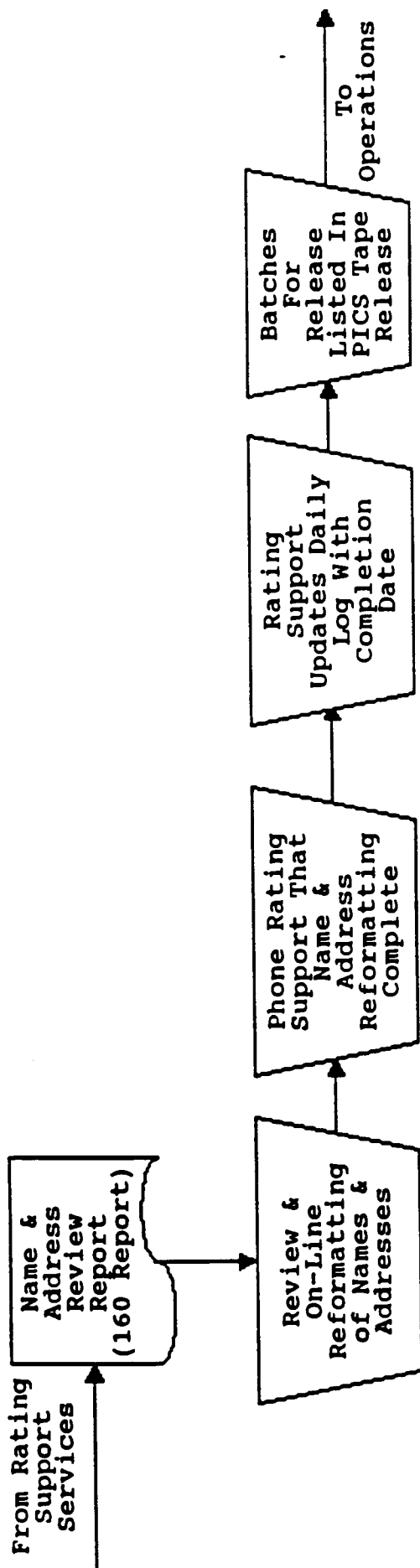
P303

Log-In Mag Tape & Prepare For Operations



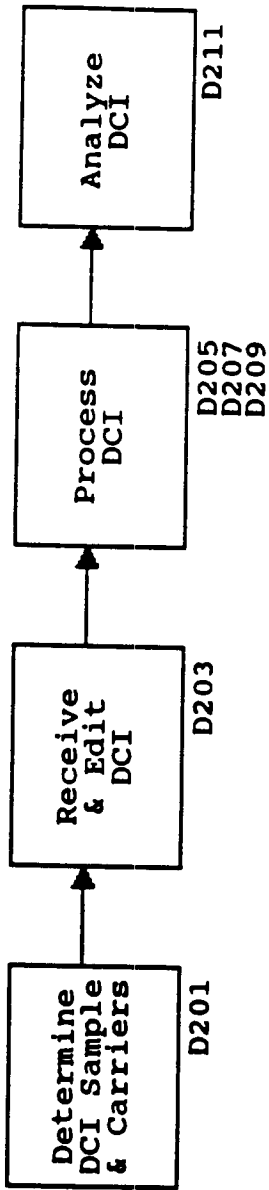
NAIC Examination of NCCI
Policy Information
On-Line Corrections

P304



NAIC Examination of NCCI
Detailed Claim Information Processing (DCI)
High Level Flow

D101

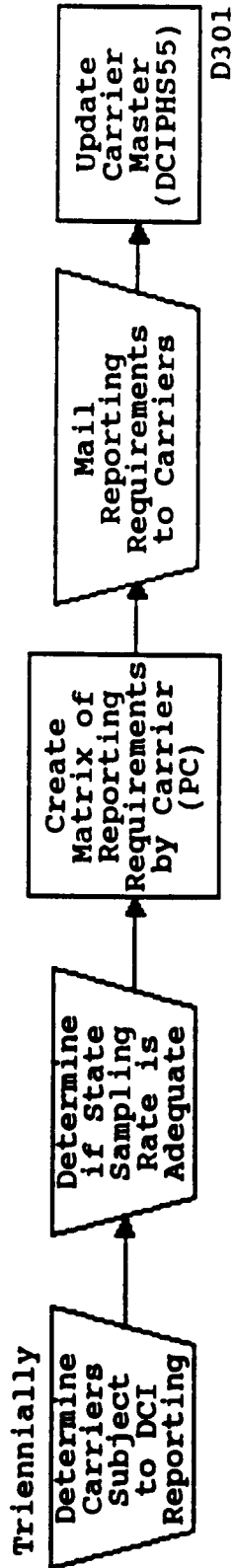


NAIC Examination of NCCI

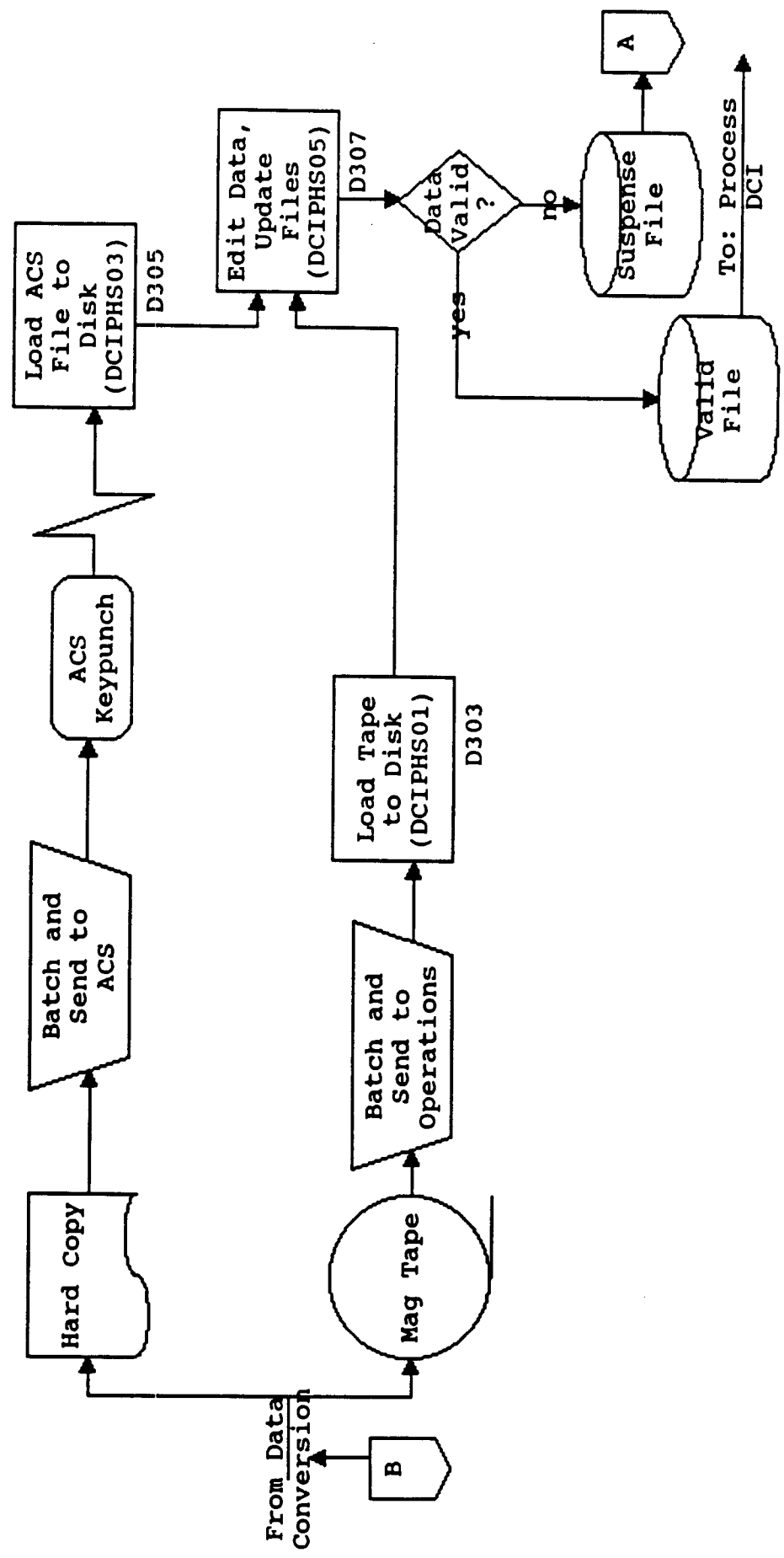
Detailed Claim Information (DCI)

Determine Sampling Rate and Carriers

D201

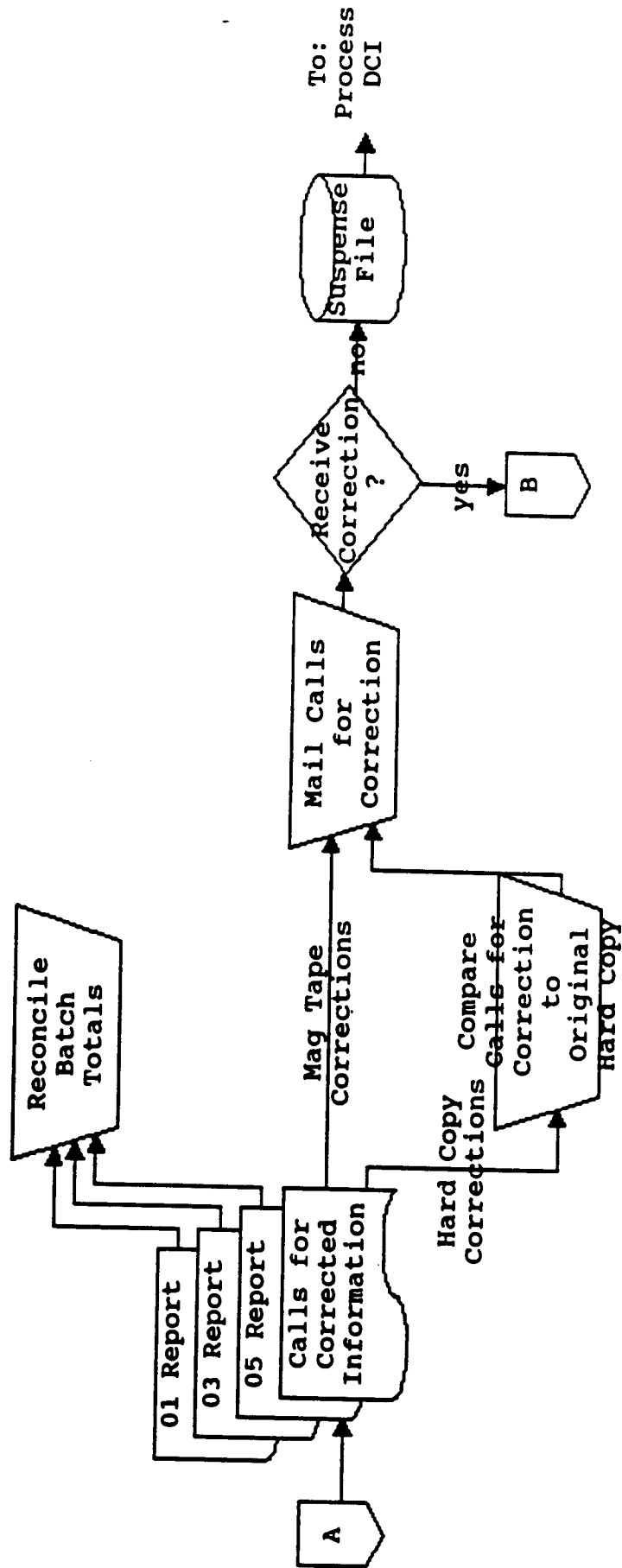


NAIC Examination of NCCI
Detailed Claim Information (DCI)
Receive and Edit DCI

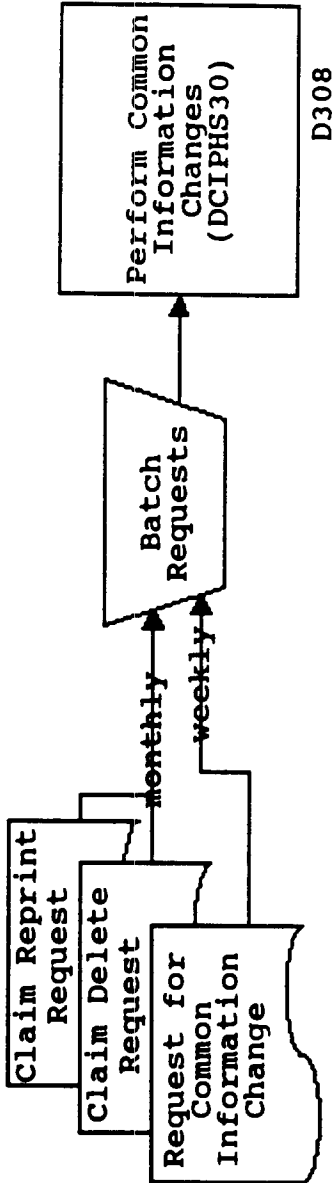


NAIC Examination of NCCI
Detailed Claim Information (DCI)
Receive and Edit DCI

D203B

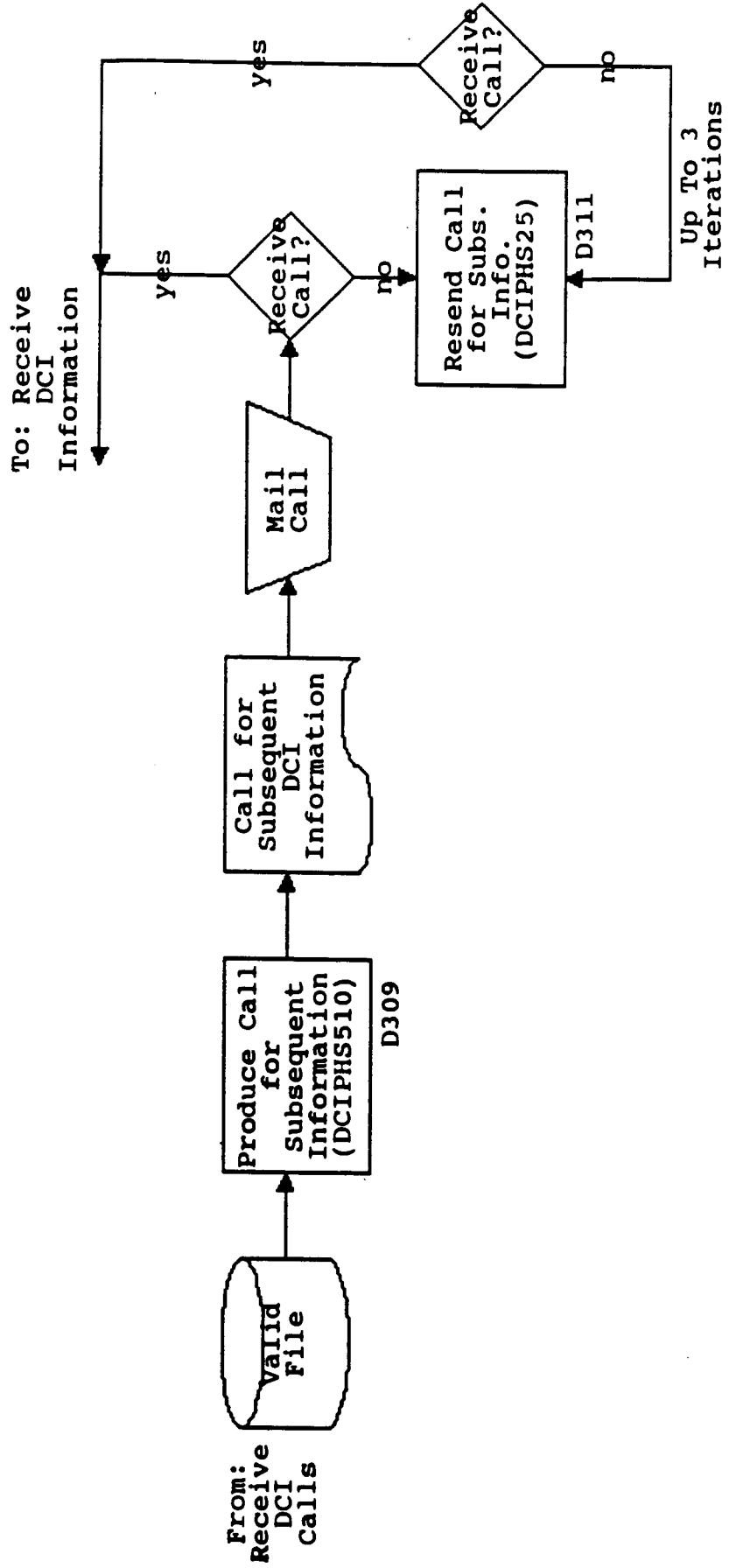


NAIC Examination of NCCI
Detailed Claim Information (DCI)
Receive and Edit DCI



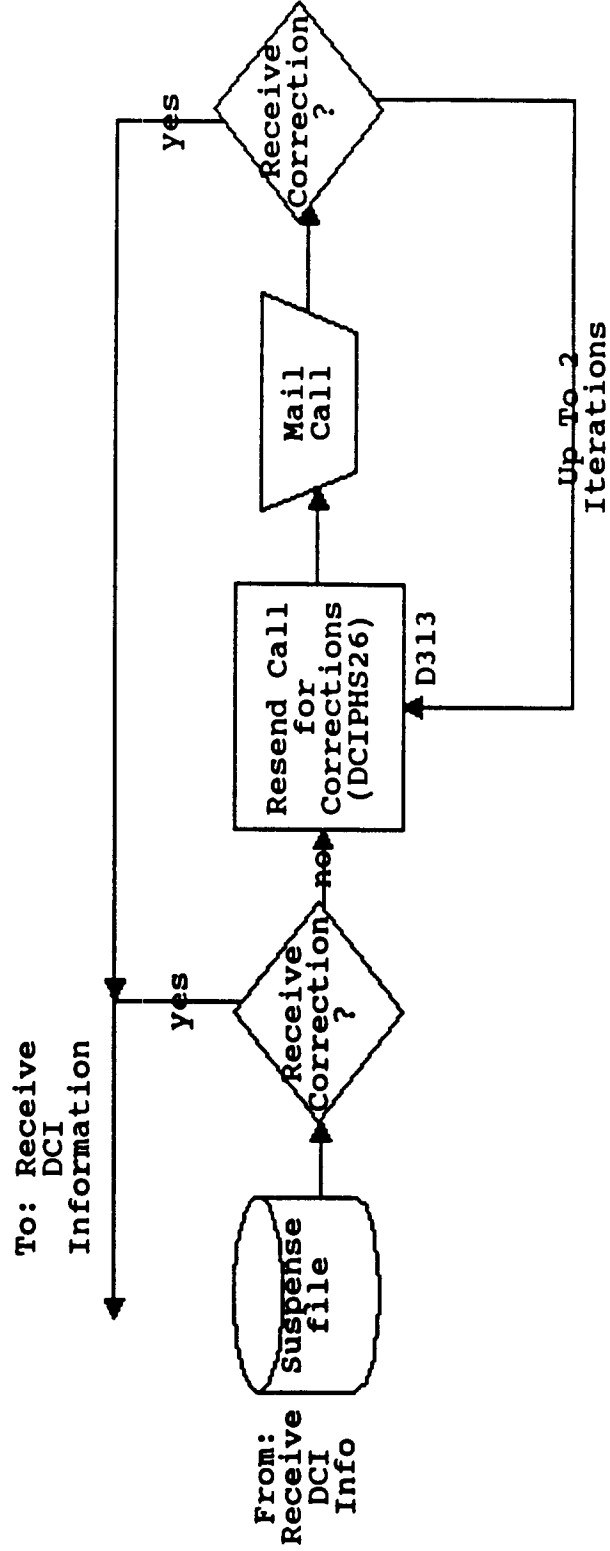
NAIC Examination of NCCI
Detailed Claim Information (DCI)
Process DCI - Weekly

D205A



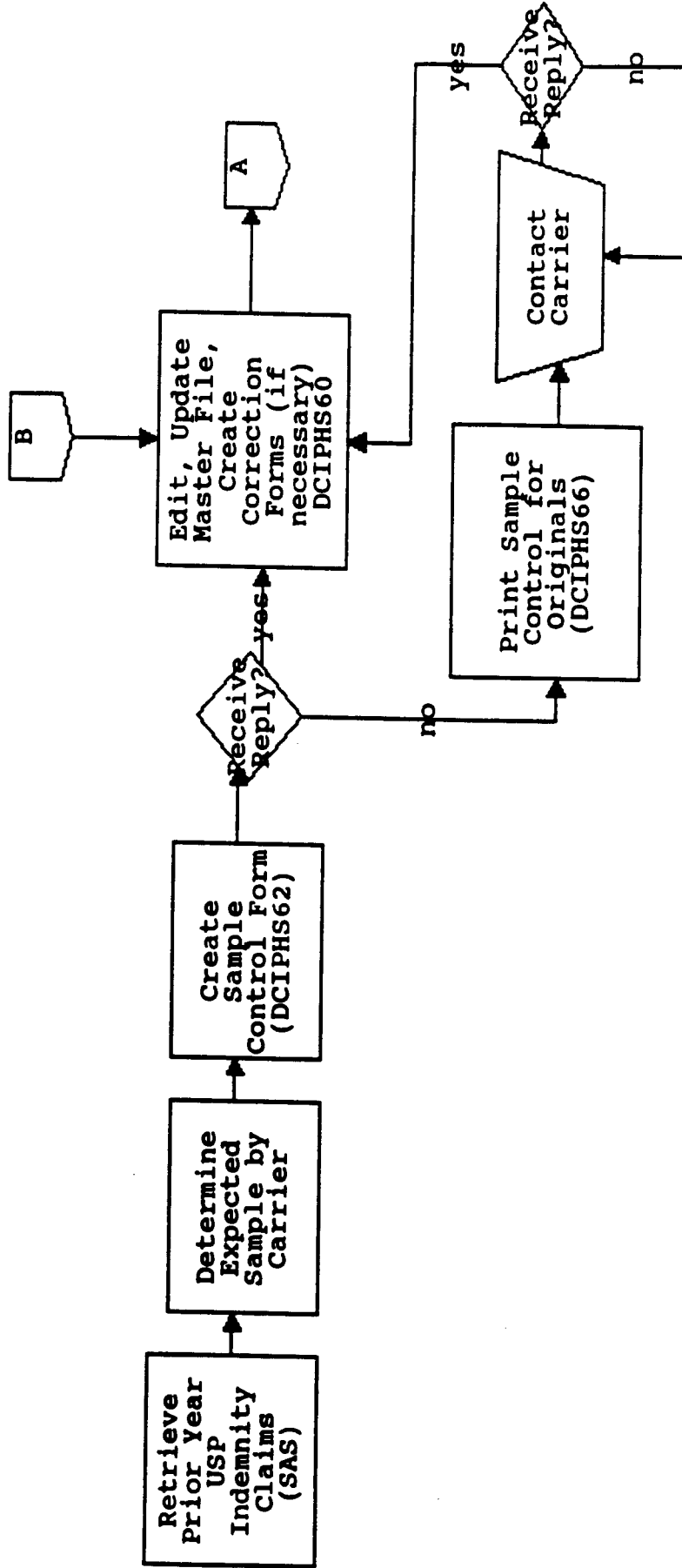
NAIC Examination of NCCI
Detailed Claim Information (DCI)
Process DCI - Weekly

D205B



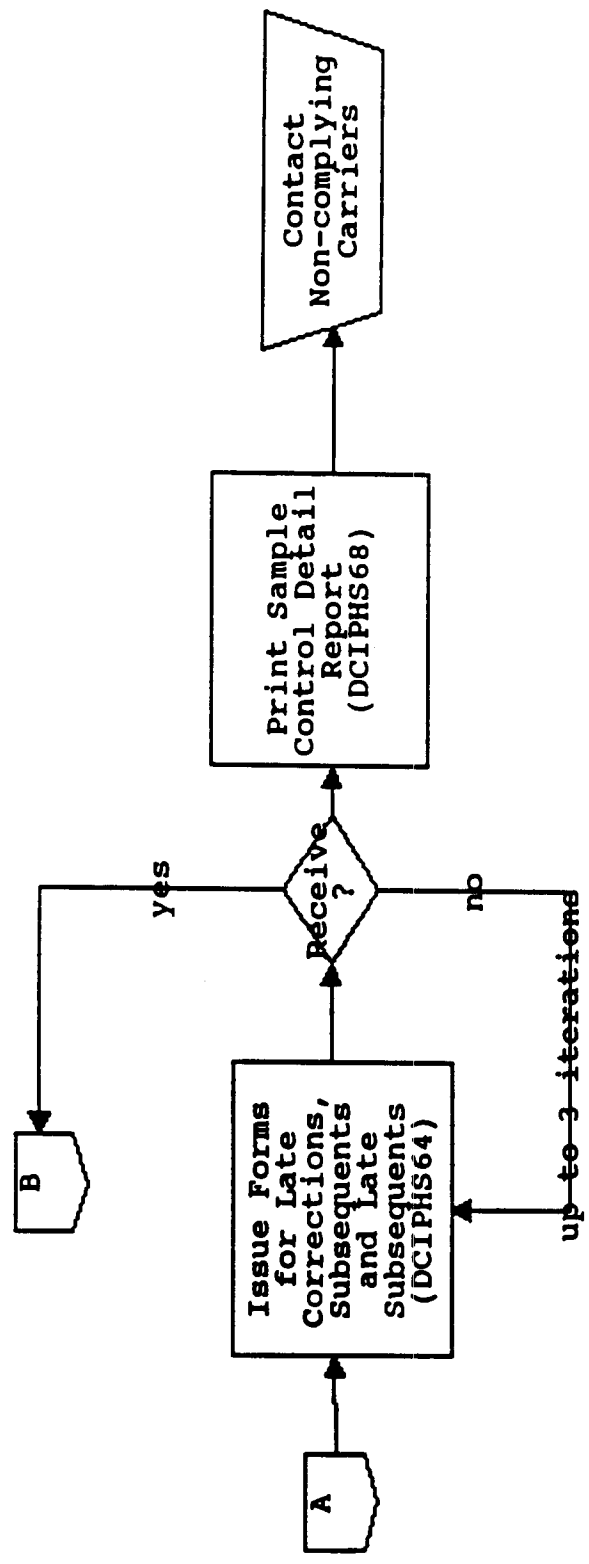
NAIC Examination of NCCI
Detailed Claim Information (DCI)
Process DCI - Monthly

D207A

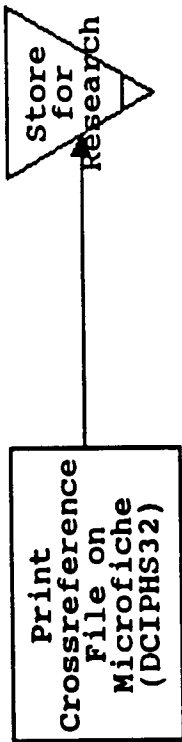


NAIC Examination of NCCI
Detailed Claim Information (DCI)
Process DCI - Monthly

D207B

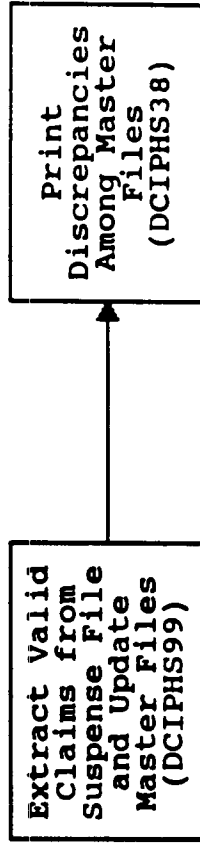


NAIC Examination of NCCI
Detailed Claim Information (DCI)
Process DCI - Monthly

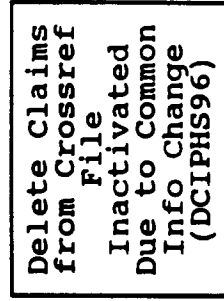


NAIC Examination of NCCI
Detailed Claim Information (DCI)
Process DCI - Annually

D209

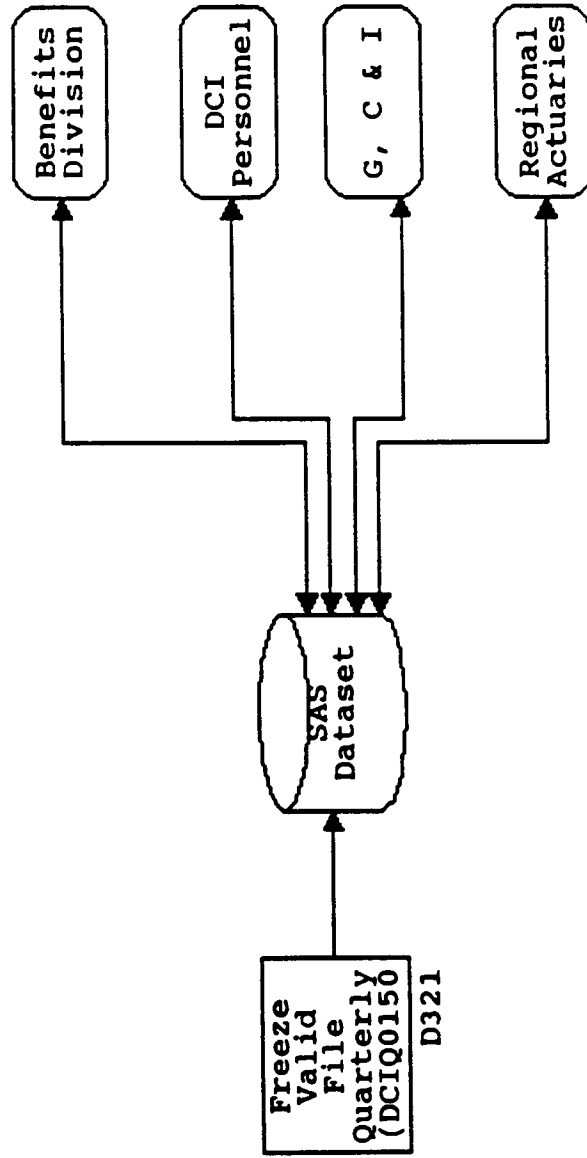


D317



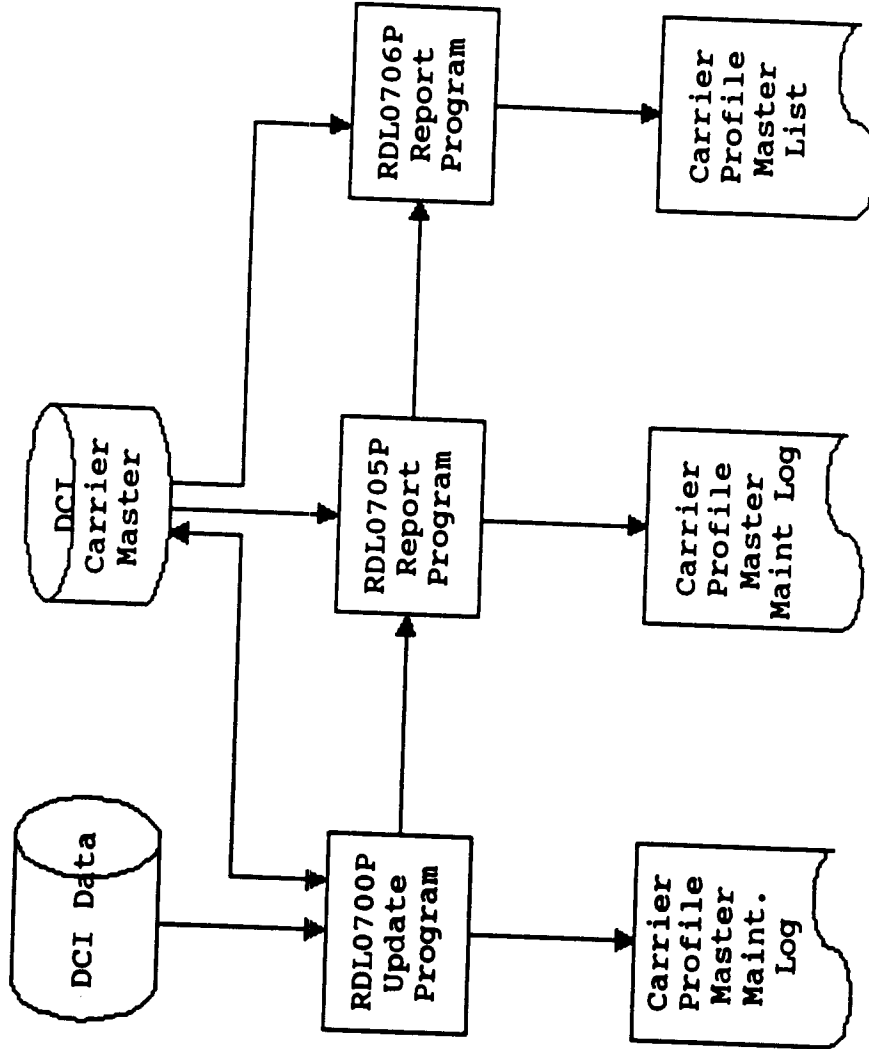
D319

NAIC Examination of NCCI
Detailed Claim Information (DCI)
Analyze DCI

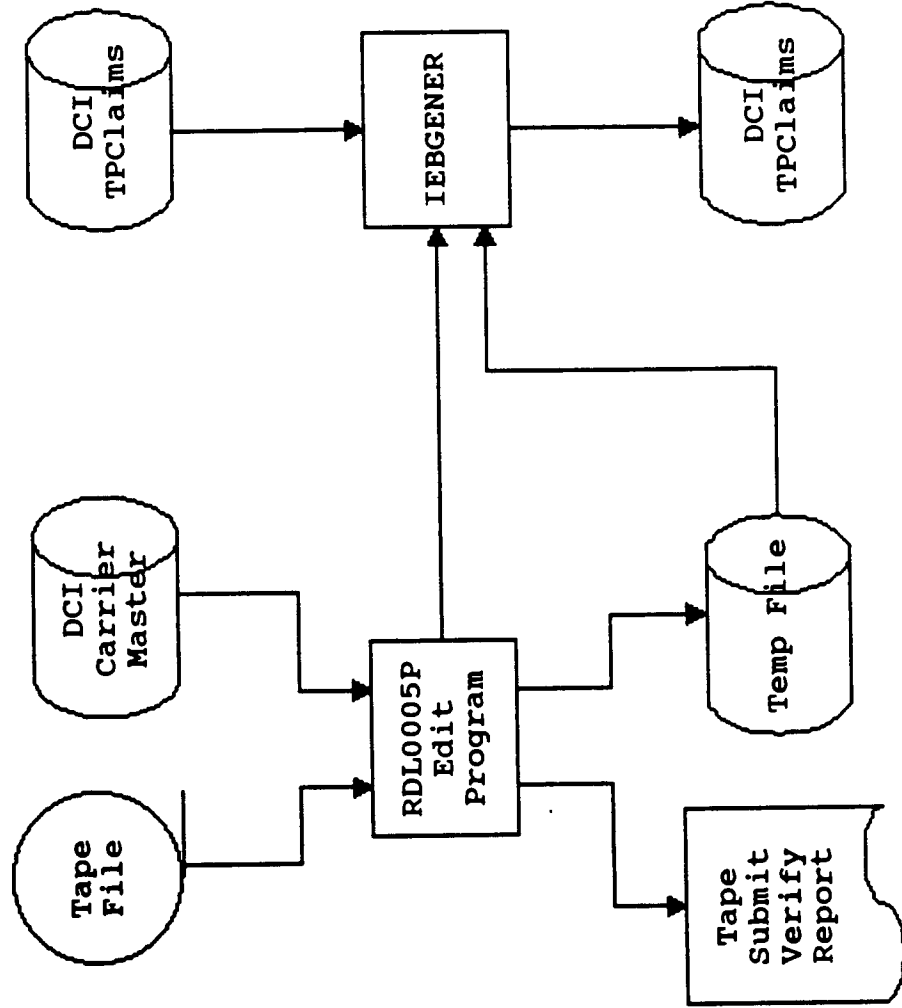


NAIC Examination of NCCI
Determine Sampling Rates and Carriers
DCIPHS55 Proc

D301

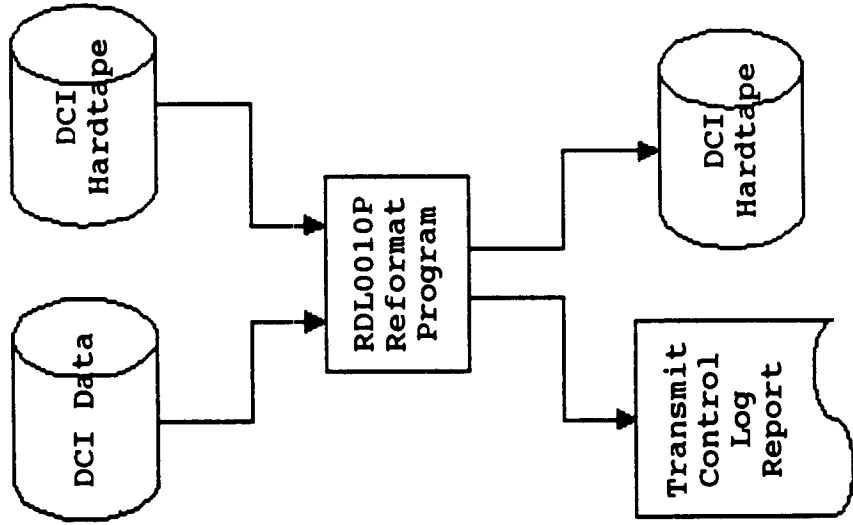


NAIC Examination of NCCI
Receive and Edit DCI
DCIPHS01 Proc

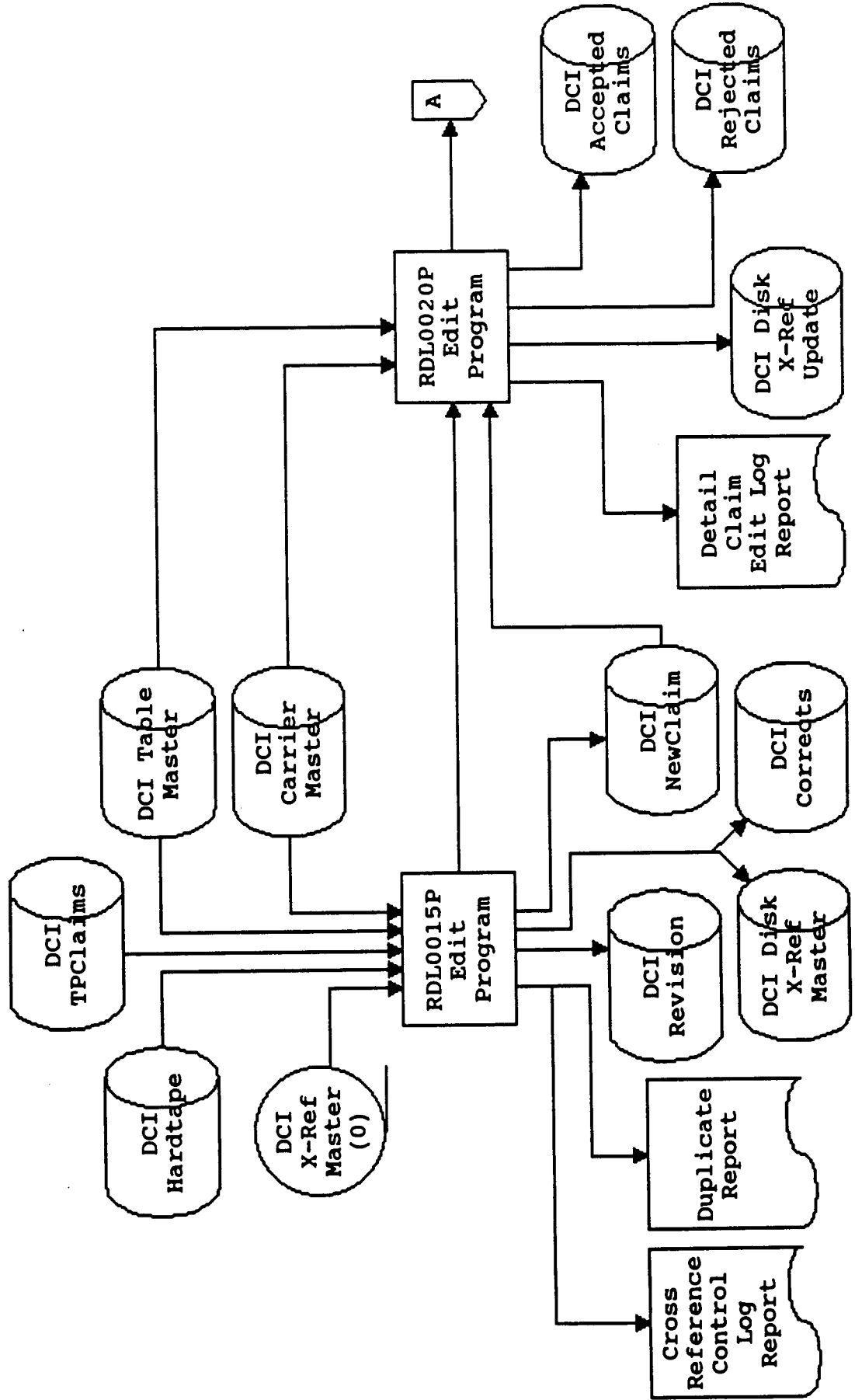


NAIC Examination of NCCI
Receive and Edit DCI
DCIPHS03 Proc

D305

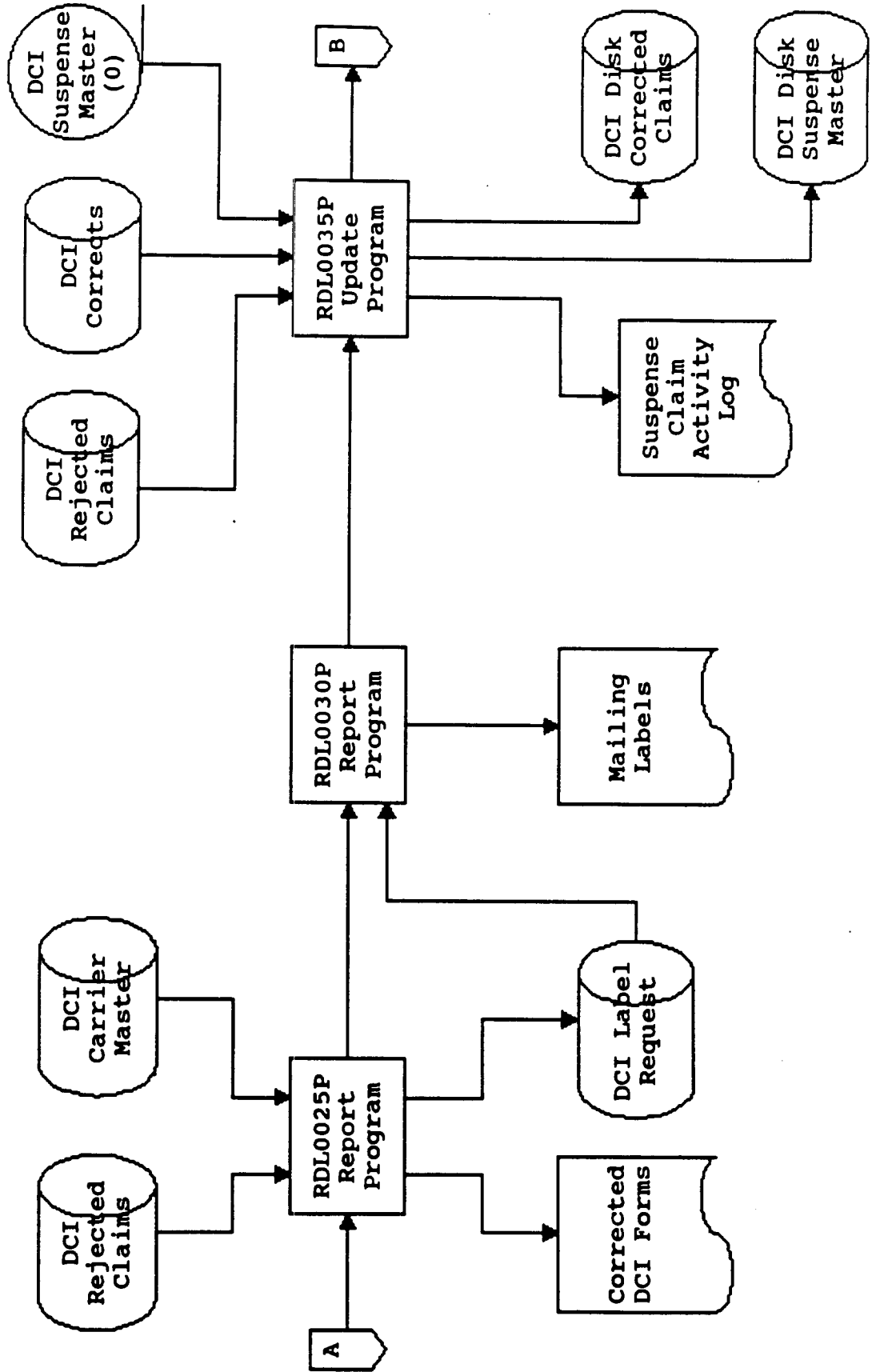


NAIC Examination of NCCI
Receive and Edit DCI
DCIPHS05 Proc



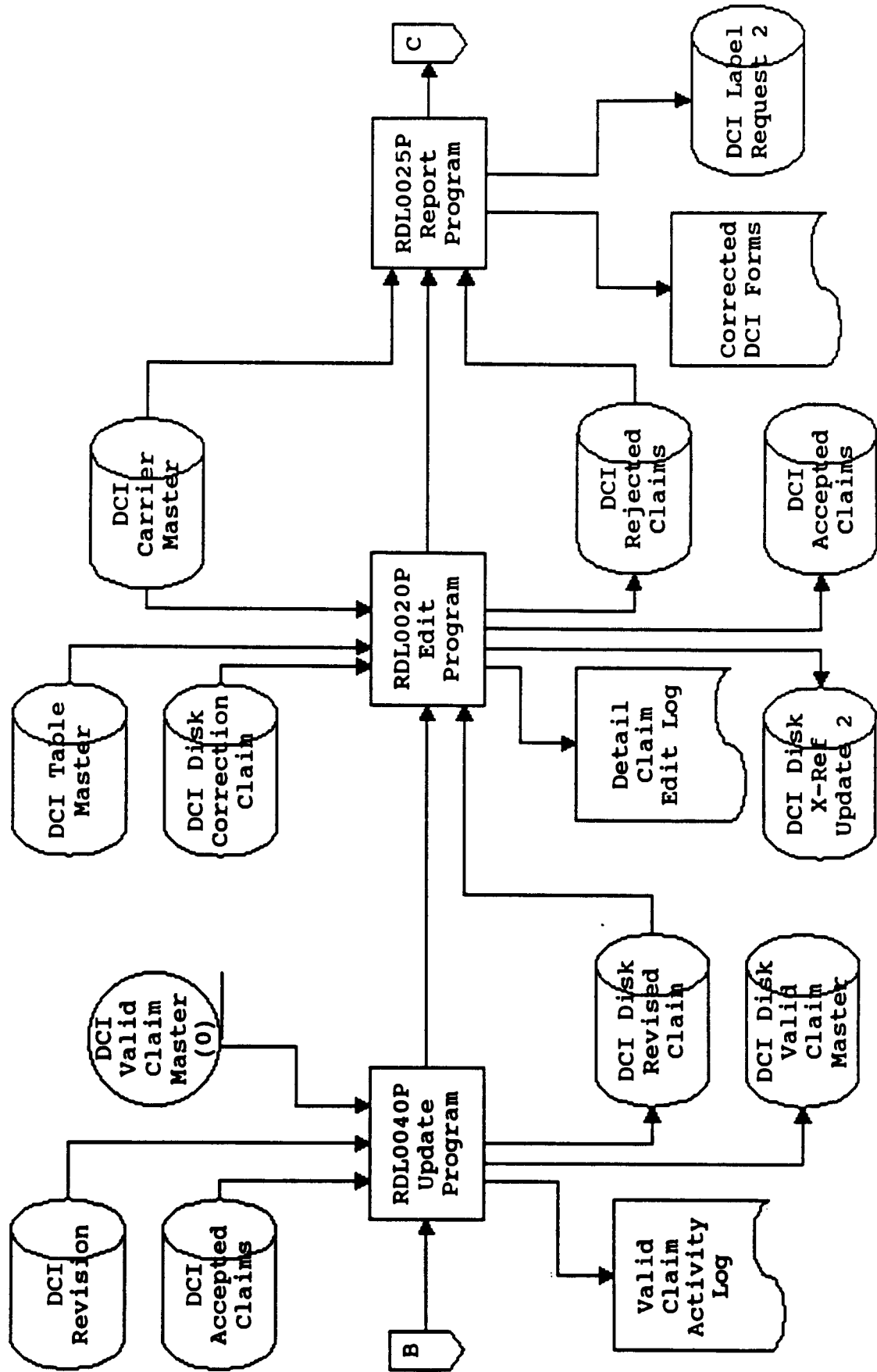
NAIC Examination of NCCI
Receive and Edit DCI
DCIPHS05 Proc

D307B



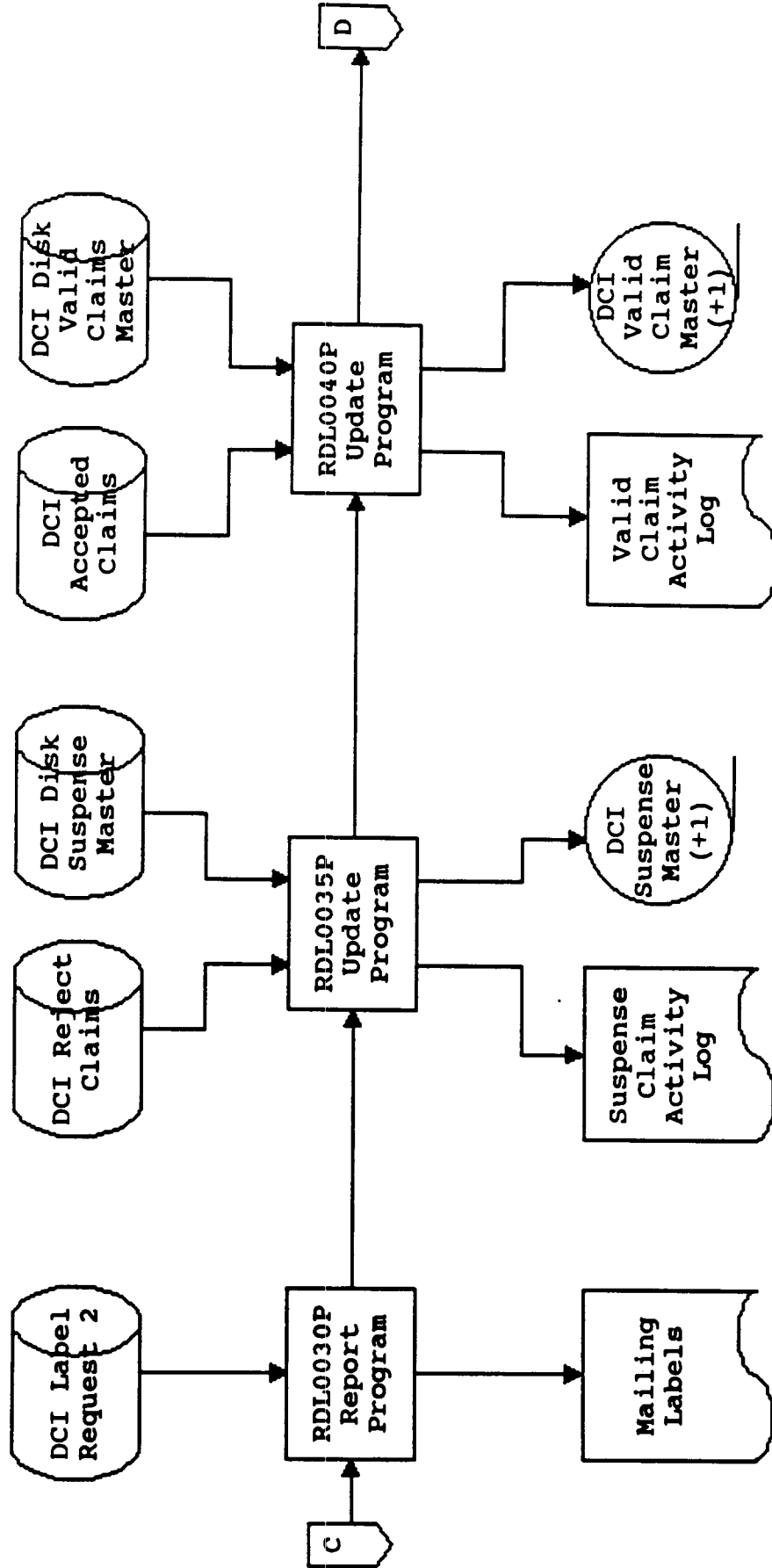
NAIC Examination of NCCI
 Receive and Edit DCI
 DCIPHS05 Proc

D307C



NAIC Examination of NCCI
Receive and Edit DCI
DCIPHS05 Proc

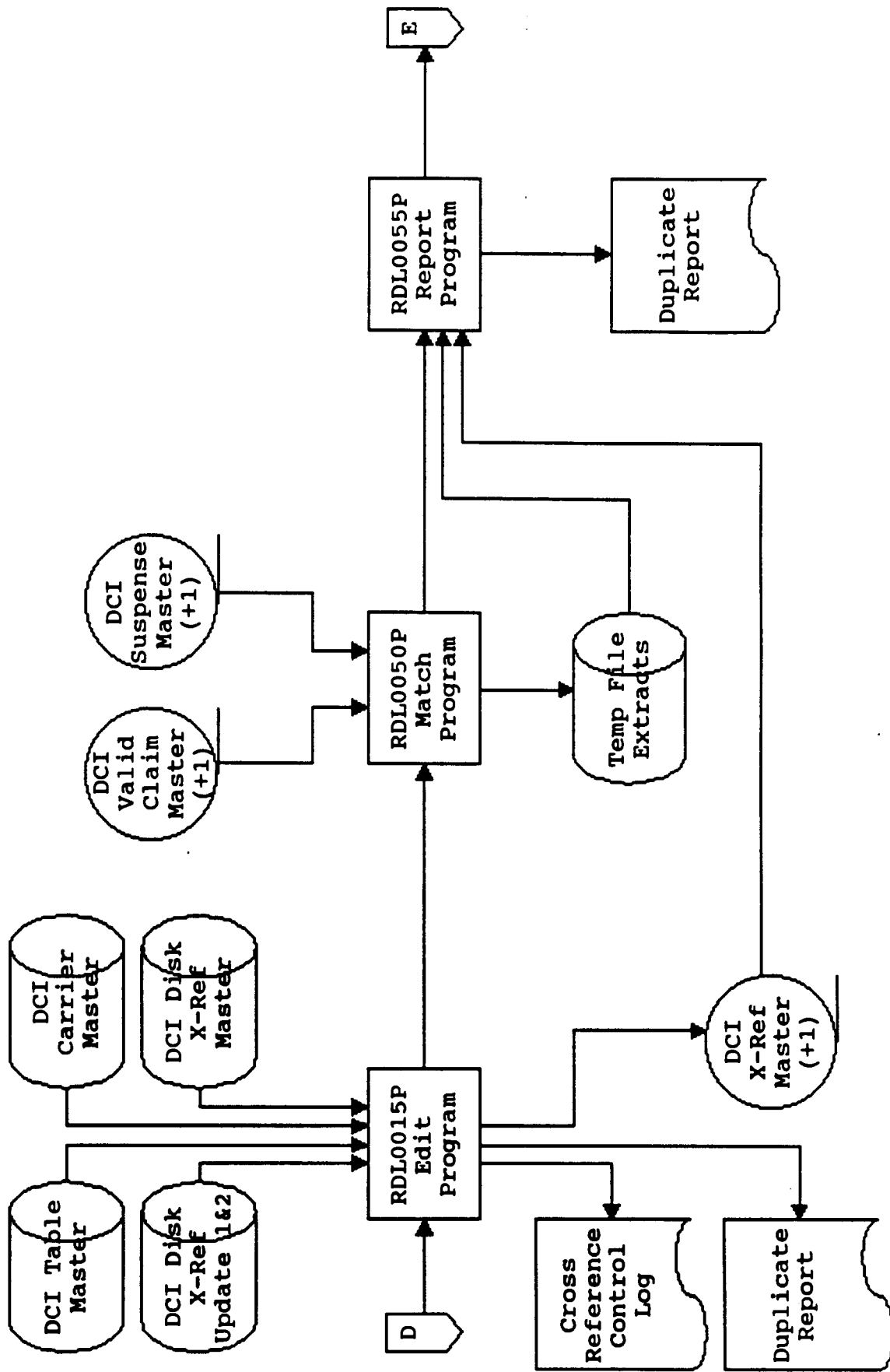
D307D



NAIC Examination of NCCI
Receive and Edit DCI

D307E

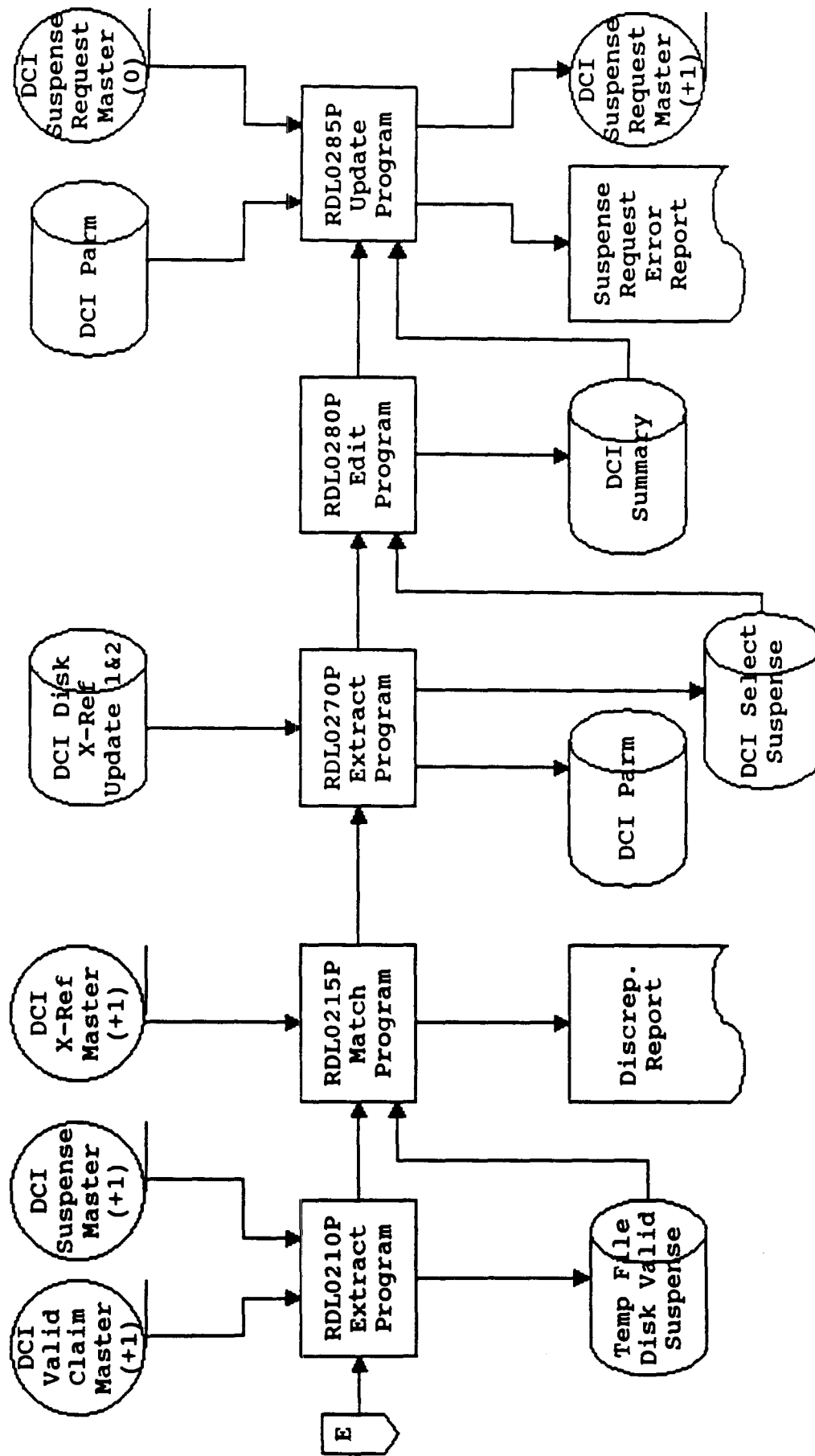
DCIPHS05 Proc



NAIC Examination of NCCI
Receive and Edit DCI

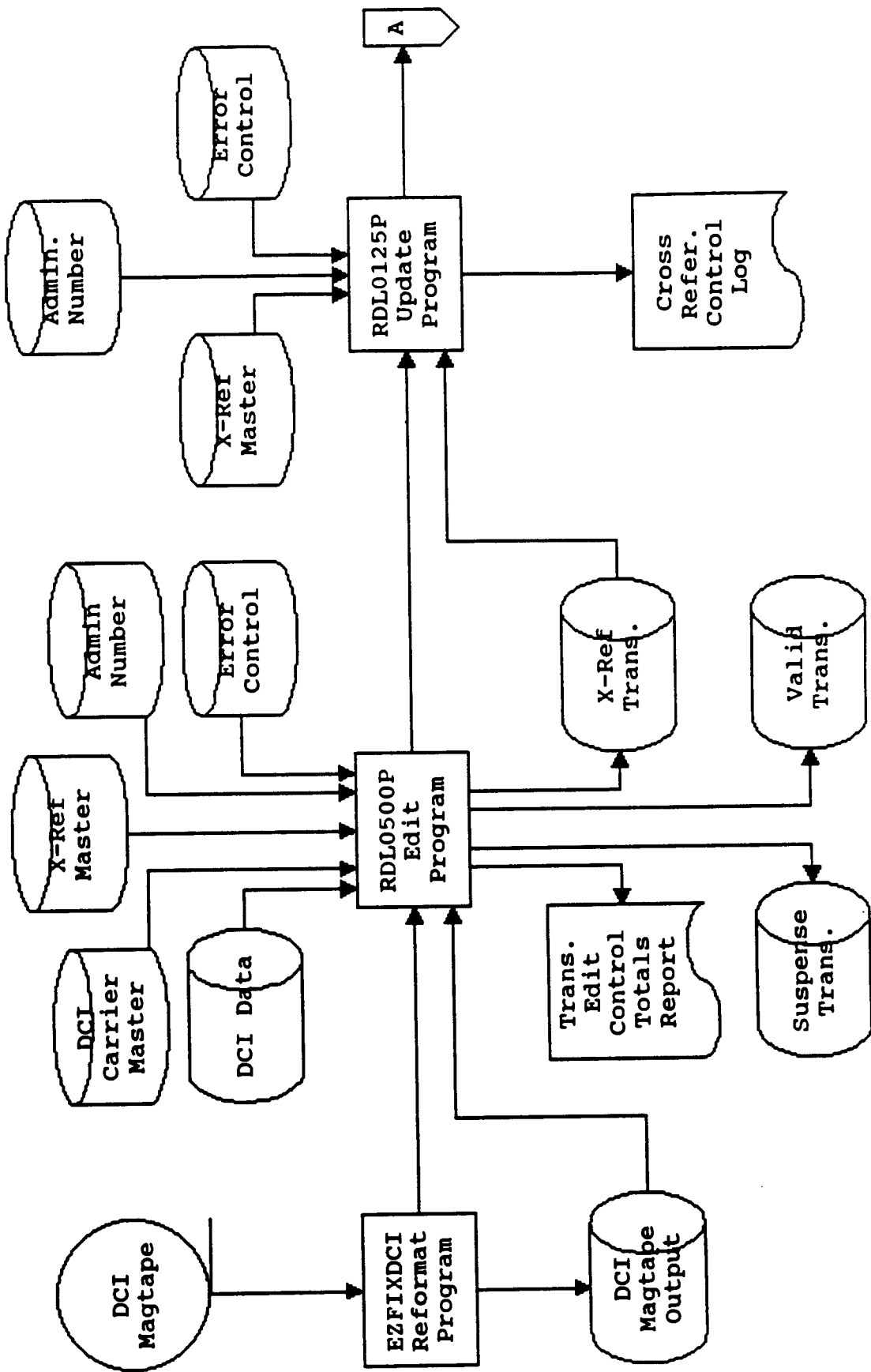
D307F

DCIPHS05 Proc



NAIC Examination of NCCI
 Receive and Edit DCI
 DCIPHS30 Proc

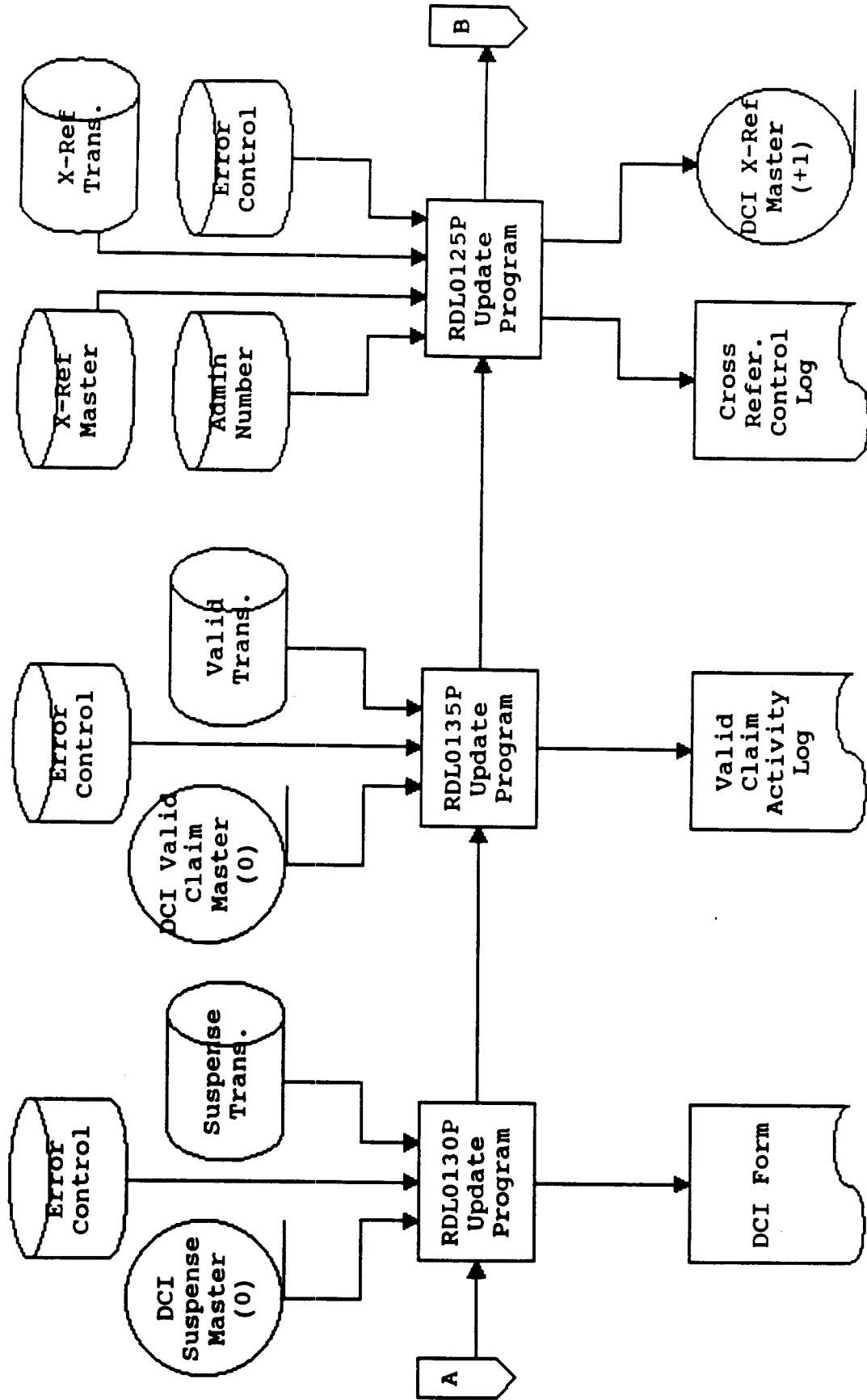
D308A



NAIC Examination of NCCI
Receive and Edit DCI

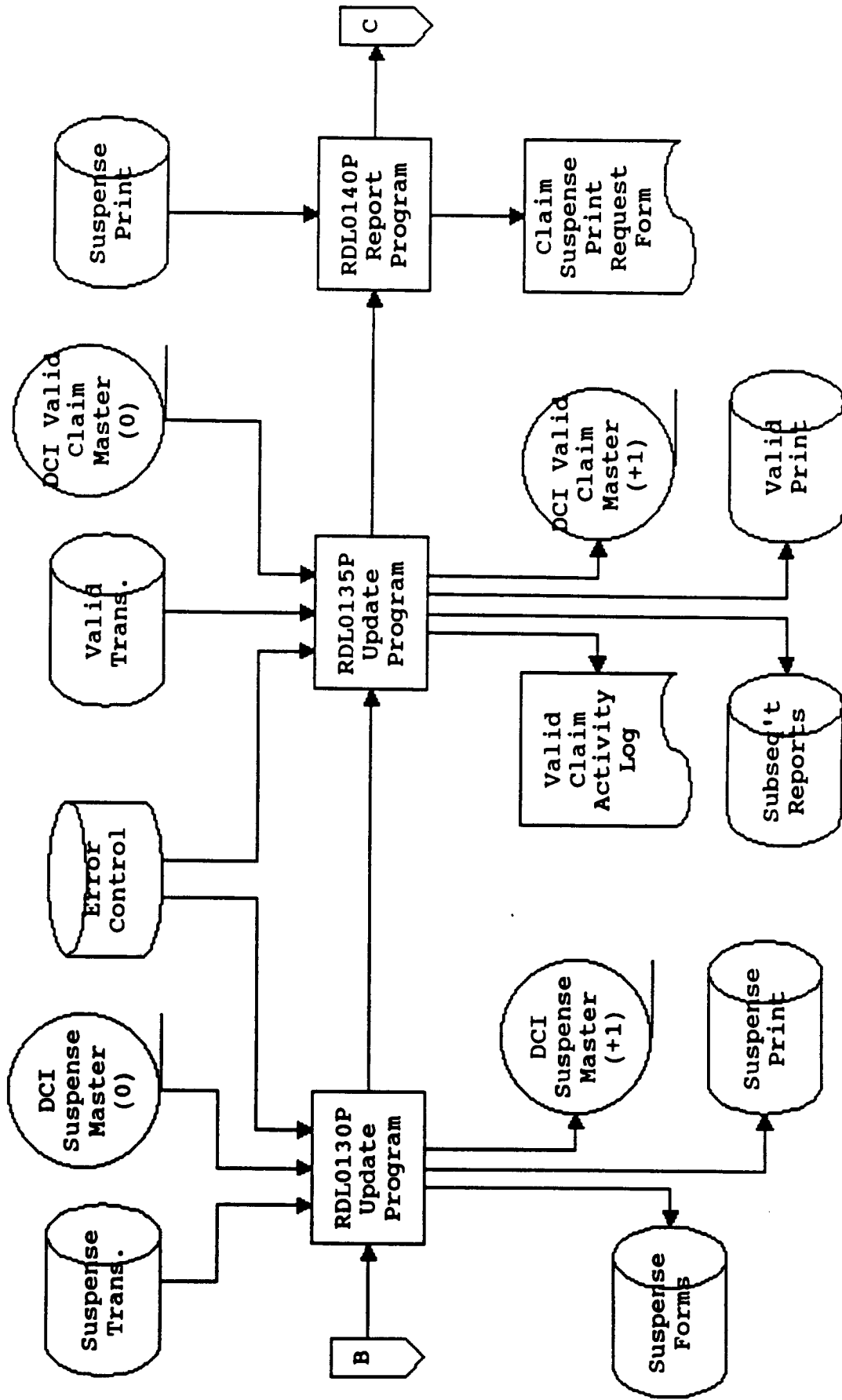
D308B

DCIPHS30 Proc



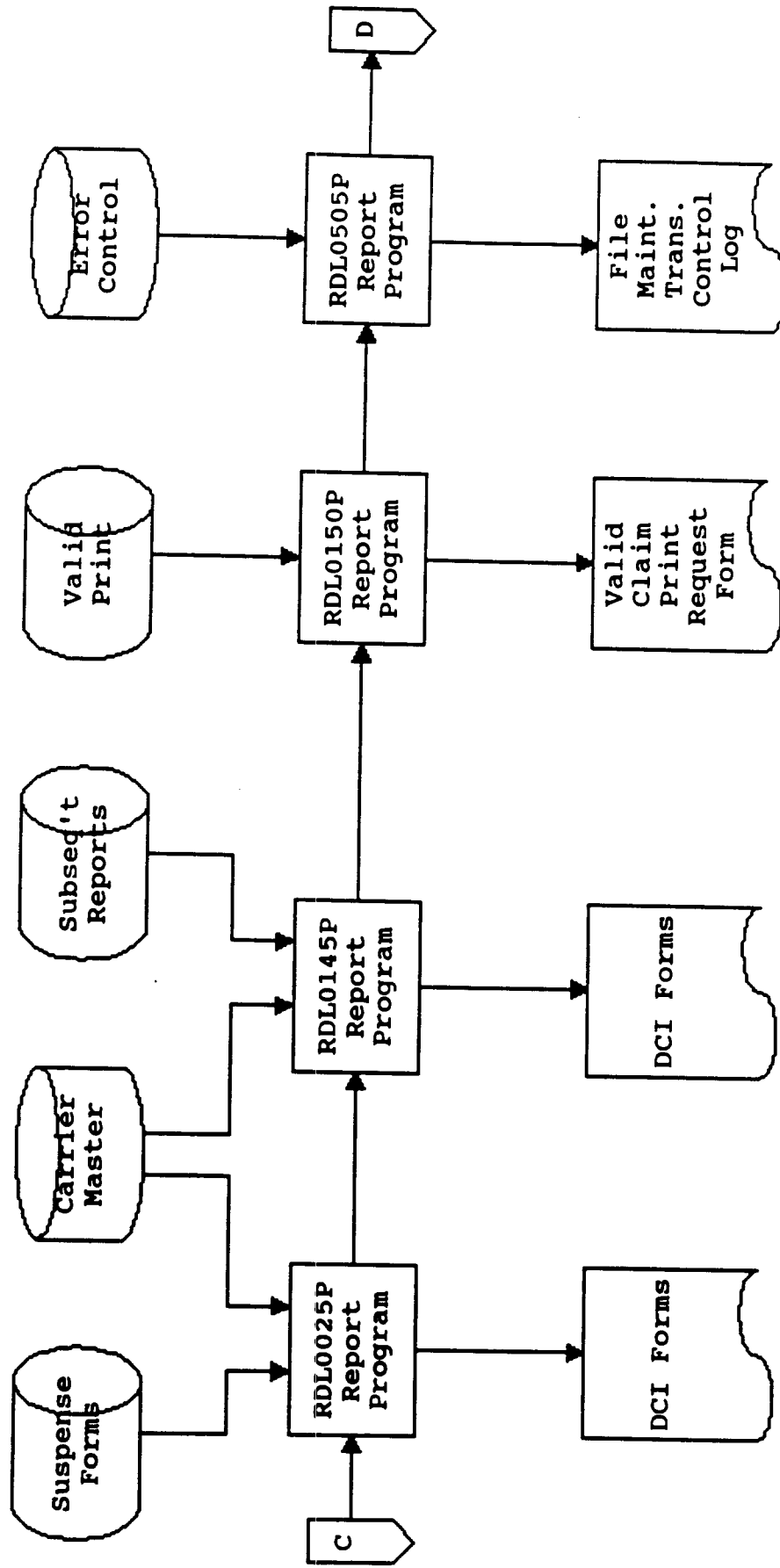
NAIC Examination of NCCI
 Receive and Edit DCI
 DCIPHS30 Proc

D308C



NAIC Examination of NCCI
Receive and Edit DCI
DCIPHS30 Proc

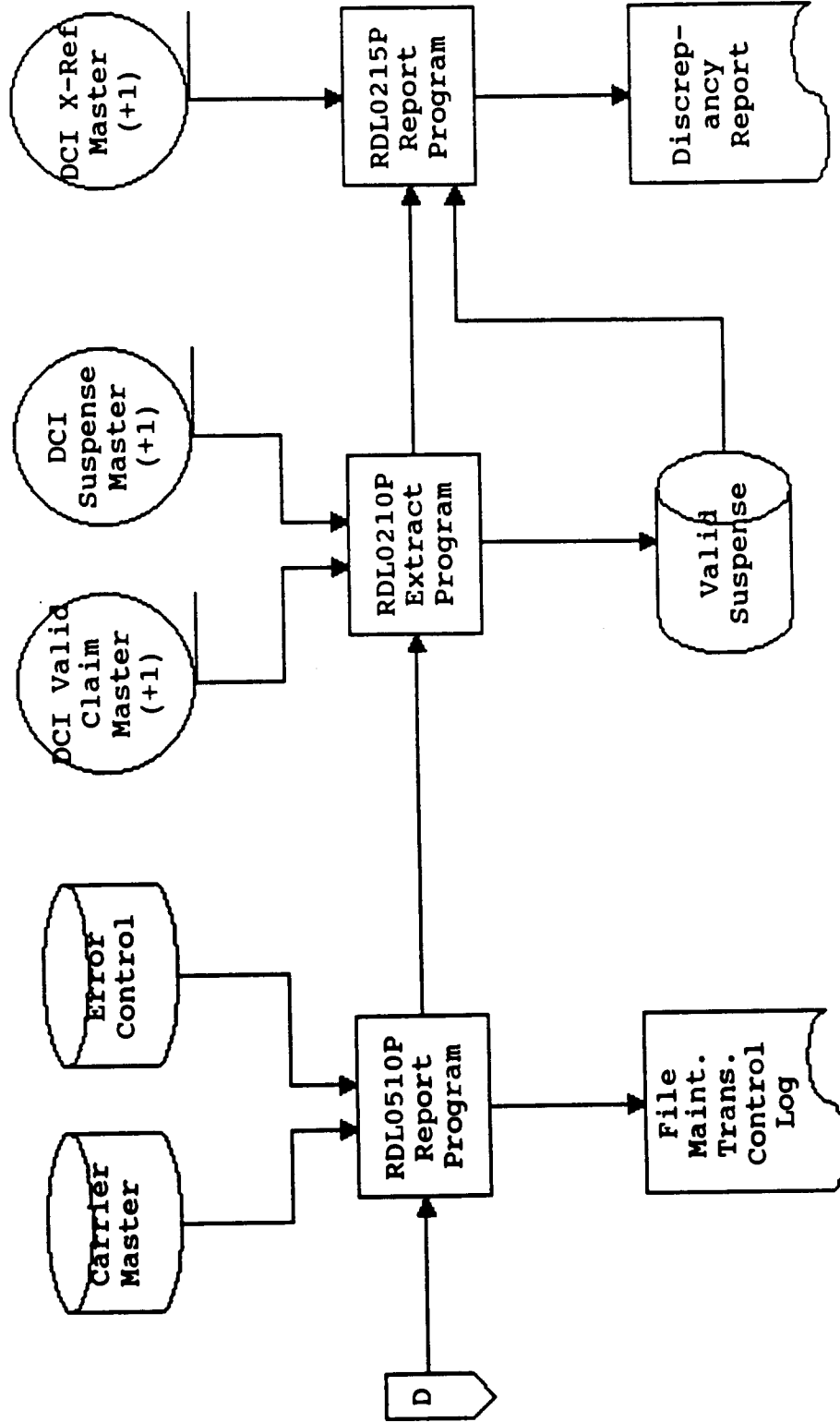
D308D



NAIC Examination of NCCI
Receive and Edit DCI

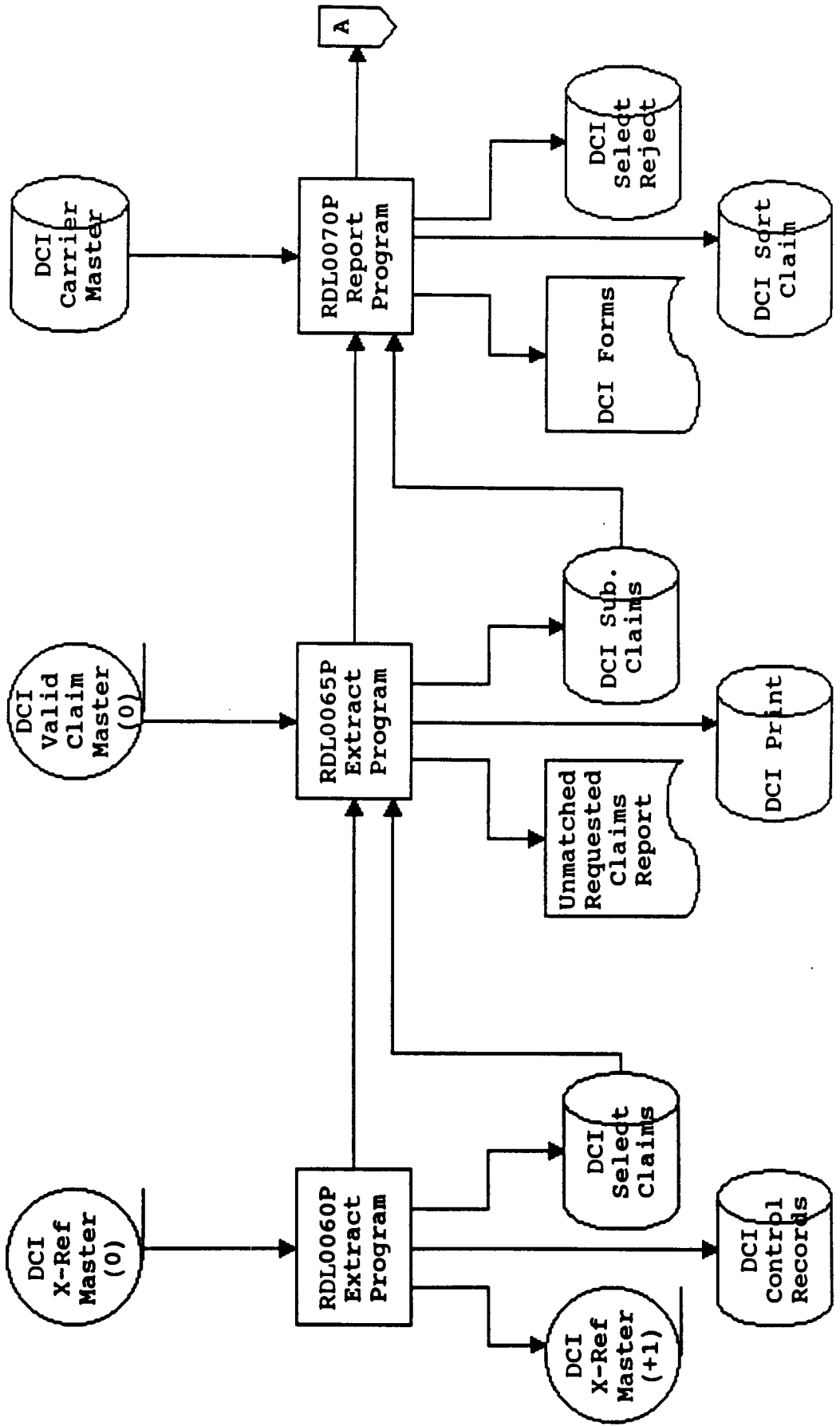
D308E

DCIPHS30 Proc



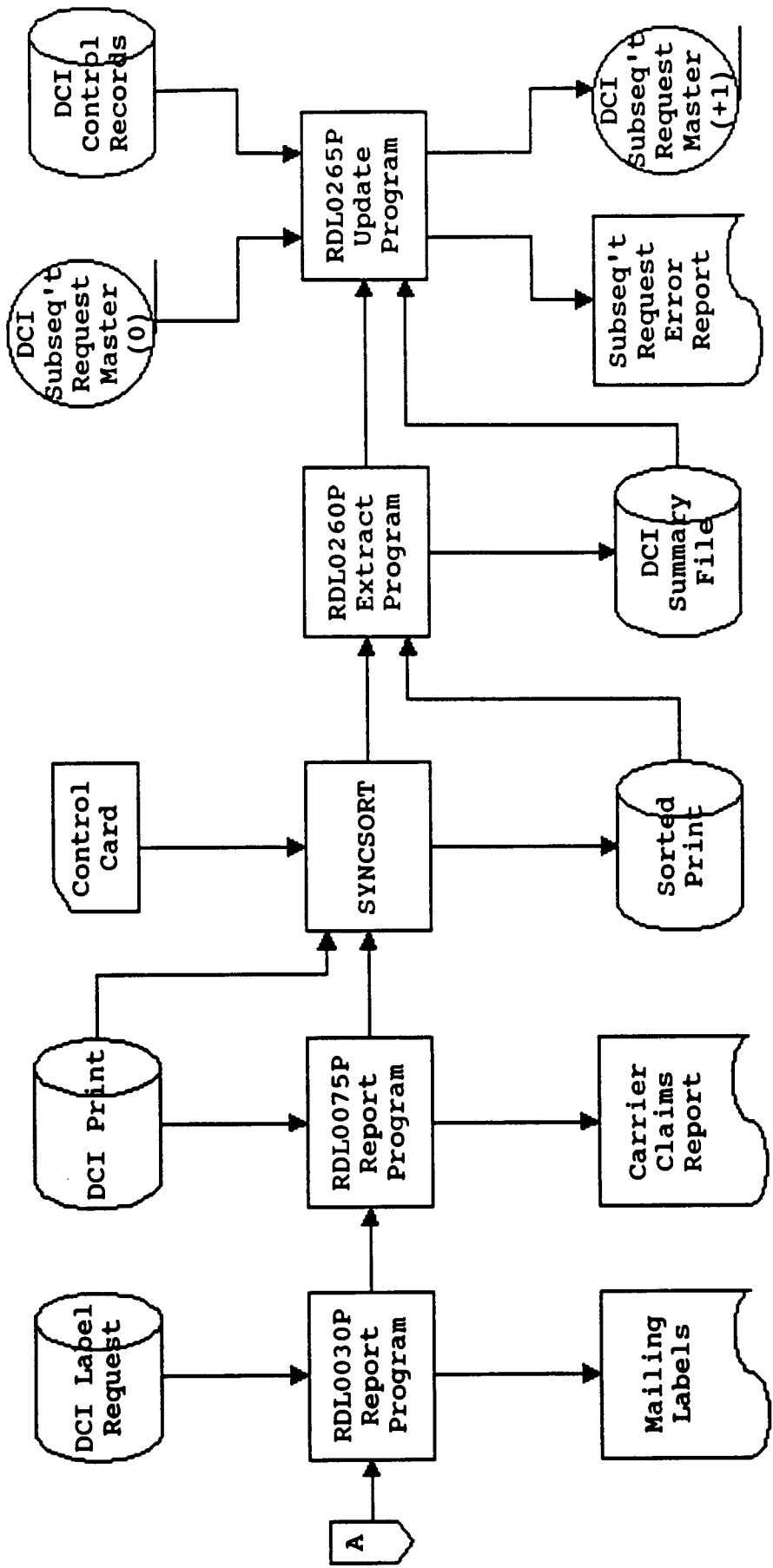
NAIC Examination of NCCI
 Process DCI -- Weekly
 DCIPHS10 Proc

D309A



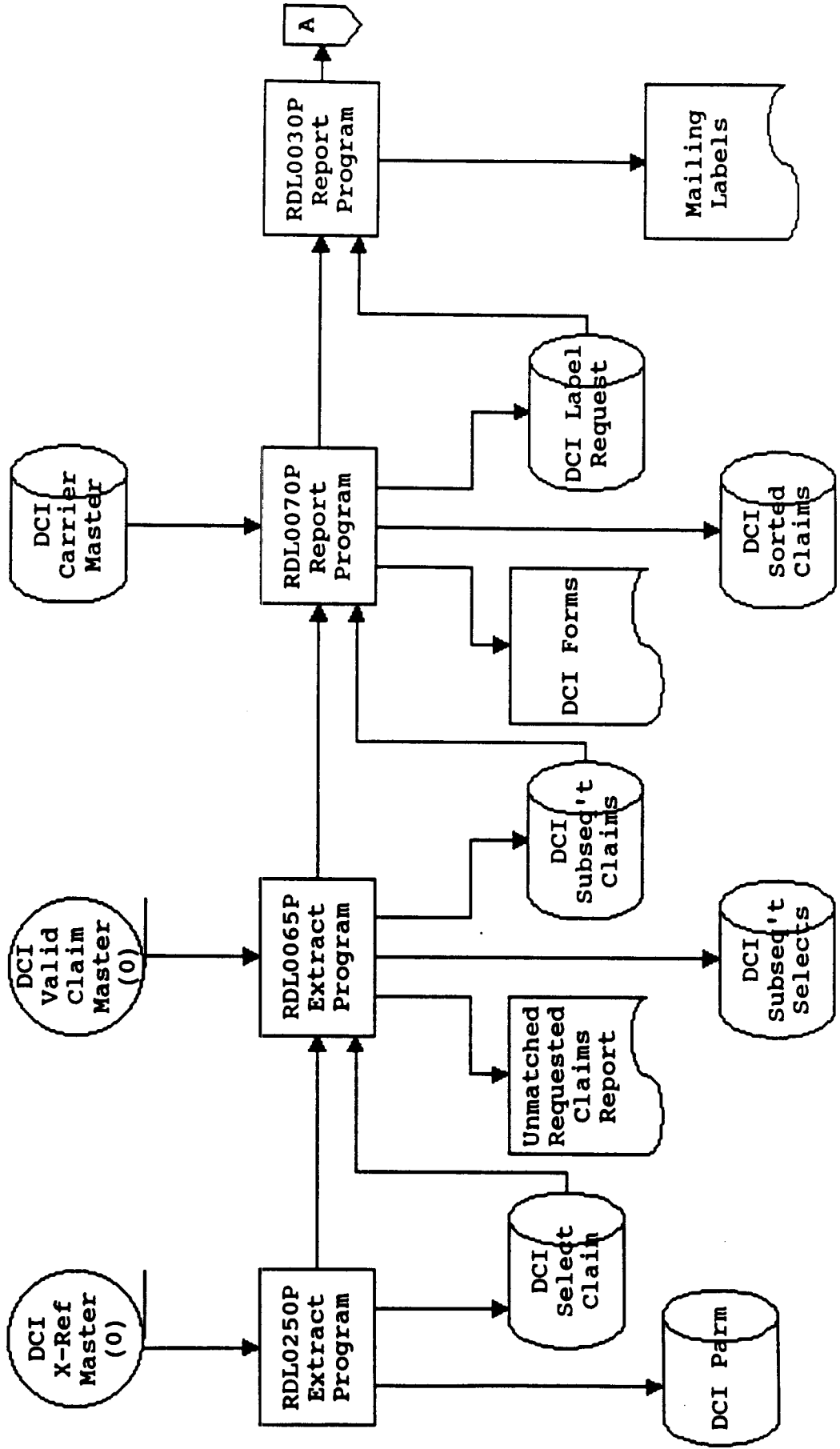
NAIC Examination of NCCI
Process DCI -- Weekly
DCIPHS10 Proc

D309B



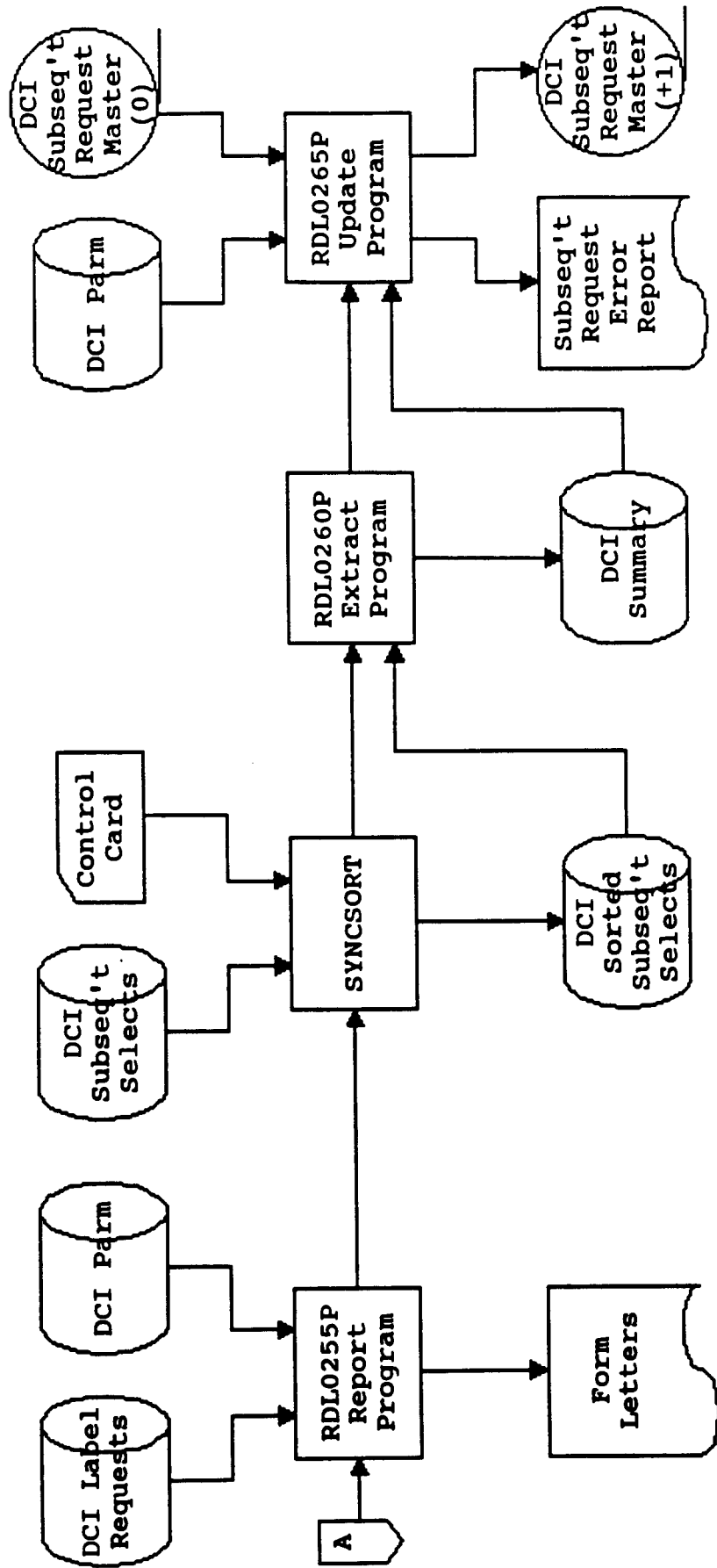
NAIC Examination of NCCI
 Process DCI -- Weekly
 DCIPHS25 Proc

D311A



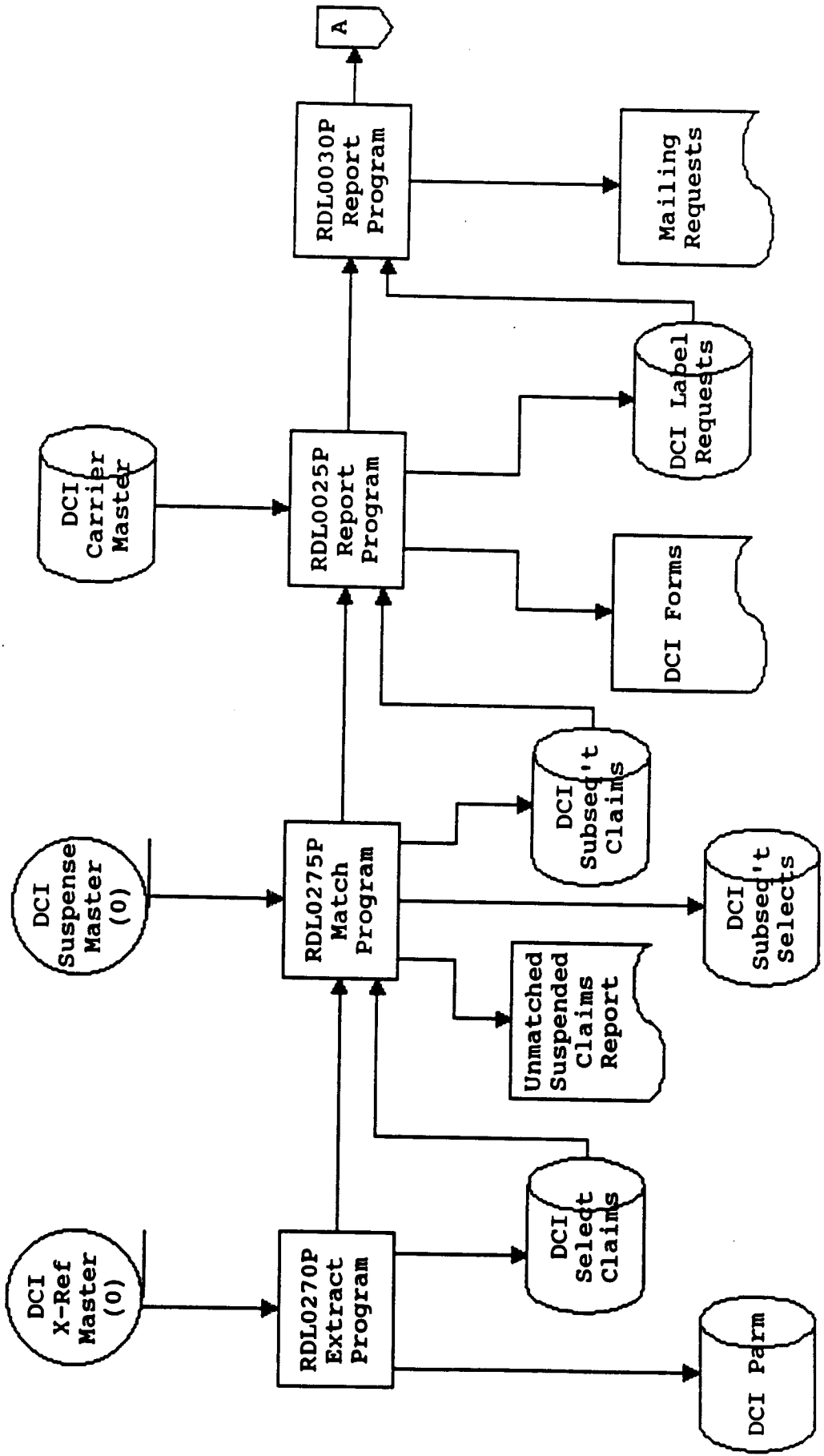
NAIC Examination of NCCI
Process DCI -- Weekly
DCIPHS25 Proc

D311B



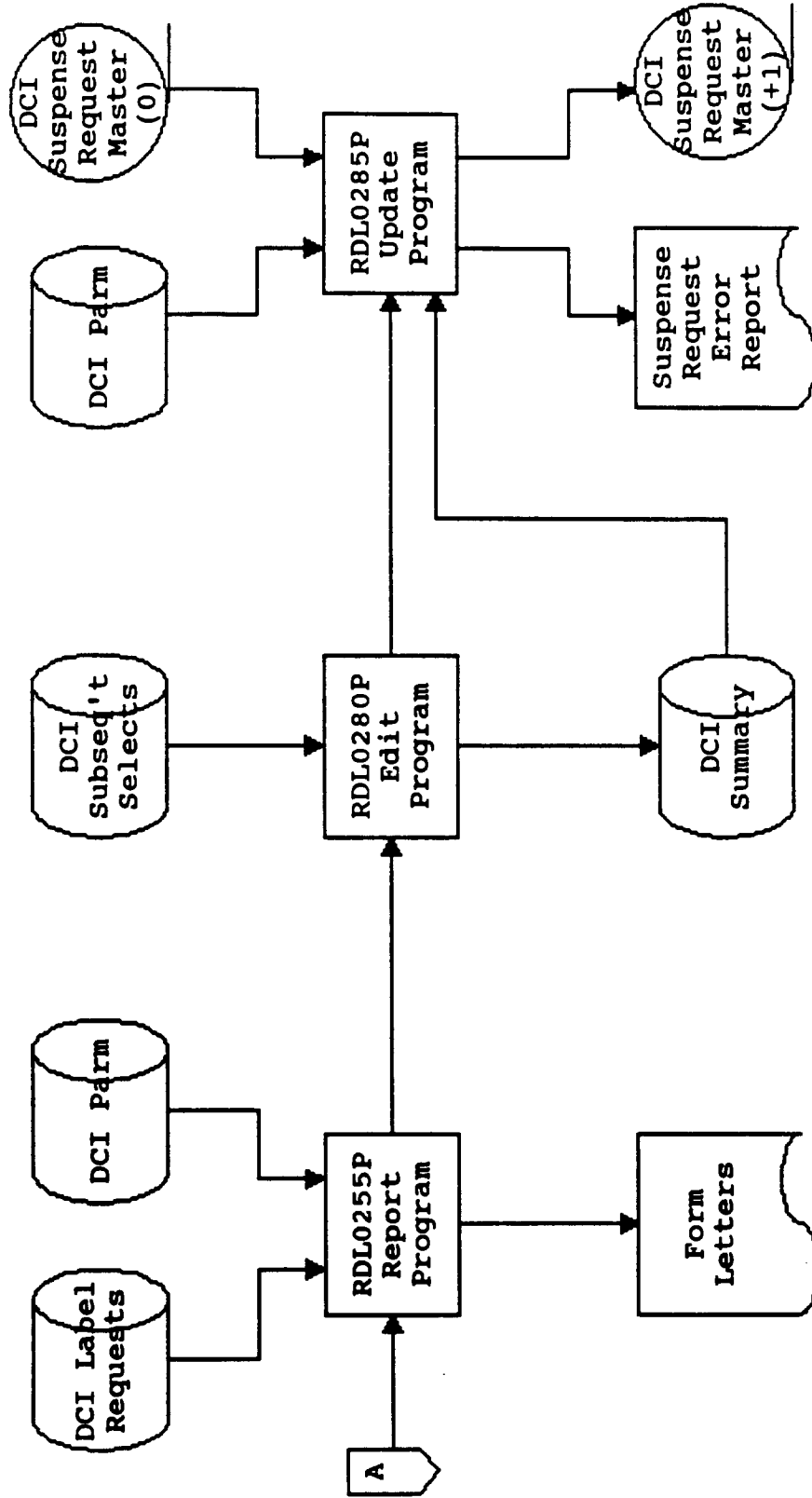
NAIC Examination of NCCI
 Process DCI -- Weekly
 DCIPHS26 Proc

D313A



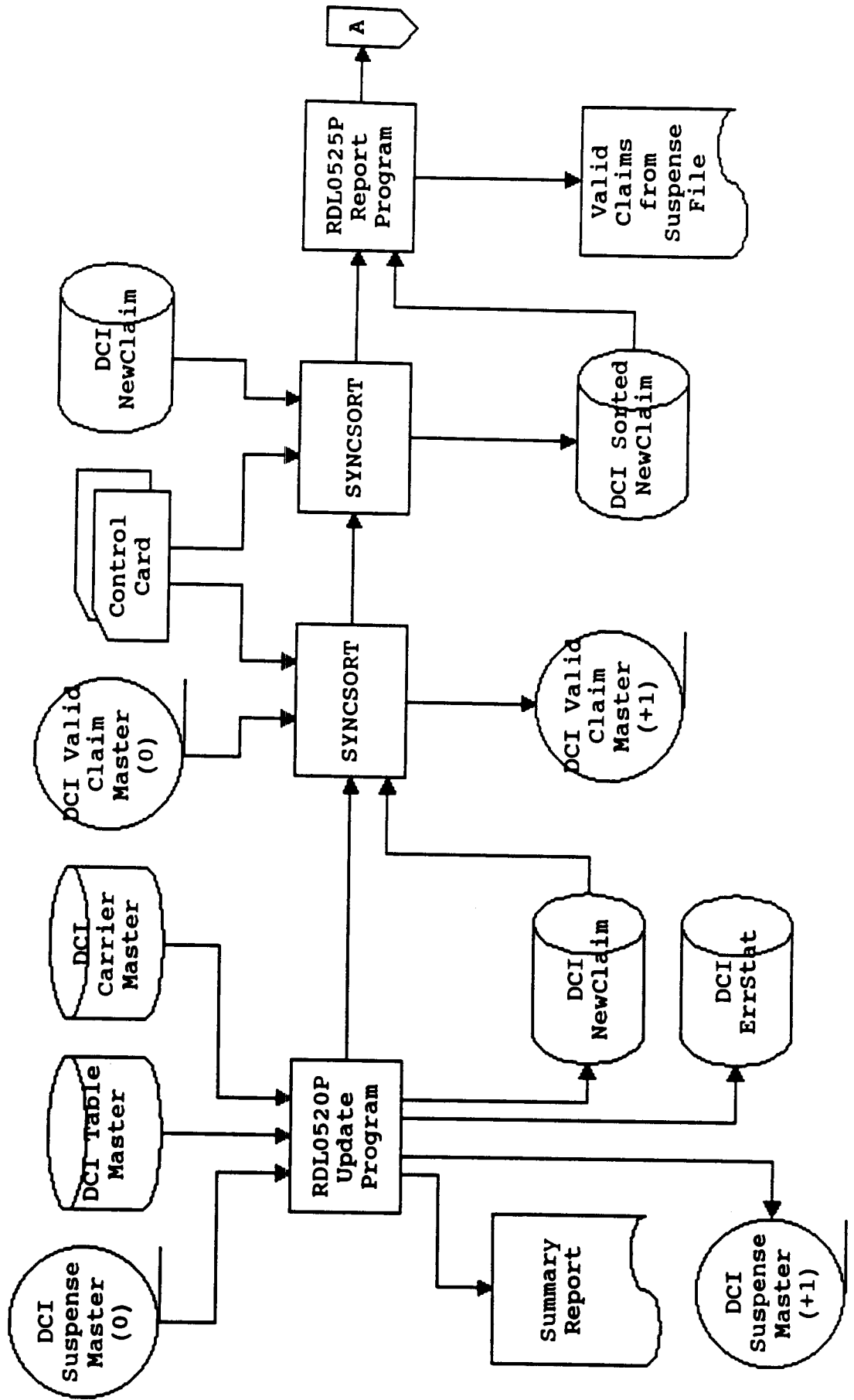
NAIC Examination of NCCI
Process DCI --- Weekly
DCIPHS26 Proc

D313B



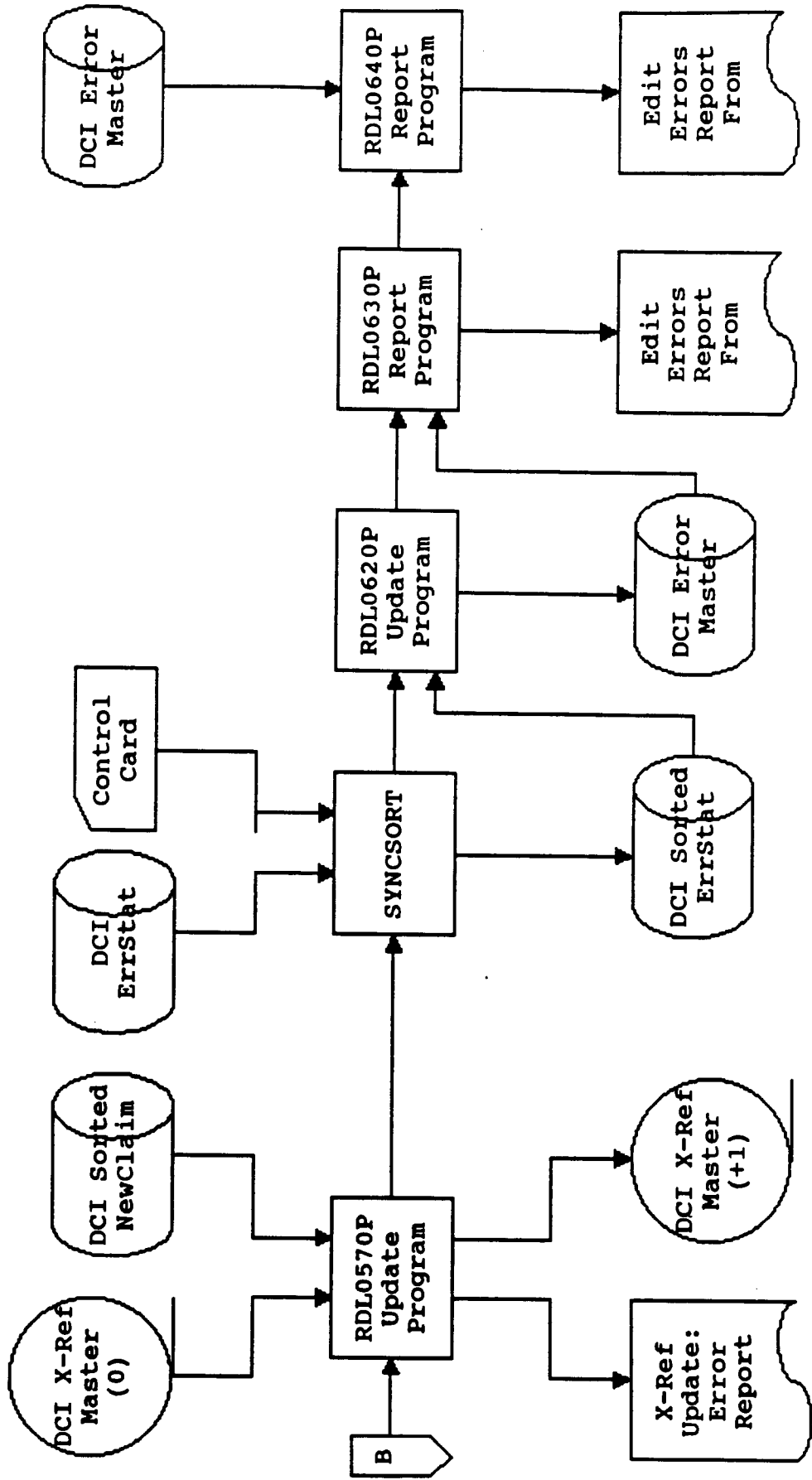
NAIC Examination of NCCI
Process DCI -- Annually
DCIPHS99 Proc

D317A



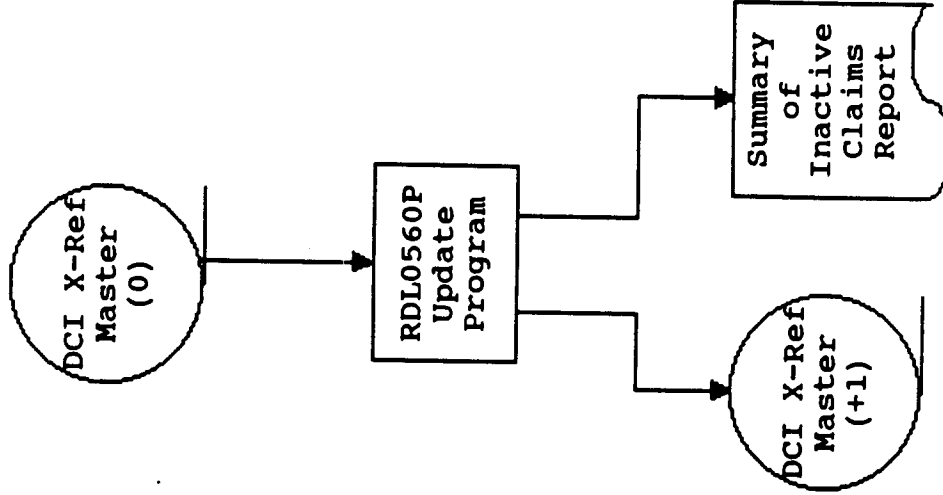
NAIC Examination of NCCI
 Process DCI -- Annually
 DCIPHS99 Proc

D317B



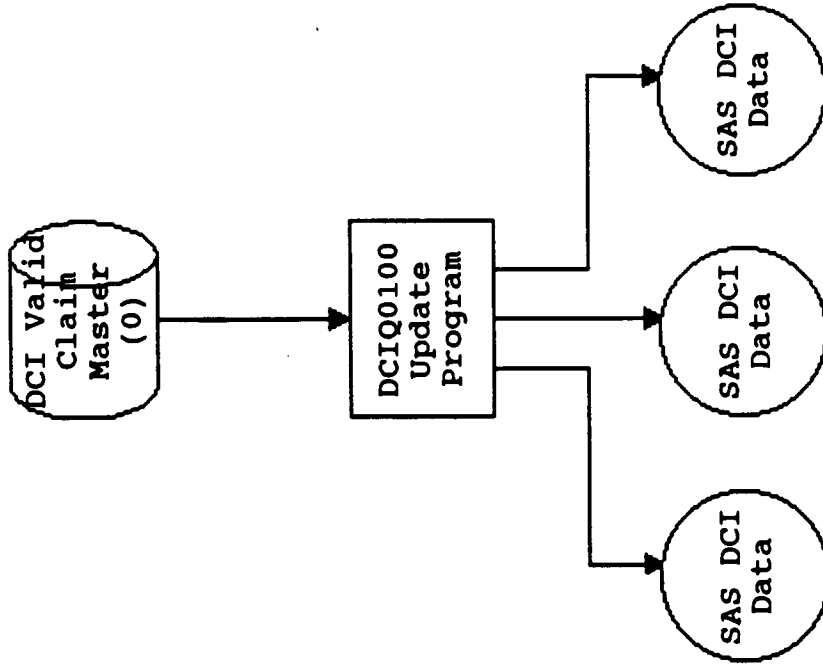
NAIC Examination of NCCI
Process DCI -- Annually
DCIPHS96 Proc

D319



NAIC Examination of NCCI
Analyze DCI
DCIQ0150 Proc

D321



NAIC

Examination of NCCI

Section I: Data Collection and Data Quality

Volume III: Evaluation of Data Collection and Data Quality

May 15, 1991



Milliman & Robertson, Inc.

ARTHUR
ANDERSEN
ARTHUR ANDERSEN & CO., S.C.

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Volume III: Table of Contents

- A. Overall Rate Level
- B. Unit Card Data Conversion
- C. Unit Card Data Administration
- D. Class Ratemaking
- E. Experience Rating
- F. Detailed Claim Information
- G. Policy Issue Capture
- H. Appendix: Summary of Sample Test Results

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Overall Rate Level

A. Area Overview

The Overall Rate Level area collects aggregate premium, loss and expense data from each carrier on forms referred to as financial calls. NCCI receives approximately 95% of financial calls on hardcopy. The remaining calls are submitted by carriers on microcomputer diskette.

Aggregate premium, loss and expense data is combined with data from prior years to produce an overall rate level change recommendation for the industrial classes in each state. The proposed overall rate level change is delivered to Class Ratemaking for use in deriving rates by class and is included as part of the annual state rate filing.

For a more detailed description of the Overall Rate Level area, refer to Volume II, Section I, Description of Data Collection and Data Handling. Detailed flow diagrams for this area are included in the Volume II Appendix.

B. Area Evaluation

Key Strengths:

- o NCCI accurately processes the aggregate premium and loss amounts reported by carriers for use in the calculation of overall rate level indications.
- o NCCI consistently uses more than 98% of the premium written in a state to calculate the overall rate level.
- o NCCI's Quality Control department provides an independent check of critical validations and calculations used to determine the overall rate level.
- o NCCI performs extensive actuarial analysis of the financial call data as reported by the carriers.

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Key Weaknesses:

- o Current NCCI policy, procedures, and systems place too much of the burden of data verification and error correction on NCCI, and not enough on the carriers.
- o NCCI has limited controls over its end user systems. These systems account for the majority of overall rate level processing.
- o NCCI collects F-Class financial call data which is not used to determine rate level changes and is not currently validated.
- o The fines assessed through NCCI's current monetary incentive program do not provide significant financial incentive to improve carrier performance.

Key Recommendations:

- o NCCI should place more of the burden of the correction and validation of financial call data on the carriers.
- o NCCI should develop, establish, and strictly enforce standards for developing, executing, and maintaining end user applications.
- o NCCI should examine their current list of financial calls. Calls which are not validated or required should be eliminated.
- o Fines for late submissions and errors should be more significant and should also be assessed for failure to respond to NCCI inquiries about possible errors. This would encourage carriers to submit quality data on time and to respond promptly to NCCI requests for additional information.

C. Testing Objectives

- To evaluate the quality and adequacy of financial call data validation in Overall Rate Level.

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- To evaluate the controls over completeness of financial call data used to produce overall rate level indications.
- To verify that all corrections made to financial call data are documented and authorized by the appropriate carrier.
- To evaluate the accuracy of financial call data used to determine overall rate level indications as compared to the data reported by carriers.

D. Testing Methods

The evaluation of Overall Rate Level was accomplished through control procedures review, systems review and analysis, and statistical sampling. These techniques are described in the Evaluation Approach section of Volume I, Part C of this report.

E. General Observations & Recommendations

1) NCCI has limited controls over its end user systems in Overall Rate Level.

The Overall Rate Level area currently performs a great deal of its automated processing using systems controlled by actuarial personnel. These systems perform functions critical to NCCI's ratemaking function. They perform extensive financial call data validation, data correction and actuarial analysis and produce major components of rate filings. While these systems seem to operate adequately and the results are carefully checked by the Quality Control function, they do not have systems controls commensurate with their importance to NCCI's business objectives.

Key deficiencies include:

- o There are no processing control reports or audit trails which document the activity of extraction and update programs.
- o Documentation of existing applications is limited.

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- o There are no standards for testing new application programs or making changes to existing application programs.

Given the importance of end user computing to the Overall Rate Level process, NCCI is incurring significant risks due to their current lack of controls.

NCCI should implement more stringent controls over its end user computing environments. Standards for developing, executing, and maintaining end user applications should be established and strictly enforced.

We understand that NCCI is now developing an end user computing policy which is intended to address data processing controls.

- 2) Many of NCCI's end user systems in the Overall Rate Level area could be moved to a production environment.

The vast majority of validation of and correction to financial call data used to produce overall rate level indications is accomplished through the execution of end user controlled applications. Many of these applications are executed every year for each state.

Some of the validation processes performed through end user computing for each state are:

- o Policy Year and Accident Year Validation error reports which identify reporting errors that will have a net effect on the state rate level.
- o Deviation Analysis reports which compare the ratio of Standard Premium at NCCI Designated Statistical Reporting (DSR) Level to Standard Premium at Company Level on the Policy Year Call to NCCI's estimate of the ratio.
- o The Reconciliation Report which reconciles data used in the rate level calculations to the annual statement.

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- o Policy Year and Accident Year Check Reports which check to see that the allocation of losses to the Policy Year and Accident Year is consistent.

NCCI actuarial personnel currently maintain and execute these applications. Some of the types of modifications recently made to the validation and deviation analysis programs by end users are:

- o The validation programs were modified to allow validation of the new Assigned Risk Calls.
- o New edits were created to check for 8th-to-Ultimate development and separate indemnity and medical developments.
- o Enhancements were made which enabled more accurate validation of the Designated Statistical Reporting Level premium by utilizing the new Assigned Risk Financial Call.
- o The 8th-to-Ultimate development edit was changed to 10th-to-Ultimate, to reflect the collection of 10th-to-Ultimate data.

The "basic" and "general" edit functions do not change significantly from one year to the next and could be supported by NCCI's data processing department. Some functions, such as actuarial analysis, are better suited to an end user computing environment.

NCCI should move stable, regularly executed end user applications into a production environment where they can be maintained and executed by NCCI's data processing department. This will reduce the risk of processing errors by taking advantage of a more tightly controlled environment.

- 3) NCCI collects F-Class financial data which is not used to set rate levels and is not currently validated.

Each year, NCCI distributes twenty-two requests for financial data (financial calls) to member carriers. These financial calls provide NCCI with information necessary to determine overall rate level indications and to respond to state specific information requirements.

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The two "F-Class" calls collected by NCCI are not used to set rate levels or to respond to state insurance commission requests for information.

The F-Class Calendar Year Call and the F-Class Policy Year Call were originally distributed in 1974. In 1978 it was determined that most of the carriers had problems reporting F-Class financial data. NCCI decided to try to use statewide development factors or to use WCSP data to come up with a trending model. To NCCI it appears that trending using WCSP data is more accurate.

In 1986 an attempt was made to produce F-Class rate levels using the F-Class financial call data, but quality problems as well as the relatively low premium volume in most states led to results of questionable value. In the eight years between 1978 and 1986 no significant improvement was noted in F-Class data quality.

F-Class calls have never been consistently validated. Currently there are only two identified uses of the F-Class calls. The first use is to determine assigned risk market share. This figure is used as part of the calculation of on-level factors. An on-level factor is a factor that adjusts premiums (losses) to the current premium or law level. The second use is part of a reconciliation of financial call data to page 14 data in the insured's annual statement. During this process, the F-Class Calendar Year Net Direct Earned Premium and Direct Incurred Losses are used to verify the insured's reported data on the Calendar Year Reconciliation Report. F-Class calls will no longer be used when data from the newly implemented Assigned Risk calls is deemed mature.

NCCI should examine their current list of financial calls. Calls which are not required should be eliminated. Carriers should be required to submit quality data for any remaining calls. Likewise, NCCI should fully validate any financial data they continue to request from the carriers.

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- 4) The fines assessed through NCCI's current monetary incentive program are not large enough to provide an effective incentive to improve carrier reporting.

NCCI currently distributes twenty-two financial calls to over 400 carriers/carrier groups. NCCI procedures indicate that carriers are fined for:

- o Late financial call submissions.
- o Data submitted in error.
- o Late responses to NCCI requests for additional information.
- o Financial call submissions which are not reported in sequential page order.

We observed that NCCI assesses fines according to their procedures except for fines for late responses to requests for additional information. NCCI requests this information from carriers to explain unusual shifts in financial call data or to correct identified errors. NCCI procedures allow carriers two weeks to respond. Although carriers are often delinquent in responding, NCCI is not currently assessing any fines for late responses.

In a 1990 rate filing, a carrier's financial call data was not available at the time of preparation of the policy year and accident year rate filing calculations. This carrier wrote approximately 5% of the state's direct written premium. The carrier originally submitted its financial calls to NCCI, but additional information was requested before the data was to be used in the rate filing calculations. Unfortunately, the carrier did not respond to several requests by NCCI for additional information and its data was omitted from last year's rate filing.

Even the fines that NCCI does assess do not appear to be effective in encouraging timely, quality data submissions from carriers.

Fines assessed for errors in submitted data are based on three levels of editing:

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- o General Edits - identify errors that will result in NCCI's inability to process the data (e.g. a missing state code).
- o Basic Edits - identify validation checks that identify conditions that can occur as the result of an error or omission and can be determined on a comparison of data elements on one or more calls. A major source of Basic edit errors is incorrect arithmetic or careless data entry (e.g. total line for IBNR losses does not equal the sum of the individual line items).
- o Actuarial Edits - identify those checks performed on a carrier's data designed to verify the accuracy and reasonableness of the data submitted (e.g. loss development for a policy year is unusual).

In addition to fining carriers for data errors and late submissions, NCCI charges carriers a \$50 reformatting fee for submissions which are not sorted in the standard NCCI sequence. Many carriers incur the \$50 charge rather than have their staff reformat the data.

In any given year, the total fines that can be assessed for a single carrier/carrier group is limited to 1/10 of 1% of the carrier/carrier group's prior calendar year net direct workers compensation premiums.

In 1990, 565 carriers were fined for late submissions and for failing "Basic" and "Actuarial" edits for their five PEMIP financial calls. There was a total fine assessment of \$72,800 for 449 "Basic" edit errors and \$77,380 for 203 "Actuarial" edit errors. Carriers were assessed \$214,122 in fines for submitting their PEMIP financial calls a total of 2,030 days late. The total fines assessed in 1990 were \$364,272, approximately 6/10 of 1% of NCCI's carrier contributed operating budget. NCCI will bill an estimated \$245,141 of this total. \$54,806 of the remaining \$119,131 is applicable to state funds. As a matter of policy, state funds do not pay fines. The remaining discrepancy is due to limitations of fines assessed against carriers.

NCCI should strongly encourage carriers to submit quality financial call information. The first step in this process is to establish precise quality and timeliness standards and to obtain carrier commitment to meet those standards. The second step is to measure and report results. Establishing consistent and regular carrier performance

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reporting will help measure data quality and timeliness and communicate the results. Reports of carrier data quality and timeliness performance should be distributed to the carrier and to the industry as a whole. Peer reporting would assist NCCI in improving overall carrier performance. Financial incentive programs and/or fines should be more significant to encourage carrier compliance with the established quality and timeliness standards.

- 5) NCCI spends a significant amount of time performing basic and actuarial data edits which are intended to verify that carriers report data accurately and consistently. This reduces the time available to perform actuarial analysis.

Each year, NCCI receives financial calls from over 400 carriers/carrier groups. All financial call data is subjected to basic edits to ensure that all required fields are completed, detail amount fields add up to total amount fields, amounts are within acceptable limits, and data from one financial call is consistent with data reported on other financial calls. All of these edits must be performed before the actuarial analysis of the data begins.

When financial calls are received, NCCI clerks perform manual and automated processing to identify basic errors in financial data submitted by carriers. In addition, NCCI actuaries spend an average of two to three weeks per state identifying data that fails data edits.

NCCI has developed a PC edit package known as Financial Calls on Diskette (FCOD). This package provides carriers with the option of prevalidating their financial call data and submitting it on microcomputer diskette. The FCOD system package performs basic edits on financial call data, thus allowing carriers to correct the data before submitting it to NCCI. It also allows carriers to submit financial data on an electronic medium (diskettes), eliminating the need for manual entry of this data. The FCOD system does not provide a medium for carrier submitted corrections to financial call data. Only 34 of over 400 carriers/carrier groups currently submit financial call data through the FCOD system.

There are currently no carrier performance statistics available indicating the quality of the financial call data submitted on FCOD versus the data previously submitted on hard copy financial calls.

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NCCI should institute procedures to require carriers to validate and correct their own financial call data. While the current FCOD system is an excellent first step, more significant carrier participation and a mechanism for carrier submitted corrections are required to make it effective. The FCOD system should be enhanced and required. More significant fines should be assessed against carriers for all data submitted in error.

NCCI will still be required to validate carrier data, but by placing more of the burden of correction and validation of financial data on the carriers, NCCI actuaries will have more time to perform actuarial analysis.

6) NCCI eliminates financial call data from rate level calculations.

Each year NCCI eliminates ("zeros out") financial call data from rate level calculations. This is done to reduce distortion in rate level indications caused by unusual, inaccurate, or incomplete data. In our random sample three out of 180 Policy Year calls were "zeroed out", and eight out of 180 Calendar-Accident Year calls were "zeroed out".

NCCI personnel indicate there are several reasons why carrier submitted data may be excluded or "zeroed out". Among these are:

- o Policy year losses and/or premiums are reported as negative.
- o Losses are reported without corresponding premiums.
- o Reported losses do not accurately reflect the split between medical and indemnity components.
- o Reported data reflects significant, unreconcilable increases or decreases in reserves. An example of this would be unusual changes in outstanding losses.
- o Reported data is missing certain components because the acquiring company in a merger or buyout situation does not provide the carrier with premium information related to the acquired company.

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NCCI attempts to resolve problems with data before excluding it. In reviewing 38 NCCI state rate filings for 1990, 39 carriers in total had their data "zeroed out". This was the result of 100 exclusions of specific figures relating to policy year data from rate filings and 82 exclusions of specific figures relating to accident year data.

NCCI should continue to eliminate data if it is inaccurate and will significantly distort rate level calculations. Carriers should be strongly encouraged to submit quality data and to respond promptly to NCCI requests for additional information. A more effective fining procedure that includes more significant fines for data submitted in error would help in this regard.

- 7) NCCI's Quality Control department provides an independent and thorough check of critical calculations used to determine the overall rate level.

The Quality Control department (QC) is responsible for assuring the accuracy and reasonableness of the data that affects the overall rate level. QC provides an independent check intended to verify most overall ratemaking procedures. QC performs and independently recalculates the on-level factors using the input parameters and other supporting documentation provided by the Overall Ratemaking area. An on-level factor is a factor that adjusts premiums (losses) to the current premium or law level.

QC documents the data which they review with a red dot. This red dot signifies that the value reviewed reconciles to its supporting ("backup") documentation. The review mark is also placed by any recalculations that are performed by QC.

After QC has finished their review of the overall rate level data, a Rate Level Review Form is completed. Errors that QC has identified are designated with an asterisk on a draft of the rate level filing. The rate level filing is returned to Overall Ratemaking supervisors, who ensure that all identified errors are investigated and corrected.

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F. Specific Tests Performed

- 1) Evaluated the controls over receipt and data entry of hard copy financial calls.
 - Determined whether existing controls over carrier submission of financial calls are being executed.
 - Evaluated the adequacy of existing controls over carrier submission of financial calls.
 - Determined whether existing visual edits of financial calls are performed and that identified errors are cleared.
 - Evaluated the manual sorting process for hard copy financial calls.
 - Evaluated whether General edit errors are cleared properly and on a timely basis.

- 2) Evaluated procedures in place to validate and correct financial call data by carrier.
 - Determined whether corrections identified were applied to the Financial Call Production File.
 - Determined whether all corrections made to the financial call data had supporting documentation to explain any changes made.

- 3) Evaluated procedures in place to identify and clear errors using the Loss Analysis Report.
 - Evaluated whether those exceptions identified using the Loss Analysis Report were corrected and cleared on a timely basis.
 - Evaluated the procedures that ensure that carriers who reported total losses incurred which do not reconcile to their medical and indemnity amounts are identified and corrected.

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- Determined whether the proper level of management reviews this report.
- 4) Evaluated procedures in place to identify and clear errors using the Policy Year Validation, Accident Year Validation, and Deviation Analysis reports.
- Evaluated whether error messages are properly investigated and corrected on a timely basis.
 - Determined whether errors that were cleared or explained are supported with sufficient documentation.
 - Reviewed the documentation sign-off procedures to ensure that all errors have been addressed.
 - Evaluated whether sufficient documentation exists to explain discrepancies or changes in the rate level package.
- 5) Evaluated procedures to reconcile Policy Year and Accident Year information included in the final rate filing.
- Reconciled Policy and Accident year summaries to Policy and Accident year Early Warning reports.
 - Reconciled Policy and Accident year Early Warning reports to the Rate Level Including IBNR report.
- 6) Evaluated controls to ensure the accuracy of development factors used in determining overall rate levels.
- Determined whether the Development Checksheet Report identifies carriers that have contributed to any differences between this and last year's Policy Year Development Factors.
 - Determined whether development factors from the Policy Year Summary and Accident Year Summary Reports were used in last year's rate filings.

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- 7) Evaluated the effectiveness of the Quality Control Department in ensuring the accuracy of overall rate level indications:
- Determined whether Quality Control provides an independent check of the critical validations and calculations used to determine the aggregate ratemaking level.
 - Determined whether the input financial data used in the aggregate rate level calculations are correct.
 - Evaluated whether an adequate audit trail exists to determine what has been reviewed by Quality Control.
 - Determined whether the new on-level factor calculations are being computed properly.
 - Evaluated whether procedures exist to ensure that discrepancies identified by Quality Control are cleared on a timely basis.
- 8) Statistically sampled financial call data and compared it to originally submitted financial call forms and documented corrections.
- An attribute sampling approach was used. This approach measures frequency of errors rather than size of errors.
 - Five populations were defined. The Policy Year and Calendar-Accident Year populations consisted of all records submitted in 1987, 1988 and 1989. The Calendar Year, Insurance Expense Exhibit and Calendar Year Reconciliation Report By State populations consisted of all records submitted in 1989.
 - A confidence level of 95%, an expected error rate of 2% and a tolerable error of 5% were used to determine the sample sizes.
 - Samples were extracted from NCCI's computerized files used for overall ratemaking.

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- These samples were verified by comparing the original financial call to its corresponding file record. The specific fields tested for each call were:
 - o Calendar-Accident Year - State Code, Standard Premium, Company Premium, Net Premium, Total Losses Paid, Total Losses Outstanding excluding IBNR, Total IBNR, Total Incurred Losses including IBNR, Incurred Indemnity Claim Count, Paid Indemnity, Paid Medical, Outstanding excluding IBNR Indemnity, Outstanding excluding IBNR medical, IBNR Medical, and IBNR Indemnity.
 - o Policy Year - State Code, Standard Premium, Company Premium, Net Premium, Total Losses Paid, Total Losses Outstanding excluding IBNR, Total IBNR, Total Incurred Losses including IBNR, Incurred Indemnity Claim Count, Paid Indemnity, Paid Medical, Outstanding excluding IBNR Indemnity, Outstanding excluding IBNR medical, IBNR Medical, and IBNR Indemnity.
 - o Calendar Year - Net Direct Earned Premium, Direct Incurred Losses, State Code, Standard Premium and Company Premium.
 - o Calendar Year Reconciliation Report By State - Code, Net Direct Earned Premium and Direct Incurred Losses.
 - o Insurance Expense Exhibit - Net Premiums Written, Net Premiums Earned, Net Losses Incurred, Loss Adjustment Expenses, Acquisition Field Supervision and Collection Expenses, General Expenses, Taxes, Licenses and Fees, Net Investments and Total Expenses.
- All identified discrepancies were discussed and researched with NCCI personnel. Results were summarized and included in the Appendix of this volume.

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9) Judgmentally sampled carrier submitted financial calls and compared them to the Financial Call Production File.

- A judgmental sample of fifty carrier submitted financial calls was selected from the financial calls received in 1988, 1989 and 1990. Twenty-five Policy Year and Twenty-five Accident Year financial calls were selected from microfilm records.
- The financial calls selected were compared to data contained on the Financial Call Production File to determine whether the data existed on the file.
- All identified discrepancies were discussed and researched with NCCI personnel. Results were summarized and included in the Appendix of this volume.

G. Specific Findings & Recommendations:

1) Aggregate premium and loss amounts reported by carriers are accurately processed for use in the calculation of overall rate level indications.

NCCI's electronically stored financial call data was compared to carrier submitted source documents. This comparison was performed for five financial calls collected by NCCI. A summary of the results follows:

- o In a random statistical sample of 180 Calendar-Accident Year financial call records, one error which affected three premium fields was noted. This error was caused by receipt of a correction call after the overall rate levels had been produced. In addition, NCCI actuarial personnel zeroed out data for eight carriers. While eliminating data is warranted in many cases, these eliminations were considered to be errors for the purpose of quantifying the sample test results.
- o In a random statistical sample of 180 Policy Year financial call records, data for three carriers had been zeroed out.
- o In a random statistical sample of 176 Calendar Year financial call records, one error in a premium field was noted. This was caused by

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receipt of a correction call after the overall rate levels had been produced. In addition, data for two carriers had been zeroed out.

- o In a random statistical sample of 177 Reconciliation Report records, no errors were noted.
- o In a random statistical sample of 181 Insurance Expense Exhibit records, one error was noted.

In all of these samples, errors were defined as discrepancies greater than \$5,000 between the originally submitted financial call and its corresponding data record used to calculate last year's aggregate rate level.

The results from these tests indicate that aggregate financial data is accurately processed for use in calculating overall rate levels.

Detail sampling results are included in the Appendix to this volume.

- 2) Limited testing indicates that financial call data files include all carrier submitted financial call data received by NCCI.

In a judgmental sample of fifty carrier submitted financial calls, no indication was found that data which should have been present on the Financial Call Production File was not.

In this sample, discrepancies were defined as differences between what was reported by carriers on financial calls and what was resident on the Financial Call Production File.

- 3) The current control mechanism to ensure that all member carriers submit financial call data is not based on an authoritative list of carriers.

Each year, NCCI receives financial call data from over 400 carriers or carrier groups. At the end of each year, NCCI sends out a financial call questionnaire to each member and subscribing carrier. On the questionnaire, carriers request that the financial call packages be sent during the coming year. NCCI uses this information as the basis to send out financial calls and acknowledgement letters.

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The log of expected financial calls is developed from the acknowledgement letters sent by the carriers and from a list of large carriers. Carriers who do not return the acknowledgement letter may not be included in this log.

For the 1990 financial calls, we observed that a subscribing carrier failed to indicate on the questionnaire those calls to be submitted, and consequently did not receive its package of financial calls in time to comply with the submission schedule. (The carrier apparently assumed that the calls would be sent automatically.) Subsequent follow-up, by the carrier, resulted in NCCI mailing the calls much later to the carrier. Without that carrier follow-up, the calls would not have been received. The carrier operates in only one state and did submit 1988 and 1989 financial calls.

If a carrier's financial calls are not received in time for the start of the overall ratemaking process, NCCI will, in theory, identify the problem during rate level processing. Year-to-year comparisons of data should reveal the possibility of an omission. If the data cannot be obtained within the rate filing schedule constraints, NCCI eliminates the data from development patterns and in calculating cost ratio calculations.

This situation highlights a control inadequacy. Any small or medium size carrier that does not return the questionnaire will not be expected to submit financial call data. This missing data may be identified later via reasonableness tests performed during a state's overall rate level processing, but will often result in eliminating related data rather than obtaining the missing data. Carriers that do not submit for several years in a row may not be missed.

NCCI should implement a front-end financial call tracking mechanism based on the assumption that all carriers writing workers compensation policies in a state will submit all financial calls required for that state. Carriers who do not submit a call should be required to submit an explanation letter. A carrier's submission requirements will not be fulfilled until all financial calls and/or explanation letters have been received. The tracking mechanism would also denote those carriers that are in liquidation or receivership, or no longer write workers compensation coverage. Such front-end monitoring at the

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workers compensation coverage. Such front-end monitoring at the carrier submission level would reduce some of the basic edit validation effort performed by actuarial personnel during the state rate level processing.

This tracking system should be integrated with NCCI's policy database.

- 4) NCCI's current Carrier Correspondence files do not document all actions authorized by the carrier.

NCCI performs validation procedures to identify errors and unusual shifts in financial data. NCCI contacts carriers with requests for additional information when inconsistencies are identified in their financial data. Carriers are required to respond in writing to such requests within a two week period. These responses often result in modification to previously submitted financial call data. Frequently, NCCI personnel will elicit carrier responses over the telephone in order to expedite the production of overall rate levels.

Written correspondence is documented for each carrier in a Carrier Correspondence file. This documentation serves as an audit trail for carrier authorized modifications to financial call data.

Not all authorized changes are documented in the correspondence file. NCCI does not usually adequately document phone conversations made with the carrier which may result in modifications to financial data. There is no standard form or standard policy. Specific actions which the carrier agrees to take may not be followed up on or documented.

NCCI should document carrier authorization for all changes to financial call data. Phone conversations resulting in modifications to data should be documented on a standard form. Any follow up action agreed to by the carrier should be tracked to ensure its timely and successful completion. A log of written correspondences and detailed accounts of phone conversations should be stored on a centralized carrier correspondence database which could be accessed on-line.

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In the long term, carriers should be required to correct their own financial data through data resubmission. Carrier performance reports should be regularly distributed. More significant fines should be assessed against carriers for any data submitted in error.

5) NCCI rate filings do not indicate all exclusions of data from overall rate level calculations.

Each year NCCI eliminates some carrier submitted financial call data from rate level calculations. This action reduces the distortion caused by unusual, inaccurate, or incomplete data in actuarial analysis.

In state rate filings, NCCI identifies carriers with data excluded from cost ratio calculations if they write more than \$10,000 in premium in the state. The premium as a percent of market share is shown. Appendix A-VI from the thirty-seven state rate filings in 1990 indicated that between 0.0% and 5.2% of state premium volume was excluded depending on the state.

Rate filings do not indicate the dollar amounts of excluded losses and premiums or the percentage of total incurred loss data excluded. Data exclusions for carriers writing less than \$10,000 in premium are not noted.

NCCI should document all exclusions of data in state rate filings. This documentation should indicate all carriers excluded, the dollar amount of losses and premiums excluded, and the percentage of total losses and premiums. For those carriers writing less than \$10,000 in premium in a state, the amount of data eliminated should be shown in aggregate. Such documentation would then display both the market share proportion and magnitude of the excluded data.

NCCI should consider distributing a yearly carrier performance report to the NAIC indicating all carriers whose data has been zeroed out because of substandard reporting.

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- 6) NCCI rate filings do not explain differences in premium or loss amounts, valued as of the same point in time, in consecutive year's rate filings.

As part of state rate filings, NCCI includes development triangles. These development triangles include three evaluation years of data by accident year and policy year, and display changing valuations over time for reported losses. Loss development data contains cumulative payments, and may contain case reserves or case reserves plus IBNR depending upon the actuarial methodology being used. A sample of a development triangle is shown below.

Premium and Indemnity & Medical Paid Losses for Matching Companies As Per:

Policy Year	Valuation				Dev Factor
	1st Rpt	2nd Rpt	3rd Rpt	4th Rpt	
1983 Std Prem.	xxx	xxx	618,728,661	620,373,796	1.003
Ind.Pd.Losses	xxx	xxx	173,256,798	213,833,383	1.234
Med.Pd.Losses	xxx	xxx	197,519,536	210,036,314	1.063
1984 Std Prem.	xxx	xxx	776,498,413	776,258,920	1.000
Ind.Pd.Losses	xxx	xxx	229,006,153	279,300,997	1.220
Med.Pd.Losses	xxx	xxx	227,879,545	244,561,057	1.073
1984 Std Prem.	xxx	770,595,025	771,705,886	xxx	1.001
Ind.Pd.Losses	xxx	159,459,468	225,299,150	xxx	1.413
Med.Pd.Losses	xxx	203,482,534	226,825,872	xxx	1.115
1985 Std Prem.	xxx	968,285,939	966,377,985	xxx	.998
Ind.Pd.Losses	xxx	199,060,751	281,345,101	xxx	1.413
Med.Pd.Losses	xxx	225,353,862	257,587,536	xxx	1.143
1985 Std Prem.	920,763,764	961,567,704	xxx	xxx	1.044
Ind.Pd.Losses	111,630,649	195,164,743	xxx	xxx	1.748
Med.Pd.Losses	173,706,258	223,666,728	xxx	xxx	1.288
1986 Std Prem.	1,052,479,864	1,104,574,907	xxx	xxx	1.049
Ind.Pd.Losses	124,868,768	228,163,337	xxx	xxx	1.827
Med.Pd.Losses	180,682,687	243,830,361	xxx	xxx	1.349

The reported loss amount as of a specific valuation year for a policy year or accident year is, in effect, a "snapshot" of losses and would be expected to remain constant over time. However, rate filings often list different values from one filing year to the next. This difference is due either to corrections received during the year or to data excluded one year that was not excluded in the previous year. The second cause can lead to an apparent anomaly where the total loss amount for a given policy year valued as of a third report, for example, will be different when used for

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development from the second to third report than when used for the development from the third to fourth report in the same rate filing.

These differences are neither noted nor explained in the rate filing. The differences investigated during testing were legitimate. There were two reasons for the differences.

First, some data corrections were received after the corresponding rate filing had been completed; if the corrections had been received earlier, the corrections would have been part of the data in that rate filing. Instead, the corrections were part of the data in the next rate filing.

Second, carrier data was eliminated from a particular loss development calculation if there was a major change in reserving or settlement procedures that was judged to distort loss development patterns. An example is negative IBNR which cannot be reconciled. Thus, if there is a major change in the reserving practices between the third and fourth report of a policy year for a particular carrier, the amounts valued as of the third report will be included in the development factor calculation from the second to third report, but may be excluded from the third to the fourth report.

NCCI should explain any major differences in data used from one year to the next. A summary paragraph should be sufficient.

- 7) NCCI's method for applying corrections to financial call data requires redundant data entry.

At the beginning of the rate filing process for a state, all financial call data for the state is extracted from repositories of financial call data called "Production" files. Policy Year and Accident Year data extracted in this manner is stored in state specific SAS files called "Frozen" files. During the rate filing process, NCCI's actuarial staff correct errors in Policy Year and Accident Year data through a mechanism known as the "Corr" file. This file is merged with the Frozen files in order to apply the corrections.

Corrections are entered into two versions of the Corr file independently and the results are compared. Any differences in the two versions are resolved before the corrections are applied to the data. In this way, NCCI

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staff are assured that no mistyped corrections are applied to the Frozen file financial call data.

At the end of the rate filing process, NCCI prints the contents of the Corr file. This printout is sent to ACS for data entry and the resulting correction file is merged with the original Production file.

NCCI should automate the application of Corr file corrections to the Production file.

8) NCCI's documentation of state rate filing production is inconsistent.

NCCI retains a "state folder" for each state in which it files workers compensation rates. These folders contain system generated reports, notes indicating special circumstances encountered, and documentation indicating modifications to carrier submitted data. Written procedures provide guidelines for producing and maintaining the documentation in these folders. These procedures are documented in a letter distributed to aggregate ratemaking personnel.

While NCCI procedures encourage consistent production notes, signatures, data notations, and documentation of data changes in state folders, the actual format and content of state folders vary from one supervisor to the next.

The same actuaries do not always validate a particular state's financial call data from one year to the next. A consistent state folder format would provide an informative documentation file of any problems or questions identified during the previous production year. Currently, actuaries processing a state for the first time must rely on the actuary who processed the state during the previous year to fully understand state specific issues. By providing consistent documentation, NCCI would encourage consistent rate filing procedures each year, regardless of the actuary performing the work.

NCCI should enforce their standards for documentation in state folders. This would ensure that any special knowledge required to validate a particular state's data is retained from one year to the next.

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Unit Card Data Conversion

A. Area Overview

The Unit Card Data Conversion area collects payroll, premium and loss data for each insured from insurance carriers on a standard form referred to as a unit report. This data is often referred to as Workers Compensation Statistical Plan (WCSP) data.

Carriers are required to submit unit reports for each workers compensation policy. First reports are valued as of eighteen months from the policy effective date and are due at NCCI at twenty months. Subsequent reports, valued at twelve month intervals after the first report, must be submitted for all policies which have open claims. Up to five unit reports (first and subsequents) may be submitted for a single policy.

Carriers may submit WCSP data on either hard copy unit cards or magnetic tape. Each year, NCCI receives about 1.2 million hard copy and 1.8 million magnetic tape unit reports. All unit report data received by the Data Conversion area is converted to electronic format, verified for completeness, and sent to the Unit Card Data Administration area for further validation in preparation for the development of insurance rates. In addition to being sent to the Data Administration area, unit report data for experience rated policies is sent to the Experience Rating area.

For a more detailed description of the Unit Card Data Conversion area, refer to Volume II, Section I, Description of Data Collection and Data Handling. Detailed flow diagrams for this area are included in the Volume II Appendix.

B. Area Evaluation

Key Strengths:

- o 60% percent of unit report data is received on magnetic tape. This reduces manual effort required to process WCSP data and increases data accuracy.
- o Statistical sampling of Data Administration and Experience Rating files suggests that NCCI accurately converts WCSP data reported by the carriers into NCCI computer files.

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- o Statistical sampling of Experience Rating files suggests that NCCI accurately associates unit report experience data with the correct insured.
- o Current NCCI system initiatives will address many of the current shortcomings of unit report processing.

Key Weaknesses:

- o There are currently no controls in place to ensure all unit reports are submitted by carriers.
- o NCCI's current systems do not thoroughly validate unit report data at the time it is received.
- o There is no centralized database of WCSP data. As a result, NCCI retains substantial amounts of hard copy, microfilm, and microfiche to document carrier submissions of WCSP data.
- o NCCI's Risk Identification Number (Risk ID), used to identify WCSP experience with a specific insured, is frequently reported inaccurately by carriers.

Ongoing system initiatives at NCCI are intended to resolve the first three of these weaknesses.

Key Recommendations:

- o NCCI should implement a system which tracks the due date and receipt of unit reports for each workers compensation policy.
- o NCCI should perform more extensive validation at the time of unit report receipt.
- o NCCI should develop a centralized unit report database.

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- o NCCI should consider using industry established risk identification information such as Federal Employer's ID Number (FEIN).

NCCI has development projects underway which, if successful, will satisfy the first three of these recommendations. These projects are described in Volume I, Part C of this report.

C. Testing Objectives

- To evaluate the controls over the timeliness and accuracy of receipt of information received from carriers.
- To evaluate the controls over the conversion of unit report data into an electronically stored format.
- To evaluate the process of associating policy experience reported on unit reports with the appropriate policy and insured. This is accomplished through the use of a Risk Identification Number (RiskID) for experience rated policies. Data for non-rated policies is not currently identified with a risk ID.
- To evaluate the quality of unit report data validation performed by the Data Conversion area.

D. Testing Methods

The evaluation of the Data Conversion area was accomplished through control procedure reviews and systems review and analysis. These techniques are described in the Evaluation Approach section of Volume I, Part C of this report.

EVALUATION OF DATA COLLECTION AND DATA QUALITY

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E. General Observations & Recommendations:

- 1) There are currently no controls in place to ensure unit reports for non-experience rated risks are submitted by carriers.

Carriers are required to submit unit reports to NCCI for every workers compensation policy they write. The first unit report for a policy is due twenty months after the policy effective date. This time allows six months of loss development from the policy expiration date (most policies are twelve months) and two months for carrier processing time. Subsequent reporting for the policy is due every twelve months after the first report. Carriers are required to submit up to four subsequent reports for each policy. If all claims for a policy have been closed, the carrier is not required to submit additional reports.

NCCI receives approximately 250,000 unit reports per month from carriers, but does not currently have a system in place to identify all of the unit reports which are due each month.

The Experience Rating system does track unit reports due by insured for those businesses that are experience rated. NCCI personnel estimate that experience rated policies represent approximately 25% of workers compensation policies written.

There is no process in the Class Ratemaking systems to track unit reports by risk. Instead, NCCI personnel perform reasonableness checks to identify significant omissions of data.

NCCI should implement a system which tracks the due date and receipt of unit reports for each workers compensation policy. Such a system would greatly improve NCCI's control over the timely and complete submission of Workers Compensation Statistical Plan (WCSP) data.

We understand that NCCI is currently implementing the Unit Report Control (URC) system which will initially track the due date and receipt of unit reports for experience rated and rated size policies only. Rated size policies are large enough (or within \$500) to be

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experience rated, but were not experience rated in the previous two years.

NCCI plans to expand URC tracking to non-rated unit reports by the fourth quarter of 1992. The URC tracking mechanism is driven by policy information received from carriers. NCCI began retaining policy information for all non-rated policies in April of 1991. Unit reports for these policies will not be due until late in 1992.

- 2) NCCI's current systems do not thoroughly validate unit report data at the time it is received.

Data Conversion receives unit report data from carriers, converts it to electronic format, associates experience rated WCSP data with a risk identification number (risk ID), and then forwards the data to Experience Rating and/or Unit Card Data Administration. Limited data validation is performed in Data Conversion. The majority of WCSP data validation is performed independently by the Experience Rating and Data Administration areas. This current procedure results in significant delays in data verification in Data Administration and duplication of validation effort.

NCCI should perform more extensive validation at the time of unit report receipt. This validation should include field level edits (e.g. class codes are valid), field relationship edits (e.g. losses cannot be reported without corresponding payroll and premium), and risk validation (e.g. the class codes reported are consistent with the risk's policy specifications and inspection reports).

Carriers should be required to correct data submitted in error themselves through data resubmission.

NCCI should consider distributing a unit report edit software package to carriers. This would allow carriers to pre-validate their submissions of WCSP data. This should significantly reduce the number of WCSP errors requiring identification and correction by NCCI.

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We understand that NCCI has plans to implement the Unit Report Control (URC) and the Unit Report Quality (URQ) systems which are intended to perform extensive front-end WCSP data validation and provide a mechanism for carrier corrections. Field level validation is targeted for implementation in August of 1991. The implementation of additional, more complex validation has not been scheduled.

NCCI plans to distribute a unit report edit software package to carriers by the fourth quarter of 1992.

- 3) NCCI retains substantial amounts of hard copy, microfilm and microfiche to document carrier submissions of WCSP data.

NCCI currently receives WCSP data on unit reports and magnetic tape. Hard copy unit reports are microfilmed, keypunched and sent to the appropriate field office. Magnetic tapes are processed and the data is then printed and microfiched. Microfiche and microfilm copies of the unit report data are sent to each field office. The hard copy, microfilm and microfiche copies of unit reports are used for research and verification of input WCSP data.

NCCI should develop a centralized unit report database. Such a database would eliminate the need for hard copy, microfilmed and microfiched unit reports. It would also facilitate the validation, use and correction of WCSP data.

NCCI should also develop an electronic data transfer mechanism for transmitting WCSP data between the carriers and NCCI. NCCI should strongly encourage carriers to submit data through this mechanism by offering financial incentives for doing so. Such a data transfer would reduce the cost of manual handling and data entry of unit reports, eliminate data entry errors and speed the processing of WCSP data.

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Unit Card Data Conversion

We understand that NCCI has plans to implement the URS system which is intended to provide a centralized database for WCSP data. This database is scheduled for initial production in August 1991.

F. Specific Tests Performed

- 1) Evaluated the controls over receipt and processing of magnetic tapes received from carriers.
 - Examined and verified the Magnetic Tape Control Log which records all magnetic tapes received.
 - Compared carrier transmittal letters to the Magnetic Tape Control Log for agreement.
 - Examined and verified the Magtape Records Control Log for agreement with system generated record counts.
 - Examined the Record Count Exception Report and procedures in place to return faulty tapes to the carrier and track their resubmission.
 - Examined procedures intended to ensure that all unit report data due on magnetic tape is received on a timely basis.
 - Evaluated the control procedures intended to ensure that all unit report data received is processed into NCCI systems.
 - Evaluated the use of error reports generated by magnetic tape automated processing.

- 2) Evaluated controls over receipt, sorting, batching, and microfilming of hard copy unit cards received from carriers.
 - Examined procedures intended to ensure that all unit report data due on hard copy is received on a timely basis.

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- Evaluated control procedures intended to ensure hard copy unit cards are not lost during sorting and batching.
 - Evaluated the accuracy of the manual sorting process.
 - Evaluated the effectiveness of the Micrographics Daily Log as a control for unit card batches sent to an external microfilming service.
- 3) Evaluated effectiveness of visual edits for hard copy unit cards and controls over unit cards sent to the external data entry service.
- Determined whether the 11 documented visual edits for hard copy unit cards are properly performed.
 - Evaluated the effectiveness and completeness of the documented visual edits.
 - Determined whether the Transmittal Sheets accompanying the hard copy unit card batches sent to the data entry service are accurately completed.
 - Evaluated the effectiveness of the ACS Daily Log as a control for unit card batches sent out for data entry. Appalachian Computer Services (ACS) is the data entry service used by NCCI.
 - Evaluated the tracking and handling of unit cards which were sent to ACS, but could not be keypunched. These unit cards are removed from the batches for further follow-up.
- 4) Evaluated the unit report indexing process. This process associates policy experience reported on unit reports with the appropriate policy and insured. This is accomplished through the use of a Risk Identification Number (Risk ID) for experience rated policies. Data for non-rated policies is not currently identified with a risk ID.
- Observed clerks researching indexing error reports.

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- Evaluated the efficiency of the indexing process.
 - Determined whether corrections indicated on indexing error reports are successfully processed into the electronically stored unit report data.
 - Evaluated the review procedures in place for on-line indexing corrections.
- 5) Evaluated the process of combining unit report data received on hard copy with unit report data received on magnetic tape.
- Reviewed program logic and determined the criteria for combining and generating unit report records.
 - Evaluated the control procedures intended to ensure that data is not lost during the execution of this process.

G. Specific Findings & Recommendations:

- 1) The risk identification number (Risk ID) is frequently reported inaccurately by carriers submitting WCSP data.

The risk ID is assigned to each insured to identify the insured's WCSP experience. This relationship is critical for developing experience modification factors for each insured. This association could be very useful in identifying and researching missing unit reports for ratemaking purposes. If all unit reports were associated with a unique risk, it would be possible to identify those risks with incomplete WCSP data. Currently risk IDs are used only for WCSP data associated with experience rated risks.

The risk ID is an NCCI generated number. It is not widely used or recognized in the insurance industry. Because of this, carriers frequently do not include the risk ID with the WCSP data or they report it inaccurately. Based on a three month sample of NCCI indexing reports, 45% of unit reports requiring risk IDs are submitted with inaccurate or missing risk IDs or require research to verify the risk ID. Five full time

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indexing clerks are currently employed to research and resolve risk ID problems. In 1990, these clerks reviewed over one million risk IDs.

NCCI should explore other possibilities for an insured's identification number. Federal Employer's ID Number (FEIN) is one possibility. This number is widely available to carriers, easily auditable, and would eliminate many of the inaccuracies and omissions in reporting the risk ID. Federal tax IDs could also be used to identify data associated with non-experience rated risks. This would facilitate tracking all unit reports due and would help to identify those risks with incomplete WCSP data.

We understand that differences between experience rating and Federal tax ownership rules may require grouping FEINs for the purposes of experience rating.

An alternative to associating WCSP data directly with a risk identifier is to focus on associating the data with the policy number which is submitted on all unit reports. Policy information is initially received by NCCI during the effective life of the policy. The policy should be accurately associated with the correct risk before the first unit report arrives, eight months after the policy expiration date. By associating the unit report to the policy and the policy to the insured, the necessary relationships will be established to control unit report receipt and to support experience rating.

- 2) There are no controls in place to ensure that all WCSP magnetic tapes sent by carriers are received by NCCI.

Carriers send WCSP magnetic tapes to NCCI via different delivery services. Confirmation notices are not sent to NCCI by the carrier indicating tapes have been mailed. If a tape is lost in transit, NCCI may not be aware of it.

NCCI should implement controls to ensure all WCSP tapes are received. A separate transmittal letter from the carrier may satisfy this requirement.

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- 3) NCCI does not follow-up with the carrier when magnetic tape record counts per the carrier do not agree with NCCI system generated record counts.

The WCSP Magtape Records Control Log lists WCSP tapes received from carriers. Clerks compare record counts per the transmittal letters received with the tapes to system generated record counts. In a review of the WCSP Magtape Records Control Log, the carriers' record counts for 10 of 35 WCSP tapes did not agree with system generated counts. In all cases, the carrier transmittal letter indicated more records than the NCCI system count. This is possible due to non-WCSP records on the tape which cannot be identified and processed by NCCI.

The WCSP data on these tapes is processed normally. All tapes are returned to the carrier with reports listing processed record counts. No follow-up is performed by NCCI for those tapes with record count discrepancies.

NCCI should implement follow-up procedures or a fining system which encourages carriers to submit only valid WCSP records and verify record counts. Carrier submitted tapes include trailer records which indicate the number of records on the tape. NCCI systems should reconcile valid NCCI records against the record counts indicated on the trailer record.

- 4) Magnetic tapes that cannot be processed are returned to carriers without NCCI follow-up.

In 1990, Data Conversion processed 758 WCSP magnetic tapes; 23 of these tapes were returned to carriers because they could not be processed. This situation occurs if a tape contains incomplete carrier information or is physically damaged.

Before an unprocessed tape is sent back to the carrier, procedures indicate that the carrier is to be contacted and advised of the problem. There are no follow-up procedures or additional measures taken by NCCI to ensure the magnetic tape is resubmitted.

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NCCI should track all unprocessed tapes returned to the carriers. A log indicating when the tape was returned along with follow-up procedures would ensure that the carriers resubmit the data on a timely basis. This control mechanism should be integrated with NCCI's Unit Report Control (URC) system currently being implemented.

Carrier performance reporting and fining procedure for returned tapes would encourage carriers to submit only quality tapes and data.

- 5) Unnecessary processing occurs in the automated procedure which loads WCSP magnetic tapes into NCCI files.

NCCI inputs carrier submitted magnetic tapes to an automated procedure which loads the data into NCCI files. This procedure performs steps which are obsolete. Specifically, the procedure separates WCSP data into header data, detail data, and errors. Header and detail data are then recombined and input to magnetic tape format and print processing.

The split of header and detail data was intended to facilitate reporting and the application of ACS keyed corrections. Neither function is used at this time and there is no apparent reason for separating header and detail data only to recombine them in the next processing step.

The procedure described is IMGR01PA. The program which separates the data is IMG0100 and is executed as step PS10 of the procedure.

This process should be examined and redesigned to eliminate processing and storage inefficiencies.

- 6) The report entitled "Risks Not Identified As Interstate Or Intrastate With Manual Premium Greater Than \$2,000" is produced but not reviewed.

As indicated, this report lists errors, however it is not reviewed by NCCI personnel or carriers.

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Unit Card Data Conversion

The report ID number is IMG0110-1 and is produced by procedure IMGR01PA, step PS20, program IMG0110P.

NCCI should determine the purpose of this report. If it provides useful information it should be reviewed regularly. If it does not, it should be eliminated from the system.

- 7) There are no controls to ensure that all hard copy unit card batches sent by carriers are received by NCCI.

Carriers mail hard copy unit cards to NCCI. Confirmation notices are not sent to NCCI by the carrier indicating hard copy unit cards have been mailed. If unit cards are lost in transit, NCCI may not be aware of it. **NCCI should implement controls to ensure all hard copy unit cards are received. A separate transmittal letter from the carrier may satisfy this requirement.**

In the long term, NCCI should provide software and incentives to encourage carriers to transmit data electronically or by magnetic tape.

- 8) Hard copy unit cards are not adequately controlled before the assignment of sequential administration numbers.

NCCI receives, on average, 4000 to 5000 hard copy unit cards each day. These cards are sorted, batched, and left in an unrestricted area overnight. The following day, sequential administration numbers are manually stamped on individual cards to track them and the unit cards are sent to ACS for data entry. The unit cards are not adequately controlled prior to the assignment of the administration numbers.

NCCI should implement procedures to track and control unit cards immediately upon receipt. Prior to the assignment of administration numbers and data entry, unit cards should be stored in a secure area.

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In the long term, NCCI should provide software and incentives to encourage carriers to transmit data electronically or by magnetic tape.

- 9) Of eleven visual unit card edits required by NCCI's written procedures, eight are actually performed.

Data Conversion procedures specify that clerks perform eleven visual edits to ensure that hard copy unit cards are properly completed prior to data entry. Three of these edits are not actually performed. The three edits not performed are:

- o Verify that the condition code is entered on the unit card
- o Verify that the risk ID is entered on the unit card, as applicable
- o Verify that the experience modification factor is entered on the unit card, as applicable

Of 119 unit cards reviewed, 101 were missing at least one of the above three data elements.

NCCI should reevaluate its procedures. If the three omitted edits are unnecessary, NCCI should revise the written procedures. If the edits are necessary, they should be performed.

In the long term, NCCI should perform WCSP data edits in an automated fashion at the time of unit report receipt.

We understand that NCCI has plans to implement the Unit Report Control (URC) and the UnitReport Quality (URQ) systems which are intended to perform extensive automated front-end WCSP data validation and provide a platform for carrier corrections. Field level validation is targeted for implementation in August of 1991. The implementation of additional, more complex validation has not been scheduled.

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Unit Card Data Conversion

- 10) The current procedure for correcting unit report data which has not been associated with the proper insured involves unnecessary paper flow and manual intervention.

The Unidentified Interstate Risks and Unidentified Intrastate Risks reports list WCSP data for experience rated policies that could not be associated with its insured through the use of a risk ID. These reports are received by Data Conversion clerks located in Boca Raton. These hardcopy reports are batched, logged and sent to the appropriate field offices where field office clerks review them. The purpose of the review is to identify unit report data that is not properly associated with an insured. Clerks research the errors and mark corrections on the reports. The reports are sent back to Boca Raton where they are checked in and forwarded to the indexing department. Indexing clerks key the corrections as indicated on the hardcopy reports into the on-line correction system. Approximately 40% of unit reports requiring risk IDs or risk ID verification or approximately 400,000 unit reports per year appear on this report. Field office clerks correct about 5% of these unit reports.

Fifteen corrections noted by field office clerks were compared to the corresponding correction entered on-line by indexing clerks. Two of the fifteen were entered incorrectly. The errors were caused by misunderstanding the indicated correction on the report.

Nine reports with corrections indicated by field office clerks were examined for appropriate sign off of the individual at the field office who recommended the indicated correction. None of the nine reports were initialed or signed off.

At a minimum, standards should be established for documenting required corrections on the hardcopy reports. Field office clerks should sign and date corrections to provide an audit trail.

These reports should be printed at the various field offices. Field office clerks should make indexing corrections through the on-line Indexing System known as IDV. The field offices have on-site printers and computer terminals to facilitate this change.

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Unit Card Data Conversion

An automated audit trail based on a clerk's user ID should be implemented for all on-line corrections.

In the long term, the process of associating WCSP experience with an insured should be almost completely automated. A risk identifier which is more readily available to carriers should be used. (see Finding #1 in this section)

- 11) Data Conversion personnel undermine system security by sharing on-line user IDs.

On-line user IDs and passwords are widely shared between clerks and supervisors. This represents a violation of established system security policy and a risk to data integrity.

NCCI employees should not share on-line user IDs and should keep passwords confidential. Management should establish strict security policies and enforcement measures.

- 12) No audit trail exists for WCSP records which are discarded by the application program which combines magnetic tape data and keypunched hard copy data.

The automated process (IDV0100P) which combines WCSP data submitted on magnetic tape with WCSP data submitted on hard copy discards records. This program also combines records and generates records. This process results in a change in record counts. In a review of one control report generated by this program, 75,655 total records were input, 104 additional records were generated, and 2,281 records were bypassed or combined.

A record is discarded by this program if it cannot be processed because it is an address record, non-WCSP data or an invalid record type. Records are combined if they report payroll for the same class code, risk or firm. Records are generated when unit report detail records span more than one page when printed. In this case, additional unit report header records are created and each page of the unit report is treated as a separate card.

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Unit Card Data Conversion

There is currently no audit trail documenting the detail records discarded or generated by this program. If a problem or question arises as a result of this processing, there is no medium for research. The program does provide for an audit trail, but this function has been inactivated.

NCCI should print an error report from this program listing the records discarded, bypassed, and combined. This report should be distributed to the appropriate carriers and a fining procedure established to encourage carriers to supply only valid records.

This process should be integrated with NCCI's current systems initiatives Unit Report Control (URC) and Unit Report Quality (URQ) and should be implemented under a pervasive policy of carrier performance reporting and financial incentives.

- 13) The Carrier Performance Statistics process is not widely accepted and therefore not effective.

The Carrier Performance Statistics process was designed to provide feedback to carriers on their performance with regard to accurate and timely submission of WCSP data. While over 400 of the 700 carriers who submit WCSP data to NCCI subscribe to this report, some of the largest carriers do not.

NCCI should determine the carriers' concerns regarding the Carrier Performance Statistics process. The process should then be redesigned or replaced. NCCI should consider distributing carrier performance information to State insurance departments.

We understand from our discussions with NCCI management that Unit Report Control (URC) and Unit Report Quality (URQ) may provide better mechanisms for reporting carrier performance than are currently available.

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Unit Card Data Administration

A. Area Overview

The Unit Card Data Administration area receives WCSP data by state from Unit Card Data Conversion. A series of automated and manual edits is performed on this data. This validation includes: payroll comparisons by class code from one year to the next, loss development reasonableness checks, duplicate data identification, and various other edits. Identified errors are corrected either on-line or through NCCI's data entry service (ACS). Validated data is summarized by class code and passed to Class Ratemaking.

For a more detailed description of the Data Administration area, refer to Volume II of this report.

B. Area Evaluation

Key Strengths:

- o NCCI is committed to improving the integrity of data used in ratemaking.
- o On the whole, data provided for use in ratemaking accurately reflects data submitted by carriers.

Key Weaknesses:

- o NCCI validation of WCSP data involves manually intensive procedures.
- o NCCI does not validate ratemaking data at the time of receipt. A year or more may pass before this validation occurs.
- o NCCI performs separate validation of the same WCSP data in Experience Rating and in Data Administration.
- o Current NCCI policy, procedures, and systems place too much of the burden of data verification and error correction on NCCI, and not enough on the carriers.
- o NCCI procedures allow changes to WCSP data without direct carrier approval.

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Unit Card Data Administration

- o Many Data Administration application programs are old, poorly structured and undocumented.

Key Recommendations:

- o NCCI should validate WCSP data at the time of unit report receipt.
- o NCCI should place the burden of WCSP data correction on the carriers.
- o NCCI should implement a centralized WCSP data repository. All applications requiring WCSP data for processing should access this database.
- o NCCI should use modern software engineering techniques and follow strict structured programming techniques and documentation standards when rebuilding Data Administration applications.

C. Testing Objectives

- To evaluate the quality and adequacy of WCSP data validation in Data Administration.
- To evaluate the controls over completeness of WCSP data delivered to Class Ratemaking.
- To verify that all corrections made to WCSP data are authorized by the appropriate carrier.

D. Testing Methods

The evaluation of Unit Card Data Administration was accomplished through control procedures review, systems review and analysis, and statistical sampling. These techniques are described in the Evaluation Approach section of Volume I, Part C of this report.

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Unit Card Data Administration

E. General Observations & Recommendations

- 1) NCCI expends extensive time and effort in validating WCSP data used to produce Class Rates.

NCCI spends a considerable amount of time and effort validating and correcting WCSP data used for Class Ratemaking. Approximately 3 million unit reports are received by NCCI each year. An average of 7.5 WCSP data records result from each unit report received. This amounts to 22.5 million new WCSP data records which must be validated by NCCI each year.

NCCI currently validates WCSP data for 37 states and acts as the ratemaking bureau for 33 of these states. NCCI requires two to three months to validate WCSP data for a small state, four to five months for a medium size state, and five to six months to validate data for a large state.

A great deal of the WCSP validation process is performed manually by Data Administration clerks. The State Validation Procedure provides an example of the extensive manual effort required to execute the current validation procedures.

The State Validation Report is one of the primary tools for identifying WCSP errors in Data Administration. This report is run twice for each state served by NCCI. Data Administration clerks manually review every page of this report in order to make corrections.

This year the first State Validation Report for Missouri is 5,420 pages or about three boxes of computer paper. The Florida report is about six boxes of paper or approximately 10,000 pages.

Many of the potential errors listed on the State Validation Report do not actually require corrections. However, all potential errors must be reviewed.

NCCI should further automate its WCSP validation and correction procedures. Many decisions currently made by clerks could be made by application programs.

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Unit Card Data Administration

NCCI should place the burden of data correction on the carriers. WCSP data should be validated at the time of unit report receipt. NCCI should require carriers to resubmit data found to be in error.

We understand that NCCI has plans to implement the Unit Report Control (URC) and Unit Report Quality (URQ) systems. These systems, described in Volume I, are intended to perform front-end WCSP data validation and provide procedures for carrier corrections.

The URC system is currently being tested with selected carriers; industry-wide phased implementation is scheduled to be completed by July of 1992. The URQ system is scheduled for a phased implementation to be completed in October of 1992.

2) NCCI performs separate validation and correction of the same WCSP data in Experience Rating and Data Administration.

NCCI receives WCSP data in Data Conversion. Limited validation is performed at this time. This data is routed separately to Experience Rating and Data Administration/Class Ratemaking. The majority of WCSP data validation is performed in these areas. Experience Rating and Data Administration validate, correct, and use their versions of the data independently from one another with potentially inconsistent results. NCCI does not attempt to reconcile Experience Rating and Data Administration WCSP data or corrections.

NCCI should implement a centralized WCSP data repository. WCSP data should be validated immediately upon receipt and included in this database. Applications requiring WCSP data for processing should access this database.

We understand that NCCI plans to implement the URQ system which is intended to validate WCSP data upon receipt. We also understand that NCCI plans to implement the URS database which is intended to serve as a centralized repository of validated WCSP data. The URQ system is scheduled for a phased implementation to be completed in

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October of 1992. The URS database will begin capturing new unit reports in September of 1991.

3) NCCI data collection systems and procedures give rise to duplicates in WCSP data.

NCCI receives WCSP data from carriers in the form of hard copy unit reports and on magnetic tape. All carrier submissions are processed through Data Conversion and stored on magnetic tape by month of receipt.

NCCI performs a rate revision every 12 to 24 months for each of the 33 states for which it serves as the ratemaking bureau. At the start of each state rate revision, Data Administration extracts unit reports for the state from Data Conversion files. The extract includes any unit reports received since the prior rate revision's extract was performed. The extracted data is combined with data in the previous revision's Data Administration file. This combination forms the current revision's Data Administration file. Unit reports received for the state after this extraction/combination process require special handling in order to be included in the current revision's Data Administration file.

Late unit reports sometimes arrive in Data Conversion after the extraction has been performed. If identified as missing by Data Administration, these late arriving unit reports are incorporated into Data Administration files through a special process known as "Unit Add". The Unit Add process copies WCSP data from Data Conversion files into Data Administration files. The same data then exists in both Data Conversion and Data Administration. This allows late arriving data to be included in the current revision's Data Administration file after the extract has taken place.

During the state's next rate revision, Data Administration will extract unit report data from Data Conversion and combine it with the previous revision's Data Administration file. Any unit reports that were processed through Unit Add will be present in both the extract and the previous revision's Data Administration file. Combining the extract with this file will result in duplicates.

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In a population of 20,218,299 Data Administration payroll and loss records with policy effective dates of 1986 and 1987, 39,538 records, or 0.2% of the records, were identified as records that entered the system late by way of the Unit Add process. These records result in duplicates which NCCI's processing is designed to identify and remove.

Duplicates can also result from Data Administration corrections. Data Administration clerks enter corrections to the Data Administration file using either an on-line facility or a data entry service. Carriers submit corrections known as "C" reports through Data Conversion. If a correction is entered by Data Administration clerks and is submitted by a carrier through Data Conversion, a duplicate will result.

In both duplicate data examples described above, the problem is caused by dual points of WCSP data entry into NCCI's systems.

In a population of 20,218,299 Data Administration payroll and loss records with policy effective dates of 1986 and 1987, 26,687 records, or 0.1% of the records, were identified as duplicates during validation of Data Administration files.

Duplicate data is also produced when carriers submit the same WCSP data to NCCI more than once. Each time NCCI performs a rate revision for a state, Data Administration extracts data for that state from Data Conversion files. Before the extracted data is combined with prior year data to create the current revision's Data Administration file, the extract is checked for duplicates. The first step in the validation process identifies and removes carrier submitted duplicate records. This application program produces a control report which lists the number of duplicates removed from the extracted data.

In a judgmental sample of 34 control reports, representing 34 states processed during the 1990 rate revision, 3% of records were identified and removed as duplicates by this program. Because this program may have missed some duplicates, 3% is a conservative estimate of the percentage of duplicates actually contained in carrier submitted WCSP data.

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NCCI should implement a centralized WCSP data repository. WCSP data should be validated immediately upon receipt and included in this database through a single point of entry. Duplicate data should be identified and eliminated at this time. Applications requiring WCSP data for processing should access the database.

We understand that NCCI plans to implement the URQ system which is intended to validate WCSP data upon receipt. We also understand that NCCI plans to implement the URS database which is intended to serve as a centralized repository of validated WCSP data. The URQ system is scheduled for a phased implementation to be completed in October of 1992. The URS database will begin capturing new unit reports in September of 1991.

- 4) Duplicate unit report submissions are identified at the time of unit report receipt, but no action is taken at that time.

A unit report is uniquely identified by Carrier Number, Policy Number, Policy Effective Date, and Unit Report Number (e.g. 1st, 2nd, 3rd report). At the time of unit report receipt, this identifying information is logged into the Unit Card Tracking System, also known as "ICT". Duplicate unit reports are identified in this system by adding a suffix to the report number. An original 1st report would have a report number of "1". A duplicate 1st report would have a report number of "1D1". If a second duplicate 1st report was received it would be denoted "1D2".

Although the ICT system clearly identifies duplicate unit reports at the time of receipt, no action is taken to remove or segregate duplicate data at that point. Instead, data is forwarded to Data Administration where extensive efforts are undertaken to identify and remove duplicate data.

In the short term, NCCI should use the ICT system to help identify duplicates during Data Administration processing. A simple report program should be developed to list all instances of duplicates identified in ICT. This report should be used by Data Administration during the duplicate removal process.

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In the long term, NCCI should identify and eliminate duplicate unit reports at the time of unit report receipt.

We understand that NCCI has plans to implement the Unit Report Control (URC) system which is intended to identify duplicate unit report submissions at the time of receipt. The URC system is currently being tested with selected carriers; industry-wide phased implementation is scheduled to be completed by July of 1992.

- 5) WCSP data used for Class Ratemaking may be validated a year or more after unit report receipt.

Unit reports are received throughout the year in Data Conversion. Limited validation is performed by Data Conversion. For each state rate revision, WCSP data is extracted for validation and correction in Data Administration and eventual use in Class Ratemaking. While data received shortly after the extraction process is used almost immediately for experience rating, it remains unused and unvalidated for ratemaking purposes until the following year. The next year, Data Administration performs an extraction of WCSP data. Extensive validation is performed at that time.

NCCI should fully validate WCSP data at the time of unit report receipt. Carriers should be contacted immediately for resolution of any identified errors.

We understand that NCCI has plans to implement the Unit Report Control (URC) and Unit Report Quality (URQ) systems. These systems, described in Volume I, are intended to perform front-end WCSP validation and provide procedures for timely carrier corrections. The URC system is currently being tested with selected carriers; industry-wide phased implementation is scheduled to be completed by July of 1992. The URQ system is scheduled for a phased implementation to be completed in October of 1992.

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6) Data Administration WCSP validation procedures include many "rules of thumb".

NCCI receives approximately 3 million unit reports each year. This translates to approximately 22.5 million new WCSP data records each year. To facilitate validation of this large volume of data, Data Administration has implemented many "rules of thumb" in WCSP data validation procedures. The need for time saving "rules of thumb" does not mean that such rules are acceptable and instead highlights flaws in the overall design of the validation and correction process. A few examples of these rules are:

- o Eliminate losses with no related payroll information without further research if there are five or fewer occurrences of such losses for a single carrier.
- o If two exposure records are identical except for the experience mod, keep the record with the higher mod and delete the other record. If the higher experience mod is 1.000, delete the record with the higher experience mod and keep the other record.
- o Identical exposure records should not be treated as duplicates if the payroll amount is divisible by 100.
- o For temporary total and temporary partial disability claims, 80% of unreasonable fluctuations in loss development within an injury type must be explained. For permanent partial disability claims, 75% must be explained, and for medical only claims, 70% must be explained.

Most of these rules evolved in an effort to reduce the monumental task of validating WCSP data.

At a minimum, NCCI should reevaluate these rules.

In the long term, rules such as these should be eliminated. If the burden of data correction is placed on the carrier, NCCI will no longer be in the position of modifying data based on potentially inaccurate assumptions or incomplete evaluations.

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7) NCCI does not perform risk level validation of WCSP data used in Class Ratemaking.

Data Administration validates WCSP data by performing field edits, checking relationships within unit reports, and checking aggregate data for reasonableness. These efforts are designed to ensure that items such as the following hold true for WCSP data used in Class Ratemaking:

- o The case count field on a loss record is not equal to zero. This is a field edit.
- o The case count field on a loss record does not contain a value greater than the indemnity or medical amount reported on that record. This is a verification of relationships within a data record.
- o Loss records on a unit report are accompanied by associated payroll records. This is a verification of relationships within a unit report.
- o Total payroll for a class code this year is reasonable compared to total payroll for that class code last year. This is a verification of aggregate data reasonableness.
- o Total losses for an injury type valued as of this year are reasonable compared to those losses valued as of last year. This is a verification of aggregate data reasonableness.

Validation does not currently exist to ensure that data for a specific risk is reported consistently with policy specifications, risk inspections, or previously submitted data for that risk.

NCCI should implement risk specific WCSP data validation. WCSP data for a risk should, at a minimum, be compared to policy specifications, risk inspections, and previously submitted data for that risk. Comparisons should include: reported class codes, payroll, standard premium, experience modification, and loss development. Verification and correction of WCSP data at the risk level will eliminate most of the effort required to verify and correct data in aggregate.

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- 8) Many Data Administration application programs are old, poorly structured and undocumented.

Applications should be documented and programs should contain comments in order to provide systems personnel and end users with easily understood explanations of program functions and logic. When little documentation exists and programs contain few comments, systems personnel must decipher computer code in order to understand programs.

Much of the current Data Administration system was developed during the mid 1970s. NCCI has almost no documentation for Data Administration applications developed during that time. The source code for these programs is generally unstructured and contains few comments. These conditions make the programs very difficult to maintain, especially since most of the systems personnel who created these programs are no longer employed by NCCI.

Because programs are difficult to maintain, known program deficiencies are circumvented through manual intervention rather than addressed through proper program maintenance.

For example, the Administration Number, a unique identifier for unit reports, is truncated in the Payroll/Loss (P/L) Detail file forcing Data Administration personnel to perform additional steps when retrieving unit reports. This problem has existed at least since July of 1987, the last time major changes were made to the format and content of the P/L Detail file.

NCCI should use modern software engineering techniques and follow strict structured programming techniques and documentation standards when rebuilding Data Administration applications.

NCCI should document existing applications using the standards which are to be applied to new development.

We understand that the new DCI system was recently developed using modern software engineering techniques and that strict structured programming techniques and documentation standards were followed. We also understand that a current management

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objective for the Applications Support Department is to document existing application programs by the end of 1991.

9) Data Administration procedures allow changes to WCSP data without direct carrier approval.

Data Administration correction procedures instruct clerks to modify WCSP data believed to be in error. In many cases, these procedures do not require any contact with the carrier. Examples of cases where carrier contact is not required before changing data include:

- o Removal of duplicate payroll records.
- o Removal of duplicate loss records.
- o Elimination of loss data without corresponding payroll information.
- o Replacement of invalid case count information.

Some of these corrections do not warrant contact with the carrier, e.g. NCCI can reliably confirm that a duplicate exists by tracing suspect data back to hard copy unit reports. When a duplicate is identified the appropriate correction is always to remove the duplicate and carrier comment or approval is unnecessary.

In a population of over 20 million Data Administration payroll and loss records with policy effective dates of 1986 and 1987, 1.1% of the records were correction records created by NCCI. The serial number on these correction records indicates the type of correction. Based on the serial numbers observed, it appears that approximately 45% of the corrections in this population could have been reliably made without contacting the carrier. Examples of these corrections include removal of verifiable duplicates and correction of keypunch errors.

NCCI's Data Administration department made approximately 513,000 corrections to unit report data last year. Although sample results suggest that 55% of corrections should involve carrier contact, NCCI contacted carriers to resolve only about 1,000 errors last year. While one error may lead to multiple corrections on NCCI's systems, it is clear that NCCI

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contacted carriers for only a very small percentage of corrections made to unit report data last year.

NCCI should place the burden of WCSP data correction on the carriers. WCSP data should be validated at the time of unit report receipt. NCCI should require carriers to resubmit data found to be in error.

We understand that NCCI has plans to implement the Unit Report Control (URC) and Unit Report Quality (URQ) systems. These systems, described in Volume I, are intended to perform front-end WCSP validation and provide procedures for timely carrier corrections.

- 10) NCCI data files are unnecessarily complex and voluminous due to the use of a credit offset method for updating and correcting WCSP data.

NCCI receives WCSP data from carriers and stores this data in computer files. Data for a new policy is stored in the form of debit records. Debit records reflect WCSP data using positive values for information such as payroll, losses, and number of cases.

Over time, carriers submit more current WCSP data to update policy information. NCCI requires that carriers identify the existing data and specify how the revised data should appear after the update. NCCI offsets the existing data by creating a negative, or credit entry. A new debit record is then created to reflect the revised information. Similarly, any corrections made to WCSP data by NCCI are recorded by offsetting the data in error with a credit record, and creating a new debit record to reflect the correct information.

Updates and corrections require a minimum of two records: a credit record offsetting the original data, and a debit record containing the revised data. Data that has been modified once will therefore be represented by three records:

- o The original debit record.

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- o The offsetting credit record.
- o The current debit record.

To determine correct data values, the current debit record must be identified from among these other records.

While use of this credit offset method provides NCCI with an audit trail for tracing changes made to WCSP data, it hinders processing by increasing data volume and making interpretation more difficult.

NCCI should implement a centralized WCSP database. When updating information, instead of adding credit records to the database to offset non-current data records, a status field within each data record should be used to differentiate current from non-current data. This would decrease the volume of data records while maintaining historical data to provide for analysis of trend and development. Corrections should be made by changing records in the database. A separate history of these changes should be maintained to provide an audit trail.

We understand that NCCI plans to implement the URS database which is intended to serve as a centralized repository of validated WCSP data. We also understand that the credit offset method will not be used to update or correct information in this database. NCCI plans to capture new unit reports in the URS database in September of 1991.

F. Specific Tests Performed

- 1) Evaluated the effectiveness of the State Validation process. The State Validation process consists of computerized identification and manual correction of WCSP data errors.

- Observed procedures used for clearing errors on the State Validation report.

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- Determined whether actions taken by clerks to correct errors were supported by documented procedures.
 - Reviewed documented procedures for clearing errors to assess the reasonableness of the procedures.
 - Determined whether documentation accompanying corrections sufficiently supported the corrective action taken.
 - Reviewed procedures used to research WCSP data.
- 2) Evaluated the effectiveness of efforts to identify and remove duplicate WCSP data.
- Observed procedures used for identifying and clearing duplicate data.
 - Determined whether actions taken by clerks to identify and remove duplicate data were supported by documented procedures.
 - Reviewed documented procedures for clearing duplicates to assess the reasonableness of the procedures.
 - Reviewed program logic and control reports and interviewed data processing personnel to determine the effectiveness of duplicate removal programs. (RP10100P, RP10102P, RP10103P).
 - Reviewed statistically sampled data to identify duplicates missed by both automated and manual duplicate removal processes.
- 3) Evaluated the controls in place to ensure that corrections sent to ACS are accurately keypunched and incorporated into the P/L Detail file.
- Determined whether intended corrections as listed on the Payroll/Loss Detail Correction forms were present on the RCDUPDATE listing of corrections applied to the P/L Detail file.

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- 4) Evaluated the controls in place to ensure that corrections made on-line are accurately incorporated into the P/L Detail file.
 - Determined whether intended corrections as noted on the State Validation report were present on the RCDUPDATE listing of corrections applied to the P/L Detail file.

- 5) Evaluated the effectiveness of the Reasonableness Test. The Reasonableness Test identifies unreasonable fluctuations in reported losses from one valuation point to the next.
 - Observed procedures used to research and explain unreasonable fluctuations in loss development.
 - Reviewed documented procedures to assess their reasonableness.
 - Determined whether sufficient documentation existed to support the explanations provided.
 - Observed the quality control review of the reasonableness test to assess its adequacy.

- 6) Evaluated the effectiveness of the Class Payroll Fluctuation Investigation. This investigation is used to identify unreasonable fluctuations in payroll by class between policy periods.
 - Reviewed documented procedures to assess their reasonableness.
 - Determined whether actions taken to explain unreasonable fluctuations were supported by documented procedures.
 - Determined whether the explanations provided for fluctuations in payroll were reasonable.
 - Determined whether sufficient documentation existed to support the explanations provided.

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7) Statistically sampled Data Administration payroll and loss records and compared them to the originally submitted unit reports and documented corrections.

- Two populations were defined. The first was all payroll records in the Payroll/Loss Detail file having a policy effective date of 1986 or 1987. The second population was all loss records in the Payroll/Loss Detail file having a policy effective date of 1986 or 1987.
- Data for policies with effective dates after 1987 had not yet been incorporated into the Payroll/Loss Detail file at the time of this sample. This is because data for a policy is not due at NCCI until 20 months after the effective date. Once received, this data does not enter Data Administration for validation until a year or more has passed. Then depending on the volume of data being validated, two to six months can pass before validation is complete and the data is included in the final Payroll/Loss Detail file.
- An attribute sampling approach was used. This approach measures frequency of errors rather than size of errors.
- A confidence level of 95%, expected error rate of 2%, and tolerable error of 5% were used to determine the sample sizes.
- The payroll and loss records selected were compared to carrier submitted unit reports and any documented corrections. The specific fields tested were: State Code, Class Code, Payroll Amount, Premium Amount, Injury Code, Indemnity Amount, and Medical Amount.
- All identified discrepancies were discussed and researched with NCCI personnel. Results were summarized and included in the Appendix of this volume.

8) Judgmentally sampled carrier submitted unit reports and compared them to Data Administration payroll and loss records.

- A judgmental sample of fifty carrier submitted unit reports was selected from unit reports received in 1990 and 1991. Twenty-five unit reports submitted on hard copy were selected from microfilm

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records. Twenty five unit reports submitted on magnetic tape were selected from microfiche records.

- The unit report data selected was compared to data contained in payroll and loss records extracted from the Data Administration P/L file. The specific fields tested were: State Code, Class Code, Payroll Amount, Premium Amount, Indemnity Amount, Medical Amount, Policy Number, Policy Effective Date, Carrier Code, and Claim number.
- All identified discrepancies were discussed and researched with NCCI personnel. Results were summarized and included in the Appendix of this volume.

9) Evaluated the accuracy of the process used to summarize unit report data by class code.

- Developed a program to summarize payroll and loss detail data by class code.
- Determined the accuracy of NCCI's summarization process. This was accomplished by comparing output from our test program with output from NCCI's summarization process.

10) Verified that the loss limitation programs limit losses according to documented procedures.

- Developed a program to identify loss records to be considered for loss limitation.
- Compared output from this program to output from NCCI's loss limitation programs.
- Determined whether loss limitation techniques applied were supported by documented procedures.
- Reviewed procedures for loss limitation to assess their reasonableness.

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G. Specific Findings & Recommendations:

- 1) WCSP exposure and loss amounts reported by carriers are accurately processed for use in calculation of Class Rates.

NCCI's electronically stored WCSP data used for calculating class rates was compared to carrier submitted source documents. A summary of the results follows:

- o In a random sample of 181 payroll records, one error in payroll amount was noted. This was caused by a duplicate record in the P/L detail file. In addition, four hard copy unit reports could not be located. Data for which supporting documentation could not be located was considered an error for the purposes of quantifying the sample test results.
- o In a random sample of 181 loss records, four errors in medical loss amount were noted. These were caused by a data entry transposition error, a duplicate record and two records on the P/L detail file which could not be supported by unit report data provided by state funds. In addition, three hard copy unit reports could not be located.

In these samples, exceptions were defined as differences between what was reported by carriers on unit reports and what was resident in detail payroll and loss data files that are summarized for use by Class Ratemaking. Errors were defined as those exceptions which could not be attributed to acceptable WCSP data processing practices.

The results from this test indicate that WCSP exposure and loss amounts reported by carriers are accurately processed for use in calculating class rates.

Detail sampling results are included in the Appendix to this volume.

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- 2) Testing indicates that WCSP data files include all carrier submitted WCSP data received by NCCI.

In a judgmental sample of fifty carrier submitted unit reports, no indication was found that data which should have been present in Data Administration files was missing.

In this sample, discrepancies were defined as differences between what was reported by carriers on unit reports and what was resident in Data Administration files.

- 3) Carriers periodically fail to submit WCSP data on a timely basis, fail to submit particular units of data, and fail to reply to NCCI's requests for missing data or data clarification.

Data Administration compares aggregate WCSP data with data from previous reporting periods and previous policy periods. When unreasonable fluctuations in the aggregate data are observed, Data Administration investigates the underlying detail. Detailed investigations sometimes reveal that WCSP data for a particular risk is missing or incomplete.

When Data Administration finds that WCSP data for a risk is missing or incomplete, an analyst sends a research letter to the carrier who wrote the policy. The research letter specifies the risk name, policy number, effective date, class code, and a statement of the problem.

The Data Administration Analyst allows approximately fifteen days for carrier response before issuing a follow-up letter or phone call.

The effect of missing and incomplete WCSP data on ratemaking is difficult to quantify. The dollar amount of missing WCSP data is significant only in terms of its relative effect on the experience available for making rates in a given class.

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In a recent rate revision, one class for one state showed a decrease of \$8.7 million in reported payroll between policy periods. Data Administration suspected that the decrease was due to missing WCSP data for a single risk. Although efforts were made, contact with the carrier failed to resolve the problem.

The missing data caused at least an 18% decrease in the state experience available for making rates for that particular class. This exclusion of data resulted in more credibility being given to nationwide experience than would have been warranted if all state experience had been available. It is difficult to quantify the effect of this missing data on class rates.

NCCI is sometimes forced to remove WCSP data because it is obviously incomplete. In a recent rate revision, \$16.5 million was reported as payroll for a risk, but there were no losses reported for that risk. Research letters and follow-up efforts brought no response from the carrier. NCCI removed the payroll data to avoid potentially distorting the database. The effect on rates in this instance is difficult to quantify.

Carriers should be held to strict reporting standards. They should be made aware of their performance with regard to these standards, and fined for any deviations from them.

We understand that NCCI has plans to implement the Unit Report Control (URC) system which will help ensure the timeliness and completeness of data. The URC system is currently being tested with selected carriers; industry-wide phased implementation is scheduled to be completed by July of 1992.

- 4) WCSP data reflecting losses without payroll for an insured is eliminated without contacting the carrier.

The State Validation Report identifies errors in WCSP data, including WCSP data reflecting losses reported for a class code with no corresponding payroll. Data Administration procedures dictate that data meeting the criteria for losses without payroll should be removed from the ratemaking files without further research unless there are more than five occurrences for a single carrier. If there are more than five occurrences of

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this error for a single carrier, an investigation will occur before eliminating the data. This investigation may include contacting the carrier.

In practice, an investigation may also occur if the loss is considered large. However, this practice is not reflected in documented procedures.

In a population of 6,726,062 loss records having policy effective dates of 1986 and 1987, 36,252 loss records, or .5% of the loss records, were removed because corresponding payroll information did not exist.

NCCI procedures should require investigation into all loss without payroll errors. Carrier approval should be required on all resulting modifications.

In the long term, the loss without payroll and other data edits should be performed at the time of unit report receipt. NCCI should require carriers to correct any identified errors through data resubmission.

We understand that NCCI has plans to implement the Unit Report Control (URC) and Unit Report Quality (URQ) systems. These systems, described in Volume I, are intended to perform front-end WCSP validation and provide procedures for timely carrier corrections. The URC system is currently being tested with selected carriers; industry-wide phased implementation is scheduled to be completed by July of 1992. The URQ system is scheduled for a phased implementation to be completed in October of 1992.

5) Duplicate WCSP data exists in the data used to produce Class Rates.

The detailed WCSP data processed in Data Administration is comprised of exposure records and loss records. Each exposure record indicates payroll and premium in a payroll classification for a specific risk. Each loss record indicates indemnity and medical loss amounts for a specific loss or for aggregated small losses. Data Administration summarizes the detailed WCSP data and forwards it to Class Ratemaking where it is used to produce rates.

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Two random samples were taken from detailed WCSP data. The samples included 181 payroll records and 181 loss records. In these samples, two instances of duplicate WCSP data were identified. These duplicate records were used in Class Ratemaking to produce rates. In both instances, the duplicates detected were insignificant and had no impact on ratemaking.

At a minimum, NCCI should reevaluate procedures used to identify and remove duplicate WCSP data.

In the long term, NCCI should implement a centralized WCSP data repository. WCSP data should be validated immediately upon receipt and included in this database through a single point of entry. Duplicate data should be identified at this time. Applications requiring WCSP data for processing should access the database. NCCI should also strictly enforce the timeliness of data submission. This measure would decrease the incidence of duplicate data.

We understand that NCCI plans to implement the URS database, which is intended to serve as a centralized repository of validated WCSP data. NCCI plans to capture new unit reports in the URS database in September of 1991.

We understand that NCCI has plans to implement the Unit Report Control (URC) and Unit Report Quality (URQ) systems. These systems, described in Volume I, are intended to perform front-end WCSP validation and provide procedures for timely carrier corrections. The URC system is currently being tested with selected carriers; industry-wide phased implementation is scheduled to be completed by July of 1992. The URQ system is scheduled for a phased implementation to be completed in October of 1992.

- 6) State Validation procedures do not adequately document the steps necessary to clear certain types of errors.

The Data Administration State Validation Procedures outline, in detail, the steps necessary to correct errors appearing on the State Validation Report. However, procedures for clearing certain errors (e.g. error code

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E: Average Indemnity Not Within Specified Ranges, and error code F: Average Medical Not Within Specified Ranges) are not adequately documented. In the specified examples, the procedures refer the user to a supervisor for resolving the error.

NCCI should update the State Validation Procedures to include sufficient detail to clear all State Validation errors.

- 7) Duplicate Removal Procedures dictate that exposure records identified as duplicates should not be removed if payroll amounts are divisible by 100. This allows some identified duplicates to remain in the data.

Under the Workers Compensation Statistical Plan (WCSP), exposure should be reported in aggregate for each class code. It is not unusual for carriers to report multiple line items of exposure for one class code. The net sum of these line items is the aggregate exposure for the class code. In identifying duplicate data, Data Administration clerks look for multiple line items that indicate the same risk id, class code, and exposure. Potential duplicates are researched and, if appropriate, removed from the WCSP data.

Duplicate Removal Procedures indicate that identical line items should not be treated as duplicates if the exposure amount is divisible by 100. Such exposure amounts are referred to as "Common Payroll".

In practice, common payroll may be investigated if the payroll amount is considered large. However, this practice is not reflected in documented procedures.

In a random sample of 181 payroll records, one duplicate was identified. This duplicate amounted to a net overstatement in payroll of \$31,000. It was not removed, presumably because it met the "Common Payroll" criterion (i.e. 31,000 is divisible by 100). In comparing this data to carrier submitted unit reports, it was identified as a true duplicate.

At a minimum, NCCI should research all potential duplicates, including those with payroll amounts divisible by 100. Written procedures should be updated to reflect this policy.

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In the long term, NCCI should identify and eliminate duplicate unit reports at the time of unit report receipt.

We understand that NCCI has plans to implement the Unit Report Control (URC) system which is intended to identify and eliminate duplicate unit report submissions. The URC system is currently being tested with selected carriers; industry-wide phased implementation is scheduled to be completed by July of 1992.

8) Data Administration loss investigation reports do not list Claim Number.

Loss investigation reports provide detail listings of specified subsets of WCSP data. These reports are used to investigate unusual loss development trends and other anomalies in WCSP loss data.

Current loss investigation reports do not include Claim Number as part of the detail. Claim Number is required to positively identify duplicate loss records. Data Administration clerks retrieve hard copy unit reports or order custom data extracts to obtain this information.

NCCI should include Claim Number on loss investigation reports.

9) The Administration Number, a unique NCCI identifier for unit reports, is not accurately recorded in WCSP data files, and is not used on Data Administration reports.

A unique Administration Number is assigned to each unit report received by NCCI either on hard copy or on magnetic tape. This information is stored in most WCSP data files at NCCI.

Microfilm and microfiche copies of original documents are stored in Administration Number order. Knowledge of the Administration Number is necessary to locate a carrier submitted unit report.

Data Administration reports list Carrier Number, Policy Number, Policy Effective Date, Report Number, State Code, and/or Risk Id. Clerks use

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Unit Card Data Administration

this information to "look up" the Administration Number in the Unit Card Tracking System (ICT). Once the Administration Number is determined, the original unit report can be located on microfilm or microfiche.

If the Administration Number were included on Data Administration reports, unit reports could be located immediately. The interim step of using ICT could be eliminated. This would reduce error research time. However, Administration Numbers are not readily accessible because they are truncated in WCSP data files.

NCCI should resolve processing errors which cause Administration Numbers to be truncated in WCSP data files. In addition, the Administration Number should be added to many current Data Administration error reports.

We understand that NCCI is currently addressing truncation problems which affect the Administration Number. These problems are being addressed through NCCI's normal change order process for system maintenance.

10) The procedure to obtain unit report source documents is time consuming.

In researching WCSP data errors, Data Administration personnel often retrieve original unit report data. Currently this procedure requires:

- 1) Determining the Unit Report Administration Number through the ICT system by using the Policy Number or Risk ID.
- 2) Obtaining the appropriate microfilm or microfiche based on the Administration Number.
- 3) Viewing and printing the unit report image using microfilm and microfiche machines.

Sometimes the PICS database and the Risk Directory are also accessed during this process.

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Unit Card Data Administration

Given the large number of errors requiring research by Data Administration, this process represents a significant time commitment.

NCCI should print Administration Number on Data Administration error reports. This would eliminate the need to access ICT, the PICS database, and the Risk Directory.

In the long term, NCCI should provide on-line access to detail unit report data. This could be accomplished through the development of a centralized WCSP database.

We understand that NCCI plans to implement the URS database which is intended to serve as a centralized repository of validated WCSP data. NCCI plans to capture new unit reports in the URS database in September of 1991.

11) The State Validation on-line correction system formats the Policy Effective Date incorrectly.

WCSP errors identified on the State Validation Report are corrected by Data Administration clerks through an on-line correction system. This system formats credit and/or debit records to offset the erroneous data and, if appropriate, replace it.

The on-line correction system formats the Policy Effective Date as part of each record it creates. This date is formatted without the decade, e.g. January 5, 1988 would be formatted as 01/05/08.

In a population of 20,218,299 exposure and loss records, 13,965 records had incorrectly formatted Policy Effective Dates.

While this deficiency does not impact processing, it should be corrected to provide data consistency.

NCCI should modify the State Validation on-line correction system so that the Policy Effective Date is formatted correctly.

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Class Ratemaking

A. Area Overview

The Class Ratemaking area uses overall rate level change indications from the Overall Rate Level area and summarized payroll and loss data from Unit Card Data Administration. This information is used to produce workers compensation rates by payroll classification code for each state.

Class Ratemaking also produces Expected Loss Rate Factors (ELR Factors) and D-Ratios used by Experience Rating to produce Experience Modification Factors (experience mods). (ELRs indicate the expected losses for a classification per unit of exposure; D-ratios indicate the portion of those losses below a specified dollar threshold.)

For a more detailed description of the Class Ratemaking area, refer to Volume II, Section I, Description of Data Collection and Data Handling. Detailed flow diagrams for this area are included in the Volume II Appendix.

B. Area Evaluation

Key Strengths:

- o NCCI adheres to its stated methodologies during the ratemaking process.
- o NCCI's Quality Control Department provides an independent review of data and calculations used in ratemaking.
- o NCCI is committed to improving integrity and accuracy in the ratemaking process.

Key Weaknesses:

- o Critical class ratemaking applications are developed, maintained, and controlled by actuarial personnel. These end user systems do not have the degree of automated application control required of most production systems.
- o Class Ratemaking application programs are in need of maintenance to correct long standing deficiencies and to provide needed enhancements.

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Key Recommendations:

- o NCCI should implement more stringent controls over its end user computing environments. Standards for developing, executing, and maintaining end user applications should be established and strictly enforced.
- o NCCI should address maintenance and enhancement requirements of Class Ratemaking application programs.

C. Testing Objectives

- To evaluate the accuracy of processing used to produce Expected Loss Rates (ELRs) and D-ratios.
- To evaluate the accuracy of processing used to produce class rates.

D. Testing Methods

The evaluation of Class Ratemaking was accomplished through control procedures review and systems review and analysis. These techniques are described in the Evaluation Approach section of Volume I, Part C of this report.

E. General Observations & Recommendations

- 1) NCCI's Quality Control department performs an independent and thorough check of data and calculations used to determine class rates.

Quality Control (QC) is responsible for providing an independent review to ensure the accuracy and reasonableness of data affecting class ratemaking. QC's review of Class Ratemaking begins at the point where summarized WCSP data is received from Data Administration, and continues through the calculation of class rates and final assembly of the bound rate filing.

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QC actions include independent checking of input to sources, review of formula calculations, review of state specific items, and independent derivation of certain factors (e.g. state law amendment factors).

QC places a red dot next to data that has been reviewed. The red dot indicates that the data reviewed has been successfully recalculated or reconciled to sources.

- 2) NCCI's end user systems do not have the degree of automated application control required of most production systems.

Class Ratemaking currently performs portions of its automated processing using systems developed, maintained and controlled by actuarial personnel. These systems perform functions critical to NCCI's ratemaking function. They perform WCSP data validation, calculate critical rate adjustment and rate calculation factors, and produce major components of rate filings.

While these systems operate adequately, and their output is carefully checked by the Quality Control Department, they do not have systems controls commensurate with their importance to NCCI's business objectives.

Critical deficiencies include the following:

- o There are no processing control reports or automated audit trails which document application program activity.
- o There are no documented procedures to control program changes. (It should be noted, however, that in some areas efforts have been made to provide control over program changes by assigning program maintenance responsibility to one individual.)
- o Documentation of existing applications is sparse and poorly integrated.
- o There are no formal backup procedures. Although most applications and data sets are backed up, most backups are not stored off site and a documented retention schedule does not exist.

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Class Ratemaking

- o Access to microcomputer applications is not restricted through use of passwords or other security measures.
- o Microcomputer applications reside on unsecured personal computers (PCs).
- o There are no documented standards for testing new end user application programs or for testing changes to existing end user application programs.

Given the importance of end user computing to the class ratemaking process, NCCI is incurring significant risk due to their current lack of controls.

NCCI should implement more stringent controls over its end user computing environments. Standards for developing, executing, and maintaining end user applications should be established and strictly enforced.

NCCI should move more stable, regularly executed end user applications into a production environment where they can be maintained and executed by NCCI's data processing department. This will reduce the risk of processing errors by taking advantage of a more tightly controlled environment.

We understand that NCCI is developing an end user computing policy which is intended to address data processing controls. NCCI has not set a date for implementation of this policy.

- 3) Ratemaking procedures allow WCSP data to be eliminated without direct carrier approval.

WCSP data used for class ratemaking is primarily validated and corrected in Data Administration. Identified errors are sometimes resolved through contact with the carrier. NCCI investigates approximately 1000 errors a year by requesting information from carriers. Approximately 10-15% of these requests go unanswered.

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When a carrier does not respond to a request for information, Data Administration supervisors contact Class Ratemaking actuarial supervisors for advice. If the actuarial supervisor determines that the data in error is insignificant or may substantially distort class rate levels, the data is eliminated.

This situation occurs approximately one or two times for every three states processed.

NCCI should continue to eliminate data if it is inaccurate and might adversely affect the integrity of class rate levels. Carriers should be strongly encouraged to submit quality data and to respond promptly to NCCI requests for additional information.

In the long term, NCCI should place the burden of WCSP data correction on the carriers. WCSP data should be validated at the time of unit card receipt. NCCI should require carriers to resubmit data found to be in error.

We understand that NCCI plans to implement the Unit Report Control (URC) and Unit Report Quality (URQ) systems, which are intended to perform front-end WCSP data validation and provide a platform for carrier corrections. Both systems are scheduled to be fully operational by the end of 1992.

- 4) NCCI's process for creating Unit Statistical Plan (USP) rate filing exhibits is complex due to the implementation of makeshift controls in an end user environment.

During the production of each rate filing, NCCI produces various reports listing summarized Workers Compensation Statistical Plan (WCSP) data and factors derived from this data. These reports, referred to as USP exhibits, provide information for analysis, factors used in class rate calculations, and exhibits for rate filings.

Currently, all USP exhibits are produced utilizing an end user controlled PC spreadsheet application (LOTUS 123). Each year, Class Ratemaking copies portions of the previous year's USP Exhibit diskette onto two new

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diskettes. The new diskettes are numbered "1" and "2" and serve as the starting point for USP Exhibits for the current year. In order to complete the necessary input to these diskettes, Class Ratemaking performs the following steps:

- o Data is downloaded from mainframe computer files to Diskette 2. To verify the results of the download process, key values from hard copy reports are manually entered onto Diskette 1 for later comparison:
 - Limited and summarized WCSP data for five policy years, known as NC235 data, is downloaded from the mainframe computer to Diskette 2.
 - Limited and summarized WCSP data for the second most recent policy year valued as of the 1st report is known as 1&9 Limited Summary data. The 1&9 Limited Summary includes 1st reports received the previous year, late 1st reports received during the current year, and any carrier submitted corrections. This data is downloaded from the mainframe to Diskette 2.
 - Total amounts from the report of NC235 Limited Summary data are manually entered onto Diskette 1.
 - Total amounts from the report of 1&9 Limited data are manually entered onto Diskette 1.
- o Data from hard copy source documents is manually entered onto Diskette 1. To verify the results of the data entry process, a second person enters the same data onto Diskette 2 for later comparison.
 - Total amounts from a report of 4th and 5th Limited Summary data are manually entered onto both Diskette 1 and Diskette 2. The 4th and 5th Limited data includes limited experience for the 4th and 5th oldest policy years included in the NC235 data. Data is entered onto the two diskettes by two different people.
 - Factors intended to adjust data based on the effects of state legislation are manually entered from the Amendment Factors Page onto both Diskette 1 and Diskette 2. Data is entered onto the two diskettes by two different people.

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- Cost ratios, trend factors, statewide average weekly wages and other factors are manually entered from the Form R Input Page onto both Diskette 1 and Diskette 2. Data is entered onto the two diskettes by two different people.
- o Diskette 1 is compared to Diskette 2 by an automated microcomputer program. Any differences are researched and resolved.
- o Diskette 1 is used to produce USP exhibits.

This process is complex because two diskettes are updated independently with the objective of ultimately making them identical. The independent diskettes are compared after all updates. This double entry verification serves as a control mechanism to ensure data accuracy.

If standard data processing controls were in place, it would not be necessary to produce two independent diskettes. Input data could be verified through on-line entry validation and batch total verification.

NCCI should streamline the process used to create USP Exhibit diskettes. Implementing tighter data processing controls over its end user systems in general will eliminate the need for double entry verification strategies.

We understand that NCCI is developing an end user computing policy which is intended to address data processing controls. NCCI has not set a date for implementation of this policy.

In the long term, NCCI should implement most of this process as a standard production application.

F. Specific Tests Performed

- 1) Evaluated the use and effectiveness of the Preparation Checksheet.

The Preparation Checksheet is used to ensure that specific data integrity checks have been completed before class rates are calculated.

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- Determined whether maximum aggregate amounts were identified and researched.
- Determined whether new class codes were identified and researched for experience prior to their effective dates.

2) Verified the accuracy of data on the Form R Input Sheet.

The Form R Input Sheet is used to record information for use as input to USP exhibits. The information on the Form R Input Page includes: cost ratios, trend factors, statewide average weekly wages, etc.

- Verified the accuracy of the data by tracing it back to its sources.

3) Verified the accuracy of data on the Amendment Factors Page.

The Amendment Factors Page is used to record information for use as input to USP exhibits. The information on the Amendment Factors Page includes: amendment factors, adjustment factors, and assessment factors.

- Verified the accuracy of the data by tracing it back to its sources.

4) Evaluated the adequacy of Class Ratemaking's assessment of data reasonableness.

Class Ratemaking's assessment of data reasonableness includes the review of reasonableness checks performed by Data Administration, as well as the performance of additional reasonableness checks as needed by actuarial personnel.

- Determined whether reviews of Data Administration reasonableness checks were performed.
- Evaluated the adequacy of the tests performed by Data Administration and the tests available for performance by Class Ratemaking.

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- Reviewed documentation and audit trails for changes.
- Investigated follow-up procedures to ensure that changes were properly made.

5) Verified the accuracy of data contained in the Lotus Input Spreadsheet.

The Lotus Input Spreadsheet contains the input data used to create the USP Exhibits. The USP Exhibits provide information for analysis, factors used in class rate calculations, and exhibits for rate filings.

- Evaluated the process used to enter and download data to the input spreadsheet.
- Verified the accuracy of the data by tracing it back to its sources.

6) Verified the accuracy of data contained in the USP Exhibits.

The USP Exhibits provide information for analysis and inclusion in the rate filing, factors used in class rate calculations, and exhibits for rate filings.

- Evaluated Quality Control's review of data in the USP Exhibits.
- Verified the accuracy of the data through recalculation and by tracing the data back to its sources.

7) Reviewed the accuracy of data entered on A-sheet control cards.

Data entered on A-Sheet control cards is used as input to the A-sheet calculation program.

- Verified the accuracy of the data by tracing it back to its sources.

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8) Identified the reasons for data truncation in Class Ratemaking application programs. Evaluated the controls in place to ensure these truncation errors do not affect the calculation of class rates.

- Identified truncation errors in Class Ratemaking data.
- Interviewed Class Ratemaking personnel to determine how truncation errors are resolved.

9) Verified that the automated A-sheet calculation program produces A-sheets according to documented procedures.

- Developed a parallel A-Sheet program to test NCCI's A-Sheet process.
- Verified the accuracy of NCCI's A-Sheet process by comparing NCCI A-Sheets to A-Sheets produced by the A-Sheet test program.

10) Verified the accuracy of data used to calculate Expected Loss Rate Factors (ELR Factors).

Expected Loss Rate Factors are used in the Revised Experience Rating Plan to calculate expected losses.

- Verified the accuracy of input data by tracing it back to its sources.
- Verified the accuracy of worksheet calculations by recalculating values.

11) Verified the accuracy of data used to calculate D-Ratios.

D-Ratios are used under the Revised Experience Rating Plan to calculate expected primary losses. A primary loss is the portion of a single loss, including medical and indemnity, up to a dollar threshold. This threshold varies from between \$2000 to \$10,000.

- Verified the accuracy of input data by tracing it back to its sources.

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- Verified the accuracy of worksheet calculations by recalculating values.
- 12) Verified the accuracy of data on Rate Factor Card Worksheets.
- Rate Factor Card Worksheets are used to record information in order to facilitate construction of rate factor cards. Rate Factor Cards are used as input to the automated class rates calculation program (IDRATE).
- Verified the accuracy of the data by tracing it back to its sources.
- 13) Verified the accuracy of data on Rate Factor Cards.
- Rate Factor Cards are used as input to the automated class rates calculation program (IDRATE).
- Verified the accuracy of the data by tracing it back to its sources.
- 14) Verified that Rate Factor Card data is accurately input to the automated class rates calculation program (IDRATE).
- Verified the accuracy of the data by tracing it back to its sources.
- 15) Verified that the automated class rates calculation program (IDRATE) calculates rates according to documented procedures.
- Verified the accuracy of the rate calculation program by performing rate calculations manually.
- 16) Evaluated the controls in place to ensure that calculated class rates achieve the proposed overall rate level change calculated by Overall Rate Level.
- Calculated achieved overall rate level by calculating rate levels using an independent program.

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- Verified that intended rate levels were achieved by comparing intended rate levels to rate levels calculated by the independent program.
 - Reviewed program logic to determine whether adequate controls exist to ensure that the intended rate level is achieved.
- 17) Evaluated the effectiveness of the Quality Control Department to ensure the accuracy of class ratemaking indications.
- Interviewed Quality Control Department personnel to gain an understanding of quality control procedures.
 - Reviewed Class Ratemaking documentation for evidence of Quality Control review.
 - Verified the accuracy of Quality Control's review by spot checking data reviewed by Quality Control.
- 18) Reviewed F-class ratemaking processing steps to gain an overall understanding of similarities and differences between F-class and industrial class ratemaking.
- Interviewed actuarial personnel to understand responsibilities and identify key processing steps.
 - Reviewed Quality Control's involvement in reviewing and evaluating F-class ratemaking calculations and rates produced.

G. Specific Findings & Recommendations:

1) Class Ratemaking application programs truncate dollar amounts.

Class Ratemaking mainframe application programs do not correctly process payroll amounts of \$10 billion or more or pure premium amounts greater than \$100. Both payroll and pure premium sometimes exceed these amounts.

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Pure premium is usually defined as the dollar amount of losses per \$100 of payroll. In some cases pure premium is defined using an exposure base other than payroll. When an exposure base other than payroll is used (e.g. number of employees), it is not uncommon to encounter pure premium amounts greater than \$100.

The application programs that produce A-sheets truncate payroll amounts greater than \$10 billion. For example, a payroll amount of \$26,000,000,000 processed by this program is erroneously transformed to \$6,000,000,000. Pure premium amounts greater than \$100 are also truncated. For example, a pure premium amount of \$112.012 is truncated to \$12.012.

The application program which calculates class rates (IDRATE) also truncates dollar amounts. This program truncates pure premium amounts greater than \$100.

Class Ratemaking personnel currently overcome these truncation problems by manually correcting the output from these programs. Although a system generated report is available to help identify some truncation problems, a manual review of the data is often necessary.

In some cases, once problems are identified, only hard copy output or print files are corrected and magnetically stored data remains truncated. Each time the magnetically stored data is used, Class Ratemaking personnel must recorrect the truncated data. During our limited review of this process, manual processing and quality control procedures identified and addressed these problems. However, identifying and correcting these errors is time consuming and NCCI unnecessarily assumes the risk of missing errors and grossly misstating amounts.

NCCI should correct truncation problems in the A-sheet process and the IDRATE process.

We understand that truncation problems were corrected in test programs modified for this examination. These problems should similarly be addressed in NCCI's production environment. NCCI estimates that correcting these problems in the A-Sheet process will

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involve modifications to 22 application programs. NCCI has made plans to correct these problems through its normal change order process for system maintenance.

- 2) F-class ratemaking is performed within an environment that is separate from the environment used for industrial class ratemaking.

F-class financial call data is not used for overall rate level change indications since NCCI has determined that the F-class financial data is unreliable. Therefore F-class ratemaking is based solely upon WCSP data. The validation and processing of F-class WCSP data is completely separate from validation and processing used for industrial class ratemaking. F-class processing utilizes its own programs which were independently created in 1988. These programs are maintained by actuarial personnel.

Beginning in 1991, NCCI intends to perform F-Class ratemaking annually. Between 1985 and 1990, there were only two F-class rate filings: in 1988 and 1990. The infrequency of filings was attributed to the need to train new employees after the move to NCCI's Boca Raton facilities and the higher priority given to industrial classes during that transition. Now, with sufficiently trained staff, NCCI is reviewing processing procedures, processing responsibilities, and methodology to support annual F-class filings.

We understand that NCCI is reviewing the feasibility of transferring validation of F-class WCSP data to the Data Administration production systems. It is important to note that F-class validation is somewhat more complicated than industrial class validation. Personnel performing F-class validation must be familiar with the applicable Federal and state laws governing the determination of rates.

NCCI is also reviewing issues which may affect methodology and thus the design of application programs. Two outstanding issues include the provision for loss development after the fifth report and the inclusion of a provision for trending losses.

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NCCI should consider the recommendations provided in this report regarding end user systems, industrial class ratemaking, and WCSP validation and processing to ensure consistency in the development of F-class ratemaking.

3) Class Ratemaking verifies the achievement of the proposed overall rate level change before class rates have been finalized.

The application program that determines class rate levels (IDRATE) verifies that the proposed overall rate level change is actually achieved by the changes in individual class rates. This is accomplished as follows:

- o Proposed class rates are multiplied by current exposure to calculate the proposed manual premium.
- o Current class rates are multiplied by current exposure to calculate the current manual premium.
- o Proposed manual premium is divided by the current manual premium to calculate the achieved overall rate change.
- o The achieved overall rate level change is compared to the change proposed by the Overall Rate Level area.
- o If the two values do not match within a specified tolerance, class rates are appropriately adjusted.

This process is repeated until the achieved overall rate level change matches the proposed overall rate level change.

The IDRATE program performs the verification of overall rate level before class rates have been finalized. Two types of changes to the rates occur after this verification is completed. The IDRATE program makes changes to class rates based on individual state specific requirements, and NCCI Class Ratemaking personnel manually change class rates based on class specific requirements. No formal verification process exists to ensure the final class rates achieve the proposed overall rate level change.

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NCCI has developed an on-request end user program which determines the achieved overall rate level change. This program could be used to verify that final class rates achieve the proposed overall rate level change.

NCCI should procedurally verify that final class rates achieve the proposed overall rate level change. The existing end user program mentioned could be used to achieve this objective.

- 4) The number of significant digits applied to a key rate adjustment factor is inconsistent.

Class Ratemaking calculates class rates using an application process known as IDRATE. IDRATE calculates class rates based on the proposed overall rate level change, class experience, various trend factors, class swing limits, and loss limitations. Class swing limits restrict the amount a class rate can change from one year to the next.

Because of swing limits, IDRATE typically does not achieve the proposed overall rate change in its first calculation of class rates. The calculation must be iteratively performed, adjusting class rates to satisfy the overall rate level as well as swing limits by class.

The overall rate level is achieved using a multiplier called the test correction factor. The test correction factor is adjusted with each iteration to reduce the difference between the targeted overall rate level change and the overall rate level change resulting from the newly calculated class rates. When the final test correction factor has been determined the next step calculates final class rates.

The test correction factor used to calculate final class rates is different from the final test correction factor resulting from the iterative process.

The test correction factor calculated and verified during the iterative process has five significant digits after the decimal point, e.g. 1.12345. The test correction factor used to calculate class rates has three significant digits after the decimal point, e.g. 1.123. The potential impact of this difference on any class rates is less than .01% per class rate.

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While this deficiency has no material impact on class rates, it should be corrected to provide consistency.

NCCI should use the same test correction factor to verify the achieved overall rate level and to calculate the actual class rates.

5) Tasks on the Preparation Checksheet are not consistently checked off to denote completion.

Class Ratemaking personnel use the Preparation Checksheet to ensure that certain tasks have been completed prior to the class rate production process. Examples of tasks that must be completed include the following:

- o Review state memos to identify any state specific information which might be helpful during ratemaking.
- o Review data from the previous rate revision to identify state specific information that might be helpful during ratemaking.
- o Research maximum limits for losses in the state. If limits exist, data should be reviewed to determine whether any limits have been exceeded.
- o Research the effective dates for any new class codes in the state. Data should be reviewed to determine whether data for new classes was reported prior to effective dates for those classes.
- o Research the state requirements for any special wording for appendices included in the rate filing.

Class Ratemaking personnel do not always complete the checklist. In some cases, they perform the checks but do not indicate this action on the form. In a judgmental sample of three Preparation Checksheets, two checksheets were not adequately completed.

Class Ratemaking personnel should complete the Preparation Checksheet and sign off on items as they are completed. In addition,

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a supervisor should review the checksheet to verify that the form is complete.

- 6) Documented procedures for Class Ratemaking's review, execution and follow-up of data reasonableness checks are incomplete.

Data Administration executes various reasonableness checks on WCSP data. These checks include analysis of loss data, payroll data, and changes occurring in the data between policy periods and valuation points. For example, Data Administration reviews loss development by injury type. When "unreasonable" data or unusual patterns are identified, investigations are performed to research the underlying causes. Investigations may reveal missing or inaccurate data. Data Administration analysts attempt to resolve errors through carrier contact.

Class Ratemaking analysts review the results of reasonableness checks performed by Data Administration. If needed, Class Ratemaking analysts may perform additional reasonableness checks on the data, especially for fluctuation of payroll by class. Class Ratemaking's review and execution of reasonableness checks may result in requests for follow-up investigation of the data. Such requests are made verbally to Data Administration supervisors and are accompanied by a photocopy of the data in question.

Documented procedures for Class Ratemaking's review and execution of reasonableness checks are sometimes vague.

There is no formal procedure requiring sign off on data reviewed or checked.

There are no documented procedures for tracking follow-up investigation requests or questions to monitor their resolution.

NCCI should implement formal procedures for Class Ratemaking's review and execution of reasonableness checks of the data. NCCI should adopt a policy of signing off on data reviewed or checked. A tracking mechanism for investigative follow up should also be implemented.

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We understand that informed actuarial judgment is necessary when reviewing and performing reasonableness checks of the data. We further understand that standard written procedures can not anticipate all applications of such judgment. However, we believe that most of the reasonableness checks can be formally specified by actuaries, documented, and signed off on when completed.

7) NCCI Class Ratemaking reports contain inconsistent names and labels for some identical types of information.

NCCI produces various reports during the class ratemaking process. Many of these reports list some of the same information. In some cases, the same information is labeled differently on different reports. Examples follow:

- o The "Effect of Changes By Parts" factor on the Rate Calculation Form contains the same information as the "Law Amendment" factor on the Rate Factor with Swing Limits report.
- o The "Final Exhibit I Loss Ratio" on the Rate Factor Card contains the same information as the "Average Cost Ratio" on Exhibit I of the Rate Level Worksheet.

These inconsistent names make it difficult to trace data from one report to another. Training of new personnel is generally more difficult under these circumstances.

NCCI should enforce consistent naming standards on ratemaking reports.

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Experience Rating

A. Area Overview

The Experience Rating area uses up to three years of payroll and loss experience data received from Data Conversion and Expected Loss Rate Factors (ELRs) and D-Ratios received from Class Ratemaking to produce Experience Modification Factors (experience mods). (ELRs indicate the expected losses for a classification per unit of exposure; D-ratios indicate the portion of those losses below a specified dollar threshold.)

An Experience Mod for a risk is printed along with the risk's experience on Experience Rating Sheets. Rating Sheets are sent to carriers who use them to adjust an insured's total premium. An experience modification factor is a number less than one for risks with fewer actual losses than expected and greater than one for risks with more actual losses than expected.

For a more detailed description of the Experience Rating area, refer to Volume II of this report.

B. Area Evaluation

Key Strengths:

- o Statistical sampling of Experience Rating files indicates that NCCI accurately converts WCSP data reported by the carriers to NCCI computer files used to produce experience mods.
- o The Experience Rating Profile System serves as a control to ensure all required WCSP data has been received prior to producing experience mods. This system appears to be working effectively.
- o Current NCCI initiatives will address some of the current shortcomings of the experience rating processing.

Key Weaknesses:

- o NCCI performs separate validation of the same WCSP data in Experience Rating and Data Administration.

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- o NCCI's validation of rating sheets is heavily reliant on manual procedures.
- o NCCI's Risk Identification Number (Risk ID), used to identify WCSP experience with a specific insured, is frequently reported inaccurately by carriers. Risk ID verification and correction requires extensive NCCI effort.

Ongoing system initiatives at NCCI are intended to resolve the first two of these weaknesses. These initiatives are discussed in Volume I of this report.

Key Recommendations:

- o NCCI should develop a centralized unit report database.
- o NCCI should perform automated validation of WCSP data used to produce rating sheets. Most of this validation should occur at the time of unit report receipt.
- o NCCI should consider using an industry established risk identifier, such as Federal Employer's ID Number (FEIN).

NCCI has development projects underway which, if successful, will satisfy the first two of these recommendations. These projects are described in Volume I, Part C of this report.

C. Testing Objectives

- To evaluate the controls in place to ensure the completeness of payroll and loss data used to produce experience modification factors.
- To evaluate the procedures in place to ensure the accuracy of payroll and loss data used to produce experience modification factors.
- To evaluate the controls in place to ensure the completeness and accuracy of ELR Factors and D-Ratios used to produce experience modification factors.

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Experience Rating

- To evaluate the controls in place to ensure timely production and distribution of experience modification factors.
- To evaluate the accuracy of payroll and loss data used to produce experience modification factors as compared to the data reported by carriers.

D. Testing Methods

The evaluation of Experience Rating was accomplished through control procedures review, systems review and analysis, and statistical sampling. These techniques are described in the Evaluation Approach section of Volume I, Part C of this report.

E. General Observations & Recommendations

- 1) NCCI performs separate validation of the same WCSP data in Experience Rating and Data Administration.

NCCI receives WCSP data in Data Conversion. Limited validation is performed at this time. This data is routed separately to Experience Rating and Data Administration/Class Ratemaking. The majority of WCSP data validation is performed in these areas. Experience Rating and Data Administration validate, correct and use their versions of the data independently from one another with potentially inconsistent results. NCCI does not attempt to reconcile Experience Rating and Data Administration WCSP data or corrections.

NCCI should implement a centralized WCSP data repository. This database should contain validated WCSP data for use by all applications requiring this data for processing.

We understand that NCCI plans to implement the Unit Report Quality (URQ) system which is intended to validate WCSP data upon receipt. We also understand that NCCI plans to implement the URS database which is intended to serve as a centralized repository of validated WCSP data. The URQ system is scheduled for a phased

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Experience Rating

implementation to be completed in October of 1992. The URS database will begin capturing new unit reports in September of 1991.

- 2) Experience Rating personnel perform substantial manual edits that could be performed in automated application programs.

NCCI manually reviews all rating sheets it produces. These manual audits include risk specific reasonableness checks (e.g. no unusual class code changes since last year, premium this year compared to last year, etc.), comparison to original unit reports, and contacting the carrier or insured if necessary. NCCI manually reviews over 600,000 rating sheets per year.

At a minimum, NCCI should perform most of the current manual rating sheet edits as part of Experience Rating automated validation processing.

In the long term, NCCI should perform these edits, in an automated fashion, at the time of unit report receipt.

We understand that NCCI has plans to implement the Automated Auditing system which is intended to automate many of the current manual rating sheet edits. We also understand that NCCI has plans to implement the Unit Report Quality (URQ) system which is intended to perform extensive front-end unit report validation, eventually including risk specific validation. The Automated Auditing system is scheduled for production in the fourth quarter of 1991. The URQ system is scheduled for a phased implementation to be completed in October of 1992.

- 3) Experience Rating validation programs identify basic errors in unit report data that could be identified and corrected at the time of unit report receipt.

Two major application programs in the Experience Rating system (EXP0205P and EXP0210P) validate payroll and loss data. The edits performed by these programs are field level and include verifications such as:

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Experience Rating

- o Indemnity Amount is numeric
- o Loss Injury Code is greater than 1 and less than 7
- o Effective Date is a valid date.
- o Exposure Amount is numeric
- o State Code is an existing state code.
- o Class Code exists for the specified state
- o Loss Status Code must be 0, 1, or *

Most of the edits performed in these application programs could easily be performed at the time of receipt of the unit report.

Rating Support Services estimate that 60% of the data rejected by these programs is rejected because of invalid Class Codes. Another 10% of the rejections are due to invalid Status Codes and Injury Types.

NCCI should perform field level edits at the time of receipt of the unit report. This will improve the timeliness of error identification and correction.

We understand that NCCI has plans to implement the Unit Report Control (URC) and Unit Report Quality (URQ) systems which are intended to perform field level validation at the time of unit report receipt. An industry-wide phased implementation of the Unit Report Control system is scheduled to be completed by July of 1992. The Unit Report Quality system is scheduled for a phased implementation, to be completed in October of 1992.

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F. Specific Tests Performed

- 1) Evaluated the procedures in place to verify and correct the completeness of experience rating data through the use of the Experience Rating Profile System known as EPU. This system indicates which unit reports are required for a risk's rating to be produced and which have been received. The EPU system allows modification to the list of required unit reports.
 - Evaluated the procedure for clearing entries on the Ratings Not Produced Report. This report indicates all experience ratings due in the next three months that have not yet been produced because of missing unit reports.
 - Determined whether entries appearing on the Ratings Not Produced Report are cleared using the EPU system where appropriate.
 - Determined whether on-line activity through the EPU System is reflected on the Employee Activity Log. This log is a system generated audit trail of EPU activity.
 - Evaluated the adequacy of the Employee Activity Log as an audit trail for Profile System on-line activity.
 - Evaluated the procedure in place for supervisors to review on-line EPU activity made by experience rating clerks.
 - Evaluated controls in place to limit access to the EPU on-line system.

- 2) Evaluated the controls in place to ensure that corrections to WCSP data initiated by NCCI field offices are received and processed by the centralized rating support group.
 - Determined whether correction checking slips are adequately completed with all significant information. Checking slips accompany corrections sent to NCCI's main office by the field office. They include information of the number and type of corrections sent.
 - Determined whether correction checking slips accurately reflect contents of correction batches.

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- Evaluated the procedures to follow up on discrepancies between the contents of correction batches and the information indicated on checking slips.
- 3) Evaluated the controls in place to ensure WCSP data is not lost during processing and that processing problems are resolved in a timely manner.
- Verified the "Grid Log" record count balancing procedure through an independent reconciliation. The Grid Log is a manual procedure for verifying record counts through the Experience Rating System.
 - Reviewed the Rating Support Services Problem Log. This log indicates processing problems identified by Rating Support Services.
- 4) Evaluated the automated programs which validate payroll and loss data used to produce experience modification factors.
- Reviewed program logic and error reports, and interviewed data processing personnel to determine the specific validation procedures for loss data performed by the primary experience rating loss validation program (EXP0205P).
 - Reviewed program logic and error reports and interviewed data processing personnel to determine the specific validation of payroll data performed by the primary experience rating payroll validation program (EXP0210P).
 - Reviewed program logic and interviewed data processing personnel to determine the reasons for bypassing, combining, and deleting records.
 - Reconciled input and output record counts from validation program control reports.

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- 5) Evaluated controls in place to ensure that errors identified on the Reclaimables Rejection Report are cleared. This report identifies basic errors in unit report data such as invalid class codes, invalid injury types, etc.
- Observed procedures for clearing errors appearing on the Reclaimables Rejection Report.
 - Determined whether ratings identified on the Reclaimables Rejection Report appeared on the "B" listing as well as the Ratings Produced Report after corrections were applied. The "B" listing is a report of ACS keyed corrections.
 - Interviewed NCCI personnel to determine the type and relative frequency of errors which cause ratings to be rejected.
- 6) Evaluated the final rating sheet review and correction procedures.
- Determined whether approved rating sheets satisfied documented reasonableness tests.
 - Determined whether corrections noted on the Employee Activity Log were initiated by an error noted on the rating sheets.
 - Determined whether corrections noted on the rating sheet appeared on the Employee Activity Log and were included in the final rating sheets.
 - Determined whether corrections processed through ACS were included in the final rating sheets.
- 7) Statistically sampled Experience Rating payroll and loss records and compared them to the originally submitted unit reports and documented corrections.
- Two populations were defined. The first was all payroll records appearing on rating sheets produced in 1990. The second population was all loss records appearing on rating sheets produced in 1990.

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These rating sheets include WCSP data from policy years 1986, 1987, and 1988.

- The population was verified by comparing the number of risks in the sampled file to NCCI's risk directory. The risk directory is an electronically stored list of all experience rated risks. It includes such information as risk ID, risk name and the current experience mod.
- An attribute sampling approach was used. This approach measures frequency of errors rather than size of errors.
- A confidence level of 95%, expected error rate of 2%, and tolerable error of 5% were used to determine the sample sizes.
- The payroll and loss records selected were compared to carrier submitted unit reports and any documented corrections. The specific fields tested were: Insured Name, Risk Id, Rating Effective Date, Class Code, Payroll Amount, and Loss Amount.
- All identified discrepancies were discussed and researched with NCCI personnel. Results were summarized and included in the Appendix of this volume.

G. Specific Findings & Recommendations:

- 1) WCSP exposure and loss amounts reported by carriers are accurately processed for use in calculation of experience modification factors.

NCCI's electronically stored WCSP data used for calculating experience ratings was compared to carrier submitted source documents. A summary of the results follows:

- o In a random statistical sample of 181 payroll records, two errors in payroll amount were noted. In one case, a correction unit report was omitted from an experience rating. In addition, the supporting documentation for one record could not be located. Data for which supporting documentation could not be located was considered an error for the purposes of quantifying the sample test results.

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- o In a random statistical sample of 181 loss records, one error in loss amount was noted. This was due to the omission of a correction unit report from an experience rating.

In these samples, discrepancies were defined as differences between what was reported by carriers and what was used to calculate experience modification factors.

The results from this test indicate that WCSP exposure and loss amounts reported by carriers are accurately processed for use in calculating experience ratings.

Detailed sampling results are included in the Appendix to this volume.

2) Carriers frequently report incorrect risk IDs and risk names when submitting WCSP data.

NCCI uses the risk ID and risk name to associate WCSP experience with a specific insured. This relationship is critical for developing experience modification factors for the insured.

In a random sample of 181 WCSP payroll records and 181 WCSP loss records representing 362 Experience Rating Sheets, 47 risk IDs and 13 risk names were changed by NCCI from what was reported on the original unit reports. NCCI has a specific function defined to verify and correct risk IDs and risk names reported on unit reports. Carriers make significant errors in reporting risk IDs and risk names, as these sample results illustrate.

NCCI should explore other possibilities for an insured's identification number. Federal Employer's ID Number (FEIN) is one possibility. This number is widely available to carriers and would eliminate many of the inaccuracies and omissions in reporting the risk ID.

Regardless of the identification number used, it should be required input on all unit reports. NCCI should institute policies which will encourage carriers to report correct risk IDs and names. Financial

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Experience Rating

incentives and forcing carriers to correct their own data will help in this regard.

We understand that differences between experience rating and federal tax ownership rules may require grouping FEINs for the purposes of experience rating.

- 3) Checking slips, which indicate the number of unit report corrections sent to Rating Support Services from the field offices, do not always agree with the actual number of corrections received.

Field office clerks send corrections to the Rating Support department with checking slips which indicate the number of corrections sent. Rating Support procedures require the receiving clerk to count the corrections and compare them to the checking slip counts. If there are differences, the clerk sends the corrected checking slip to the field. There are no follow up procedures in place to verify that all corrections are received.

Four checking slips were compared to physical counts of corrections. Two of these checking slips did not indicate the correct physical counts. The impact of these discrepancies was minimal.

NCCI should verify checking slip counts and actively follow up on any discrepancies with the field offices.

We understand that Rating Support Services does follow up large differences between correction counts on the checking slip and actual corrections. It is unclear what signifies a large discrepancy in this context.

- 4) Checking slips are numbered manually, sometimes resulting in batch sequence gaps.

Checking slips which accompany corrections sent to Rating Support by the field offices are numbered manually by field office clerks. The receiving clerk sometimes notices gaps in checking slip numbers. These

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Experience Rating

gaps could indicate incorrectly numbered checking slips or missing correction batches.

NCCI should use preprinted, prenumbered checking slips.

5) Two out of ten rating sheet audit procedures are not being followed consistently.

Experience Rating procedures specify ten basic reasonableness edits to be performed after a rating sheet is produced. If a rating sheet fails any of these edits, procedures dictate that related unit reports are pulled and a full verification of information is performed.

Thirty-five rating sheets were reviewed for compliance with the reasonableness edits. Twenty-eight rating sheets failed at least one edit. In these cases, further investigation of the rating sheet data should be performed by Experience Rating clerks.

An Experience Rating clerk indicated that two of the ten edits are not actually performed. These two edits are:

- o Experience Modification increases or decreases are within 25% of last year's rating
- o In comparing the last two years, payroll increases or decreases are within 50%.

In the sample of thirty-five rating sheets, two failed the first edit and eight failed the second. Further follow up indicated the omission of these edits may have been due to inadequate training of the clerk.

NCCI should consistently perform the two identified edits. NCCI should implement a mechanism for ensuring all edits are actually performed. One possibility is a checklist and required clerk sign off. NCCI training should be enough to ensure clerks are aware of all procedures and the reasons behind them. In the long term, edits of this type should be performed in an automated fashion.

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Experience Rating

We understand that NCCI is currently implementing the Automated Auditing System which is intended to perform rating sheet edits in an automated fashion. The Automated Auditing system is scheduled for production in the fourth quarter of 1991.

- 6) Experience Rating application programs produce non-standard processing control reports.

Control reports produced by several consecutively executed application programs are inconsistent. Some of these reports list record counts, some list risk counts and some list both. This inconsistency makes it difficult to verify data output from one program and input to the next.

An integrated set of control reports was reconciled as part of the testing of Experience Rating. These reports represented consecutive processing steps of the same WCSP data. Any changes in the number of data records should have been attributable to a specific program and reason.

We were unable to balance all control reports during this test since not all necessary information was readily available.

NCCI should make control reports consistent between programs. This will facilitate reconciliation of inputs and outputs.

We understand that NCCI currently maintains the "Grid Log" which is a manual system intended to verify the number of records processed through the Experience Rating system. The system, although cumbersome, appears to be effective.

- 7) Experience Rating's current control mechanism over record counts is manual but uses input from automated procedures and could be automated.

The "Grid Log" is a mechanism by which Rating Support tracks data through the Experience Rating system. Rating Support personnel use record and risk counts from automated procedures and post these numbers to a manual reconciliation sheet. Reconciliation of these numbers is performed manually.

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Experience Rating

NCCI should automate this reconciliation procedure. Since all inputs to the Grid Log are from automated sources, an automated reconciliation procedure could be implemented. Alternatively, NCCI could include trailer records in all files. Trailer records would indicate expected detail record counts. Programs would verify that records processed match records indicated on the trailer record for input. Consistent control reports would provide a suitable mechanism for review.

- 8) Rating Support Services does not directly verify that ACS keyed corrections were entered correctly.

Rating Support Services sends corrections to ACS via the Rejected Risks Report (Rpt No EXP0215P-2). These corrections are keypunched by ACS and returned to NCCI along with a listing of the entered data called the "B" Listing.

Rating Support personnel compare the "B" Listing to the on-line experience rating system. This comparison verifies that the ACS correction file was successfully transmitted to NCCI. There is no direct verification that all corrections on the Rejected Risks Report were successfully entered.

Rating Support Services should compare ACS corrections listed on the "B" Listing to the Rejected Risks Report. This comparison process may be a candidate for automation using standard file compare software or custom developed applications.

In the long term, NCCI should require carriers to correct any identified WCSP data errors through data resubmission.

- 9) Experience Rating supervisors do not review on-line corrections made by clerks.

Experience Rating clerks make on-line corrections to WCSP data through the ERC system and to the Experience Rating Profile through the EPU

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Experience Rating

system. The Profile indicates which unit reports are required before a rating can be produced for a risk.

Supervisors do not review the corrections made by clerks. Current automated on-line activity audit trails do not provide sufficient detail to verify or backout changes made to data. Hard copy rating sheets are retained, however, and might be usable for reversing erroneous changes.

NCCI should implement complete system generated audit trails for these on-line functions. Experience Rating supervisors should review these audit trails on a regular basis.

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Detailed Claim Information

A. Area Overview

The Detailed Claim Information (DCI) system is used to provide more in depth information on claims and to analyze trends in workers compensation claims. The DCI data consists of random samples of indemnity claims from thirteen states. The samples are designed to capture 1,000 valid permanent partial disability cases per state annually. The DCI system provides additional information concerning claimant data, indemnity benefits, medical benefits and claim administration details. Claims are reported for nine years, until they are closed or until they no longer include indemnity benefits. Quarterly, all valid DCI data is loaded into a database and is available for batch reporting.

For a more detailed description of the DCI system, refer to Volume II of this report.

B. Area Evaluation

Key Strengths:

- o The DCI system performs extensive validations on data at the time of receipt.
- o Data which fails any edits is immediately returned to the carrier for correction.
- o The system generates calls for corrected and subsequent information.
- o DCI data is stored in a centralized database.
- o The new DCI system being developed will address many of the weak points in the existing system.

Key Weaknesses:

- o DCI data is not integrated with policy and claim data residing in other NCCI systems.

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Detailed Claim Information

- o There is no mechanism in place to encourage carriers to comply with DCI reporting requirements or to penalize them for failing to do so.

Key Recommendations:

- o DCI claim data should be compared to WCSP data to verify its consistency.
- o The PICS carrier master should be used in all applications requiring carrier data.
- o Procedures for measuring and reporting carrier reporting performance should be implemented. Enforcement measures such as fines or financial incentives should also be implemented.

C. Testing Objectives

- To evaluate the controls in place to ensure the completeness of detailed claim information received at NCCI.
- To evaluate the controls in place to ensure the accuracy of detailed claim information received at NCCI.
- To evaluate the controls in place to ensure the timely receipt of detailed claim information.
- To evaluate the accuracy of the processing of DCI data received by NCCI.

D. Testing Methods

The evaluation of controls in the Detailed Claim Information system was accomplished through systems and procedures review and analysis. The evaluation of the accuracy of data processing was accomplished through statistical sampling. These techniques are described in Volume I, Part C of this report.

EVALUTION OF DATA COLLECTION AND DATA QUALITY

Detailed Claim Information

E. General Observations & Recommendations

1) NCCI does not verify the consistency of DCI data with unit report data.

NCCI does not verify that total incurred claim costs are consistently reported on unit reports and DCI calls for the same individual claims. This would provide some evidence that DCI data is being reported reliably by carriers. It would also provide a limited completeness validation of WCSP data which is part of the DCI sample. NCCI has compared average costs per claim from WCSP data for all states to average cost per claim from DCI data for policy years 1983 - 1987. The analysis shows that the DCI sample is representative of the WCSP population.

We recommend that a comparison of DCI and unit report loss data be performed periodically. This requires a unique claim identifier to associate claims in the two systems. This can be done using data currently existing in the two systems, such as policy, carrier and claim numbers, or by capturing a unique risk identifier in both systems.

We understand that claim data is valued at different points in time, however the data should be reasonably consistent for open claims and should match exactly for closed claims. As of December 31, 1989, 88% of all valid claims in the DCI database were closed.

2) NCCI does not effectively enforce DCI reporting requirements.

Carrier reporting of DCI data is mandatory for all member carriers in each DCI state where they write more than 0.1% of statewide premiums. NCCI analysis indicates an upward trend in carrier compliance with DCI reporting requirements since 1987. The compliance rate has increased from approximately 55% in 1987 to approximately 75% in 1990. A large increase in compliance is evident beginning in the first quarter of 1989, which coincides with a system upgrade which resulted in automatic generation of requests for missing subsequent calls and correction calls.

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Detailed Claim Information

Carrier reporting compliance is not considered in determining the sampling rate for each state. Poor compliance causes the DCI database to capture fewer permanent partial claims than intended.

We recommend that carriers be strongly encouraged to submit all required DCI data. Carrier performance reporting should be implemented to provide carriers with data on their individual compliance. These reports should be distributed to carrier management and should be made available to regulatory agencies. Performance reporting should be combined with either a fining or incentive program.

We understand that a monetary incentive program is included in the design of the new DCI system and that decisions about implementing the programs are being made by the Workers Compensation Data Management (WCDM) group. We recommend that NCCI evaluate trends in carrier compliance on an ongoing basis to ensure the effectiveness of the program.

- 3) There are no procedures to ensure that the DCI system is capturing the targeted number of permanent partial disability cases for each state.

NCCI targets the capture of 1,000 valid permanent partial disability cases in each DCI state annually. Carriers are required to take a random sample of all claims in DCI states. A sampling rate is determined by DCI actuarial personnel who determine the sampling rate by evaluating the ratio of permanent partial claims to total claims for all carriers in the state. The rate does not take into account the possibility that some carriers may not submit the requested number of claims. The risk exists that the DCI database will not contain the desired amount of data. NCCI does not periodically evaluate the DCI database to determine whether the target has been achieved.

NCCI statistics indicate that carrier reporting compliance for 1990 was between 75-80%. An analysis of the DCI database for accident years 1985 through 1989 for the 13 current DCI states indicates that, of the 63 samples represented, only 19 captured the targeted number of claims. In

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Detailed Claim Information

1990, the target was achieved in 7 of 13 states. Additional samples are not requested when the target is not met.

We recommend that the DCI data be analyzed periodically to determine whether the targeted number of permanent partial claims is being captured. If the target is not being met, then NCCI should analyze the causes of the failure to obtain the desired number of permanent partial claims. Based on the results of the analysis, either the sampling rate should be adjusted or carrier compliance with DCI reporting requirements should be more strictly enforced.

- 4) The DCI carrier master file is not reconciled to carrier master files in the overall rate level and PICS systems.

The DCI carrier master file lists all carriers subject to DCI reporting requirements. The file is updated by analyzing the amount of premium written by carrier in each DCI state using financial call data. Carrier master files also exist in the Overall Rate Level and PICS systems.

We recommend that, in the short term, the DCI carrier master file should be reconciled to the PICS carrier master file. In the long term, NCCI should maintain only one carrier master file.

We understand that a new DCI system is being developed which will use the PICS carrier master file. DCI actuarial personnel will continue to periodically determine the states for which each carrier must submit a DCI sample. However, this information will be entered into the PICS carrier master file instead of an independent carrier master file.

- 5) There are no procedures in place to contact carriers who fail to submit DCI Calls for Corrected Detailed Claim Information and Calls for Subsequent Detailed Claim Information after four system generated calls have been mailed.

If a Call for Detailed Claim Information passes the fatal error edits, but fails any of the other logical edits, it is processed into a suspense file. The

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Detailed Claim Information

system will automatically generate Calls for Corrected Detailed Claim Information every two months. Once a call is established, the system generates a Call for Subsequent Detailed Claim Information one to two months prior to the due date for annual subsequent submissions. If no response is received, up to three additional calls will be generated.

If four calls for either corrections or subsequent information are mailed but not returned by the carrier, the system stops generating requests. NCCI does not have formal procedures to contact the carrier when this occurs. The claim data will remain on the suspense file. As of May 1, 1991 there were 25,490 claims on the suspense file compared to 631,732 total claims in the system. This indicates that not all required reports have been processed for approximately 4% of claims in the DCI system.

We recommend that carriers be encouraged to submit all DCI data required by NCCI. Complete data for all DCI claims will enhance the credibility and integrity of the data used in DCI analyses. Carrier performance in submitting all required claims should be monitored and reported. Performance reporting should be combined with a fining or incentive program to further encourage complete and timely submission of DCI data.

We understand that a monetary incentive program is included in the design of the new DCI system and that decisions about implementing the programs are being made by the Workers Compensation Data Management (WCDM) group. We recommend that NCCI evaluate trends in carrier compliance on an ongoing basis to ensure the effectiveness of the program.

- 6) There are no procedures in place to track DCI calls which create fatal errors and are not processed into the database.

If a call fails certain edits of critical information, such as invalid carrier code or policy number, it is rejected from the system as a "fatal error" and is returned to the carrier. The data must be resubmitted to NCCI on the same form.

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Detailed Claim Information

There are no procedures to track calls which fail these edits. NCCI cannot determine whether specific calls which generate fatal errors are ever resubmitted and established in the system. According to NCCI statistics, 8,780 fatal errors occurred in 1990 out of 106,949 submissions.

We recommend that procedures be developed to specifically identify and track DCI reports which create fatal errors before they are returned to carriers. Follow up procedures with the carriers for specific claims should be implemented. Carriers should be encouraged to resubmit these claims. Information regarding carrier resubmission rates should be incorporated into a comprehensive performance monitoring plan.

We understand that the new DCI system will address the tracking of individual fatal errors and provide a method to follow up on these errors.

7) DCI data received from carriers is accurately processed into the DCI system.

We randomly sampled DCI data from a population of all DCI calls received from August 1, 1990 to March 31, 1990. The sampling unit was defined to be an individual DCI call. We extracted the population from the DCI file of valid claims and selected a random sample of 200 calls.

The sample was tested by comparing information in the DCI system to the hard copy calls received from the carriers. An attribute sampling method was used to focus on the occurrence rate of errors. Each field on the call was defined to be a separate attribute. The sampling parameters used were a confidence level of 95%, an upper error limit of 5% and an expected error rate of 2%.

We noted three minor discrepancies in different data fields on three calls which we discussed with NCCI personnel.

Detailed results of the sampling can be found in the Appendix to this volume of the report.

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Policy Issue Capture

A. Area Overview

The Policy Issue Capture area collects workers compensation policy information from carriers in the form of policy declaration pages. Carriers may submit this information on either hard copy documents or magnetic tape. Carriers send hard copy documents to NCCI field offices. Magnetic tapes are sent directly to NCCI's headquarters for processing. Approximately 66% of policies sent to NCCI are submitted on magnetic tape.

NCCI validates policy information through a series of automated processes. Policy information is checked for correct field values, completeness, and consistency. Valid policy data is loaded into the Policy Issue Capture System (PICS) database.

The PICS database is used internally by NCCI for research and by subscribers to NCCI's Proof of Coverage (POC) service. PICS serves as the basis for the new Unit Report Control (URC) system (operational 5/1/91). This system is intended to control the receipt of WCSP data based on the assumption that carriers must submit a unit report for every state on every workers compensation policy written. In addition, policy information contained in PICS will be used by the Unit Report Quality (URQ) system to verify data submitted on unit reports.

For a more detailed description of the Policy Issue Capture System (PICS), refer to Volume II of this report.

B. Area Evaluation

Key Strengths:

- o NCCI stores policy information in an integrated database providing a single, centralized source of data.
- o NCCI requires carriers to correct NCCI identified errors in submitted policy information through resubmission of data. This moves the burden of error correction to the carrier.
- o As of May, 1991, NCCI is capturing all policies, including all non-experience rated policies. This should ultimately build an authoritative repository of policy information.

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Policy Issue Capture

Key Weaknesses:

- o NCCI does not currently verify that all policies written have been submitted by carriers.
- o NCCI does not currently capture all relevant policy information submitted by carriers in the PICS database. This information is currently stored on microfilm.
- o There is no clear, consistent agreement with carriers regarding the timely submission of individual policy information.
- o There is no current mechanism (i.e. performance reporting, fining) to encourage carriers to submit quality policy data on a timely basis.

The current automated policy review and PICS 3.0 projects are intended to address the first and second of these weaknesses respectively. These initiatives are described in Volume I of this report.

Key Recommendations:

- o NCCI should establish and enforce clear standards for quality and timeliness of carrier submitted policy information.
- o NCCI should institute controls to ensure carriers submit all workers compensation policies written in NCCI states.
- o NCCI should capture all pertinent policy information submitted by carriers.

NCCI has development projects underway or planned which, if successful, will partially satisfy the last two of these recommendations. These projects are described in Volume I, Part C of this report.

C. Testing Objectives

- To evaluate the controls in place to ensure the completeness of policy information received by NCCI.

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Policy Issue Capture

- To evaluate the procedures in place to ensure the accuracy of policy information received by NCCI.
- To evaluate the controls in place to ensure the timely receipt of policy information.

D. Testing Methods

The evaluation of Policy Issue Capture was accomplished through systems and procedures review and analysis. This technique is described in the Evaluation Approach section of Volume I, Part C of this report.

E. General Observations & Recommendations

- 1) There is no effective procedure to ensure all policy information for all member states is submitted to NCCI.

NCCI requires carriers to submit information for all workers compensation policies written in NCCI member states. Currently, NCCI has this information for over 6,000,000 policies dating back to 1984. This population is growing at a rate of approximately 125,000 policies each month.

In two states subscribing to NCCI's Proof of Coverage (POC) service, strict fines are assessed against carriers for claims filed against a policy which does not exist in the Policy Issue Capture System (PICS) database. This provides significant incentive for carriers to submit policy information for these states. However, this procedure provides only limited control over policy receipt. There is no control mechanism to ensure that all policy information is submitted.

Complete policy information is critical to the successful implementation of NCCI's current system initiatives. The Unit Report Control System (URC) identifies unit cards required from carriers based on policy information contained in the PICS database. Without complete policy information, the URC system will not be an effective control over unit card receipt.

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Policy Issue Capture

NCCI should implement controls to ensure all policy data is submitted by carriers. All expiring policies in PICS should require either a renewal from the same carrier, a policy from a new carrier, or a legitimate explanation of why the risk will not require coverage. This explanation would have to be elicited from the insured and could require significant follow up effort on NCCI's part.

NCCI should establish procedures for the member carriers to certify that they have submitted all policies written to NCCI.

Other authoritative sources of workers compensation policy information should be sought out and used for control and validation purposes if possible. One suggestion is to require carriers to include the number of policies written by state in the Call for Net Direct Written Premium. The number of policies captured in the PICS system for a carrier and state can be compared to this number.

We understand that NCCI has plans to implement the Automated Policy Review System. One objective of this system is to identify non-renewed policies. The Automated Policy Review System will be implemented in October of 1992. This system is discussed further in Volume I of this report.

- 2) NCCI does not have a clear, consistent agreement with carriers as to when policy information is due.

NCCI currently receives policy information from over 700 carriers in 33 member states as well as additional non-member states. This policy information is for both assigned risk and voluntary market policies.

All states require policy information to be submitted either to the state or a service bureau. This requirement is only effectively enforced for those states subscribing to NCCI's Proof of Coverage service.

There is no specific state regulation for timely submission of voluntary market policies written in non-POC states.

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Policy Issue Capture

Currently, the only operational requirement that policy information be received in a timely fashion is to verify claims through the Proof of Coverage (POC) system. Experience rating and ratemaking personnel sometimes use policy information to investigate unit report data questions. This use begins when the first unit report is received for the policy, 18 to 20 months after the effective date.

With the advent of the Unit Report Control System (URC), policy information will be needed fifteen months after the policy effective date in order to support URC reporting.

Workers compensation policies form the basis for NCCI's ratemaking and experience rating services. It is reasonable to expect that as systems integration efforts and increased data capture make policy information more accessible and complete, other uses for this information will be identified. Future uses of policy information may have different requirements as to the timeliness of receipt of policy information.

NCCI should establish clear and consistent standards regarding due dates for policy information. Carriers should be encouraged to adhere to these standards through regular performance reporting and financial incentives for late and incomplete submissions.

3) NCCI does not fine carriers for policy data submitted in error.

NCCI receives policy information on magnetic tape and on hard copy documents. In 1990, NCCI performed an audit of policy information submitted on magnetic tape for 40 carriers. Data on 429 tapes was inspected. There were over 32,000 errors identified on these tapes. The most frequent error was invalid risk identification number accounting for 40% of the identified errors across 34 carriers.

While carriers are requested to resubmit data in error, NCCI does not currently have a process to fine carriers for policy data submitted with errors.

NCCI should strongly encourage carriers to submit quality policy information. Instituting clear, precise quality standards and

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Policy Issue Capture

obtaining carrier commitment to meet those standards is the first step in this process. The second step is to measure and report results. Establishing consistent and regular carrier performance reporting will help to measure data quality and communicate the results. Financial incentive programs and/or fines should be implemented, as required, to encourage carrier compliance to the established quality standards.

- 4) NCCI does not currently capture all pertinent policy information in their policy database.

NCCI receives policy information on both magnetic tape and on hardcopy policy declaration pages. Both types of submissions contain data which is not currently captured in the PICS database. Two significant fields which are not captured are the experience modification factor (experience mod) and payroll classification codes other than the governing class code. The governing class code is the class code, other than clerical codes, with the most payroll on a policy.

Both class codes and experience mods are very important to NCCI's future systems initiatives. NCCI can use this information to verify the accuracy of submitted unit report (WCSP) data.

NCCI should capture the experience modification factor and all class codes from carrier submitted policy information. Other information should be evaluated for capture as well.

We understand that NCCI has plans to upgrade the Policy Issue Capture System (PICS). One of the major modifications planned is to capture more of the available policy information. The PICS 3.0 enhancements are scheduled to be implemented by January of 1992.

- 5) NCCI does not validate all captured policy information received from carriers.

NCCI performs extensive edits through the Policy Issue Capture System (PICS) and manual review of policy declaration pages to ensure all

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Policy Issue Capture

required policy information has been entered and that the data meets basic criteria (e.g. estimated premium must be numeric). Not all policy information is validated to ensure its accuracy.

One field that is not validated for accuracy is the estimated premium. This information indicates the total standard policy premium the carrier expects for the policy. This information could be checked for reasonableness by comparing it to previously submitted policy information.

NCCI could eventually use this and other data fields to verify the accuracy of unit report (WCSP) data submitted by carriers.

NCCI should implement procedures to check the reasonableness of this and other data fields. This is of particular importance given NCCI's plans to use policy information to verify WCSP data accuracy.

We understand that NCCI has ongoing plans to upgrade their Policy Issue Capture System procedures. One of the major modifications planned is to perform more validation of policy information using alternate information sources such as risk inspections. The PICS 3.0 enhancements are scheduled to be implemented by January of 1992.

6) Carriers submit hardcopy policy declaration pages on various formats.

NCCI receives approximately 34% of carrier submitted policy information on hardcopy policy declaration pages. This represents an estimated 40,000 policies a month. NCCI field office clerks verify this information visually and either enter it on-line themselves or forward it to ACS, NCCI's external keypunching service.

Currently, there is no standard form for submitting policy information on hardcopy. NCCI published guidelines have resulted in general format consistencies between submissions for these formats, but, the declaration pages received still differ widely.

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Policy Issue Capture

Because of the different formats, it is difficult to establish standard data entry rules. Therefore, NCCI and ACS data entry personnel must be very well trained to handle the inevitable exceptions.

NCCI should establish a standard form for carrier submitted policy information. Carriers should be encouraged to use this form. A monetary incentive program would help in this regard.

NCCI should continue to encourage carriers to submit policy information on magnetic tape. Magnetic tape or electronic transfer are the preferred long term media for data submissions.

7) NCCI's primary access to policy information is by risk name.

NCCI stores policy information in the Policy Issue Capture System (PICS) database. Currently, there are over 6,000,000 policies resident in the PICS database. This number is currently growing at an average rate of about 125,000 policies each month.

NCCI personnel currently access policy information through policy number, risk name, or risk ID. Risk name is the primary access method because it is easily identifiable by carriers, risks, and NCCI personnel.

In order for risk name to be effective in accessing policy information, it must be entered consistently each time a policy for a specific risk is captured. NCCI has developed standard name formatting rules for accomplishing this. Without this standardization, risk name would not be effective in accessing policy information.

While risk name seems to be working effectively as an access point for policy information, NCCI expends a great deal of effort to standardize it. For policies submitted on hard copy, this standardization occurs at the time of data entry. NCCI field office clerks and ACS data entry clerks standardize risk name as they enter the policy information. This requires that data entry clerks be well trained in order to properly handle all possible variations in the reporting of a name.

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Policy Issue Capture

Magnetic tape submitted policies are stored in a temporary database after processing. NCCI personnel reformat names on these policies to make them standard. Currently, 11 full time clerks are employed to perform name and address standardization for magnetic tape submissions.

NCCI should explore other identifying information that could be used to access policy information without reformatting. One readily available possibility is the Federal Employers Identification Number (FEIN). This number is already captured by PICS and is readily available to carriers, risks, and NCCI.

Accessing policy information by name can be enhanced by using available packaged software designed to match similar names of different spellings or word orders (e.g. Christin vs. Kristin or The Company Name vs. Company Name, The).

We understand that NCCI has ongoing plans to upgrade their Policy Issue Capture System (PICS) and procedures. One modification planned is to allow access to policy data using the FEIN. The PICS 3.0 enhancements are scheduled to be implemented by January of 1992.

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Appendix: Summary of Sample Testing Results

A. Appendix Overview

This appendix summarizes the results of our sample testing. We tested ten statistical samples to evaluate the accuracy of NCCI's processing of the data which it receives from carriers. We examined two judgmental samples to test the completeness of critical computer files. This was tested by ensuring that judgmentally selected data from microfilm and microfiche media resided in critical computer files. Also, two judgmental samples were used to test the consistency of data between systems.

This appendix first presents the quantification and specific findings of our statistical samples and then presents the findings of our judgmental samples. The statistical samples are organized by functional area and are in the same order as the area reports in this volume.

B. Testing Overview

We tested the data used to calculate overall rate level indications, class rates and experience modifications. We also tested the detailed claim information data used in analyzing workers compensation loss costs.

An attribute sampling approach was employed to test the occurrence rate of errors in the population. The sampling units tested were randomly extracted from NCCI computer files. Errors were defined as discrepancies between the computer files and the source documents received from carriers, including originally submitted data and corrections. The occurrence of an error indicates that the data in the computer files does not agree with the carriers' submissions. Our testing did not include verifying the accuracy of the data submitted by the carriers. The inferences made from the sample results were statements about the rate of errors, as defined above, which are likely to occur in NCCI data for the specific populations tested.

The judgmental samples were selected from hard copy input received from the carriers. The data from the carriers was compared to the information in the computer files. While the samples were not random, an attempt was made to draw unbiased samples.

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Appendix: Summary of Sample Testing Results

C. Definitions

The following terms are used in the statistical sample summaries:

- o Confidence Level: The probability that the true error in the population does not exceed a stated value (i.e., the achieved upper error limit).
- o Achieved Upper Error Limit: This represents the maximum potential error rate that is likely to be found in the population at the specified confidence level.
- o Tolerable Error: This defines the judgmental assessment of the maximum error in the population which can be tolerated and still satisfy the objectives of the testing.
- o Expected Error: This is a preliminary assessment of the anticipated error rate in the population and is used in determining sample size.
- o Sample Error Rate: This is the actual error rate observed in the sample.

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Appendix: Summary of Sample Testing Results

Sample Name:	Policy Year Financial Call
Population:	Policy Year Libraries for Data Used in 1990 Overall Rate Level Calculations
Population Size:	16,451 records
Confidence Level:	95%
Tolerable Error:	5%
Expected Error:	2%
Sample Size:	180
Tolerance Level:	\$5,000

Quantification of Errors

Attribute	Number of Errors	Sample Error Rate	Achieved Upper Error Limit
State Code	3	1.7%	4.2%
Standard Earned Premium at Company Level	2	1.1%	3.4%
Standard Earned Premium at Designated Statistical Reporting Level	2	1.1%	3.4%
Net Earned Premium	2	1.1%	3.4%
Total Paid Losses (Indemnity and Medical)	2	1.1%	3.4%
Total IBNR	2	1.1%	3.4%
Total Incurred Losses Including IBNR	2	1.1%	3.4%
Total Outstanding Losses Excluding IBNR	2	1.1%	3.4%
Incurred Indemnity Claim Count	3	1.7%	4.2%
Paid Indemnity Losses	3	1.7%	4.2%
Paid Medical Losses	3	1.7%	4.2%
Outstanding Indemnity (Excluding IBNR)	3	1.7%	4.2%
Outstanding Medical (Excluding IBNR)	3	1.7%	4.2%
Indemnity IBNR	3	1.7%	4.2%
Medical IBNR	3	1.7%	4.2%
	38		

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Appendix: Summary of Sample Testing Results

Sample Name: Policy Year Financial Call

Description of Errors

Description of Errors	Number of Errors
Call data for three carriers in the sample was found to have been partially or completely deleted, or "zeroed out", by NCCI. The deletions were done deliberately to avoid distortion of overall rate level indications. Inclusion of these deletions in our error statistics increased the error count for each attribute by either two or three errors. For error statistics net of this effect, see the following page. For a more detailed discussion of zeroing out of data, see General Observation #6 and Specific Finding # 5 in the Overall Rate Level Area Report in Volume III.	38
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Note) Two carrier summation errors were detected by NCCI validation programs and corrected in the Overall Rate Level system. They were both below the \$5,000 tolerance level.

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Appendix: Summary of Sample Testing Results

Sample Name: Policy Year Financial Call

Quantification of Errors Net of Deletions

Attribute	Number of Errors	Sample Error Rate	Achieved Upper Error Limit
State Code	0	0.0%	1.6%
Standard Earned Premium at Company Level	0	0.0%	1.6%
Standard Earned Premium at Designated Statistical Reporting Level	0	0.0%	1.6%
Net Earned Premium	0	0.0%	1.6%
Total Paid Losses (Indemnity and Medical)	0	0.0%	1.6%
Total IBNR	0	0.0%	1.6%
Total Incurred Losses Including IBNR	0	0.0%	1.6%
Total Outstanding Losses Excluding IBNR	0	0.0%	1.6%
Incurred Indemnity Claim Count	0	0.0%	1.6%
Paid Indemnity Losses	0	0.0%	1.6%
Paid Medical Losses	0	0.0%	1.6%
Outstanding Indemnity (Excluding IBNR)	0	0.0%	1.6%
Outstanding Medical (Excluding IBNR)	0	0.0%	1.6%
Indemnity IBNR	0	0.0%	1.6%
Medical IBNR	0	0.0%	1.6%
	<u>0</u>		

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Appendix: Summary of Sample Testing Results

Sample Name:	Calendar-Accident Year Financial Call
Population:	Calendar-Accident Year Libraries for Data Used in 1990 Overall Rate Level Calculations
Population Size:	16,424 Records
Confidence Level:	95%
Tolerable Error:	5%
Expected Error Rate:	2%
Sample Size:	180
Tolerance Level:	\$5,000

Quantification of Errors

Attribute	Number of Errors	Sample Error Rate	Achieved Upper Error Limit
State Code	7	3.9%	7.2%
Standard Earned Premium at Company Level	8	4.4%	7.9%
Standard Earned Premium at Designated Statistical Reporting Level	8	4.4%	7.9%
Net Earned Premium	8	4.4%	7.9%
Total Paid Losses (Indemnity and Medical)	6	3.3%	6.5%
Total IBNR	5	2.8%	5.7%
Total Incurred Losses Including IBNR	6	3.3%	6.5%
Total Outstanding Losses Excluding IBNR	5	2.8%	5.7%
Incurred Indemnity Claim Count	7	3.9%	7.2%
Paid Indemnity Losses	6	3.3%	6.5%
Paid Medical Losses	6	3.3%	6.5%
Outstanding Indemnity (Excluding IBNR)	5	2.8%	5.7%
Outstanding Medical (Excluding IBNR)	5	2.8%	5.7%
Indemnity IBNR	5	2.8%	5.7%
Medical IBNR	5	2.8%	5.7%

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Appendix: Summary of Sample Testing Results

Sample Name: Calendar-Accident Year Financial Call

Description of Errors

Description of Errors	Number of Errors
Call data for seven carriers in the sample was found to have been partially or completely deleted, or "zeroed out", by NCCI. The deletions were done deliberately to avoid distortion of overall rate level indications. Inclusion of these deletions in our error statistics increased the error count for each attribute by five to seven errors. For error statistics net of this effect, see the following page. For a more detailed discussion of zeroing out of data, see General Observation #6 and Specific Finding # 5 in the Overall Rate Level Area Report in Volume III.	88
One correction call was received from a carrier after overall rate levels had been produced. This call caused a difference in three premium fields between the amounts on the correction and the data in the overall rate level system.	3
The indemnity claim counts did not agree between the system and the financial call. The difference was less than 15 claims.	1
	<hr/> 92

Note 1) One data entry error was noted which was below the \$5,000 tolerance level.

Note 2) The achieved upper error limit for all attributes in this sample exceeds our tolerable error of 5%. This is primarily due to NCCI's procedure of zeroing out data, which for our sample purposes is considered to be an error. Zeroing out of data is further discussed in General Observation #6 and Specific Finding # 5 in the Overall Rate Level Area Report in Volume III.

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Appendix: Summary of Sample Testing Results

Sample Name: Calendar-Accident Year Financial Call

Quantification of Errors Net of Deletions

Attribute	Number of Errors	Sample Error Rate	Achieved Upper Error Limit
State Code	0	0.0%	1.6%
Standard Earned Premium at Company Level	1	0.6%	2.6%
Standard Earned Premium at Designated Statistical Reporting Level	1	0.6%	2.6%
Net Earned Premium	1	0.6%	2.6%
Total Paid Losses (Indemnity and Medical)	0	0.0%	1.6%
Total IBNR	0	0.0%	1.6%
Total Incurred Losses Including IBNR	0	0.0%	1.6%
Total Outstanding Losses Excluding IBNR	0	0.0%	1.6%
Incurred Indemnity Claim Count	1	0.6%	1.6%
Paid Indemnity Losses	0	0.0%	1.6%
Paid Medical Losses	0	0.0%	1.6%
Outstanding Indemnity (Excluding IBNR)	0	0.0%	1.6%
Outstanding Medical (Excluding IBNR)	0	0.0%	1.6%
Indemnity IBNR	0	0.0%	1.6%
Medical IBNR	0	0.0%	1.6%

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EVALUATION OF DATA COLLECTION AND DATA QUALITY

Appendix: Summary of Sample Testing Results

Sample Name:	Calendar Year Financial Call
Population:	Calendar Year Libraries for Data Used in 1990 Overall Rate Level Calculations
Population Size:	6,339 Records
Confidence Level:	95%
Tolerable Error:	5%
Expected Error:	2%
Sample Size:	176
Tolerance Level:	\$5,000

Quantification of Errors

Attribute	Number of Errors	Sample Error Rate	Achieved Upper Error Limit
Net Earned Premium	2	1.1%	3.5%
Standard Earned Premium at Company Level	1	0.6%	2.7%
Standard Earned Premium at Designated Statistical Reporting Level	2	1.1%	3.5%
Incurred Losses	1	0.6%	2.7%
State Code	1	0.6%	2.7%
	7		

Description of Errors

Description of Errors	Number of Errors
Call data for two carriers in the sample was found to have been partially or completely deleted, or "zeroed out", by NCCI. The deletions were done deliberately to avoid distortion of overall rate level indications. Inclusion of these deletions in our error statistics increased the error count for each attribute by either one or two errors. For error statistics net of this effect, see the following page. For a more detailed discussion of zeroing out of data, see General Observation #6 and Specific Finding # 5 in the Overall Rate Level Area Report in Volume III.	6
One correction call was received from a carrier after overall rate levels had been produced. This call caused a difference in the designated statistical reporting premium field between the amount on the correction call and the data in the Overall Rate Level system.	1
	7

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Appendix: Summary of Sample Testing Results

Sample Name:	Calendar Year Financial Call		
Quantification of Errors Net of Deletions			
<u>Attribute</u>	<u>Number of Errors</u>	<u>Sample Error Rate</u>	<u>Achieved Upper Error Limit</u>
Net Earned Premium	0	0.0%	1.7%
Standard Earned Premium at Company Level	0	0.0%	1.7%
Standard Earned Premium at Designated Statistical Reporting Level	1	0.6%	2.7%
Incurred Losses	0	0.0%	1.7%
State Code	0	0.0%	1.7%
	<hr/> 1		

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Appendix: Summary of Sample Testing Results

Sample Name:	Reconciliation Report Used to Reconcile Financial Call Data to Carrier Annual Statements
Population:	Production File Containing 1989 Data
Population Size:	4,919 Records
Confidence Level:	95%
Tolerable Error:	5%
Expected Error:	2%
Sample Size:	177
Tolerance Level:	\$5,000

Quantification of Errors

Attribute	Number of Errors	Sample Error Rate	Achieved Upper Error Limit
Net Direct Earned Premium	0	0.0%	1.7%
Direct Incurred Losses	0	0.0%	1.7%
State Code	0	0.0%	1.7%
	<hr/> 0		

Note) We noted one data entry error which was below the \$5,000 tolerance level.

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Appendix: Summary of Sample Testing Results

Sample Name:	Insurance Expense Exhibit (IEE)
Population:	Production File Containing 1989 Data
Population Size:	29,602 records
Confidence Level:	95%
Tolerable Error:	5%
Expected Error:	2%
Sample Size:	181
Tolerance Level:	\$5,000

Quantification of Errors

Attribute	Number of Errors	Sample Error Rate	Achieved Upper Error Limit
Net Premiums Written	0	0.0%	1.6%
Net Premiums Earned	0	0.0%	1.6%
Loss Adjustment Expenses	1	0.6%	2.6%
Acquisition, Field Supervision and Collection Expenses	1	0.6%	2.6%
General Expenses	1	0.6%	2.6%
Taxes, Licenses and Fees	0	0.0%	1.6%
Net Investments	0	0.0%	1.6%
Total Expenses	0	0.0%	1.6%
	3		

Description of Errors

Description of Errors	Number of Errors
We noted that one amended IEE was not captured in the Overall Rate Level system.	3
	3

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Appendix: Summary of Sample Testing Results

Sample Name:	Unit Report Payroll Data Used in Class Ratemaking
Population:	Payroll and Loss (P/L) Detail File Payroll Records for Policy Years 1986 and 1987
Population Size:	13,805,551 Records
Confidence Level:	95%
Tolerable Error:	5%
Expected Error:	2%
Sample Size:	181

Quantification of Errors

Attribute	Number of Errors	Sample Error Rate	Achieved Upper Error Limit
State Code	4	2.2%	5.0%
Class Code	4	2.2%	5.0%
Payroll Amount	5	2.8%	5.7%
Premium Amount	5	2.8%	5.7%
	18		

Description of Errors

Description of Error	Number of Errors
Four unit reports in the sample could not be located. Inclusion of the unlocated unit reports in our error statistics increased the error count for each attribute by four errors. For error statistics net of this effect, see the following page.	16
One duplicate payroll record was noted in the P/L detail file.	1
An offsetting debit and credit amount existed for the premium amount in the P/L detail file which could not be traced to unit reports or correction reports.	1
	18

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Appendix: Summary of Sample Testing Results

Sample Name: Unit Report Payroll Data Used in Class Ratemaking

Quantification of Errors Net of Unlocated Documentation

<u>Attribute</u>	<u>Number of Errors</u>	<u>Sample Error Rate</u>	<u>Achieved Upper Error Limit</u>
State Code	0	0.0%	1.6%
Class Code	0	0.0%	1.6%
Payroll Amount	1	0.6%	2.6%
Premium Amount	1	0.6%	2.6%
	<u>2</u>		

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Appendix: Summary of Sample Testing Results

Sample Name: Unit Report Loss Data Used in Class Ratemaking
Population: Payroll and Loss (P/L) Detail File Loss Records for Policy Years 1986 and 1987
Population Size: 6,726,062 Records
Confidence Level: 95%
Tolerable Error: 5%
Expected Error: 2%
Sample Size: 181

Quantification of Errors

Attribute	Number of Errors	Sample Error Rate	Achieved Upper Error Limit
State Code	3	1.7%	4.2%
Class Code	3	1.7%	4.2%
Injury Code	3	1.7%	4.2%
Indemnity Amount	3	1.7%	4.2%
Medical Amount	7	3.9%	7.1%
	19		

Description of Errors

Description of Errors	Number of Errors
Three unit reports in the sample could not be located. Inclusion of the unlocated unit reports in our error statistics increased the error count for each attribute by three errors. For error statistics net of this effect, see the following page.	15
A data entry transposition error created an error in the P/L detail file medical amount.	1
One duplicate loss record was noted in the P/L detail file medical amount.	1
A system correction record which affected the medical amount was not supported by the unit report data of a state fund.	1

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Appendix: Summary of Sample Testing Results

Sample Name: Unit Report Loss Data Used in Class Ratemaking

A medical only claim in the P/L detail file was not supported by the unit report data provided of a state fund. 1

19

Quantification of Errors Net of Unlocated Documentation

Attribute	Number of Errors	Sample Error Rate	Achieved Upper Error Limit
State Code	0	0.0%	1.6%
Class Code	0	0.0%	1.6%
Injury Code	0	0.0%	1.6%
Indemnity Amount	0	0.0%	1.6%
Medical Amount	4	2.2%	5.0%
	4		

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Appendix: Summary of Sample Testing Results

Sample Name:	Unit Report Payroll Data Used in Experience Rating
Population:	Compress File Payroll Records for 1990 Ratings (1986, 1987 & 1988 Unit Reports)
Population Size:	4,679,948 Records
Confidence Level:	95%
Tolerable Error:	5%
Expected Error:	2%
Sample Size:	181

Quantification of Errors

Attribute	Number of Errors	Sample Error Rate	Achieved Upper Error Limit
Name	2	1.1%	3.4%
Risk ID	1	0.6%	2.6%
Policy Effective Date	1	0.6%	2.6%
Class Code	2	1.1%	3.4%
Payroll Amount	2	1.1%	3.4%
	8		

Description of Errors

Description of Errors	Number of Errors
One unit report and rating sheet in the sample could not be located. Inclusion of the unlocated unit report and rating sheet in our error statistics increased the error count for each attribute by one error. For error statistics net of this effect, see the following page.	5
The company name on one rating sheet was very similar to the name on a unit report which was used in the experience modification calculations. The entities were not related and the rating sheet improperly included the unit report experience.	1
A class code on one rating sheet did not agree to the unit report.	1

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Appendix: Summary of Sample Testing Results

Sample Name: Unit Report Payroll Data Used in Experience Rating

One rating sheet did not include the data from a correction unit report, causing payroll to be misstated. 1

8

Note 1) The risk ID on 26 rating sheets did not agree to the unit reports (e.g. risk ID not reported on unit report, risk had changed interstate/intrastate status since unit was submitted, etc.). The rating sheets correctly included the unit report data.

Note 2) The name on 10 rating sheets did not agree to the unit report. The company identified on the rating sheet was related to the company on the unit report. Data handling by NCCI was deemed to be appropriate.

Quantification of Errors Net of Unlocated Documentation

Attribute	Number of Errors	Sample Error Rate	Achieved Upper Error Limit
Name	1	0.6%	2.6%
Risk ID	0	0.0%	1.6%
Policy Effective Date	0	0.0%	1.6%
Class Code	1	0.6%	2.6%
Payroll Amount	1	0.6%	2.6%
	3		

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Appendix: Summary of Sample Testing Results

Sample Name: Unit Report Loss Data Used in Experience Rating
Population: Compress File Loss Records for 1990 Ratings (1986, 1987 & 1988 Unit Reports)
Population Size: 1,997,261 Records
Confidence Level: 95%
Tolerable Error: 5%
Expected Error: 2%
Sample Size: 181

Quantification of Error

Attribute	Number of Errors	Sample Error Rate	Achieved Upper Error Limit
Name	0	0.0%	1.6%
Risk ID	0	0.0%	1.6%
Policy Effective Date	0	0.0%	1.6%
Class Code	0	0.0%	1.6%
Loss Amount	1	0.6%	2.6%
	1		

Description of Error

Description of Error	Number of Errors
One rating sheet did not include the data from a correction unit report, causing the loss amount to be misstated.	1

Note 1) The risk ID on 21 rating sheets did not agree to the unit report (e.g. risk ID not reported on unit report, risk had changed interstate/intrastate status since unit was submitted, etc.). The rating sheets correctly included the unit report data.

Note 2) The name on 3 rating sheets did not agree to the unit report. The company identified on the rating sheet was related to the company on the unit report. Data handling by NCCI was deemed to be appropriate.

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Appendix: Summary of Sample Testing Results

Sample Name:	Detailed Claim Information
Population:	All DCI Calls Processed into the Valid File between 8/1/90 and 3/30/9
Population Size:	41,001 Records
Confidence Level:	95%
Tolerable Error:	5%
Expected Error:	2%
Sample Size:	200

Quantification of Errors

Attribute	Number of Errors	Sample Error Rate	Achieved Upper Error Limit
Field #23 - Claim Reopened Indicator	1	0.5%	2.3%
Field #37 - Paid to Date Hospital Costs	1	0.5%	2.3%
Field #40 - Number of Days Confined in Hospital to Date	1	0.5%	2.3%
All Other Fields on DCI Call	0	0.0%	1.5%
	3		

Description of Errors

Description of Errors	Number of Errors
One error was due to a change made to the data by an NCCI clerk which differed from the carrier's submission, including the carrier's correction submission. The correction call had failed one of the system field edits, therefore NCCI changed the field to a presumed valid number.	1
Two errors noted were due to data entry input errors.	2
	3

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Appendix: Summary of Sample Testing Results

Results of Judgemental Samples

Sample Name: Overall Rate Level - Calendar-Accident Year and Policy Year Calls
Sample Size: 25 Policy Year Calls
25 Calendar-Accident Year Calls

<u>Test Performed/Purpose</u>	<u>Test Result</u>
Comparison of judgmentally selected financial calls to state level data files to ensure that financial calls received are processed into the Overall Rate Level system.	No errors were noted.

Sample Name: Unit Reports - Data Administration Area
Sample Size: 50 Unit Reports

<u>Test Performed/Purpose</u>	<u>Test Result</u>
Comparison of judgmentally selected unit reports to Data Administration P/L Detail File, Month Pools and Futures File to ensure that unit reports received are processed into the Class Ratemaking system.	No errors were noted.

EVALUATION OF DATA COLLECTION AND DATA QUALITY

Appendix: Summary of Sample Testing Results

Results of Judgemental Samples

Sample Name: Unit Reports - Data Administration and Experience Rating Area
Sample Size: 29 Unit Reports with Experience Rated or Rated Size Premium

Test Performed/Purpose

Comparison of unit report data to experience rating sheets to ensure that data used in experience rating calculations and class rate calculations is consistent.

Test Result

One unit report was omitted from an experience rating sheet because it was received after the rating production date. However, it was received prior to the rating effective date and should have been included in the rating calculation.

Sample Name: Unit Report - Experience Rating
Sample Size: 29 Rating Sheets.

Test Performed/Purpose

Comparison of Expected Loss Rates (ELRs) and D-Ratios produced by Class Ratemaking to ensure they are being accurately transferred from Class Ratemaking to Experience Rating.

Test Result

No errors were noted.

NAIC
Examination of NCCI
Review of DCI Development Project

June 15, 1991

**ARTHUR
ANDERSEN**
ARTHUR ANDERSEN & CO., S.C.

Review of DCI Development Project

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Appendix

Review of DCI Development Project

Introduction:

This report presents the approach, findings and recommendations of the review of the Detailed Claim Information (DCI) system development project at the National Council on Compensation Insurance (NCCI) performed by Arthur Andersen & Co. It contains the written deliverables of this review.

Background

Milliman & Robertson, Inc. and Arthur Andersen & Co., performed an examination of the structure and operations of NCCI under the examination authorities of the Florida Department of Insurance, the Maine Bureau of Insurance, the Nebraska Department of Insurance and the Utah Department of Insurance. The National Association of Insurance Commissioners (NAIC) coordinated the activities of the four departments in administering the examination.

The overall purpose of this examination was to evaluate the data collection and data handling activities of NCCI, certain aspects of its ratemaking activities and practical considerations involved in implementing a loss cost system.

The NAIC retained Arthur Andersen & Co. to review NCCI's DCI development project through an amendment to the examination contract.

Objectives

Detailed Claim Information (DCI) is used by NCCI to provide a basis for understanding the components of changing Workers' Compensation loss costs. NCCI's stated objectives of the new DCI system are to: (1) establish an online DCI data base; (2) capture additional data elements to meet the requirements of the NAIC model data reporting regulation; (3) provide carriers with an edit package to ensure data accuracy prior to submission to NCCI; and (4) ensure data quality through the implementation of a Workers' Compensation Data Monitoring (WCMDM) program.

Review of DCI Development Project

The objective of our review of the DCI project was to assist the NAIC in assessing NCCI's progress in achieving these objectives and the broader objective of providing flexible and timely access to accurate detailed claim information.

Scope

The scope of this review included NCCI's DCI system development project, carrier edit package development project, and WCDM program development project. We have provided comments on the objectives and progress of these projects but could not assess the final products because they were not complete at the time of this review.

Approach

1. Review DCI System Definition:

We began by reviewing the NAIC model regulation and NCCI's user requirements and system definition documentation. We met with NCCI's project leaders to confirm our understanding of project objectives.

The issue of whether the data elements included in the expanded DCI design meet the data requirements of NAIC model data reporting regulation was beyond the scope of our DCI project review.

2. Review DCI Design:

In our next work segment, we reviewed NCCI's design of the new DCI system. Our design review included the project data model, application architecture, user view of the system, including screen and report designs, and key interfaces to other systems. We reviewed the detailed design specifications for selected application programs within the new system.

Review of DCI Development Project

3. Review DCI Project Development and Implementation

In the third segment of our work, we reviewed the ongoing programming and testing phase of the DCI project. We began this phase of work by reviewing NCCI's project work plan and status for the development and implementation phases of the project. We met with project team leaders and programming supervisors to review the programming and unit testing approach and results. We reviewed the system test approach and the conversion plan. As part of the review, we conducted detailed reviews of selected application programs, unit test results and system test results.

4. Review Procedures to Ensure Timeliness and Accuracy

In the fourth segment of our work, we reviewed NCCI's proposed procedures to ensure timeliness and accuracy of the data. Our approach built on our knowledge of existing DCI timeliness and accuracy standards and the changes NCCI contemplates making in those standards.

Lists of the interviews we conducted and documents we reviewed are included in the appendix to this report.

Review of DCI Development Project

DCI Reporting Overview:*

The Call for Detailed Claim Information (DCI) is a data collection program by the National Council on Compensation Insurance (NCCI) whereby insurance companies furnish specific information on workers compensation indemnity claims. An indemnity claim is one which is made by an employee who has lost time from work because of a work-related injury. Claims involving medical costs only are not included in the Call.

The purpose of the DCI is to provide insight into the underlying elements inherent in the aggregate costs of Workers Compensation Insurance. DCI is an invaluable tool for a more refined analysis of workers compensation.

The original DCI data collection program was initiated for claims with report dates of April 1, 1979 and subsequent. In 1991, this DCI system was replaced with an expanded system that carriers could report on a voluntary basis. The new DCI system contains 85 data elements compared to the original 54 data elements. It consists of a continuous random sampling of workers compensation indemnity claims. Insurance companies participating in the Call update claims six months after they are filed by an injured worker and submit them to NCCI two months later. Follow-up reports are then submitted on a yearly basis until the claim is closed, no longer includes indemnity or reaches the 9th report level.

The expanded format is mandatory with new claims reported to the carrier January 1, 1992 and subsequent. The January 1, 1992 reported claims are valued in July 1992. Also, any subsequent reports valued as of July 1992 will be printed in the expanded format for submission to NCCI. Prior implementations may be made by carriers on a voluntary basis.

*Source: NCCI's Call for Detailed Claim Information Instruction Manual

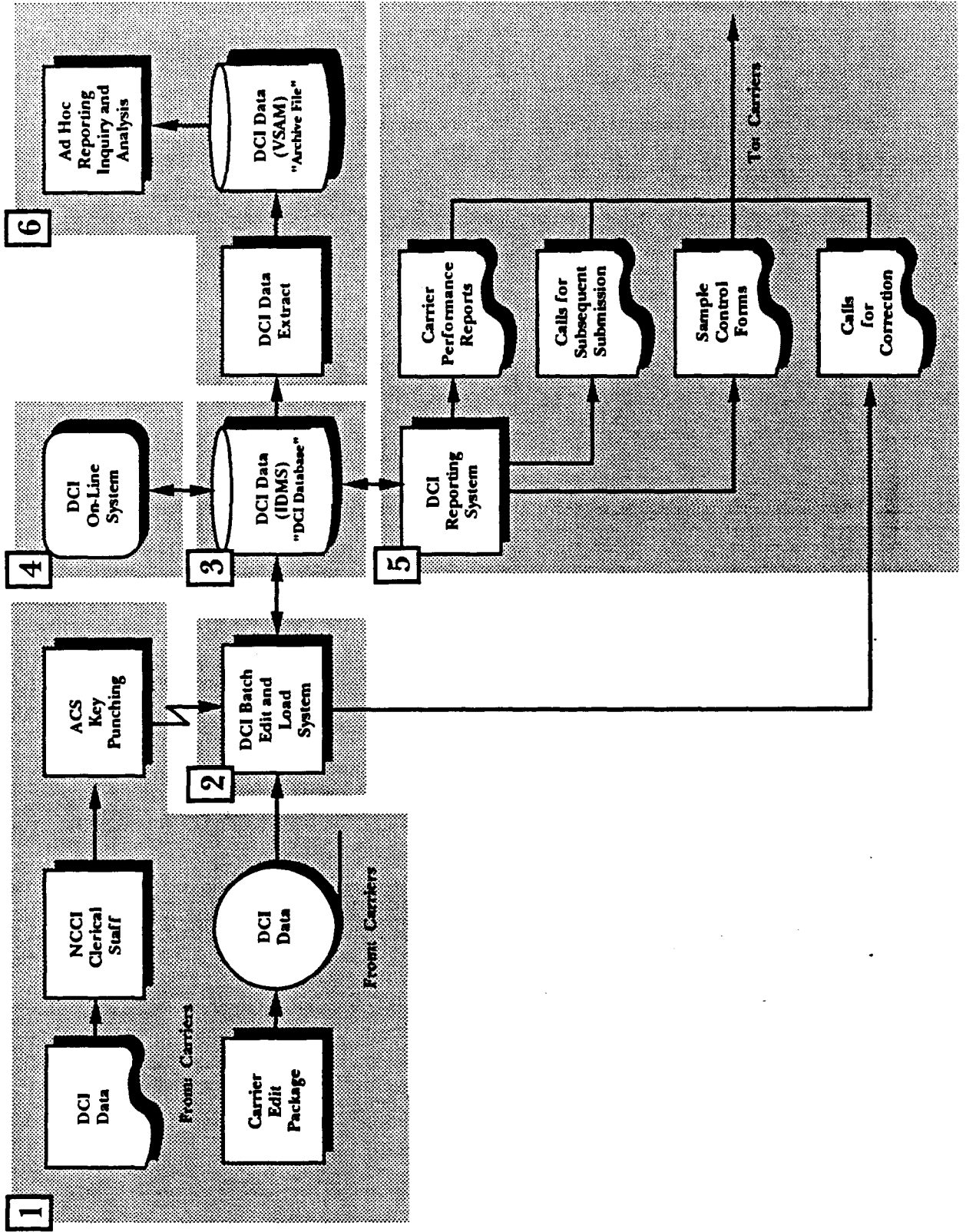
Review of DCI Development Project

DCI System Overview:

- 1) Carriers will have the option of submitting DCI data on hardcopy or magnetic tape.
 - Hardcopy submissions will be received by NCCI clerks and sent to ACS for data entry.
 - Carriers submitting data on magnetic tape will have the additional option of prevalidating their submissions through the carrier edit package.
- 2) Magnetic tape and hardcopy submissions will be validated through DCI's main edit program. This program will produce error reports and calls for correction for all data found to be in error.
- 3) Valid data will be loaded into the DCI database. Data with minor errors will also be loaded, but will be held in suspense until corrected. Data with fatal errors will not be loaded into the database.
- 4) NCCI clerical personnel will use the DCI online system to investigate errors, maintain data edit parameters, maintain carrier contact information, and to expedite entry of carrier submitted corrections and revisions.

(continued on next page)

DCI System Overview

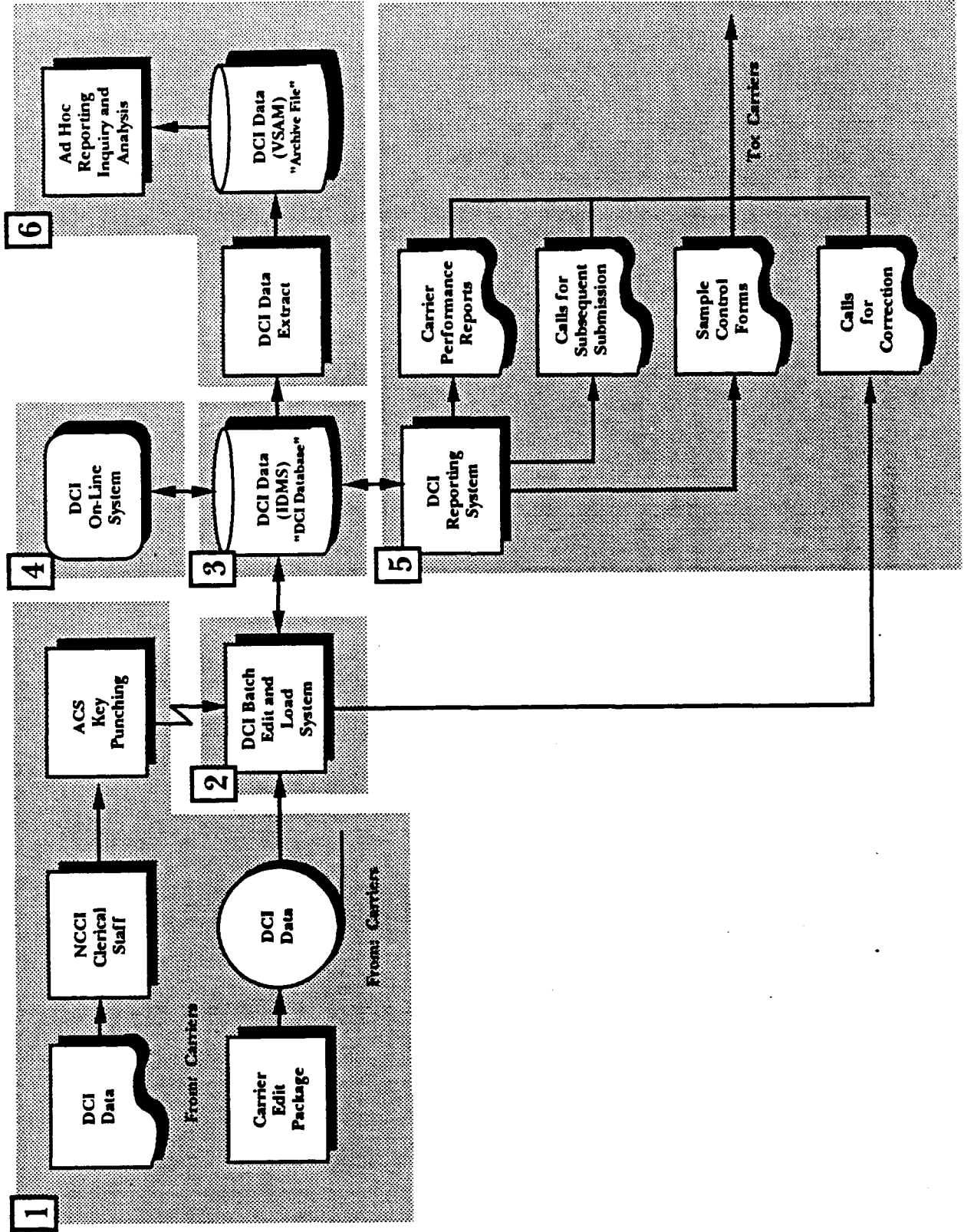


Review of DCI Development Project

- 5) The DCI system will automatically track required input and generate carrier performance reports.
- Calls for subsequent reports for existing DCI claims will be produced and sent to carriers.
 - Sample control forms will be produced and sent to carriers for completion. Completed sample control forms will indicate the number of claims carriers are required to submit.
 - The system will monitor and report carrier performance and calculate monetary incentives. For each valid submission of an original report, carriers will be credited \$10; for each valid correction or subsequent report, carriers will be credited \$5.
- 6) Quarterly, current DCI claim data will be extracted from the DCI database and combined with previously extracted data to produce the archive file which contains 10 years of DCI claim data. The file will be used for actuarial reporting, inquiry and analysis of DCI claim data.

NOTE: NCCI will convert historical DCI data. However, the new archive file will not contain 10 complete years of expanded DCI data until the year 2002.

DCI System Overview



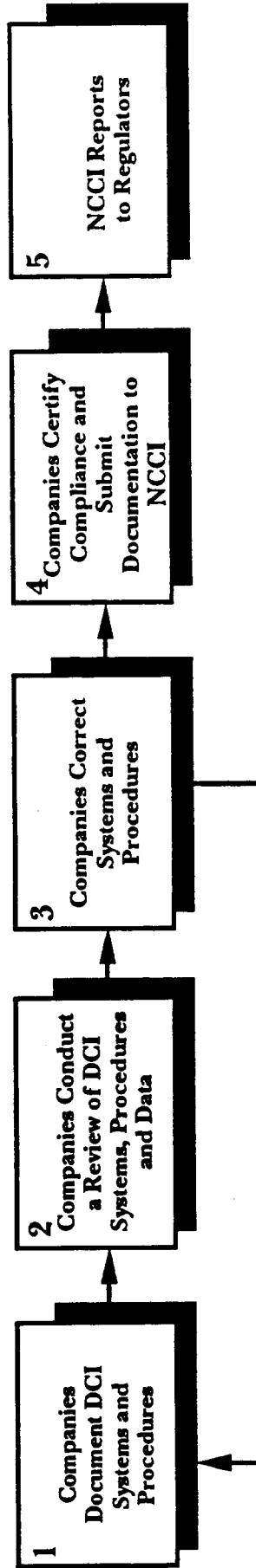
Review of DCI Development Project

WCDDM Overview:

The Workers' Compensation Data Monitoring (WCDDM) program is a set of standards and procedures designed to monitor carrier compliance with DCI reporting requirements and audit the quality of reported DCI data.

- 1) During the first year of the WCDDM program, companies must document their DCI systems and procedural controls. This documentation must be updated as necessary.
- 2) Annually, company personnel not directly associated with the production or use of DCI data will conduct a review of DCI systems, procedures, and data. The objective of this review will be to verify that all requirements of the WCDDM have been satisfied.
 - The annual review will be based primarily on a random sample of DCI data. A random sample consisting of 10% of the DCI reports submitted to NCCI will be compared to data in claim adjusters' files. Data will not be traced back to the insured risk.
 - If a carrier's random sampling results indicate an error rate greater than 3%, the carrier will be required to produce detailed documentation of its controls and plans to improve them.
- 3) Each data error identified in the random sample will be traced to its source. Companies will be expected to correct all systems or controls deficiencies identified if feasible.
- 4) Annually, companies will submit results to NCCI. At this time, companies will certify, in writing, their compliance with WCDDM.
- 5) NCCI will review and summarize company certification reports. NCCI will report the results to regulators.

WCDM Overview



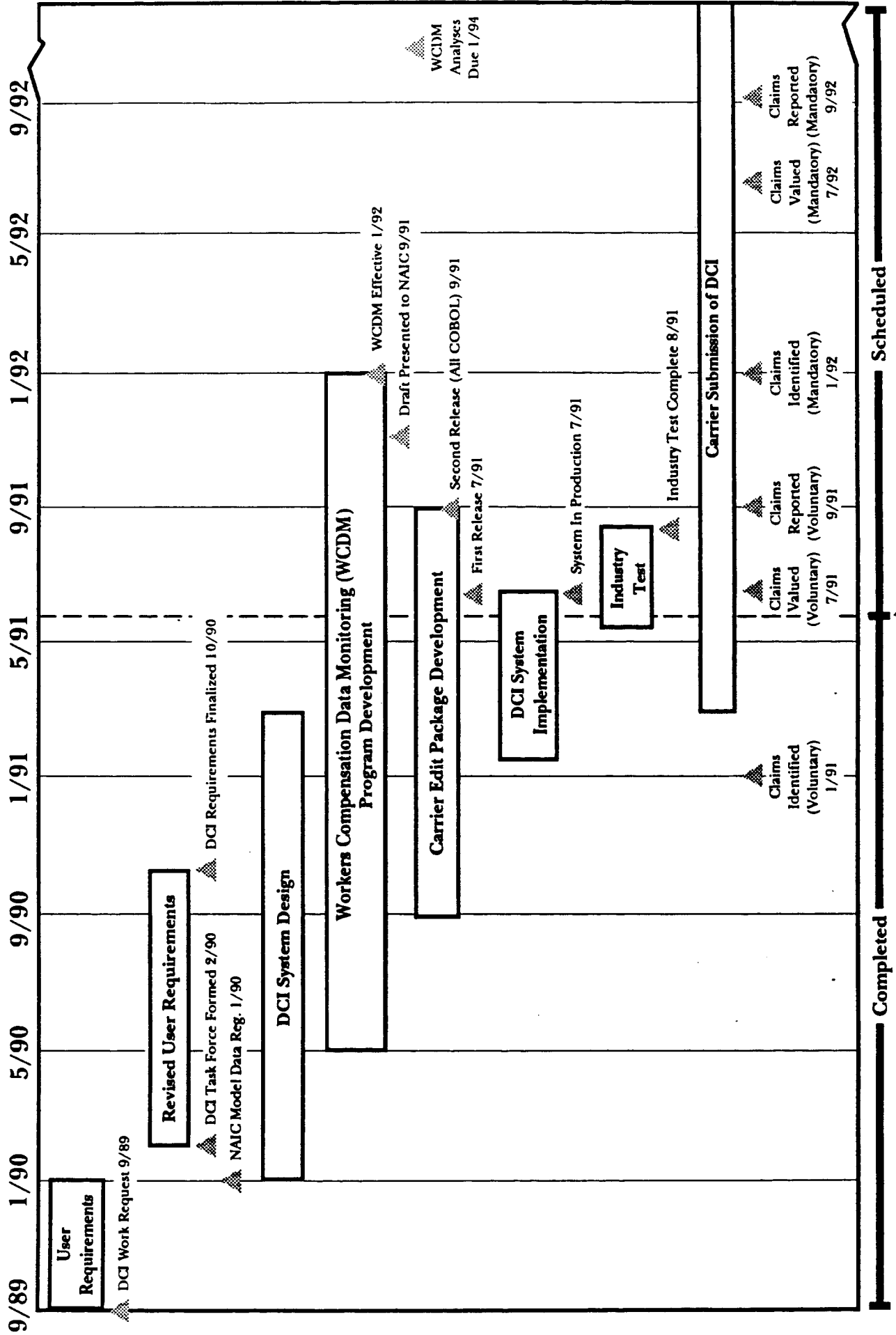
Review of DCI Development Project

Summary of DCI Project Schedule:

The DCI project has been in process since September 1989. Listed below are key historical events and dates. On the following page, future milestones and their target dates are listed.

Completed Milestones	Date
• Work request submitted to develop an online DCI data base	9/89
• User requirements defined and approved	12/89
• NAIC model data reporting regulation published	1/90
• DCI industry task force formed	2/90
• Revised user requirements approved (including NAIC model data reporting regulation requirements)	10/90
• Carriers began identifying claims for the new DCI reporting format on a voluntary basis	1/91

DCI Project Timeline



Review of DCI Development Project

Summary of DCI Project Schedule:

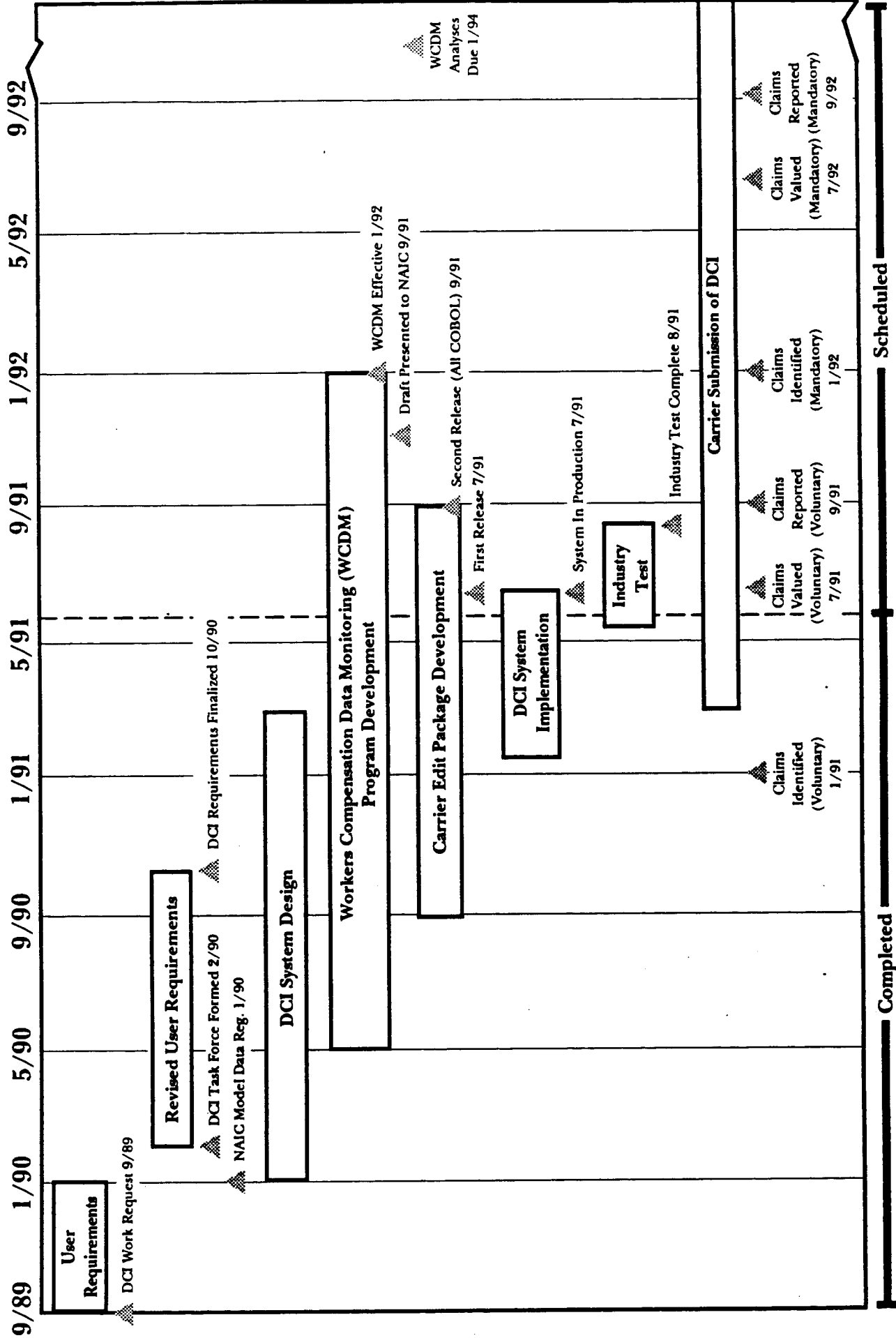
<u>Scheduled Milestones</u>	<u>Date</u>
• New DCI system in production	7/91
• Carrier edit package available	7/91
• Industry testing complete	8/91
• First voluntary DCI claims in the new reporting format are due at NCCI	9/91
• Revised carrier edit package (all COBOL version) available	9/91
• Final draft of WCDM presented to the NAIC	9/91
• All carriers begin sampling claims for the new DCI reporting format	1/92
• WCDM program becomes effective for DCI submissions due at NCCI starting 9/92	1/92
• All carriers submit expanded DCI claims	9/92
• First set of WCDM analyses due at NCCI	1/94

Review of DCI Development Project

NCCI's Stated Project Objectives:

- 1) Establish an online DCI data base.
- 2) Capture additional data elements to meet the requirements of the NAIC model data reporting regulation.
- 3) Provide carriers with an edit package to ensure data accuracy prior to submission to NCCI.
- 4) Ensure data quality through the implementation of a Workers' Compensation Data Monitoring (WCDM) program.

DCI Project Timeline



Completed

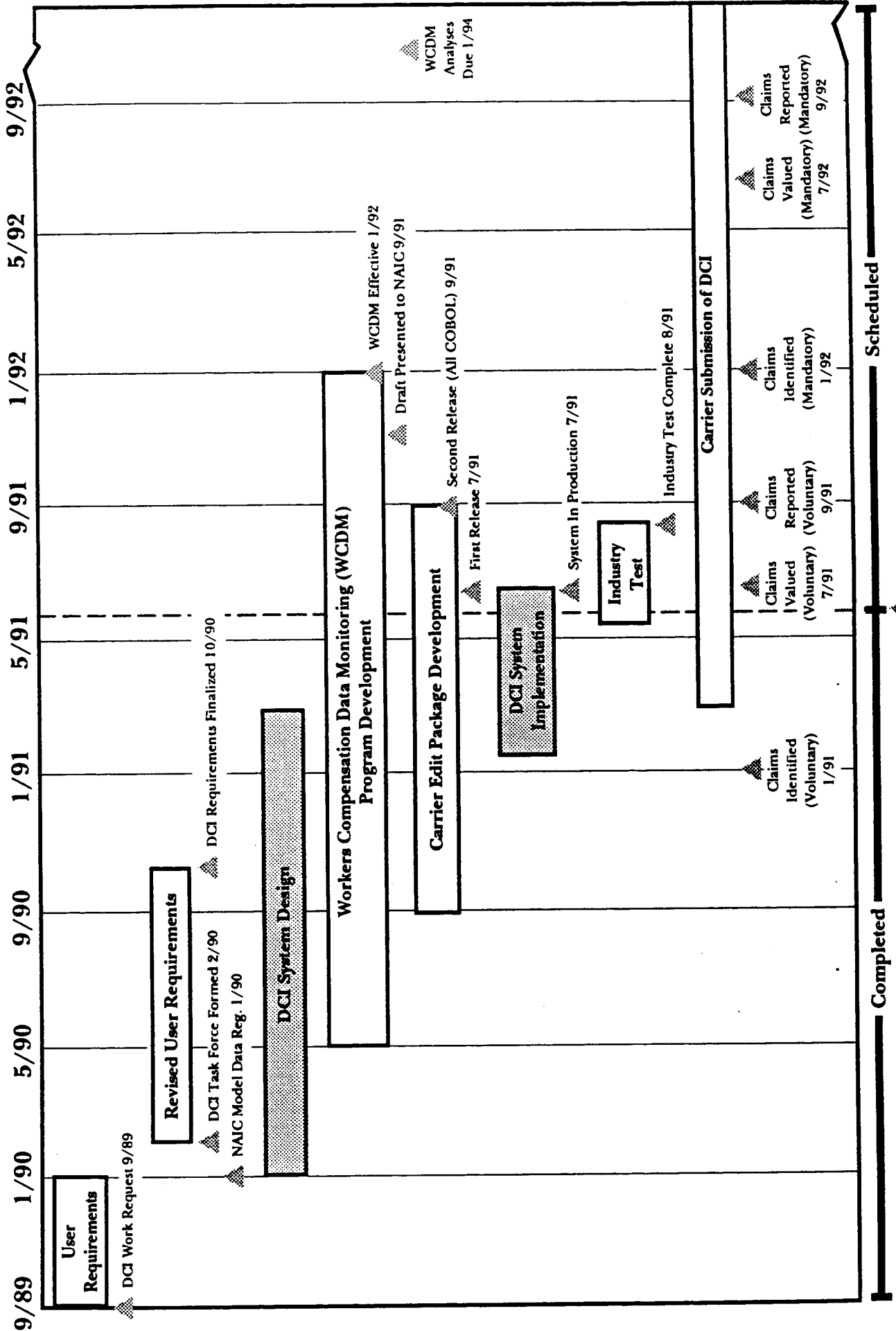
Scheduled

Review of DCI Development Project

NCCI's Progress Against Stated Objectives:

- 1) Establish an online DCI data base.
 - NCCI has designed and implemented a DCI database which will contain DCI sample control data, DCI claim data, carrier information, and edit tables.
 - NCCI has designed, programmed, and tested an online system which allows users to query, add, update, and delete data on the DCI database.
 - NCCI has designed, programmed, and tested a conversion system to load the DCI database with historical DCI data.
 - NCCI has designed, programmed, and tested a batch system to receive new DCI data from carriers on magnetic tape or hardcopy and load this information into the DCI database.

DCI Project Timeline

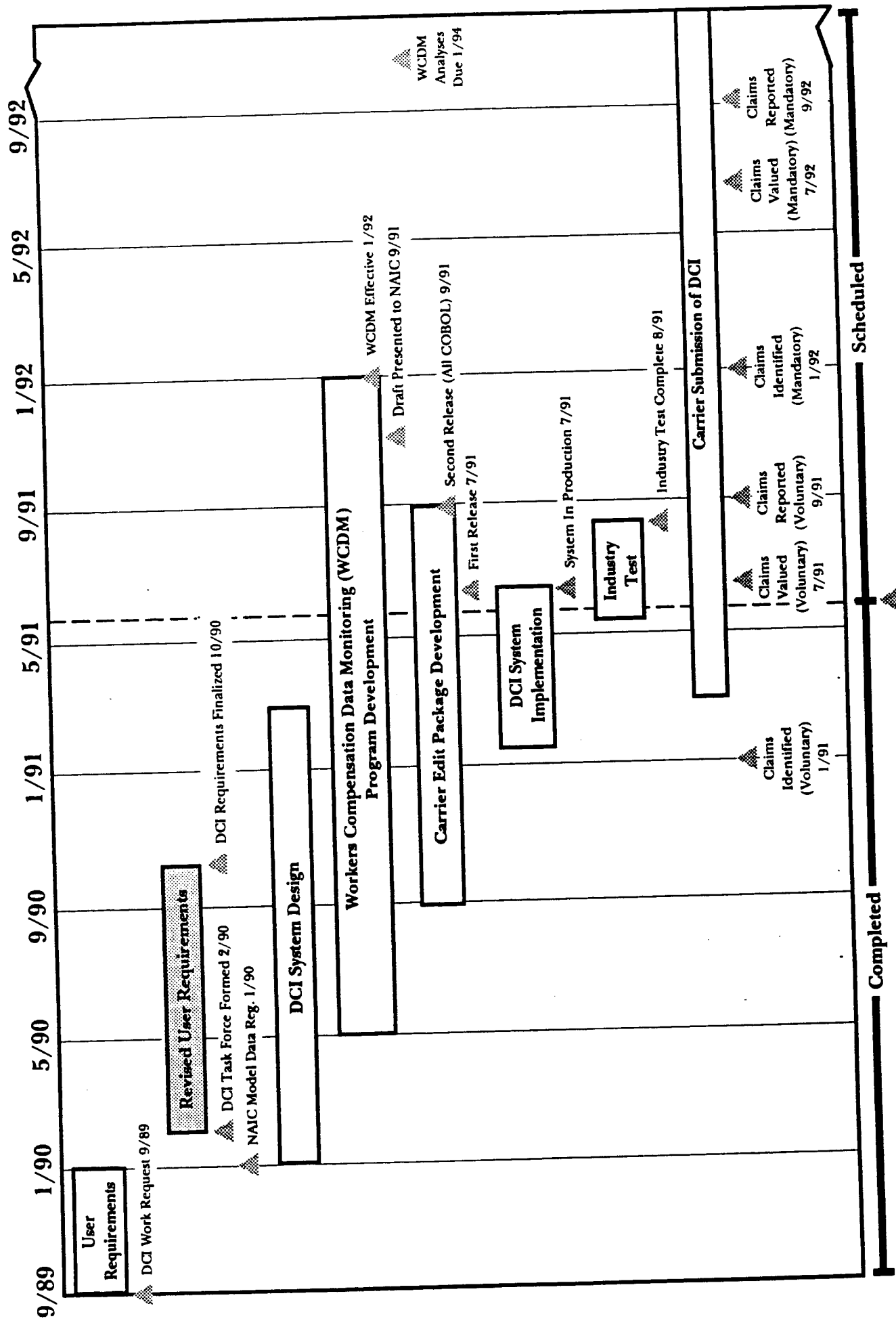


Review of DCI Development Project

NCCI's Progress Against Stated Objectives:

- 2) Capture additional data elements to meet the requirements of the NAIC model data reporting regulation.
 - NCCI has designed a new DCI submission form to capture 85 DCI elements and implemented a database to store this information.
 - NCCI has reconciled its 85 DCI data elements to the NAIC model data reporting regulation. Omissions were noted and agreement reached with the NAIC data collection task force. Agreement was also reached on the specific definition of each data element included in DCI.
 - NCCI has involved the NAIC data collection task force in defining DCI data requirements through monthly meetings and negotiations.

DCI Project Timeline



Review of DCI 6/91

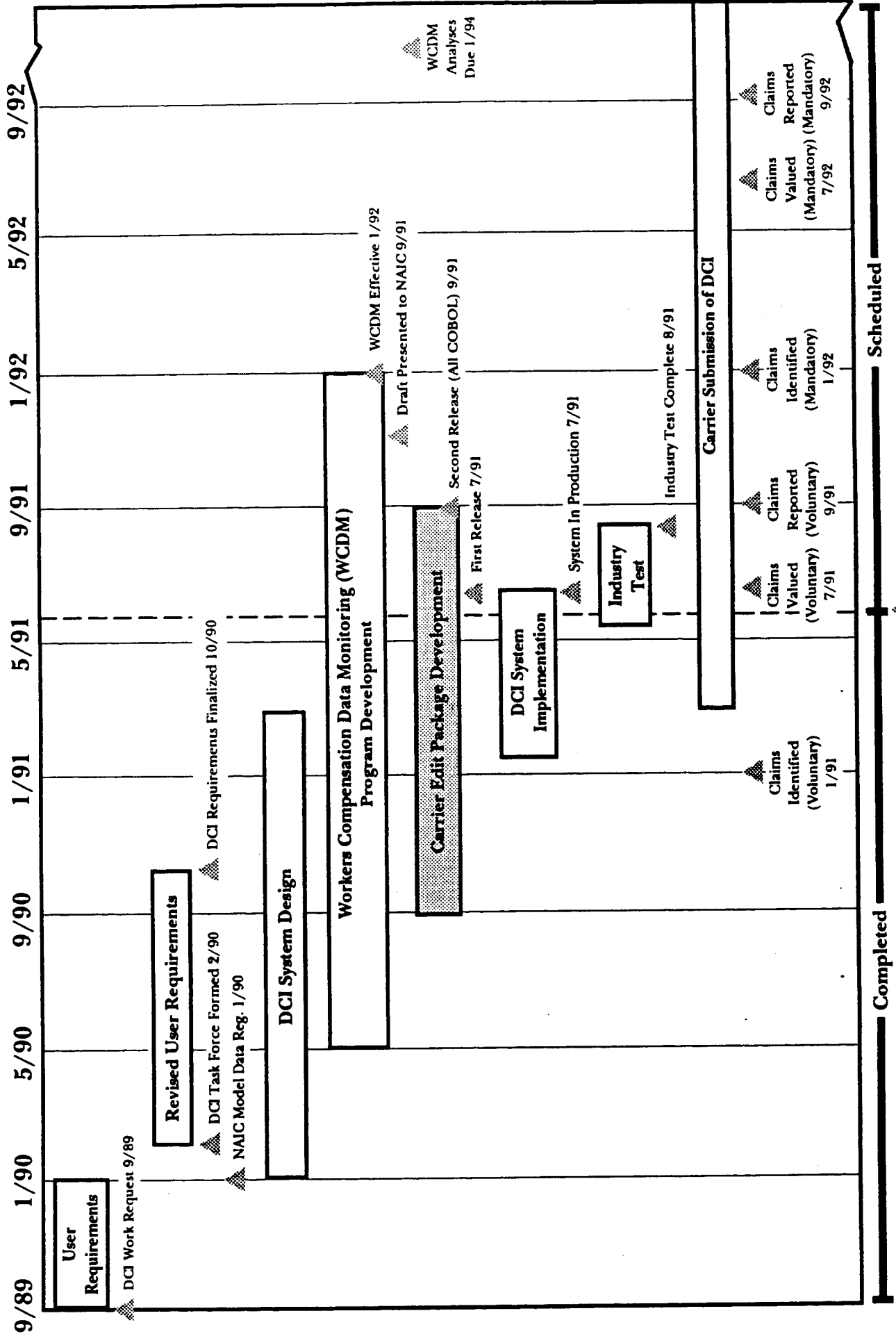
MILESTONE

Review of DCI Development Project

NCCI's Progress Against Stated Objectives:

- 3) Provide carriers with an edit package to ensure data accuracy prior to submission to NCCI.
 - NCCI has designed, programmed, and tested a carrier edit package which can be executed in an IBM main-frame environment. This package takes DCI data as input and produces error reports based on edits included in NCCI's DCI system.
 - Two carriers are in the process of testing the edit package.
 - NCCI is in the process of developing a procedures manual for the carrier edit package.
 - NCCI has developed a strategy to maintain consistency between the carrier edit package and the DCI system validation programs.
 - NCCI has developed a strategy for distributing modifications and enhancements to the carrier edit package.

DCI Project Timeline



Completed

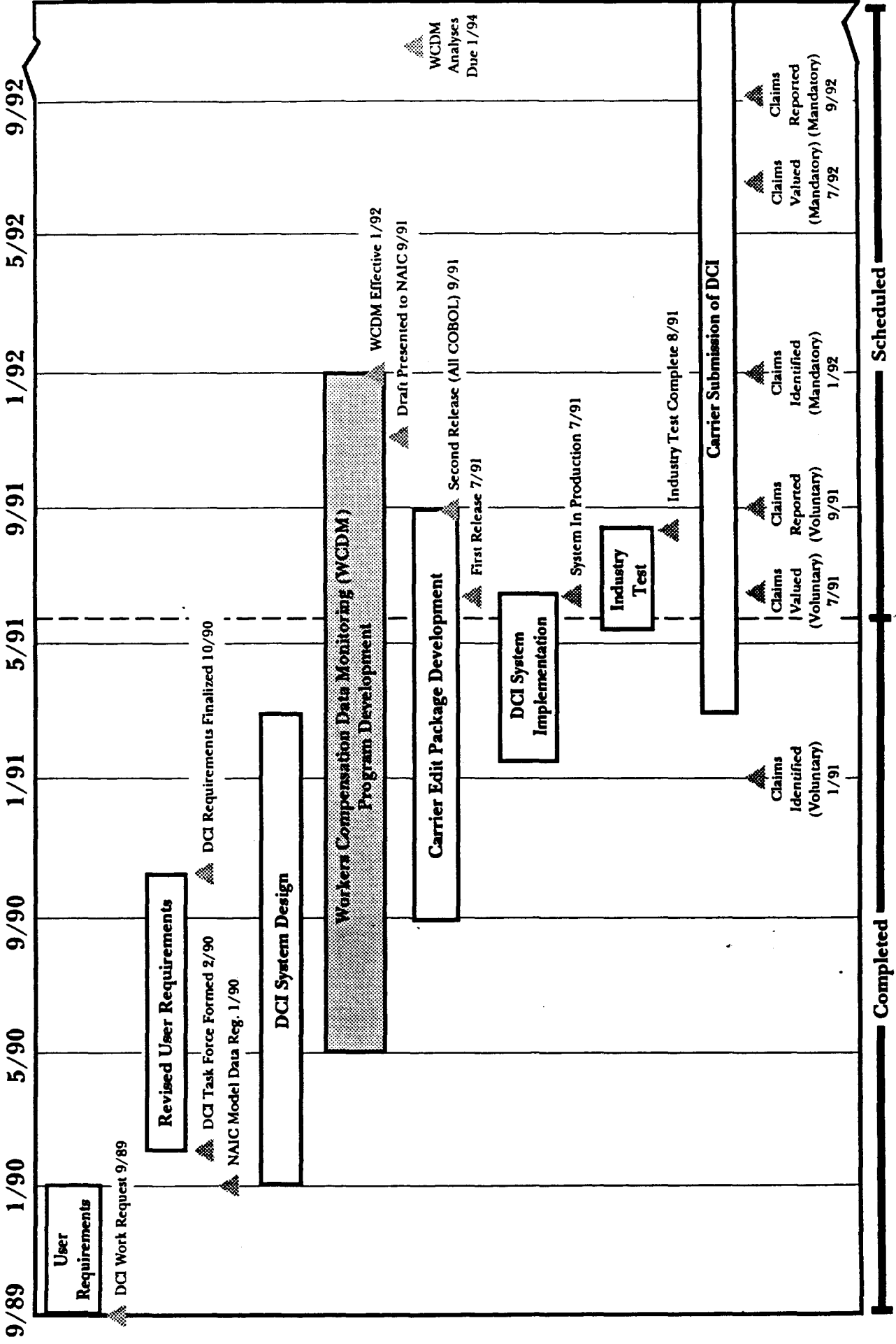
Scheduled

Review of DCI Development Project

NCCI's Progress Against Stated Objectives:

- 4) Ensure data quality through the implementation of a Workers' Compensation Data Monitoring (WCDM) program.
 - NCCI is continuing to work with carriers and regulators to develop the WCDM program.
 - NCCI has drafted the first section of the WCDM manual which outlines general responsibilities of carriers, regulators, and the NCCI and specific procedures that carriers must follow.
 - Section I of the WCDM manual describes:
 - Carriers' responsibility to comply with the requirements of the WCDM program.
 - Carriers' responsibility to document its data quality control procedures.
 - Carriers' responsibility to statistically test, document and report on the accuracy of the data it submits to NCCI.
 - NCCI is in the process of drafting Section II of the WCDM manual which will describe NCCI's responsibilities including enforcement of WCDM.

DCI Project Timeline



Review of DCI Development Project

Summary Evaluation of DCI Design:

Strengths:

- Regulators, industry representatives and NCCI actuarial and clerical personnel were very involved in the design of the DCI system. This high degree of user involvement increases the likelihood that the DCI system will meet the needs of its users.
- The DCI design supports the tracking and control of receipt of DCI data.
- The DCI design supports measurement of carrier performance regarding the timely and accurate submission of DCI data.
- The DCI design supports an efficient error turnaround process. Data found to be in error is returned to the carrier with descriptions of the errors. Carriers are required to correct and resubmit this data.
- The design includes a carrier edit package. This package will allow carriers to validate DCI data prior to submission to NCCI. This should improve the quality of DCI data submitted to NCCI by carriers using the package.
- The DCI data design adequately supports the current systems functions and provides for future addition of new data elements.
- Online application designs were subjected to project team and Quality Review Board (made up of NCCI management) review to ensure adequate functionality and compliance to standards. The database management team reviewed the design for performance considerations.

Review of DCI Development Project

- Batch application designs were subjected to project team and Quality Review Board review to ensure adequate functionality and compliance to standards.
- Database access logic was designed to be executed from a single module. This enhances application maintainability.

Review of DCI Development Project

Summary Evaluation of DCI Design:

Weaknesses:

- State regulators have not formally signed off on the DCI design. There is some risk that they will not accept DCI in its current form. Regulators may request additional information or alternative data selection methods.
- The DCI design specifies IDMS as the application's database management system (DBMS). This choice was necessary to ensure the timely completion of the system, but IDMS does not support the degree of flexibility of data access provided by relational DBMS's.
- The carrier edit package is designed to be executed on only one hardware/software platform (IBM/MVS/COBOL). NCCI does not plan to support other platforms. The one platform strategy may limit carrier acceptance of the software.
- The DCI design supports submission of data from carriers on hardcopy or magnetic tape, but specifies that data in error will be returned to carriers on hardcopy only. Additionally, the design does not support submission of data on alternate media such as electronic transfer or microcomputer diskette.
- NCCI has not clearly defined its position on providing and charging for external access to DCI data. They are now drafting a position statement addressing this issue.
- The DCI design does not specify mechanisms for providing external access to DCI data (e.g., magnetic tape, online access, electronic transfer, etc.).

Review of DCI Development Project

Summary Evaluation of DCI Development & Implementation:

Strengths:

- The development of the DCI system followed a structured methodology. This helped to ensure the quality of the final product.
- The DCI development effort and system are well documented. This will help to ensure that the system is maintainable.
- During the DCI development effort, there was a high degree of user involvement. This helped to ensure that the system meets the business objectives of the design.
- The DCI development effort was carried out by a very competent team of users and systems personnel. This team provided necessary business and systems skills to help ensure the successful implementation of the system.
- The conversion plan was developed jointly by NCCI users and systems personnel and approved by industry and regulators. This wide involvement helped ensure that all users of the system are aware of and able to prepare for conversion to the new system and procedures.
- Application programs were developed from detailed specifications and subjected to review by project team members and the Quality Review Board to ensure proper function and compliance to standards. Online programs were further reviewed by the database management group for performance considerations. This approach helped to ensure the quality of the system.

Review of DCI Development Project

- NCCI's primary DCI user conducted a thorough test of the business functions of the new system and demonstrated that the system supports NCCI user requirements.
- An industry test is being conducted to ensure the new system meets the requirements of the insurance carriers who will submit DCI data.
- NCCI is publishing a clear and complete manual explaining expanded DCI forms, edit rules and magnetic tape specifications.
- NCCI is publishing a manual for the DCI carrier edit software package which explains installation and use.

Review of DCI Development Project

Summary Evaluation of DCI Development & Implementation:

Weaknesses:

- Only carriers with DCI systems capable of supporting NCCI's magnetic tape input specifications can use the carrier edit package. Currently, only six carriers submit on magnetic tape.
- NCCI has not completely defined its strategy for providing technical support for the carrier edit package.
- There are no formal plans or guidelines for training industry DCI personnel in completing the expanded DCI forms. Each insurance company is responsible for developing its own training program.
- DCI data used for analysis is stored in VSAM files and accessed by user developed SAS and EASYTRIEVE programs. Relational database technology and user inquiry tools would provide more flexible access to DCI data.
- Program and subsystem integration testing did not include test conditions for every logic path. Also, since input test data was not saved, tests which identified problems could not be easily repeated to verify program corrections. There is some risk that system bugs have remained undetected.
- NCCI's program change control procedures dictate that batch programs are promoted to production by one group and online programs by another. The lack of centralized change management to control changes to the production system could result in coordination problems during production support.

Review of DCI Development Project

Summary Evaluation of DCI Timeliness & Accuracy Standards & Controls:

Strengths:

- The DCI system includes a sample control mechanism which indicates the number of claims a carrier is required to submit.
- The DCI system includes front-end data edits which should help to ensure the quality of data in the DCI database.
- The DCI system automatically requests DCI subsequent and correction reports and monitors their receipt.
- The DCI system produces reports which measure carriers' quality and timeliness performance.
- The WCDM manual will define specific data quality standards and monitoring procedures. If followed, the WCDM program should help ensure the quality of DCI data.

Review of DCI Development Project

Summary Evaluation of DCI Timeliness and Accuracy Standards & Controls:

Weaknesses:

- NCCI's authority to enforce DCI and WCDM quality and timeliness standards is not clearly defined.
- The regulators' role in enforcing DCI and WCDM compliance is not clearly defined.

Review of DCI Development Project

Major Recommendations:

- The NAIC, carriers and NCCI should clearly define NCCI's authority to enforce DCI and WCDM quality and timeliness standards.
- The NAIC, carriers and NCCI should define the regulators' role in enforcing DCI and WCDM compliance.
- The NAIC, through the appropriate task force, should develop a model Workers' Compensation data quality regulation which includes standards for DCI.
- NCCI should solicit formal acceptance of DCI from each state insurance department.
- NCCI should develop a strategy for responding to state regulator requests for detailed claim information not included in the new DCI system.
- NCCI should develop a plan and timetable to require carriers to submit DCI data on electronic media such as electronic transfer, microcomputer diskette or magnetic tape.
- NCCI should explore alternatives to make the carrier edit package usable by more carriers. Such alternatives might include other technical platforms, such as microcomputers, and providing an online entry function with the package. A reasonable goal would be to have 85% of all DCI input pre-validated by carriers using the edit package.
- NCCI should clearly define its strategy for providing technical support for the carrier edit package.

Review of DCI Development Project

- NCCI should assess its DCI database and end user access strategies within the context of its long-term strategic objectives.
- NCCI should develop and publish a standard training program which could be employed by carriers and other users to train their DCI staff.
- NCCI should develop a standard training and support program for insurance regulators who intend to use DCI data.
- NCCI should clearly define its position on providing and charging for external access to DCI data.
- NCCI should determine what mechanisms will be used to provide external access to DCI data.

Review of DCI Development Project

APPENDIX

Review of DCI System Development Project - Interviews

<u>Date</u>	<u>Time</u>	<u>Location</u>	<u>Topics</u>	<u>Interviewee</u>	<u>Position</u>	<u>Status</u>
29-May	11AM	Conf. D	Project Organization	Heard Mahon Eddinger	Head Of Applications Applications Manager User Manager	Complete
29-May	1PM	Conf. D	NAIC Model Regulation User/System Requirements Preliminary System Design	Eddinger	User Manager	Complete
29-May	3PM	Conf. D	User/System Requirements Preliminary System Design Implementation Workplan	Mahon	Applications Manager	Complete
30-May	2PM	Conf. D	Preliminary System Design	Daly	Design Analyst	Complete
30-May	4PM		Preliminary System Design	Beasley	Design Analyst	Complete
31-May	10AM	Conf. D	Database Design Database Administration	McIntyre Lazor Deverson Daly	Database Manager Database Administrator Data Analyst Design Analyst	Complete

Review of DCI System Development Project - Interviews

<u>Date</u>	<u>Time</u>	<u>Location</u>	<u>Topics</u>	<u>Interviewee</u>	<u>Position</u>	<u>Status</u>
3-Jun	10AM	Wikthru	Implementation Workplan Detailed Design Programming Specifications Programming Approach	Daly Wagner	Project Team Leader Project Team Leader	Complete
3-Jun	2PM	Wikthru	Programming Approach	McAllister Wayland	Programmer Programmer	Complete
4-Jun	9AM	Wikthru	Development Environment	Daly Lazor	Project Team Leader Database Administrator	Complete
4-Jun	10AM	Wikthru	Subsystem Integration Testing System Testing (User Acceptance) Industry Testing	Daly Dyer	Project Team Leader Project Team Leader	Complete
4-Jun	1:30PM	Wikthru	Carrier Edit Package	Rissinger Mahon Scott	User Manager Applications Manager User Manager	Complete
4-Jun	3PM	Wikthru	System Testing (User Acceptance) User Procedures & Training	Beasley	User	Complete

Review of DCI System Development Project - Interviews

<u>Date</u>	<u>Time</u>	<u>Location</u>	<u>Topics</u>	<u>Interviewee</u>	<u>Position</u>	<u>Status</u>
5-Jun	10AM	Wlthru	Carrier Edit Package	Dyer Davis	Design Analyst Design Analyst/Programmer	Complete
5-Jun	1PM	Wlthru	Industry Testing Industry Procedures & Training	Rissinger	User Manager	Complete
6-Jun	9:30AM	Conf. B	Weekly Project Management Meeting	Project Mgmt Team		Complete
6-Jun	11AM	Wlthru	Conversion	Eddinger	User Manager	Complete
6-Jun	2PM	Wlthru	Operations Turnover	Vega Daly	Technical Support Project Leader	Complete
6-Jun	3PM	Wlthru	Timeliness & Accuracy Controls (WCDM)	Eddinger Rissinger Mallon	User Manager User Manager Data Quality Director	Complete
7-Jun	9AM	Conf. G	DCI Review Project Status	NCCI Management		Complete

Review of DCI System Development Project - Interviews

<u>Date</u>	<u>Time</u>	<u>Location</u>	<u>Topics</u>	<u>Interviewee</u>	<u>Position</u>	<u>Status</u>
7-Jun	9:30AM	Wlthru	Post Production Support	Heard O'Neal Mahon	Head of Applications Applications Support Mgr Applications Manager	Complete
7-Jun	1:30PM	Wlthru	Conversion	Daly McAllister	Conversion Team Leader Conversion Pgrmer/Analyst	Complete
7-Jun	3PM	Wlthru	Future Enhancements	Eddinger Daly Davis	User Manager Project Lead Project Lead (Edit Pkg)	Complete
10-Jun	8:30AM	The Htfd	Industry Testing Carrier Edit Package Future Enhancements	Valk	Industry Representative	Complete
10-Jun	1PM	Travelers	Timeliness & Accuracy Controls (WCDM)	Crowell	Industry Representative	Complete

Review of DCI System Development Project - Document Reviews

Topic	Title	Contact	Status
Project Organization	Work Request Project Organization Chart Description of Project Team Responsibilities	Eddinger Heard/Mahon Heard/Mahon	Reviewed Unavailable Unavailable
NAIC Model Regulation	NAIC Model Regulation	Eddinger	Reviewed
User/System Requirements	User Requirements Document Mapping to NAIC Model Reg. System Definition	Mahon Eddinger Mahon	Reviewed Reviewed Reviewed
Preliminary System Design	User Design: (Preliminary Design) System Overview Screen Designs Report Designs Data Requirements Field Edits Functional Flow	Mahon	Reviewed
	Technical Design:(Advisability Study & PSD) Technical Architecture (Advisability Study) Program Definition Logical Database Design Physical Database Design Security Requirements Processing Flow	Daly/Mahon	Reviewed

Review of DCI System Development Project - Document Reviews

Topic	Title	Contact	Status
Implementation Workplan	Implementation Schedule	Mahon	Reviewed
	Current Status Workplan	Mahon	Reviewed
Detailed Design & Pgm Specifications	Detailed Design	Daly/Mahon	Reviewed
	Program Specifications	Daly/Mahon	Reviewed
	Design Review/Signoff Log	Daly/Mahon	Reviewed
Programming Approach	Programming Standards	Daly/Mahon	Reviewed
	Selected Source Code	Daly/Mahon	Reviewed
	Unit Test Plans	Daly/Mahon	Reviewed
	Program Review/Signoff Log	Daly/Mahon	Reviewed
Subsystem Integration Testing	Integration Test Plan	Daly/Dyer/Mahon	Reviewed
	Supplemental Test Plan	Daly/Dyer/Mahon	Reviewed
	Integration Test Signoff Log	Daly/Mahon	Reviewed
System Testing (User Acceptance)	System Test Plan	Beasley	Reviewed
	Problem Logs	Beasley/Daly	Reviewed
	System Test Signoff Log	Beasley	Reviewed

Review of DCI System Development Project - Document Reviews

Topic	Title	Contact	Status
Industry Testing	Industry Test Plan	Rissinger	Reviewed
	Problem Logs	Rissinger/Mahon	Reviewed
	Industry Test Signoff Procedures	Rissinger	Reviewed
Conversion	Conversion Plan (Conversion Specifications)	Eddinger	Reviewed
	Conversion Schedule	Rissinger/Daly	Reviewed
User Procedures & Training	User Guide (outline)	Beasley	Reviewed
	User Training Plan	Beasley	Reviewed
	DCI Manual (draft)	Rissinger	Reviewed
	Industry Training Seminar Agenda	Rissinger	Reviewed
	Industry Training Plan	Rissinger	Unavailable
Timeliness & Accuracy Controls (WCDM)	DCI Manual (draft)	Rissinger	Reviewed
	WCDM Instruction Manual (partial draft)	Eddinger	Reviewed
Status Meetings & Issue Resolution	DCI Task Force Minutes	Eddinger	Reviewed
	DCI Project Management Team Meeting Minutes	Mahon	Reviewed
	Weekly Status Letters	Mahon	Reviewed
Carrier Edit Package	Carrier Edit Package Design	Davis	Reviewed
	Carrier Edit Package Manual (draft)	Scott	Reviewed

NAIC

Examination of NCCI

Section II: Ratemaking Procedures
Evaluation of NCCI Ratemaking Methodologies

Volumes I through IV

Book 2

**RATEMAKING PROCEDURES
EVALUATION OF NCCI RATEMAKING METHODOLOGIES**

**NCCI EXAMINATION
VOLUME I - SECTION II
EXECUTIVE SUMMARY**

December 4, 1991

**VOLUME I - SECTION II
EXECUTIVE SUMMARY**

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VOLUME I - SECTION II EXECUTIVE SUMMARY

I. OVERVIEW OF CONCLUSIONS AND RECOMMENDATIONS

A. Introduction

Project Background

The National Council on Compensation Insurance (NCCI) is the major industry-sponsored ratemaking and statistical bureau for workers compensation coverage in the United States. NCCI operates as a rate maker and/or statistical agent in 38 jurisdictions. In some jurisdictions, NCCI only provides advisory pure premiums while in other jurisdictions, it provides the complete manual rates. NCCI promulgates experience rating modifications and manages the operations of the residual market pools for workers compensation in most states where it operates as a statistical agent. As such, NCCI plays a major role in determining the pure premiums and manual rates to be charged for workers compensation insurance coverages throughout the United States as well as in determining the types of ratemaking and statistical information that will be utilized and maintained by the industry.

Milliman & Robertson, Inc. (M&R) was retained by the Florida Department of Insurance to assist with an examination of the data collection and ratemaking operations of NCCI. Joining the Florida Department in conducting the examination were the Maine Bureau of Insurance, the Nebraska Department of Insurance, and the Utah Department of Insurance. The National Association of Insurance Commissioners (NAIC) coordinated the activities of the participating insurance departments in administering the examination and established an Examination Oversight Group (EOG), consisting of regulators from various insurance departments to oversee the examination process.

The overall purpose of the NCCI examination was to evaluate the data collection and data handling activities of NCCI, certain aspects of its ratemaking activities and practical considerations involved in implementing a loss cost system.

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The examination was conducted in three major sections:

- I. Data Collection and Data Quality;
- II. Ratemaking Procedures; and
- III. Loss Cost Implementation.

Arthur Andersen & Co (AA&CO), working as a subcontractor to M&R, had primary responsibility for Section I, the Data Collection and Data Quality phase of the examination. Actuarial consultants from M&R were primarily responsible for the Section II and III phases of the study.

A list of the regulators and consultants who participated in the examination is included in Section III, Examination Personnel, of this document. The specific requirements and conditions of the examination are specified in the Request for Proposal (RFP) for this project which is attached as Appendix A.

This Executive Summary provides an overview of Section II of the examination and outlines the approach, conclusions, and recommendations of the examination of ratemaking procedures at NCCI. This Executive Summary is supported by nine separate reports which examine various ratemaking issues specified in the RFP. These reports are identified as Section II, Volumes II through X. The reports provide additional detail and insight into the examination process and should be reviewed for a thorough understanding of the conclusions and recommendations highlighted in this document.

Similar executive summaries are available, from the NAIC Central Office, for Section I - Data Collection and Data Quality, and Section III - Loss Cost Implementation of the examination.

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Project Objectives

The primary objectives of Section II of the examination were to (1) describe the current ratemaking process of NCCI and (2) perform thorough evaluations of specific areas of that process.

Report Structure

Our report for Section II of the examination is organized in ten volumes:

- I. Section II - Executive Summary
- II. Section IIA - Part 1 - Description of Ratemaking Procedures
- III. Section IIB - Part 1 - Premium and Loss Development Factors
- IV. Section IIB - Part 2 - Expenses
- V. Section IIB - Part 3 - Trend
- VI. Section IIB - Part 4 - Classification Ratemaking
- VII. Section IIB - Part 5 - Law Amendments
- VIII. Section IIB - Part 6 - Alternative Exposure Bases
- IX. Section IIB - Part 7 - Experience Rating Plan
- X. Section IIB - Part 8 - Miscellaneous

The nine underlying ratemaking reports (Volume II through X) should be reviewed in conjunction with the Section I report on Data Collection and Data Quality and the Section III report on Loss Cost Implementation to gain a thorough understanding of

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the examination process. All of the examination reports are available through the NAIC Central Office.

B. Examination Approach

In conducting this part of the examination, we proceeded as follows:

1. Initial Project Meeting - On October 9-10, 1990, the initial project meeting was held in Boca Raton, Florida. All parties to the examination process met to discuss the importance of the examination and the need for confidentiality during the course of the examination. In addition, we reviewed the scope of the examination and emphasized the need for open and timely communications.
2. Identification of Key Contact Personnel - To facilitate the flow of information and data among parties, we identified key contact personnel working on various parts of the examination. This gave the examination team direct access to NCCI staff responsible for the areas under examination.
3. Schedule for EOG Status Reports - In addition to regularly scheduled conference calls with NCCI and/or the EOG, M&R presented status reports to the EOG/NAIC at meetings in Louisville, New York, Charleston, Indianapolis, Salt Lake City, Pittsburgh, and Houston.
4. Informational Meetings and Interviews - Informational meetings were held at NCCI where key members of the NCCI staff could be interviewed. Although meetings were primarily at the Boca Raton headquarters of NCCI, meetings were also held in New York (Law Amendments) and Hartford (Experience Rating).
5. Data and Information Gathering - To accomplish the objectives of the study, we requested a great deal of data and information in paper or electronic format from NCCI. We also gathered other data and information from various independent rating bureaus around the country. Examples of the kinds of data and information gathered by our consultants include:

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- a. NCCI and other independent rating bureau rate filings for the last 2 or 3 rate filing cycles.
 - b. Minutes from various NCCI actuarial or governing committee meetings.
 - c. Premium and loss development data for 11 states for policy years 1973 through 1987.
 - d. Trend data and information for 8 states for policy years 1981 through 1988.
 - e. Historical classification loss experience for the period 1987 through 1990 for twelve states.
 - f. Benefit filings from 6 states for the latest 2 years as well as injury and wage distribution tables underlying benefit formula calculations.
 - g. Experience rating files on computer tapes including individual risk data from 4 states.
6. NCCI Research and Analysis - We utilized the staff at NCCI in researching and analyzing certain topics. Examples include:
- a. Past classification rates were recalculated by NCCI utilizing alternative ratemaking techniques.
 - b. Calendar/accident year loss ratios vs. policy year loss ratios for all NCCI states were analyzed by NCCI for policy years 1986 through 1988 and calendar/accident years 1987 through 1989.
 - c. Trend calculations comparing exponential and linear methods for 37 states and 2 states funds.

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7. M&R Research and Analysis - Based on the data and information gathered, we conducted independent research and analysis into the areas outlined in the RFP. In some cases, as a result of our analysis, we identified areas where additional data and information were required of NCCI or where additional research was beyond the scope of the RFP. With EOG approval, we requested the additional data and/or conducted the additional research.

8. M&R Peer Review Process - Prior to releasing any draft reports to the EOG for discussion purposes, M&R actuaries, other than the authors of the report, were utilized for peer review purposes.

9. EOG Report Review Process - After the M&R peer review process, each draft report was distributed to a team of actuaries who were members of the EOG. The regulatory actuaries serving on the EOG conducted a thorough review of the M&R draft reports. Conference calls were held, and regulatory feedback was received on each report.

10. NCCI Report Review Process - The next step was the issuance of a confidential draft report to NCCI for internal review purposes only. Conference calls were scheduled with M&R and the EOG, and the NCCI staff was given the opportunity to discuss and air issues of concern with the examination team.

11. Final Report Issuance - Based on the review process noted above, M&R issued a final report to the NAIC Central Office for distribution purposes.

During the course of the examination, we received the full cooperation of the staff at NCCI. We recognize that the examination process placed a tremendous burden on NCCI to produce documents and to fulfill data requests and support research activities. NCCI should be commended for their prompt and professional manner in responding to the requests of the examination team.

The contributions of the individual members of the EOG were an essential part of this examination. Although all EOG members contributed significantly, we especially note

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the efforts of Jim Watford of the Florida Insurance Department and Alan Wickman of the Nebraska Department of Insurance.

C. Conclusions and Recommendations

NCCI has fashioned an extraordinarily complex ratemaking system. Many of our recommendations will complicate it further. It is an actuarial fact of life that greater accuracy can rarely be accomplished without further complication. The NCCI ratemaking system strives to be as accurate as reasonably possible and must therefore be complicated. Unfortunately, this results in a process that even actuaries find time-consuming to understand in detail.

Broadly speaking, for the elements studied, our conclusion is that NCCI ratemaking system is not as good as it could be, but that it is a sophisticated system that can ordinarily be expected to produce reasonably accurate results. Many of our recommendations relate to aspects of the current NCCI ratemaking system that we believe are basically reasonable but which can be improved. Only a small number of aspects of the current system were found to generally result in underestimation or in overestimation of the overall rate level.

The major ratemaking elements that we did not study were retrospective rating, target profitability, investment income, and the like. These were identified by the RFP as being outside the scope of the examination.

The more significant conclusions and recommendations are discussed in the remainder of this section. Additional conclusions and recommendations can be found in each underlying report. We stress that it would be unwise to take action on the basis of the Executive Summary alone. The summary statements contained here often cannot convey the complexity of the underlying subject matter. In addition, many of these findings will require significant additional research for confirmation and/or implementation.

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In section II of the Executive Summary, beginning on page 19, we provide a brief explanation of each of the underlying ratemaking reports for those readers unfamiliar with the RFP. Appendix A is a copy of the RFP while Appendix B provides copies of the Tables of Contents from the various reports.

Volume II - Section IIA - Part 1 - Description of Ratemaking Procedures

* Volume II contains a detailed explanation of current NCCI ratemaking procedures. In this volume, several suggestions are made for improvements in the clarity of presentation and the explanatory material included with rate filings. In contrast to the other volumes comprising Part II of the examination, this volume does not contain an analysis of NCCI ratemaking techniques.

Volume III - Section IIB - Part 1 - Premium and Loss Development Factors

* The premium and loss development analysis process cannot be reduced to a single best methodology. No one approach for analyzing development patterns or choosing among several alternative projection methods will be most appropriate in all circumstances.

* We recommend that an average of the ultimate losses resulting from paid and paid plus outstanding (excluding IBNR and bulk reserves) projection methods be used as the primary basis for the rate indications. Deviations from the primary methodology (such as using only the paid method, the paid plus outstanding method, or the incurred method) should be made when appropriate, based on diagnostic tests and consideration of the underlying forces influencing the development patterns.

* Our tests of predictive accuracy indicate that projections of ultimate losses from first report are subject to significant estimation error. This suggests that consideration should be given to using data from more than one policy and/or accident year rather than one policy year and one accident year, as in the current NCCI methodology. We recommend that future NCCI filings develop projections of ultimate, trended loss

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ratios based on the latest two or three policy years or the latest two or three policy and accident years. Judgment will need to be exercised in selecting standard weights (or a variable weighting system), although tests of predictive accuracy may be helpful in making this judgment.

* We recommend that NCCI expand the diagnostic tests to enhance their ability to analyze loss development patterns. To assist in the evaluation of changes in loss development patterns, several such tests are identified in this report, some of which can be calculated with currently available data.

* Development factors based on all three types of data studied (paid, paid plus outstanding, and incurred losses) tended to underestimate the ultimate losses by approximately equal amounts, on average, for the time period studied in this report. This resulted from an upward trend in loss development factors at early stages of development and does not, in our opinion, indicate an inherent flaw in loss development methods.

* We recommend the collection of additional claim count data (number of claims closed with indemnity payments), for use in diagnostic tests of loss development.

Volume IV - Section IIB - Part 2 - Expenses

* NCCI expense provisions have overstated the actual amount of expenses incurred by the companies. This observation is apparent in both general and production expenses. NCCI expense analysis procedures should be improved so that expense provisions more closely relate to actual expenses. To the extent that verifiable trends are apparent, NCCI should reflect them. The effect of this overstatement on final policyholders costs depends on many factors including the adequacy of loss cost estimates and the effect of individual state regulatory actions.

* NCCI compares general expenses to net earned premium. We recommend that NCCI compare general expenses to direct earned premium. NCCI should also

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combine the expense experience of stock and mutual companies in establishing general expense indications. Based on recent experience, this is not expected to have a material impact on the selected expense provision.

* NCCI does not collect data useful to the analysis of the NCCI production expense provision of 15% for the first \$5,000 of standard premium. We recommend that NCCI review production expenses annually, as it does for other expenses, in establishing production expense provisions. NCCI should establish a production expense element based on actual experience rather than the budgetary approach by comparing direct production expenses to direct written premium.

* Historically, NCCI has based their Loss Adjustment Expense (LAE) provision on a review of net and direct calendar year experience. In order to enhance their ability to analyze LAE, NCCI issued a special call to collect accident year direct paid and outstanding losses, Allocated Loss Adjustment Expenses (ALAE), and Unallocated Loss Adjustment Expenses (ULAE). We recommend that NCCI rely on the special call data (direct experience) by accident year in establishing the LAE provision. Based on reviewing the latest special call data, an LAE provision between 12.0% and 12.5% of losses is indicated.

* We recommend that NCCI collect ALAE experience by claim and that ALAE be treated like losses for ratemaking purposes. We worked with NCCI to design a survey to sample small, medium, and large companies to determine the cost of collecting ALAE by claim. The cost estimate, .05% of workers compensation premium for insurers and \$1.4 million for NCCI, is sufficiently low in relation to the benefit that we recommend ALAE be collected by claim effective January 1, 1993. However, a transition program may be appropriate for companies which will incur a high relative cost.

* The RFP asked M&R to review the appropriateness of tempering the NCCI expense provision when large rate increases are indicated. We concluded that expense provisions should generally not be tempered.

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* NCCI data suggests that there are expense variations from state to state, and we recommend that additional research be performed to determine the appropriateness of varying expense levels by state. To the extent that verifiable differences exist by state, NCCI should reflect state expense levels in the ratemaking process.

* The data from the 1982 Expense Study does not indicate that there are any significant biases by size of risk. However, we recommend that (1) the expense study by size of risk be updated more often than every nine years, and (2) the expense study by size of risk should incorporate all production expenses (i.e., commission, brokerage and other acquisition expenses), rather than just other acquisition expenses.

Volume V - Section IIB - Part 3 - Trend

* In the past, NCCI utilized linear trending procedures, which tend to yield lower trend indications than exponential trending procedures. Within the last year, NCCI has begun to use exponential trending as a standard procedure. Our tests, based on projection accuracy in recent years, support this change with regard to medical losses. For indemnity losses, our test results are not conclusive, but tend to favor the exponential procedures over the linear procedures. We recommend that NCCI perform tests similar to those contained in this report on a periodic basis (e.g., every two years) to reflect the then more current conditions.

* We recommend that NCCI move toward the adoption of a Bayesian credibility approach for weighting state and countrywide trend indications, unless subsequent investigation reveals an unanticipated problem.

* We recommend that NCCI perform extensive analysis of econometric models to better evaluate and reflect the impact of economic changes on losses.

* We recommend changes to the NCCI approach for recognizing benefit changes in ratemaking. The proposed alternative approach will facilitate econometric analysis, but is likely to increase projection accuracy to only a small degree. Because its impact

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on rate accuracy would be slight, we do not consider this a high priority recommendation.

Volume VI - Section IIB - Part 4 - Classification

- * We found that lengthening the experience period used for classification ratemaking from three to five years tended to improve the accuracy and consistency of the methodology in identifying relative loss cost differences among classes.
- * We recommend that NCCI increase the number of years of experience used from three to five unless additional tests by NCCI, using methodology we developed for this examination, are not consistent with the results we obtained. We have not tested the impact of the use of more than five years and thus have formulated no opinion regarding the use of more than five years of data.
- * There is an inconsistency in the loss limitations inherent in the three partial pure premiums currently used in calculating the pure premiums derived by formula. We recommend that NCCI modify its methodology to overcome this inconsistency.
- * We examined losses in excess of the current loss limitation and found, based on the limited data available, that different classes may have different expected losses above the loss limitation than the remaining classes in their industry group. We recommend that NCCI further test this with additional data and, if the results continue to hold, address the effect this has on classification ratemaking methodology.
- * We reviewed the composition of the "All Other" industry group. We recommend that NCCI further investigate subdividing this industry group into smaller, more homogeneous industry groups. Given the size of the "All Other" group, we believe that the resulting sub-groups could result in industry groups large enough to have full statistical credibility.

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Volume VII - Section IIB - Part 5 - Law Amendments

- * For "formula" benefit changes, NCCI's pricing methodology seems to be working satisfactorily ("formula" benefit changes are those for which NCCI applies standard benefit tables and distributions in its cost evaluation).
- * In some non-formula situations, NCCI appears to apply formula techniques when those techniques are not appropriate. In other more recent cases, NCCI has applied new data sources and new estimation techniques. NCCI should improve the method of identifying law changes significant enough to require the use of "non-formula" techniques.
- * NCCI should increase the utilization of state specific information regarding the workers compensation benefit system being analyzed.
- * NCCI should improve the explanatory material included with a benefit pricing report.

Volume VIII - Section IIB - Part 6 - Alternative Exposure Bases

- * No single exposure base for workers compensation (or any other line of insurance) is ideal for all circumstances. Unlimited payroll appears to provide the most reasonable compromise between theoretical and practical considerations for most insureds.
- * The introduction of the Revised Experience Rating Plan (RERP) will mitigate the premium basis inequities inherent in the current rating system for many insureds.
- * A further analysis of insured characteristics indicates that, despite the combined application of unlimited payroll and RERP, theoretical inequities in the rating system can remain. For purposes of this report, we refer to any unidentifiable premium disparity remaining after application of all aspects of the rating structure, including experience rating, as residual inequity. By testing the impact of the rating system in

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various hypothetical situations, we conclude that this residual inequity is most likely to exist for insureds with the following joint characteristics:

They are concentrated in classes with a wide range of verifiable average hourly wages.

The wage variation has no logical relationship to occupational hazard specific to a given type and locale of activity.

The insureds are either too small to qualify for, or have low credibility under RERP.

* The residual inequity can be further mitigated through a wage rate recognition plan limited to those classes with a demonstrated problem and with hours worked data readily available and verifiable.

We do not conclude that recognition of wage rates within the rating structure for all classes of insureds would ultimately improve the equity of the system. It is impossible to identify all who benefit (and all who do not) from such a universal change. However, it is clear that such a universal change would provoke a largely unnecessary disturbance in the workers compensation system with regard to rates and procedures.

* We believe that the costs associated with universal collection of hours worked or average hourly wage could be as much as 0.4% to 0.7% of collected premium. Even at that cost, there is no guarantee that the data collected will be accurate and usable. Furthermore, these additional expenses could be concentrated in those employments least likely to realize an equity enhancement through wage rate recognition.

* We recommend judicious use of wage rate recognition plans only for those states and classes of employment identified as having residual inequities after application of RERP to the unlimited payroll exposure base. The intent of this recommendation is to introduce wage rate differentials as a refinement of the classification system without creating new inequities or extraordinary expenses.

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Volume IX - Section IIB - Part 7 - Experience Rating Plan

* We have evaluated the accuracy of the Revised Experience Rating Plan (RERP), and find it performs better than the prior experience rating plan which it replaces. We conclude that the NCCI's method of introducing the RERP does not tend to result in a premium increase or decrease.

* We investigated an alternate experience rating modification formula which is a combination of both a formula used by the Insurance Services Office and the current NCCI approach. The alternate formula would adjust expected excess losses by an experience modification factor based on primary losses, whereas the current NCCI expected excess losses are not affected by the actual primary losses. We believe that the alternate formula can be expected to produce more accurate results than the RERP (or a version of the RERP in which the parameters have been optimized as in the alternate formula). However, the degree of improvement is not clear. We recommend that further testing be done by NCCI using more states and more time periods to evaluate the degree of improvement produced by the alternate formula. If the degree of improvement is found to be substantial, then we would recommend implementing the alternate formula as soon as is practical. If the improvement is found to be minor, then the practical difficulties involved in implementing a change in the formula make it appropriate to postpone implementation until such time as other significant changes are being implemented, or possibly to forego implementation altogether. This will be a matter of professional judgment.

* Our testing, using the alternate formula and an optimized version of the RERP, suggests that the accuracy of the experience rating plan would be improved by expanding the experience period to five years from the current three years. However, inclusion of the fourth and fifth years of experience would entail significant implementation costs as well as substantial ongoing costs. In addition to the impacts on accuracy and cost, extension of the experience period to five years could affect the perception of the plan's reasonableness by policyholders. Some policyholders already

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consider it inappropriate to use data as old as the oldest year currently used in experience rating; the addition of two older years would exacerbate this perception.

* We recommend several changes in the calculation of the Expected Loss Rates and D-ratios used in experience rating in order to make them more accurate.

* Standard NCCI methodology does not address changes in experience rating off-balances, although adjustments have been made by NCCI in some cases. We recommend that standard NCCI methodology identify off-balance levels and movements during the experience periods used for trending and rate level indications. An attempt should be made to determine the cause of significant off-balance changes whenever they are seen. Proper action in response to significant off-balance changes would be a function of the cause identified. We would recommend that adjustments not be made when changes are attributed to a change in the mix of risks insured. We would expect adjustments to be appropriate when changes in off-balance are attributed to changes in the experience rating plan itself (e.g. rules, such as eligibility requirements, or formulas such as those for calculating ELR's), or delays in updating ELR's and D-ratios, due to prior delays in the approval of rate changes. The adjustments could result in either an increase or a decrease in the indicated rate change, depending on the circumstances.

Volume X - Section IIB - Part 8 - Miscellaneous

* Minimum premium risks appear to have consistently worse loss ratios than all other risks. Due to the relatively small premium contribution from minimum premium risks and the size of the loss ratio differential, their effect on overall loss ratios is small. It is not clear what loss ratios will ultimately result from NCCI's current program of minimum premium multipliers. NCCI should continue to study the loss ratio experience of small risks.

* If premium levels for minimum premium risks were increased, either through increasing the minimum premium multipliers or adding a loss constant, insurers might be more willing to provide voluntary coverage to these risks. On the other hand,

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there are a significant number of minimum premium risks and there is likely to be some dissatisfaction after a price increase targeted at minimum premium risks. Due to the low impact of minimum premium risks on the overall loss ratio, we believe that the policy of whether or not to change the pricing of minimum premium risks should be governed by its practical effects, rather than its actuarial significance.

* In general, we believe that the standard NCCI procedures to reflect additional revenue from residual market policies are reasonable. However, we have a number of concerns regarding some related issues. These include the need to improve explanatory material in the rate filing and the need to reflect net premium programs in all states as a standard methodology. In addition, we note that experience rating of assigned risks has the potential to double-count adverse experience in states that charged a surcharge that was high enough to eliminate residual market shortfalls.

* In general, the policy year and accident year loss ratios used in recent filings appear to be consistent with each other. We recommend that NCCI continue to investigate the reasons for the premium differences in those states where they are most pronounced. We also recommend that NCCI strengthen the process for editing carriers' future calendar and policy year premium reports for consistency.

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II. SECTIONAL OVERVIEWS

For readers unfamiliar with the details of the RFP, we present below an overview of each of the sections of our report. These overviews briefly describe the analysis undertaken and do not contain any conclusions or recommendations. Appendix B provides the Table of Contents for each of the underlying reports in order to give further insight into the issues examined.

A. Volume II - Section IIA - Part 1 - Description of Ratemaking Procedures

There are three general situations in which NCCI performs ratemaking functions:

1. Administered Pricing System
2. Advisory Rate System
3. Loss Cost System

This section of the examination provides a general description of how ratemaking operates at the NCCI in other than a loss cost system. Our report describes NCCI's current annual ratemaking procedures, including standard methodologies and alternative approaches used in particular circumstances. A discussion of the assumptions underlying the NCCI's procedures and the methods used by NCCI to test these assumptions is also included.

Since this section deals with the documentation of current procedures, there are no conclusions and recommendations contained therein.

B. Volume III - Section IIB - Part 1 - Premium and Loss Development Factors

The determination of an overall rate level requirement is generally based on an estimate of the ultimate loss ratio for the period during which the rates will be in

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effect. This estimate is often derived from the ultimate loss levels of prior periods, which are also estimated.

One of the fundamental concepts underlying most actuarial projections of ultimate losses is that of loss development. Losses are aggregated by accident year or policy year and evaluated at different valuation dates. The ratios of the losses at each successive valuation are known as development factors.

When experience is analyzed on a policy year basis, a similar development technique is used in estimating the total premiums on policies insuring the claims.

In this part of the examination, we had two primary objectives:

- 1a. Evaluate the NCCI's premium and loss development techniques.
- 1b. Evaluate the NCCI's procedures for reconciling differences that occur between different development techniques and evaluate the effectiveness and likely accuracy of the criteria they use to choose one technique over another.

We reviewed NCCI's process for determining and selecting development factors. Performance tests of current methodology, measured against various alternatives, were conducted for a variety of states. We analyzed issues such as the number of years entering the development factor calculation, the use of multiple state data, as well as the selection of tail factors.

C. Volume IV - Section IIB - Part 2 - Expenses

A critical consideration in the development of a final rate is the expense factor. This component of M&R's examination of the ratemaking procedure used by NCCI discusses the methodology NCCI uses to incorporate expenses in the ratemaking process, evaluates the appropriateness of that methodology, and suggests improvements. As the RFP makes clear, NCCI's treatment of expenses is complicated by many factors. Is it appropriate to use an average, a budgeted amount, or a factor

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that reflects individual company experience? These factors are all, in a sense, interrelated in how they impact the final workers compensation premiums paid by insureds.

In this part of the examination, we had six primary objectives:

- 2a. Evaluate NCCI's expense methodology
- 2b. Costs and benefits of collecting ALAE by claim
- 2c. State specific expense issues
- 2d. Budgeted approach to acquisition expenses
- 2e. Justification for dual expense discounts
- 2f. Equity of premium discount programs and expense constants

In responding to the above objectives, we analyzed the current NCCI expense methodologies by reviewing the expense data utilized and testing alternative methods for their effectiveness and cost.

D. Volume V - Section IIB - Part 3 - Trend

In ratemaking, historical experience is used to project the loss ratios expected for the period during which rates will be in effect (the rate effective period). Due to the time necessary to compile the historical experience, prepare rate filings and, where necessary, gain regulatory approval, two or three years can elapse between the historical experience period and the rate effective period. During that time, many factors can influence loss ratios, including differences between medical and wage inflation, changes in the utilization of medical services, changes in claim frequency, and shifts in frequency between types of injuries. The purpose of trend is to measure

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these changes and to include a provision in the rate level for anticipated changes between the experience period and the rate effective period.

Trend factors are used to reflect the impact of a complex array of forces, including economic and social changes, on losses and wages. A variety of approaches are possible for estimating trends, varying from mathematically simple to mathematically complex methods, and varying from use of a curve fit for extrapolation of a series of past points to in-depth analysis of the forces influencing past points and the projection of the future course of such forces.

In recent years, loss trends have generally exceeded wage trends, particularly for the medical component of losses. Simple extrapolation of this relationship into the future is not appropriate without examining the underlying forces and evaluating the likelihood of their continuation.

In this part of the examination, we had six primary objectives:

- 3a. Evaluate NCCI's trend procedures
- 3b. Evaluate changes to NCCI's trend procedures
- 3c. Evaluate the impact on NCCI's trend procedures of significant legal or economic changes
- 3d. Evaluate an alternate method of adjusting for benefit changes
- 3e. Evaluate possible distortions in premium on level factors
- 3f. Evaluate possible distortions in benefit on level factors

We reviewed NCCI's general trending procedures and analyzed alternative trending methods for comparison purposes. We reviewed issues such as the trend period, the data underlying the calculations, the statistical approach utilized and the use of multiple state data, as well as the application of credibility concepts.

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E. Volume VI - Section IIB - Part 4 - Classification Ratemaking

An integral aspect of NCCI's ratemaking efforts is the allocation of the overall rate level change to individual classifications. This step is important in determining the relative equity of the premiums to be charged members of each rating class. The process involves analyzing data by classification as produced by the Workers Compensation Statistical Plan (WCSP) and converting this information into a final classification rate indication.

In this section, the examination was to concentrate on the following three objectives:

- 4a. Study and recommend alternatives to NCCI's current approach to credibility, their practice of using three years of data for classification ratemaking, and loss limitations used in those calculations.
- 4b. Evaluate whether procedures for determining industry group relativities could be enhanced by using more years of experience.
- 4c. Evaluate the application of trend factors in classification ratemaking.

We addressed these objectives theoretically and empirically. We first reviewed the theory underlying the current methodology to identify the procedures used and to understand their impact on NCCI rates. We then identified specific alternative procedures to be tested.

On the empirical level, we designed tests of the accuracy and consistency of the methodology in identifying relative loss cost differences among the classes. These tests can be used by NCCI to evaluate other alternatives.

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F. Volume VII - Section IIB - Part 5 - Law Amendments

NCCI is frequently called upon to estimate the impact of statutory revisions that affect benefit levels to determine their impact on loss levels. As states focus on workers compensation cost containment, it is important that the methodologies used by NCCI to price benefit changes be as accurate as possible.

According to NCCI, a benefit change (statutory revision) can be categorized as a "formula" or "non-formula" type change. However, this identification is not always clear cut. NCCI considers a formula change to be any change that can be priced through use of the existing databases and distribution tables, and a non-formula change to be a change that requires additional data and information.

In this section of the report, we address the following four issues:

- 5a. NCCI's procedures for determining the expected loss changes due to revisions in weekly benefits, waiting periods, escalation provisions, and medical fee schedules (formula benefit changes).
- 5b. The appropriateness of the 1973 Standard Wage Distribution Table.
- 5c. NCCI's performance in analyzing non-formula benefit changes.
- 5d. Whether different wage distribution tables should be used for different class groups.

For use in this report, a formula change was taken to be any benefit revision that involved changes in one or more of the following items: maximum weekly benefit, benefit level as a percentage of gross wages, waiting periods, retroactive periods, escalation rates, or medical fee schedules. All other benefit changes were considered non-formula.

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In our review of formula type changes, we discussed basic pricing parameters and assumptions, the data and distribution tables used by NCCI as well as NCCI's formula pricing methodology.

As respects NCCI's non-formula techniques, we reviewed the effectiveness of NCCI when presented with non-formula type benefit changes. To accomplish this goal, we reviewed the alternative data sources and techniques used by NCCI to price non-formula type changes in states where changes have been implemented.

In addition to studying NCCI's current approach to pricing benefit changes, we have analyzed, where necessary, alternative methods for pricing benefit changes.

G. Volume VIII - Section IIB - Part 6 - Alternative Exposure Bases

The exposure base is the fundamental measurement of an insured's exposure to loss. The exposure base is multiplied by the rate specified by the rating manual to derive the manual premium for the insured. The total premium collected during the policy term is the manual premium adjusted for experience rating modifications, premium discount, expense constant and minimum premium considerations, and other rating variables (e.g., schedule and retrospective rating) that may apply. In most jurisdictions and for most classifications, the current exposure base used by NCCI is unlimited payroll. This base has been used for at least 10 years in most states. However, at various times, limited payroll, hours worked, number of employees and several combinations thereof have been espoused as preferred alternatives to unlimited payroll.

Currently, the discussion on exposure bases centers on whether or not equity in rating can be enhanced by recognizing wage rate differences among insureds within the same classification.

As part of its examination of NCCI ratemaking procedures, M&R was directed to respond to the following two questions:

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6a. What improvement in rate equity could be expected from a system recognizing wage rates (if available) in addition to unlimited payroll?

6b. What additional expenses would be expected from administration of a system using wage rates?

The scope of the assignment did not involve collection and compilation of original data. Instead, M&R was to rely on data compiled from past studies of alternative exposure bases.

We compiled and reviewed existing studies on alternate exposure bases and the expense associated with each alternative.

H. Volume IX - Section IIB - Part 7 - Experience Rating Plan

The Experience Rating Plan (ERP) is intended to increase the accuracy of the premium calculation system by incorporating the recent experience of an insured as an enhancement to the classification process. The NCCI ERP is a prospective rating plan; i.e., it is used to determine the rate for a policy period prior to the availability of actual claim experience for that period. The ERP provides a refinement to the class rates which are determined by the type of business, in an effort to assess the appropriate premium rate for a particular insured.

The ERP results in an experience modification factor which is applied to the manual rate in order to determine the rate for a particular insured.

The fundamental technique in experience rating is to compare the historical experience of the insured with the expected experience (based on the insured's class) in order to adjust the price of the insurance provided. Currently, the process calls for three years of experience and smaller risks are not eligible for experience rating. The data used for experience rating is based on the WCSP.

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The objectives for this phase of the examination called for an evaluation of the following issues:

- 7a. NCCI's procedures and formulas.
- 7b. The number of years used in experience rating.
- 7c. Extension of the plan to small risks.
- 7d. The current formulas for ELR's and D-Ratios.
- 7e. The premium impact of implementing the Revised Experience Rating Plan (RERP).
- 7f. The impact of the experience rating plan off-balance on ratemaking methodology.

We analyzed the accuracy and equity of NCCI's RERP and have suggested improvements. We also studied the benefit and cost of using more than three years of data for experience rating.

I. Volume X Section IIB - Part 8 - Miscellaneous

In this part, we discuss the various ancillary issues that impact the ratemaking process.

The four objectives evaluated in this part included:

- 8a. Loss and expense ratios of minimum premium insureds.
- 8b. Additional premiums due to residual market surcharges.
- 8c. Experience rating plan off-balance (This objective was transferred to Section IIB - Part 7f).

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8d. Calendar/accident year vs. policy year loss ratios (This objective was added by the EOG during the course of the examination).

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III. EXAMINATION PERSONNEL

A. Examination Oversight Group

The following regulators were members of the Examination Oversight Group:

Commissioners:

William McCartney	Director, Nebraska Department of Insurance
Harold C. Yancey	Commissioner, Utah Department of Insurance
Tom Gallagher	Commissioner, Florida Insurance Department
Joseph Edwards	Superintendent, Maine Bureau of Insurance
Jeri Brown	Acting Superintendent, Maine Bureau of Insurance

Examination Coordinators:

James D. Watford	Actuary, Florida Insurance Department
Alan E. Wickman	Actuary, Nebraska Department of Insurance
Robert Klein, Ph.D.	NAIC Central Office

Other members of the review team:

Kevin J. Conley	Actuary, Iowa Insurance Division
Michael R. Lamb	Actuary, Oregon Department of Insurance and Finance
Richard Johnson	Actuary, Maine Bureau of Insurance
Martin M. Simons	Actuary, South Carolina Insurance Department
Robert A. Bailey	Deputy Commissioner, Michigan Insurance Department
Eric Nordman	NAIC Central Office
James Rose	NAIC Central Office

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B. Examination Consultants

The following consultants were responsible for Section II - Ratemaking

Overall Project Administration	James R. Berquist, FCAS E. Frederick Fossa, FCAS
Peer Reviewers	Allan M. Kaufman, FCAS Michael A. McMurray, FCAS
Section IIA - Part 1 - Description of Ratemaking Procedures	Daniel J. Flaherty, FCAS Janet G. Lockwood, FCAS
Section IIB - Part 1 - Premium and Loss Development Factors	Patrick J. Grannan, FCAS Gary R. Josephson, FCAS
Section IIB - Part 2 - Expenses	Allan M. Kaufman, FCAS Brian Z. Brown, FCAS
Section IIB - Part 3 - Trend	Patrick J. Grannan, FCAS Spencer M. Gluck, FCAS Susan E. Witcraft, FCAS
Section IIB - Part 4 - Classification Ratemaking	Roger M. Hayne, FCAS Michael A. McMurray, FCAS
Section IIB - Part 5 - Law Amendments	Allan M. Kaufman, FCAS John Herzfeld, FCAS
Section IIB - Part 6 - Alternative Exposure Bases	Michael A. McMurray, FCAS Richard S. Biondi, FCAS Robert J. Finger, FCAS Brett E. Miller, ACAS (AA&CO)
Section IIB - Part 7 - Experience Rating Plan	Patrick J. Grannan, FCAS Richard S. Biondi, FCAS Mark W. Mulvaney, FCAS Marvin Pestcoe, ACAS
Section IIB - Part 8 - Miscellaneous	John Herzfeld, FCAS Gary R. Josephson, FCAS Patrick J. Grannan, FCAS

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C. NCCI Key Personnel

The following were important contact personnel at NCCI:

Overall Project Administration	W. Hager, Esq. R. Hilton R. Retterath, FCAS
Review Coordinators	M. Dolan, FCAS R. Blanco, ACAS J. Mallon
Section IIA - Part 1 - Description of Ratemaking Procedures	R. Yenke P. Langdon
Section IIB - Part 1 - Premium and Loss Development	P. Langdon B. Spidell, FCAS
Section IIB - Part 2 - Expenses	J. Gillam, FCAS F. Leederman
Section IIB - Part 3 - Trend	P. Langdon J. Gillam, FCAS
Section IIB - Part 4 - Classification Ratemaking	R. Yenke S. Fandrey
Section IIB - Part 5 - Law Amendments	B. Llewellyn, ACAS G. Phillips, FCAS
Section IIB - Part 6 - Alternative Exposure Bases	J. Mallon B. Llewellyn, ACAS

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Section IIB - Part 7 - Experience Rating Plan

W. Gillam, FCAS
M. Washburn, ACAS

Section IIB - Part 8 - Miscellaneous

R. Yenke
R. Muller

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APPENDIX A: NAIC REQUEST FOR PROPOSAL

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REQUEST FOR PROPOSAL

PART I GENERAL INFORMATION

1-1 Purpose

The purpose of this request for proposal (RFP) is to provide information and guidelines for the submission of proposals to the Florida Department of Insurance (hereafter referred to as "the Department") by consulting firms for an examination of the structure and operations of the National Council on Compensation Insurance (NCCI).

This examination will be conducted under the examination authorities of the Florida Department of Insurance, the Maine Bureau of Insurance, the Nebraska Department of Insurance, and the Utah Department of Insurance. The examination is intended to address areas of concern to these states as well as other states with respect to the structure and operations of the NCCI. The National Association of Insurance Commissioners (NAIC) will be coordinating the activities of the four departments in administering the examination but is not a party to the contract with the consultants.

1-2 Issuing Office

The issuing office is the Florida Department of Insurance, Purchasing Section, Division of Administration, Room G-59, Larson Building, Tallahassee, Florida 32399-0300, 904/488-4984.

1-3 Contract Consideration

Due to the nature of the work to be performed, consideration will only be given to consultants with sufficiently qualified people in the areas of actuarial science, computer auditing, statistical analysis, financial and management consulting to undertake a detailed and comprehensive examination of a workers' compensation rating organization.

1-4 Acceptance

The Department reserves the right to accept or reject any or all proposals and to award the ensuing contract in the best interest of the State of Florida and the other participating states, as named above. Any material conflict of interest arising out of current or past work performed for the NCCI could cause the rejection of a proposal.

1-5 Developmental Costs

Neither the Department, nor the other participating departments, or the NAIC or any other state or agency of any other state is liable for any of the costs incurred by the respondent in preparing a proposal in response to this RFP.

1-6 Questions

Only questions in writing concerning this RFP will be received before July 13, 1990 by Robert Klein, Director of Research, NAIC, 120 West 12th

Street, Suite 1100, Kansas City, Missouri. A list of the questions received and written answers to those questions will then be distributed by First Class U.S. Mail to all recipients of this RFP by July 20, 1990. Questions received after July 13, 1990 will not be answered.

1-7 Agenda

Any significant change made in the RFP will be brought to the attention of those who have demonstrated interest in responding to the RFP and adequate time will be allowed for response.

1-8 Schedule

The following schedule will be strictly adhered to in all actions relative to this procurement.

- A. June 29, 1990: RFP issued.
- B. From June 29, 1990 to July 13, 1990, written questions will be received.
- C. All proposals are due by 3:00 p.m. on July 27, 1990 in the issuing office (see Part 1-15).
- D. From July 27, 1990, proposal evaluation will begin.
- E. A site visit at the offices of the NCCI on July 10, 1990 (see Part 1-17). The purpose of the site visit is to allow bidders to obtain information on the data systems and procedures of the NCCI.
- F. Oral presentation if required will be scheduled during the period August 21 to August 23. Since this will require coordination of evaluation committee members from four states and the NAIC, respondents should be prepared to attend on relatively short notice.
- G. Notice of the Department decision will be posted on August 24, 1990 in the issuing office (see Part 1-15).
- H. Following the evaluation negotiations and necessary concurrences between the Department and successful respondent, a contract award will occur.

1-9 Proposal Content and Signature

To facilitate an objective review, eleven (11) copies of the proposal will be required with a separately sealed cost proposal. All copies must be signed by a company official with power to bind the firm to its proposal for a sixty (60) day period. To be considered, all proposals must be completely responsive to the RFP.

1-10 Proposal Preparation

All respondents will provide a straightforward and concise description of their ability to meet RFP requirements (see Part IV). The

proposal must specify the approach to the development (i.e., computer programs, tables, reports, etc.) of the final product.

1-11 Prime Responsibilities

The selected respondent will be expected to assume responsibility for all services offered in his proposal. The selected respondent will be the sole point of contractual matters including payment of any and all charges resulting from the contract.

1-12 Project Control

Control of the project shall remain the total responsibility of the Department and the other participating departments.

1-13 Rules for Proposal

The signer of the proposal must declare that the only person, persons, company or parties interested in the proposals as principals, are named therein, that the proposal is made without collusion with any other person, persons, company or parties submitting a proposal, that it is in all respects fair and in good faith without collusion or fraud, and that the signer of the proposal has full authority to bind the principal.

1-14 Regulations

The selected firm or individual will be required to comply with all applicable State of Florida regulations and contract provisions. The ensuing contract shall contain such contractual provisions or conditions necessary to define a sound and complete agreement and to satisfy state regulations and statutory requirements of the Department.

1-15 Proposal Submission

The proposal must be submitted (per schedule in Section 1-8) to Ina Boykin, Purchasing Director, G-59 Larson Building, Tallahassee, Florida 32399-0300 telephone (904) 488-4984.

1-16 Proposal Timetable

The final report for the project may be completed on a section by section basis. The final report for Section III Practical Considerations in Implementing a Loss Cost System shall be submitted by November 15, 1990. The final reports for Sections I and II shall be submitted no later than May 15, 1991. If the respondent can complete reports sooner, then this should be noted in the proposal.

1-17 NCCI Site Visit

A site visit at the offices of the NCCI at 750 Park of Commerce Drive, Boca Raton, Florida, is scheduled for July 10, 1990, beginning at 9:00 a.m. The purpose of the site visit is to allow bidders to obtain information on the data systems and procedures of the NCCI. NCCI personnel will be available to answer questions at this meeting. Any other questions concerning the RFP should be submitted to Bob Klein in accordance with Part 1-6.

PART II INFORMATION REQUIRED FROM RESPONDENTS

Proposals must be submitted in the format below:

2-1 Organization and Credentials

Provide a listing showing all persons who will work on the project along with their experience and qualifications. Any work for the NCCI by any person who will be involved in this project over the past 5 years should be clearly noted and explained. Any potential conflict of interest arising out of current or past work performed for the NCCI by the respondent or any subcontractor should be clearly noted and explained. Also, provide an estimate of the number of hours per week that each person would be available. A separate listing should show those persons who would participate on a peer review basis as opposed to being active in the research or drafting of the reports. A separate section should show the computer hardware and systems capabilities that will be used in the project.

2-2 Respondent's Understanding of the Project and Workplan

Provide a precise rendering of the respondent's understanding of the project.

2-3 Subcontractors

Identification of any contemplated subcontractor(s) is required, with identification of personnel to be assigned, their qualifications, and experiences and specific details of how the subcontractor(s) will be used, the work products the subcontractor(s) will produce and the costs for these services.

2-4 Services of the Department, Other Participating Departments, the NAIC and the NCCI.

Respondents should indicate any data they might require from the NCCI or other sources as well as assistance anticipated from Department, other participating departments or the NAIC in acquiring such data.

2-5 Cost Proposals

A Cost Proposal attached to the eleven (11) copies of the proposal must be separately sealed and submitted to the Department utilizing the standard form attached to this RFP and in accordance with the provisions outlined in Part I of this RFP. A separate cost form should be submitted for each of the following parts of the project: Section I.A.; Section I.B.; Section II.A.; Section III; and under Section II.B. each of the following: 1a, 1b, 2a, 2b, 2c, 2d, 2e, 2f, 3a, 3b, 3c, 3d, 3e, 3f, 4a, 4b, 4c, 5a, 5b, 5c, 5d, 6a, 6b, 7a, 7b, 7c, 7d, 8a, 8b, and 8c. A separate cost form should show a consolidation for the entire project. Costs should be based on the hourly fees of required personnel clearly stated and the anticipated hourly involvement of such personnel.

2-6 Additional Information and Comments

Comments under this heading are encouraged and left to the discretion of the respondent. Material should be pertinent to the proposal but not otherwise required in the RFP.

PART III PROPOSAL REVIEW/CRITERIA FOR SELECTION

3-1 Submission

Proposals will be submitted initially on the most favorable terms from both technical and cost standpoints. The date and time of submission (see Part I, 1-8) will be strictly adhered to.

3-2 Proposals for Specific Parts of the Examination

The overwhelming preference is to award the contract to one entity for the entire project. The reason for this preference is the interrelationship between the various sections of the examination. Information or insight gained in one part of the examination could prove to be crucial to other areas of the examination. However, proposals to perform specific part(s) of the project will be accepted. The burden will be on the respondent to explain why and how the project can be performed by several providers and integrated into one final project.

3-3 Proposal Review

The proposals will be reviewed and necessary negotiations conducted by the Department, other participating departments and NAIC personnel. Oral presentations may be required to assist in the final selection of proposals.

3-4 Evaluation

Proposals will be evaluated and the respondent selected on the following criteria with a maximum possible total points of 100.

Weighting Factors for Evaluation of Proposals:

<u>Points</u>	<u>Weighting Criteria:</u>
15	A. The quality of the proposal submitted and the demonstrated understanding of the nature of the analysis and report required.
10	B. Time frames for completion of research and delivery of final reports.
20	C. Cost factors.
	D. The quality and adequacy of the team assembled, including computer hardware and system capabilities, to perform the underlying research and draft of the report(s). This involves consideration of the factors shown under D.(1), D.(2), and D(3). The total points

allowed for D. is 55 which is composed of 20 points for D.(1), 20 points for D.(2) and 15 points for D.(3).

- | | |
|----|--|
| 20 | (1) The experience and qualifications of the team to undertake the examination specified. The number of highly qualified persons who will be active in the research and drafting of the portions of the report relating to ratemaking and experience rating formula, as opposed to merely reading later drafts as a form of peer review. Any material conflict of interest arising out of current or past work performed for the NCCI. |
| 20 | (2) The number of hours per week that will be available from highly qualified persons, as well as from necessary support staff, and the computer hardware and system capabilities. |
| 15 | (3) The adequacy of peer review procedures. Any material conflict of interest arising out of current or past work performed for the NCCI. |

100 Total Points

PART IV WORK PRODUCT REQUIRED

This examination stems from a recommendation by the NAIC's Workers' Compensation Advisory Organization Activities Working Group. The working group studied the issue of implementing a "loss cost" system in workers' compensation similar to the system being implemented in the other property-casualty lines. Under a loss cost system, advisory/rating organizations are prohibited from filing final rates but they are allowed to file "prospective lost costs" which include adjustments for development and trend.

In December of 1989, the NAIC adopted that working group's resolution which said that its present belief was that workers' compensation should not be treated differently from the other property-casualty lines with respect to permissible activities of advisory/rating organizations. However, some group members expressed concerns about the impact of a loss cost system on the marketplace as well as concerns about the performance of advisory/rating organizations within workers' compensation which would not be resolved by implementation of a loss cost system. Consequently, the group deferred recommendations on the specific details of the system to be implemented until the completion of two studies: 1) a staff economic analysis of the likely impact of a loss cost system on state workers' compensation markets; and 2) a comprehensive examination of the structure and operations of the National Council on Compensation Insurance (NCCI) conducted under the examination authority of the four states.

The purpose of this examination is to thoroughly evaluate the data collection and processing activities of the NCCI as well as certain aspects of its ratemaking activities. The examination also is intended to review the practical considerations with respect to the NCCI's operations involved in implementing a loss cost system. While the examination will be conducted under the authority of four states, it is intended to address issues of general concern to all state insurance regulators.

The examiners will be expected to fully document current NCCI procedures, evaluate the adequacy or appropriateness of those procedures, and where possible, present possible alternative approaches and the practical effects of those approaches. The examiners also will be expected to use the results of previous NCCI examination reports where possible to the extent that the results of those examinations can be verified.

The final product of the examination should be a comprehensive and detailed report that will provide insurance regulators with a good understanding of NCCI procedures as well as ideas on how those procedures might be improved. In addition, the report should identify the practical questions that would be associated with the NCCI's transition to loss costs and discuss how those areas might be handled. The report should enable insurance regulators, individually and collectively, to make specific recommendations on the features of the system that would be implemented as well as other improvements to the data collection and analysis services provided by the NCCI.

Section I. Data Collection and Data Quality

A. Description of NCCI's Data Collection and Data Handling Procedures

The consultant will be expected to fully document the NCCI's data systems by either verifying information produced by NCCI or creating documentation where necessary. The final work product will completely document the NCCI data systems from input documents to final data bases. As a general introduction to data collection, the consultant should include responses to the following:

- . What types of data does the NCCI collect?
- . What is the purpose for collecting each type of data?
- . How are the data obtained from insurers and processed into a data base?

For each statistical call, the following should be shown:

- . The fields that are entered on computer systems from the source document;
- . The edits performed on each field;
- . How errors are handled and how corrected fields are integrated into the data base.
- . Any modifications to the data from the source document;
- . A list of all data bases and fields within the data base that come from the statistical call.

Also, for each data base there should be provided a list of all fields, the source of each field, an indication of how long the data are maintained and a discussion of how the data base are used.

B. Evaluation of Data Collection and Data Quality

The consultant will be expected to evaluate NCCI data collection, data handling procedures and the quality of the NCCI data. The consultant should make suggestions for improvements in any of these areas. Part of this analysis should be accomplished by sampling actual transactions and testing computer programs within the NCCI. Answers to each of the following questions should be included in the final work product:

- (1) How accurate is the data base? Are adequate quality control procedures in place to ensure the accuracy of the data as they are reported by insurers and processed by the NCCI? How could these procedures be improved?
- (2) Does the NCCI reconcile data collected for ratemaking purposes with the data reported in insurers' annual statements? If so, how are these data reconciled and what is done when these data do not match? Are there additional reconciliation measures that could be beneficial?
- (3) Does the NCCI have adequate procedures to ensure that classification data are complete and accurate? Are additional checks of the data performed when unusual classification indications appear? Does the NCCI check to be sure that insurers report reimbursements by second injury funds, subrogation and funds associated with cases determined to be noncompensable?
- (4) What quality controls are used to ensure the accuracy of data collected under a detailed claim information call?
- (5) Are the data collected and maintained in such a way that the experience from a specific policy can always be traced? If not, how could this be accomplished? Are the data for risks in the residual markets maintained in such a way that the experience can be compiled separately for the residual market versus the voluntary market?
- (6) Is sufficient information collected and maintained to test and implement reasonable alternative ratemaking methodologies? If not, what enhancements could be made to support alternative methodologies and identify the underlying causes of rate increases?
- (7) Do the NCCI's data gathering procedures ensure that the data base is not distorted by schedule rating?
- (8) What kinds of data on insurer expenses are collected and how are they processed and maintained? What controls are in place to ensure that insurers' reporting of expenses is reasonable and accurate? Are there ways in which the reporting of expense data could be improved to make it more suitable for ratemaking? Is separate information on the cost of loss prevention services collected, and if not, could it be collected?

Section II. Ratemaking Procedures

A. Description of NCCI's Current Ratemaking Procedures

The work product must include a thorough and technically complete description of the procedures and formulas currently used by the NCCI in

producing manual rates and experience rating values. When more than one procedure is sometimes used (i.e., where the NCCI may base its rate change upon policy year incurred losses, with or without incurred but not reported losses (IBNR), or upon paid losses; or where they may average differing numbers of years, etc.), describe the different procedures and describe how the NCCI chooses among them. In areas, if any, where the NCCI will often deviate from their "normal" procedures, note whether these deviations are usually reasonable responses to unusual situations where "normal" procedures would be likely to produce inaccurate results. Describe the assumptions made by the NCCI in their procedures and describe the means used by the NCCI to verify these assumptions.

B. Evaluation of Ratemaking Methodologies

Note: Within the ratemaking methodology section, priorities of "A", "B", "C" or "D" are assigned to each question. The grading corresponds to the depth to which a topic is to be covered, with "A" topics being most important. Answers to "A" priority questions should be detailed and of such quality that they may be used to advance the "state of the art". Answers to "D" priority questions should be the highest quality answers that can be obtained at a moderate cost. As such, limitations to the responses to "D" priority questions are acceptable due to the time and cost that would be necessary to cover every possible issue in the topic area. Questions with "B" and "C" priorities should receive intermediate treatment.

Comments have also been made with regard to the extent of original research which is expected to be most appropriate. These comments are presented as an attempt to be helpful, but should be interpreted as guidelines only.

1. Premium and Loss Development Factors

While the selection of link ratios and the calculation of development factors is often considered a purely mechanical process, differences of 5-10 percent in the estimated ultimate losses for a recent policy or accident year are common between different loss development methods. In addition, differences of opinion in the selection of link ratios can occur within the same development format. Past experience has clearly shown that misestimations in this regard are only compounded by trending, because indicated trends are heavily influenced by the most recent point or two, which are those points most heavily distorted by excessive or inadequate loss development. In this context:

- (a) Evaluate the NCCI's premium and loss development techniques. Would the use of more years of data or of multistate data, with appropriate adjustments, produce superior results? Are there other techniques or improvements to current techniques that would be appropriate?

(Priority: "A". Past experience in this regard should be tabulated and reviewed. An attempt should be made to discern what differences might be appropriate for larger vs. smaller states.)

- (b) The NCCI uses different formats for loss development from state to state and from year to year. Paid losses through the 8th report may be used one time as a basis, the next time incurred losses excluding IBNR may be used, etc. The use of multiple techniques is common and considered good practice in many types of reserving applications. The results of different techniques, which normally differ, can be studied to gain insights relating to the underlying assumptions used with each technique. Evaluate the NCCI's procedures for reconciling the differences which occur between different development techniques and evaluate the effectiveness and likely accuracy of the criteria which they use to choose one format over another.

(Priority: "B". The nature and quality of NCCI analytical techniques and whether they are reasonably followed should be examined here. Original research should largely be confined to that which is relevant to answer question 1(a). It is not the intent of this question to focus on whether any sort of bias from state to state occurs, although it should be covered if an overt tendency becomes apparent.)

2. Expenses

There is some question as to whether the expense loadings filed by the NCCI are consistent with the actual experience of their member insurers. Several factors complicate this analysis including premium discounts, the interplay of stock versus non-stock discounts, the consideration of stock only expenses in some instances and not in others, plus the impact of expense constants and minimum premiums.

- (a) Does the current NCCI expense methodology tend to load more or less expenses in the overall rate level than are actually expended by insurers using stock discounts in NCCI states? If there are biases or inaccuracies, what is their source and their effect?

(Priority: "A". A detailed analysis of the NCCI's expense methodology for insurers using stock discounts should be performed.)

- (b) What would be the incremental cost of collecting allocated loss adjustment expense (ALAE) on a unit basis. Discuss the pro's and con's of having this level of detail available versus what is now available. Also, discuss whether it would be more cost efficient to collect this on a more limited survey basis, or only specific areas where problems may exist such as retrospectively rated risks and residual markets. (In these two situations, there is little economic motivation for an insurer to defend claims.)

(Priority: "A". We are aware that the NCCI has been presented with this question in the past, so it is likely that some degree of documentation may exist for the consultant to start with. Consider the costs to insurers as well as to the NCCI with this question.)

- (c) When a state's premiums and rates grow at approximately the same rate as is occurring on a national basis, it is reasonable to expect a proportional increase in the expense loading for the individual state. However, when a state's proposed rate increase considerably exceeds the national average, is it reasonable to assume that expenses increase proportionally for the state? Should large state rate increases be tempered because of less than proportional increases in expenses?

(Priority: "C". No individual research is required here. The response to this question should be well reasoned and offer, if possible, suggested changes to current methodologies.)

- (d) Discuss the advantages and disadvantages of using a budgeted approach to acquisition expenses versus basing these factors on actual expense experience.

(Priority: "C". No individual research is required here. The response to this question should be well reasoned and offer, if possible, suggested changes to current methodologies.)

- (e) Traditionally, mutual insurers utilized a non-stock discount and collected a higher premium than stock insurers. In return, however, mutual insurers following this plan would also return generous dividends which resulted in net premiums that were lower than for stock insurers. The workers compensation market has since evolved into a much more complex mechanism and the consultant should examine whether the original assumptions which supported the existence of dual expense discounts still exist. Are the higher rates collected by insurers utilizing non-stock discounts fully returned in the form of higher dividends than are paid by insurers utilizing stock discount tables? In addition, are lower expenses, if any, experienced by insurers utilizing non-stock discounts also returned in the form of higher dividends? (The analysis should be restricted to NCCI states as it relates to dividends, as a high portion of countrywide compensation dividends are paid in California, which is a non-NCCI state.)

(Priority: "B". It is presumed that the NCCI can provide expense data compilations sufficient to address this question. A degree of imprecision due to the effects of company groups would be acceptable. Basically, this question presumes that the consultant will design requests for compilations to be performed by the NCCI and that the consultant will report on the indications resulting from these compilations.)

- (f) Review premium discounts (stock and non-stock) and expense constants to determine whether the relative expense loadings are equitable for all sizes of risk. (Consideration of minimum premium size risks may be excluded here as they are the subject of a broader question under the "Miscellaneous" heading.)

(Priority: "D". The NCCI has studied these factors from time to time. Review this material and report on it.)

3. Trend

In most jurisdictions, losses have increased more quickly than wages and it is necessary to apply trend factors to losses in order to generate adequate rate level indications. Because these trend indications have often been quite large, there is some question of the NCCI trend factors even when past results on a national basis would seem to indicate that trend factors have not been excessive. In addition, the NCCI also appears to project past trends into the future without offset for any legislation attempting to mitigate the increase in workers compensation claims.

- (a) Are there any expected biases or errors present in the NCCI's general trending procedures? If so, discuss their impact.

(Priority: "A". This should be an in-depth and refined analysis of the procedure and techniques.)

- (b) Would more accurate trending be likely with a different model or with revisions to the current model?

(Priority: "B". This is an extension of question 3(a).)

- (c) Are adequate adjustments made to projections by the NCCI's trend model when significant legal or economic changes occur on a state or national level?

(Priority: "C". Traditional actuarial trending procedures presume that future loss trends will continue to be similar to past loss trends. This presumption loses validity, however, when recent legal or economic developments intervene. In response to this question, examine the extent to which the NCCI brings such events into consideration and whether this appears to be adequate.)

- (d) Contrast the current model, which puts all losses to a current benefit level, to a model which puts all past losses to the same "relative" value of prospective benefits. (In other words, if the prospective min/max benefit level and state AWW were \$100/\$300 and \$320, respectively, then no adjustment would be made to past losses if the past values were \$80/\$240 and \$256. This method would apply a steeper trend line to a lower historic loss level.)

(Priority: "D". Examine the two approaches from a theoretical point of view. No original research is expected.)

- (e) The NCCI determines the overall impact of all classification rate changes combined based on the three years of payroll used in the filing at that time. If the mix of business in a state changes over the years, this estimation of the effect of a past rate filing as it would relate to the current mix of classifications may be distorted. Estimate the likely magnitude of these distortions and discuss whether an improved procedure would be warranted.

(Priority: "D". It is presumed that the NCCI can produce data runs for a sampling of states and years so that the likely magnitude of any distortions can be examined. It would be expected that the consultant would provide the specifications for the NCCI to produce such data and that the consultant would review and comment on the results.)

- (f) The NCCI brings past losses to a current benefit level by multiplying the various law change factors estimated at about the time the law changes went into effect. Is this an accurate method?

(Priority: "D". Examine this from a theoretical point of view.)

4. Classification Ratemaking

There is a significant concern that current classification ratemaking procedures may be significantly less accurate than would be possible using more years of data and an improved methodology. There are often significant swings in class rate relativities from year to year when there is no reason to expect that underlying loss expectancies are changing so rapidly. An optimum ratemaking procedure should give the weight to state class experience that would be most likely to produce accurate estimates of future losses.

- (a) Study the NCCI's current scheme of credibilities and their practice of using three years of data as a sole indicator for most national pure premium indications and as a basic unit for determining pure premiums at the state level. (We recognize the implicit weight given to older years of state data where credibilities of less than 100% are used.) For different types of loss and different expected loss volumes, determine whether class rating accuracy could be improved through the use of more years of data, different credibilities, or both. In addition, determine whether superior results would be expected using maximum loss size limitations that vary as a function of the total expected losses by class, by state, with adjustments made to recognize the effects of these differing limitations.

(Priority: "A". While the NCCI would be expected to do the data compilation necessary to address this question, a thorough response will require a significant level of original research to be performed by the consultant. It is expected that the response to this question may involve more effort than that required to respond to any other ratemaking question.)

- (b) Could the NCCI's procedure for determining industry group relativities be enhanced by utilizing more years of data (with appropriate recognition of apparent trends)? How would this vary between large states and small states?

(Priority: "C". The NCCI would be expected to do the data compilation necessary to perform this analysis.)

- (c) In their classification ratemaking, the NCCI applies loss

development and benefit level adjustments to individual years of data, but applies a single trend factor to all three years of experience combined. Should the NCCI adjust losses to a current (or common) level by trending individual years separately rather than by applying an aggregate trend factor to all years combined?

(Priority: "D". It would be expected that this question would be approached from a theoretical point of view. If it was felt that a change would produce superior results, then the likely degree of improvement, plus any practical considerations, should be discussed.)

5. Determination of Rate Changes Due to Statutory Revisions

- (a) Review NCCI's procedures for determining expected loss changes due to changes in weekly benefits, waiting periods, escalation provisions and medical fee schedules to see if they would be expected to yield fair estimations.

(Priority: "A". A technically complete analysis of this question should be provided.)

- (b) Should the 1973 Standard Wage Distribution Table be updated?

(Priority: "C". The consultant should structure a test of indemnity losses to see if they are reasonably consistent with expectations from the 1973 table. If the NCCI has undertaken studies of this question, use them to the fullest extent possible.)

- (c) Discuss the manner and anticipated or observed effectiveness of the NCCI when presented with non-formula type law changes. Could NCCI's performance in this area be practicably improved?

(Priority: "C". Examine a sampling of recent situations where this has occurred and evaluate the NCCI's performance.)

- (d) Should different wage distribution tables be determined for major classification groupings, instead of for all occupational groups, so that differences in the job mix from state to state may be recognized?

(Priority: "D". The differences in average wages from state to state will be attributable in part to different mixes of industry as well as different overall wage levels. Without significant research, except to examine any studies which the NCCI may already have available, attempt to determine whether this is an area which warrants the extensive work which it would require to have multiple wage distribution tables.)

6. Alternate Exposure Bases

There has been significant discussion and controversy over total payroll as an exposure base for workers compensation. The controversy involving man-hours as an exposure base has largely

subsidized, but plans involving recognition of the wage rate(s) at which total payrolls are earned appear to offer the hope of more equitable rating. The consultant should largely restrict themselves to a study using data culled from previous studies, thereby avoiding the need to collect original data.

- (a) What degree of improvement could be expected from a rating system that recognized the wage rate (if available) in addition to total payroll?

(Priority: "A". The consultant should conduct a thorough review of the research which already exists relating to this question.)

- (b) Discuss the additional expenses that would be expected to result from the administration of a system utilizing this additional information.

(Priority: "B". A rating system that utilized both wage rates and total remuneration might require additional recordkeeping by employers, more time for insurer audits, and additional data elements for the NCCI and its member insurers. Estimate the magnitude of these additional costs.)

7. Experience Rating Formulas

The work product must include a thorough and technically complete description of the formulas currently used by the NCCI in their production of experience rating modifications. This should include a description of interstate and intrastate experience rating as well as a description of experience rating formulas both before and after NCCI's revised experience rating plan (RERP) filing. LRAP, schedule rating and miscellaneous state exceptions should be omitted.

- (a) Is the NCCI's RERP experience rating actuarially sound? Specifically, are there significant tendencies for the formulas to produce debits or credits such that it could reasonably be predicted that groupings of risk by any combination of classification, risk size or modification range would be likely to have excessive or inadequate rates? What changes could be made to lessen these deficiencies?

(Priority: "A". A thorough analysis of the study done by NCCI to develop RERP should be completed. Additional data should be requested, if necessary, to verify the action of RERP.)

- (b) To what extent, if any, would experience rating be expected to be more accurate if more than three years of data were used for experience rating? Specifically consider whether five years would be superior, as insurers report unit data through fifth report. Discuss additional costs, if any, that might be applicable from the use of five years of data versus three.

(Priority: "B". Data provided by the NCCI should be tested to determine if the addition of two more years of data would tend

to produce more accurate experience rating. If it would, it would be necessary to examine what additional costs would be incurred by the NCCI to use five years instead of three.)

- (c) What credits would be indicated for loss free risks that were less than the minimum size to be eligible for experience rating? To what extent would it be indicated and practicable to debit small risks for higher than expected losses?

(Priority: "B". The consultant should analyze experience runs produced by the NCCI according to specifications provided by the consultant. The consultant should evaluate whether it would be feasible to provide some degree of credits for small risks that had no losses or very low loss ratios if it could be done without endangering rate adequacy.)

- (d) Are the formulas used to calculate ELR's and "D" ratios sound? Does the NCCI method of introducing RERP tend to result in a revenue increase?

(Priority: "C". Examine current techniques to see if they are appropriate.)

8. Miscellaneous

- (a) Compare the expected loss and expense ratios of minimum premium insureds to those for all classes of insureds combined.

(Priority: "B". It would be expected that the NCCI would be able to generate the data that would be necessary to address this question. The consultant should analyze data runs produced by the NCCI according to the consultant's specifications.)

- (b) What recognition does NCCI give to additional premiums expected to be collected from surcharges imposed on policyholders in residual markets? As these markets increase or decrease, is this expected change in revenue recognized?

(Priority: "C". Examine recent filings made by the NCCI to answer this question. Examine filings where surcharge plans are introduced as well as filings where surcharges are in place to determine whether NCCI filing procedures adequately recognize this additional income.)

- (c) Does the NCCI ratemaking formula accurately account for any off-balance due to the experience rating plan? Does the NCCI adequately adjust expected loss ratios (ELR) and "D" ratios to maintain the off-balance at a reasonable level? What improvements could be made in the NCCI's procedures regarding the off-balance in the experience rating plan?

(Priority: "C". Examine NCCI procedures carefully to check for their apparent balance.)

Section III. Practical Considerations in Implementing a Loss Cost System

Under the system adopted by the NAIC for the other property-casualty lines, advisory organizations are allowed to do much of what they had done previously, short of filing final rates. Advisory organizations are allowed to collect historical loss information from insurers, adjust these data for development and trend, and distribute or file this "prospective" loss cost information with the commissioner. Advisory organizations also are allowed to develop and file supplementary rating information, rating manuals (excluding final rate pages) and policy forms and endorsements. Insurers are required to determine individually, their own expense and profit factors and file their final rates. Insurers' rate filings can reference, if necessary, the prospective loss cost and supplementary rating information filed by the advisory organization. This approach seeks to promote competition and maximize benefits to consumers by preserving efficiencies gained through the joint collection and analysis of loss information, while enforcing independence in the areas of expenses and profits which should be based on each insurer's specific methods of operation.

The examination should address the practical considerations involved in implementing a loss cost system on a national scale in workers compensation insurance. In other words, how should the NCCI's activities be modified to accommodate a loss cost system similar to that which is being implemented for the other lines? This question also encompasses how member insurers would be allowed to use NCCI information in making their own rate filings. To the extent possible, the consultant should use the system being developed for the other lines as a model but also should consider areas where workers' compensation may require different treatment. In this analysis, the consultant also will be expected to review how the NCCI and member insurers operate in states that currently have a loss cost system for workers' compensation.

The consultant's analysis should consider, but not be limited to, the following areas:

- . minimum premiums
- . rating plans
- . premium discount plans
- . schedule rating plans
- . expense constants
- . experience rating systems
- . policyholder dividend plans and practices
- . retrospective rating plans
- . anniversary date rating rules
- . other rate-related rules
- . distribution of expense data to insurers

In addition to these areas, the consultant should evaluate whether any changes

should be made to Part III of the Insurance Expense Exhibit and the approval of rate changes for policies already in effect or rate filings with retroactive effective dates in a loss cost environment.

The examination report should analyze the relevant issues with respect to these areas, as well as any other significant areas, and outline the different options that might be taken and their likely consequences. It should be assumed that the NCCI would continue to administer and make rates for the residual market.

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VOLUME II - SECTION IIA
NCCI RATEMAKING PROCEDURE**

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**NCCI'S CURRENT
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Our description of NCCI's Annual Ratemaking procedures is subdivided into three chapters:

1. Overview of Ratemaking at NCCI
2. Standard NCCI Ratemaking Methodology
3. Alternative Ratemaking Methodologies

Chapter 1 presents an overview of the NCCI's ratemaking process. In this chapter we provide a non-technical description of the data, methodology and assumptions utilized by NCCI in estimating future premium needs for workers compensation insurers.

Chapter 2 provides a detailed description of the standard ratemaking process used by NCCI in the two most recent rating cycles (1989-90). The rate calculations are subdivided into three sections. The determination of the overall state rate level change is described first. Calculations underlying classification rates are discussed next. Finally, factors affecting the final premium to be charged each insured are documented. To facilitate our explanation of the NCCI procedures, a sample NCCI filing is included as a Technical Supplement and is bound separately for ease of reference.

Chapter 3 discusses alternative methodologies which have been used by NCCI in the two most recent rating cycles (1989-90). Alternative methodologies usually are brought into play in response to unique actuarial considerations, judgments about business or political issues, or to comply with legislative or regulatory requirements in particular states.

In addition to our descriptive report and Technical Supplement, we have prepared a glossary of key terms for reference purposes. The glossary can be found at the end of Chapter 3.

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CHAPTER 1 - OVERVIEW OF RATEMAKING AT NCCI

There are three general types of situations in which NCCI performs ratemaking functions:

1. Administered Pricing System
2. Advisory Rate System
3. Loss Cost System

With an administered pricing system, NCCI, in effect, is developing a set of manual rates and rating values to be used by all insurers operating in the state. However, provision may be made for individual insurers to seek approval of deviations from NCCI rates.

In an advisory system, NCCI develops a set of recommended manual rates. Each insurer must decide whether those advisory manual rates are appropriate for its business.

In the first two systems mentioned above, NCCI produces manual rates which contemplate future expected costs for losses, expenses, and profit and contingencies. In a loss cost system, the expected costs estimated by NCCI are for either losses only or for losses and loss adjustment expenses. In a loss cost state, each insurer must include its estimate of its required expense and profit provisions.

In the section that follows, we provide a general description of how ratemaking operates at NCCI in other than a loss cost system.

NCCI RATEMAKING PROCEDURES CHAPTER 1 - OVERVIEW

I. DETERMINING AN EMPLOYER'S PREMIUM - A PRIMER

The end result of the NCCI's ratemaking process is a set of manual rates and rating values that determine the premiums to be paid by each insured employer. This section provides an example of how an individual employer's premium is determined.

Most casualty insurance rating programs involve grouping insureds with similar propensity to loss into sub-groups referred to as classifications or "classes". In workers compensation this grouping process is built on the concept of similar types of employers' operations. In the NCCI classification plan, there are hundreds of classes. Any one employer may have exposure in one class or many, depending upon the diversity of the employer's operations.

Size differences between employers within the same class are measured by the amount of payroll to be paid to the workers in that class. The usual exposure base for rating workers compensation policies is the amount of annual payroll paid to the workers assigned to each distinct NCCI class.

To determine the premium for an employer in the NCCI rating system generally involves four steps:

1. Calculate the "Manual Premium".
2. If eligible, apply the Experience Rating Modification (ERM) to the manual premium to determine the standard premium.
3. If large enough, in terms of total standard premium, apply the premium discount rules to determine the insured's discounted premium.
4. Add the Expense Constant Per Policy. This results in the insured's net premium.

A simple example follows to illustrate this process. This example assumes the standard NCCI practices apply. Exceptions to this process may occur for a particular state. The example does not include the application of any schedule rating

NCCI RATEMAKING PROCEDURES CHAPTER 1 - OVERVIEW

adjustments or policyholder dividend plans. The procedures for determining these adjustments are determined by the individual insurers and not by NCCI.

Assume that our hypothetical risk is composed of operations that fall into three classes all within one state as follows:

<u>Class</u>	<u>Description</u>	<u>Estimated Payroll</u>
2014	Grain Milling	\$150,000
8742	Outside Salesmen	60,000
8810	Clerical Office	30,000

The insurer would proceed as follows:

1. Calculate Manual Premium

From the appropriate state rate manual, the rate per hundred dollars of payroll would be extracted. The manual premium would then be the sum of the products for each class of the estimated payroll in hundreds of dollars and the manual rate. Assuming the following effective manual rates, we can determine the manual premium as follows:

<u>Class</u>	<u>Estimated Payroll in Hundreds</u>	<u>Manual Rate</u>	<u>Manual Premium</u>
2014	1,500	\$6.28	\$9,420
8742	600	0.76	456
8810	<u>300</u>	<u>0.35</u>	<u>105</u>
	2,400	xx	\$9,981

The separate calculation of manual premium based upon three different classifications is appropriate only because 8742 and 8810 are standard exception classes which do not require the operation to be grouped with the one classification that best describes the business of the employer.

NCCI RATEMAKING PROCEDURES CHAPTER 1 - OVERVIEW

2. Apply the Experience Rating Plan

For employers who meet the eligibility requirements, the experience rating plan is applied. The purpose of this plan is to adjust the individual employer's manual premium up or down depending upon how that employer's recent past experience compares to other similar employers. The application of the plan produces a factor referred to as the ERM (experience rating modification).

By measuring the frequency and severity of the insured's past experience relative to the "average insured" as represented by the manual rate, a credit or debit is determined. For example, if the comparison resulted in an ERM of 0.90, the risk receives a 10% credit from the manual premium. A risk with an ERM of 0.90 is anticipated to have expected losses 10% below that contemplated in the manual rate. If the ERM is 1.20 that means the risk is expected to have losses 20% higher than the average contemplated in the manual rate. In this case, the risk would receive a 20% debit.

Assuming our hypothetical insured generates an ERM of 0.95, a 5% credit from the manual premium determined in step (1) above, we have an ERM modified premium of \$9,482 ($\$9,981 \times .95$).

The product of the insured's manual premium times the ERM is often referred to as standard premium in the NCCI statistical system. Standard premiums represent premiums after the application of the ERM but prior to the application of the mandatory premium discount rules.

3. Apply Premium Discount Rule

An integral part of the NCCI process for determining an insured's premium is calculating the effect of any premium discount.

The expense provision in the manual rate is intended to only apply to the first \$5,000 of standard premium per insured. NCCI has studied how acquisition and general expenses decline as a percentage of premium as the total amount of standard premium increases. To reflect this reduction in expense needs as a percentage of standard premium, NCCI has rules which provide premium discounts as the insured's

NCCI RATEMAKING PROCEDURES

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standard premium increases. There are two different premium discount tables, one labelled "stock companies" and the other "non-stock companies". Each insurer elects which table to use. That is, stock insurers may elect to use the non-stock table and non-stock insurers may elect to use the stock table.

To maintain the simplified example, assuming the insurer in our example had elected to use stock insurers' premium discount rules, the standard table is:

	<u>Standard Premium</u>	<u>Premium Discount Percentage</u>
First	\$ 5,000	-
Next	\$ 95,000	10.9%
Next	\$400,000	12.6%
Over	\$500,000	14.4%

Since our hypothetical risk has standard premium of \$9,482, we would develop the total amount of discount as follows:

$$\text{Premium discount} = .109 \times (\$9,482 - \$5,000) = \$489$$

Or the net premium before the application of the expense constant is \$8,993 (\$9,482 - \$489).

4. Add Expense Constant

The NCCI's system anticipates collecting premium to cover insurer operating or underwriting expenses partly by levying an expense constant per policy and partly by a percentage loading in the manual rate. An expense constant is added to the premium determined above. A typical expense constant at present is \$140 per policy. The final premium is then \$9,133 (\$8,993 + \$140).

We have determined the estimated net premium owed by the employer at the beginning of the policy year.

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It is worthy of note that the NCCI's use of the phrase "net premium" should not be confused with the more usual use of the phrase net premium in accounting terms. In financial reporting, "net premium" is premium after the application of the effect of assumed and ceded reinsurance premium transactions on the direct premiums paid by insureds.

One final point about the NCCI process for rating policies should be noted. Remember that the exposure base, in general, is payroll in hundreds of dollars. At the beginning of the policy the deposit premium is based on the amount of estimated payrolls by class. The final premium the insured owes is determined precisely after the policy has expired and an audit of actual payrolls is completed.

NCCI RATEMAKING PROCEDURES CHAPTER 1 - OVERVIEW

II. OBJECTIVES OF RATEMAKING

The Casualty Actuarial Society has developed a statement of principles regarding property and casualty insurance ratemaking. The purpose of the statement is to identify and describe principles applicable to the determination of insurance rates. The principles were developed to apply to most lines of insurance, including workers compensation.

The statement of principles consists of four parts: definitions, principles, considerations and conclusions.

Ratemaking is defined as the process of establishing premium rates used in insurance or other risk transfer mechanisms. Ratemaking is prospective because in property and casualty insurance the rate must be developed prior to the transfer of risk. Because it is prospective, estimates of future conditions must be made.

Four principles of ratemaking are stated:

- Principle 1: A rate is an estimate of the expected value of future costs.
- Principle 2: A rate provides for all costs associated with the transfer of risk.
- Principle 3: A rate provides for the costs associated with an individual risk transfer.
- Principle 4: A rate is reasonable and not excessive, inadequate, or unfairly discriminatory if it is an actuarially sound estimate of the expected value of all future costs associated with an individual risk transfer.

For workers compensation, some of the more important items listed in the section of the statement of principles as considerations are:

- Exposure Unit
- Data
- Organization of Data

NCCI RATEMAKING PROCEDURES CHAPTER 1 - OVERVIEW

Credibility
Loss Development
Trends
Catastrophes
Other Influences (i.e., external)
Classification Plans
Individual Risk Rating

These considerations largely determine the scope of the actuarial examination being conducted by the NAIC.

Finally, the statement of principles concludes with acknowledging that other business considerations are also a part of ratemaking.

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III. NCCI RATEMAKING

The ratemaking process generally involves estimating the overall rate level change required in the state for "Industrial Classes". These classes include all classes except for "F" classes, which are discussed later, and other exception classes which may vary by state. This statewide change is then distributed to the classes and finally, to individual insureds. Further adjustments to the manual rate may be based on the individual insured's experience. This approach conforms to the generally accepted actuarial practice of focusing first on overall financial needs and then secondarily on how to distribute that need amongst insureds in an equitable fashion.

The NCCI calculation of workers compensation rate levels has been divided into three levels of detail for our discussion purposes:

1. Overall Premium Level Change
2. Classification Rates
3. Individual Risk Rates

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IV. NCCI OVERALL PREMIUM LEVEL CHANGE

The NCCI's calculation of the overall premium level change depends upon comparing the projected cost ratio expected in the future with the target or permissible cost ratio.

The projected cost ratio is derived by first adjusting historical premium and loss data to their estimated ultimate levels. They are also adjusted for known changes in benefit levels and rate levels.

The target cost ratio is the percentage of premium available to pay loss and loss adjustment expenses after including a provision for expenses and profit. The NCCI methodology for incorporating loss adjustment expense assumes that these expenses vary directly with the level of losses. The NCCI's target cost ratio is analogous to what other rate filers may refer to as the permissible loss and loss adjustment ratio.

A. Data Utilized

The calculation of the statewide premium level change is based upon the premium and loss experience reported to NCCI by insurers in the state. This experience data is referred to as financial call data. The financial calls produce two data sets for premium and losses by state which are used in ratemaking:

policy year data

and

calendar-accident year data.

Two different calculations are generally performed to determine the indicated statewide premium level requirement with the proposed change being the unweighted average of the two indications. The calculations are identical in actuarial concepts, except that one uses the experience reported on a policy year basis and the other uses calendar year earned premiums and accident year incurred losses.

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Policy year data assigns both premiums and losses to the year in which the policy was effective.

Calendar-accident year experience reflects the calendar year in which the premium was reported as earned by the insurer. The losses assumed to be related to these premiums are those with accident dates in the same year, regardless of when these losses are reported or in what year the policies were written.

For example, the sample filing of NCCI used in our report to discuss the detailed actuarial calculations relied on policy year 1988 and calendar-accident year 1989. In both data sets, the experience was evaluated as of December 31, 1989. The data was reported to NCCI in the spring of 1990.

B. Adjustments to Reported Premium and Loss Data

1. Premium and Loss Development Adjustments

Policy year 1988 reflects the experience on all policies with effective dates between January 1, 1988 and December 31, 1988. As mentioned earlier, workers compensation policies are usually written at inception on the basis of estimated payrolls for the coming year. As of December 31, 1989, not all policies written in 1988 would have had their final premium audits done. Adjustments will be booked by the insurers in 1990 or even later years to reflect differences between the initial payroll estimates and the final audits.

To use policy year 1988 evaluated as of December 31, 1989, NCCI must incorporate an estimate of what the ultimate premiums will eventually be on all policies written in 1988. An estimate must be made in order to include the effect of expected future premium audits. To do this, NCCI examines how initial estimated premiums for earlier policy years gradually reach their ultimate values. This actuarial process is referred to as analyzing premium development patterns.

Just as ultimate premiums must be estimated if recent experience is to be used in ratemaking, so too must losses. The nature of workers compensation claims is for a considerable time period to elapse between the occurrence of the claim, the reporting

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of the claim to the insurer and the final settlement of the claim. It is also fairly common that the injured worker has the right to re-open the claim years after the claim may have been thought closed. Both indemnity and medical claims are usually paid through periodic payments which involve an element of uncertainty as to their duration. It can be many years before the actual losses from a block of policies will be known with certainty. In fact, while the actuarial methods for premium and loss development are similar in concept, the process of estimating ultimate losses requires many more years of prior loss development patterns to be examined.

NCCI performs a separate analysis of developments for medical and indemnity losses. The development patterns of reported losses for these two loss components differ substantially.

Additionally, the development patterns of past losses are often examined at more refined levels of detail. Losses can be categorized and analyzed at the level of losses paid, incurred losses, incurred losses excluding incurred but not reported (IBNR) and incurred losses excluding bulk. Incurred losses include payments, case reserves on known claims, IBNR reserves and bulk reserves. Incurred excluding IBNR includes all of these components except IBNR reserves. Incurred excluding bulk includes only payments plus case reserves.

Policy year losses involve accidents occurring over two successive years. For example, policy year 1988 is providing insurance coverage on claims that can occur in either 1988 or 1989. Considerably more time must elapse before the ultimate cost of these claims will be known with reasonable certainty.

Accident year 1989 encompasses all claims arising from accidents that occurred in 1989. Policy year 1988 includes some of the claims that occurred in 1989 and these losses are common to both sets of data. However, accident year 1989 is more current in that it also includes claims on accidents occurring in 1989 which are covered by policies written in 1989. By the same token, calendar year 1989 earned premium would include the portion of policy year 1989 premiums earned by December 31, 1989.

NCCI RATEMAKING PROCEDURES CHAPTER 1 - OVERVIEW

2. Premium and Loss On-Level Adjustments

Historical premiums reflect rate levels in effect when the policies were written. As a result, the reported developed premiums must be adjusted to the level of rates currently in effect. In adjusting the premiums to current rates, a special adjustment is introduced by NCCI. NCCI removes the effect of trend in the current rates in bringing premiums to current level. Accordingly, they do not multiply their adjusted and developed losses by a trend factor. Although a new trend factor is calculated with each revision, only the effect of the change in the trend is applied to current rates. Most other bureau rate filings (i.e., Insurance Services Office) incorporate a trend factor that is applied to past ultimate losses to estimate their level in the future.

It is also necessary to adjust past indemnity and medical claim costs to current benefit levels. This process depends on NCCI's estimates of the effects of benefit changes enacted since the beginning of the period when the losses used to calculate rate level indications were being incurred.

C. Determination of Indicated Changes by Components

Projected cost ratios for policy year and calendar-accident year data are calculated by dividing the adjusted and developed indemnity and medical losses by estimated premiums that would have been earned if rates equal to the current rates with the provision for trend removed had been in effect. An unweighted average of the policy year and calendar-accident year indications is calculated.

The indicated overall change in premiums is obtained by comparing the average projected cost ratio to the target cost ratio underlying current rates. The target cost ratio represents the proportion of the premium which was projected to be available to pay losses and loss adjustment expenses after expenses and profit and contingencies have been taken into account.

The determination of the expenses and profit and contingencies to be reflected in the manual rate is the end result of a process that considers:

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1. Actual average expenses of stock insurers in recent years;
2. Assumptions about certain expenses that are only analyzed periodically;
3. Budgeted expenses and profit and contingencies that have been included in the rates based on either judgment or historical usage; and
4. Past regulatory pronouncement e.g. loss adjustment expenses may be loaded onto losses or to expenses depending on state law.

The NCCI ratemaking system is designed to isolate the effect of various specific factors affecting rate levels. This objective requires introducing some complications in the manner of their presentation in order to achieve this separation of effect. NCCI isolates such things as:

1. the amount of change in the trend factor to be incorporated in the current rates,
2. any change in expense provisions,
3. changes in benefits not already reflected in the current rates,
4. any change in assessments levied for such state mandated operations as guaranty or second injury funds.

Separate rate level change indications may be calculated for the voluntary market and the residual market. In this case, separate analyses of assigned risk and voluntary experience will be performed. Alternatively the assigned risk rates may reflect a percentage differential applied to the voluntary rates.

The indicated changes by industry group are also presented as a part of the overall rate level change indication. Further discussion of the allocation of changes to industry groups is provided in the subsection which discusses standard ratemaking procedures.

NCCI RATEMAKING PROCEDURES

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V. CLASSIFICATION RATES

The second level of rate level analyses involves allocating the overall indicated change by industry group and by classification. These calculations reflect experience by class in the state and in some cases, in part, on nationwide pure premium relativities by class. The class indications determine whether the risks that have exposures in that particular class receive a larger or smaller adjustment than the overall rate level change for the industry group.

A. Data Utilized

Detailed data by state and employer is also collected from each insurer under the Workers Compensation Statistical Plan ("WCSP"). This data may also be referred to as Unit Statistical Plan data ("USP"). This detailed information, which includes premiums, payroll, incurred losses by injury type, classification and employer, is required for the analysis of the experience indications by classification and type of loss. Because of its extremely detailed level, the compilation of this data requires a considerable amount of processing time. Since this data is less up to date than the financial call, it is used to determine rate relativities by class and industry groups rather than overall rate levels. This same data is also used to calculate the experience rating modifications for individual employers.

For the reader interested in the data utilized by NCCI, both financial call and WCSP, we would refer the reader to the report on Section I (Data Collection and Data Quality) of the NCCI examination.

B. Proposed Rates

The first step in the determination of rates or loss costs by class is the distribution of the overall premium level change into three major industry groups:

1. Manufacturing
2. Contracting

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3. All other industries

The indications by industry group are used to reflect relative costs by types of employment. The industry group indications supplement the experience for classes in which the available state and national experience may not be of sufficient volume to be given full credibility.

Industry group differentials and the resulting rate level changes by industry group are calculated from the latest three years of WCSP data. The claim data is adjusted to reflect:

1. Expected development to ultimate cost levels.
2. The projected impact of benefit level changes by injury type.
3. The off-balance produced by the experience rating plan.

Rates or loss costs by class are calculated by weighting the indications based on the class experience for the state with the industry group change applied to the class' current rate and national pure premiums which have been adjusted to reflect differences in cost levels by state. Limitations are imposed on the amount of rate change permitted by class in any one rate revision. Currently, NCCI limits the class rate change to $\pm 25\%$ over the amount of rate change determined for the industry group. The effect of these limitations is measured and a correction factor is applied uniformly to each class not subject to a limitation in the industry group to assure that the indicated overall rate level change is achieved.

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VI. INDIVIDUAL RISK RATES

The analyses of the overall rate level requirement and the experience by industry group and individual class yields the NCCI's proposed manual rates. Coincident with each rate revision, NCCI calculates new factors to update that state's experience rating plan. These factors are explained in Chapter 2.

Expense constants are utilized to assure that the insurer collects sufficient premium to cover the estimated policy writing costs and other expenses which apply on a per policy basis.

Expense constant indications are developed each year by NCCI as part of the annual review of expense requirements. The premium discount tables are revised less frequently. The current expense constants and premium discount tables were based on data from a 1982 study of expenses by size of risk. A study of 1991 data will provide updated indications for general expenses, expense constants and premium discounts.

In the next chapter of this report, we provide a more detailed description of the ratemaking process currently in use at NCCI. Chapter 3 provides further explanation of significant variations in NCCI's methodology.

In Section IIB of our report on the actuarial examination, the results of our evaluation of NCCI's ratemaking methodologies is provided.

**NCCI RATEMAKING PROCEDURES
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CHAPTER 2 - STANDARD NCCI RATEMAKING METHODOLOGY

This chapter provides a detailed description of the standard ratemaking procedures of NCCI. The description is designed for a reader who has been exposed to workers compensation rate filings in the past. The structure of this chapter follows the steps in the sequence in which they are presented in a typical NCCI rate filing.

To provide a concrete example, the Illinois filing effective January 1, 1991 is included as a Technical Supplement for ease of reference. This filing uses the standard NCCI approach in most aspects.

Our discussion of the standard NCCI approach is in four sections as follows:

- I. Overview of NCCI Filing
- II. Calculation of Overall Premium Level Change
- III. Classification Ratemaking for Industrial Classes
- IV. Determination of Factors to Adjust Individual Premiums

Chapter 2 ends with a discussion of "F" classes, which are classes applicable to occupational activities covered by the United States Longshoremen's and Harbor Workers' Act.

NCCI RATEMAKING PROCEDURES

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METHODOLOGY

I. OVERVIEW OF AN NCCI FILING

The NCCI rate filing is a lengthy technical document. Each filing begins with a cover letter which presents the proposed rate level change and specifies the proposed effective date.

Following the cover letter is a two page summary of rate level indications for industrial classes which are developed in the filing. The proposed changes are shown two ways; first by what NCCI refers to as component and then by industry group.

The components of the overall proposal are:

	Sample State Filing ¹ Illinois 1/1/91 <u>Premium Level Changes</u>
• Experience	+ 7.2%
• Trend Change	+ 0.5
• Expense change	- 0.1
• Benefit change	+ 0.4
• <u>Tax change</u>	<u>+ 0.5</u>
• Overall	+ 8.5

The overall premium level changes for the three industry groups: manufacturing, contracting, and all other are then summarized.

1 The reader is encouraged to refer to the Illinois sample state filing which is included in the Technical Supplement.

NCCI RATEMAKING PROCEDURES CHAPTER 2 - STANDARD METHODOLOGY

- Manufacturing + 9.6%
- Contracting + 6.2
- All Others + 9.3
- Overall + 8.5

An NCCI filing, such as the Illinois filing provided in the Technical Supplement, is divided into two major parts.

Part I is comprised of:

Exhibit I - Determination of Indicated Change in Statewide Premium Level. (This exhibit is a presentation of how the overall premium level change was developed).

Exhibit II - Workers Compensation Expense Program. (This exhibit provides support for the expense provisions and target cost ratios used in the filing).

Exhibit III - Proposed Advisory Rates and Rating Values.

Part II of the NCCI filing contains the supporting appendices. Specifically, they are:

Appendix A - Factors Underlying Rate Revision

Appendix B - Computation of Advisory Rates

Appendix C - Law, Assessment and Tax Memoranda

Later in this chapter we will provide a complete description of each of the NCCI's documents.

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We have found it necessary to add Appendix D. This is not part of the NCCI filing. Rather it contains NCCI workpapers to document or clarify the methodology.

Appendix D - Additional Workpapers

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II. CALCULATION OF OVERALL PREMIUM LEVEL CHANGE

As mentioned, the NCCI filing develops the statewide indicated premium level change by component: Experience, Trend Change, Expense Change, Benefit Change and Tax Change. For illustrative purposes, we have grouped the components as follows:

- Experience
- Benefit Change
- Other: Trend, Expense and Tax

The Experience component is based on past premium and benefit cost data as reflected in the financial call data. The Benefit Change component is the result of the estimated impact of legislated changes in benefit level. What we have elected to call the Other Component reflects the changes in the other miscellaneous factors: trend, expenses, taxes and assessments. These components are shown in Figure 1 shown below. References to Exhibits are those in the NCCI Illinois filing (Technical Supplement) used as our sample. The final premium level change is the product of the changes due to Experience, Benefits, and Other.

Figure 1 also shows the distinction between "Overall Premium Level Change" and "Overall Manual Rate Level Change". The "Overall Premium Level Change" is offset for the "Effect of the New Expense Program" to develop the "Overall Manual Rate Level Change." Changes in such items as expense constants can affect the insurers' premium income without necessarily being the result of a change in manual rates.

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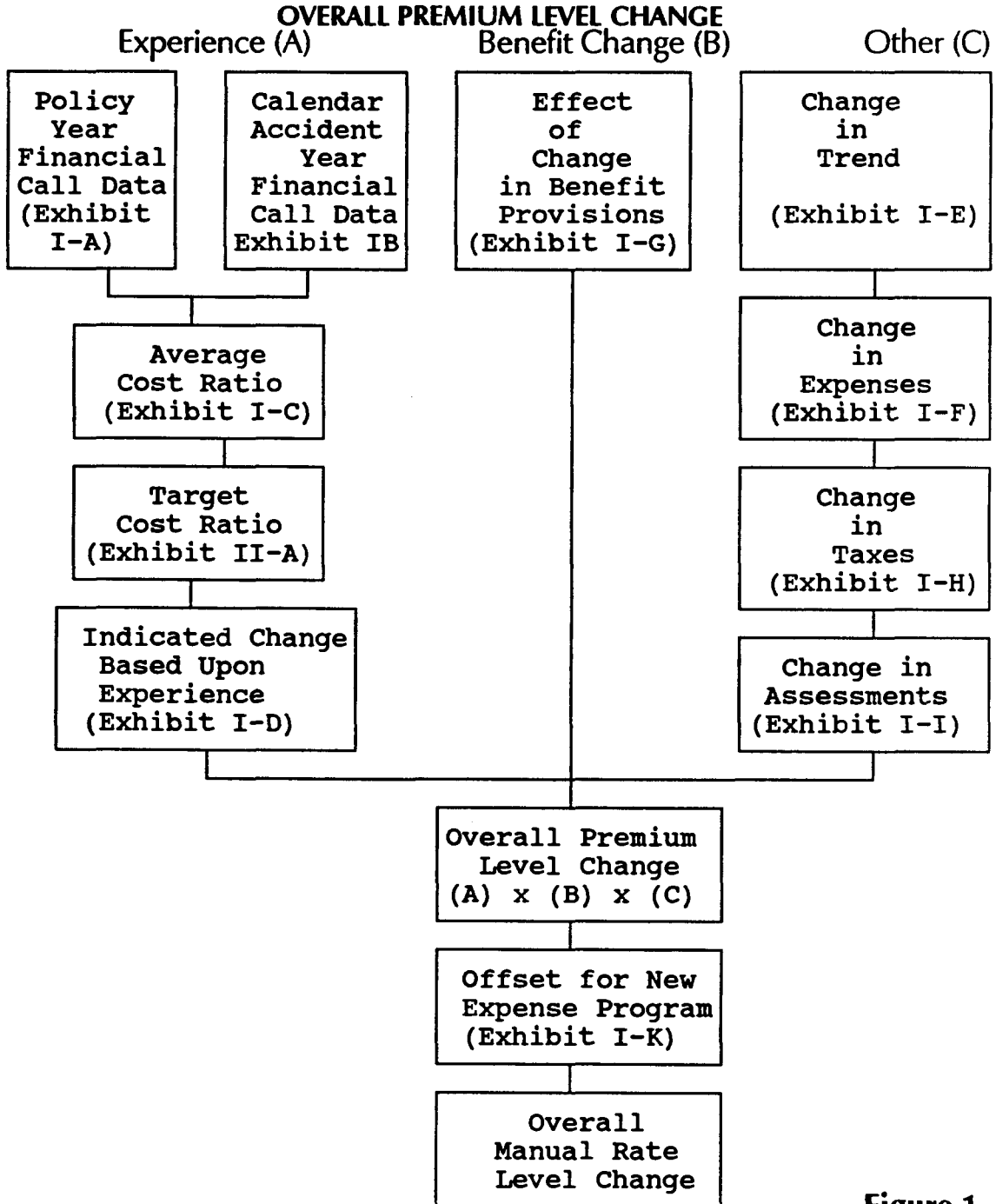


Figure 1

NCCI RATEMAKING PROCEDURES CHAPTER 2 - STANDARD METHODOLOGY

NCCI's Exhibit I includes one additional step that is beyond the determination of overall statewide requirements. In Exhibit I-J, NCCI distributes the overall premium level change to the three industry groups (See Figure 2). As will be discussed later in this chapter, this distribution process depends on a different body of premium and loss data. The industry groups differentials are derived from the WCSP data rather than the financial call data relied on for the overall state premium level. The distribution to industry groups might be considered to be the link between the overall state requirements and those for the individual NCCI classes.

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**OVERALL PREMIUM LEVEL CHANGE
BY
INDUSTRY GROUP**

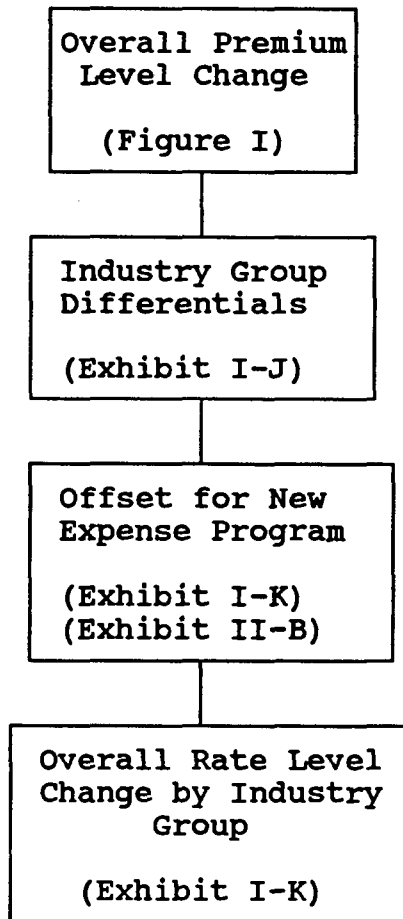


Figure 2

Note: Exhibit numbers refer to NCCI Exhibit I and II.

NCCI RATEMAKING PROCEDURES CHAPTER 2 - STANDARD METHODOLOGY

A. Premium and Loss Data Used

Workers compensation premium levels are calculated using two major types of premium and loss data. Financial call data is reported on a summary basis and is used to develop statewide premium levels. WCSP data provides detailed experience by employer, by class and by type of injury and is used for industry group and classification ratemaking.

1. Financial Call Data

The premium and loss data used to determine overall statewide premium level indications are compiled from NCCI's Financial Calls for data. All insurers in states where NCCI is the statistical agent are required to file policy year data reports by March 15 and accident year data reports by April 1 of each year. Reports are required which show experience on a policy year basis and separate reports show experience on a calendar-accident year basis. These reports include statewide premiums and losses for each policy year and accident year evaluated as of the end of the calendar year. These reports are referred to as financial data since they are reconciled to the financial statements which the companies prepare.

A small number of insurers may have their data excluded from statewide totals if their data is not provided on time or is thought to contain errors. NCCI will exclude individual company data only if they believe its exclusion would have no significant effect on the proposed rates. On average, less than 5% of premium and losses will be omitted. For example, a list of companies excluded and their respective shares of premium volume are contained in Appendix A-VI of the sample rate filing. For the Illinois sample state filing, 1.9% was omitted for the 1988 policy year and 0.6% for the 1989 calendar-accident year.

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The data collected in these calls is:

- Standard Earned Premium²
- Net Earned Premium
- Paid Losses³
- Outstanding Losses Excluding IBNR³
- IBNR Losses³
- Incurred Losses Including IBNR³
- Incurred Indemnity Claim Count
- Case Outstanding Losses⁴
- Bulk Outstanding Losses⁴

"Bulk" outstanding losses as defined by NCCI are "reserves for general case reserve inadequacy, supplemental case reserves, cases that may reopen, or other [non-IBNR] reserves which are not associated with specific claims." "Outstanding losses" include bulk reserves for some companies, while other companies include bulk reserves in IBNR.

The loss data is reported separately for medical and indemnity claims. The type of data contained on financial data reports permits the actuaries at NCCI to track the changes of indemnity and medical losses over time and to base projections on the data they expect will most likely estimate the emergence of ultimate losses.

Historically, the summary loss data collected by NCCI on both a policy year and a calendar-accident year basis contained results reported by year through eight years of development with a summary category for all prior years. The reporting forms began requiring one additional year of separate reporting per year beginning with the December 31, 1987 evaluation. The expansion in the number of years reported is scheduled to extend until fifteen evaluations will be available for the oldest year.

-
- 2 Standard Earned Premium is required to be presented at two rate levels: the NCCI Designated Statistical Reporting Level and the Company Level.
 - 3 Medical, Indemnity and Total.
 - 4 These items are required of companies that include Bulk Outstanding Losses in the "Outstanding Excluding IBNR."
-

NCCI RATEMAKING PROCEDURES CHAPTER 2 - STANDARD METHODOLOGY

a. Policy Year Data

Policy year data classifies experience based on the year in which the policy was written. Policy year 1988, for example would include the experience of all policies effective between January 1, 1988 and December 31, 1988. Policy year data takes twenty four months to become complete, since the last policy could be written twelve months after the beginning of the policy year and will expire 24 months after the beginning of the policy year. The last accident may occur twenty-four months after the beginning of the policy year. For policy year 1988, the last policy could have been effective December 31, 1988 and that policy could cover a loss occurring on December 31, 1989. For the report made at the end of 1989, policy year 1989 is referred to as an incomplete policy year. This incomplete policy year is not used in workers compensation ratemaking. However, it is needed for balancing policy year totals to other financial reports.

In the Illinois sample filing, the 1988 policy year data at the first report reflects data for policies written between January 1, 1988 and December 31, 1988 evaluated as of December 31, 1989. This experience would have been reported to NCCI in March of 1990 by each individual insurer and aggregated by NCCI for all insurers.

The policy year used in a rate filing may be two or three years prior to the proposed effective date of the filing. For filings with effective dates early in the year, such as the sample filing with a January 1, 1991 effective date, the latest available policy year would be three calendar years prior to the effective date; i.e., policy year 1988.

b. Calendar-Accident Year Data

Calendar-accident year data assigns premiums to the calendar year in which they are reported as earned. Losses are assigned to the year in which the accident occurs. The first report on an accident year basis is available to NCCI fifteen months after the start of the period and includes losses evaluated as of

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twelve months. Consequently the calendar-accident year used in rate filings is only one to two years before the proposed effective year depending on the proposed effective date of the filing. The Illinois sample filing uses calendar-accident year 1989 data valued as of December 31, 1989.

Calendar-accident year data was introduced into the ratemaking procedures in 1984 to increase the responsiveness to current conditions.⁵ The average loss date in the 1989 calendar-accident data is July 1, 1989. The comparable average loss date in the 1988 policy year data is January 1, 1989. The experience contained in calendar-accident year data used in this filing is on average six months more recent than the policy year experience.

B. Cost Ratio Based on Policy Year Experience

The first step in calculating the overall rate level change indication is to estimate the expected cost ratio derived from the policy year experience. This calculation is summarized in Exhibit I-A in the sample filing. The details supporting the calculations are contained primarily in Appendix A.

Figure 3 displays the process that is used by NCCI for policy year experience; a similar methodology is used with the calendar-accident year data.

5 Undated NCCI Memorandum on Accident Year Ratemaking.

**NCCI RATEMAKING PROCEDURES
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POLICY YEAR COST RATIO CALCULATION
Benefit Cost

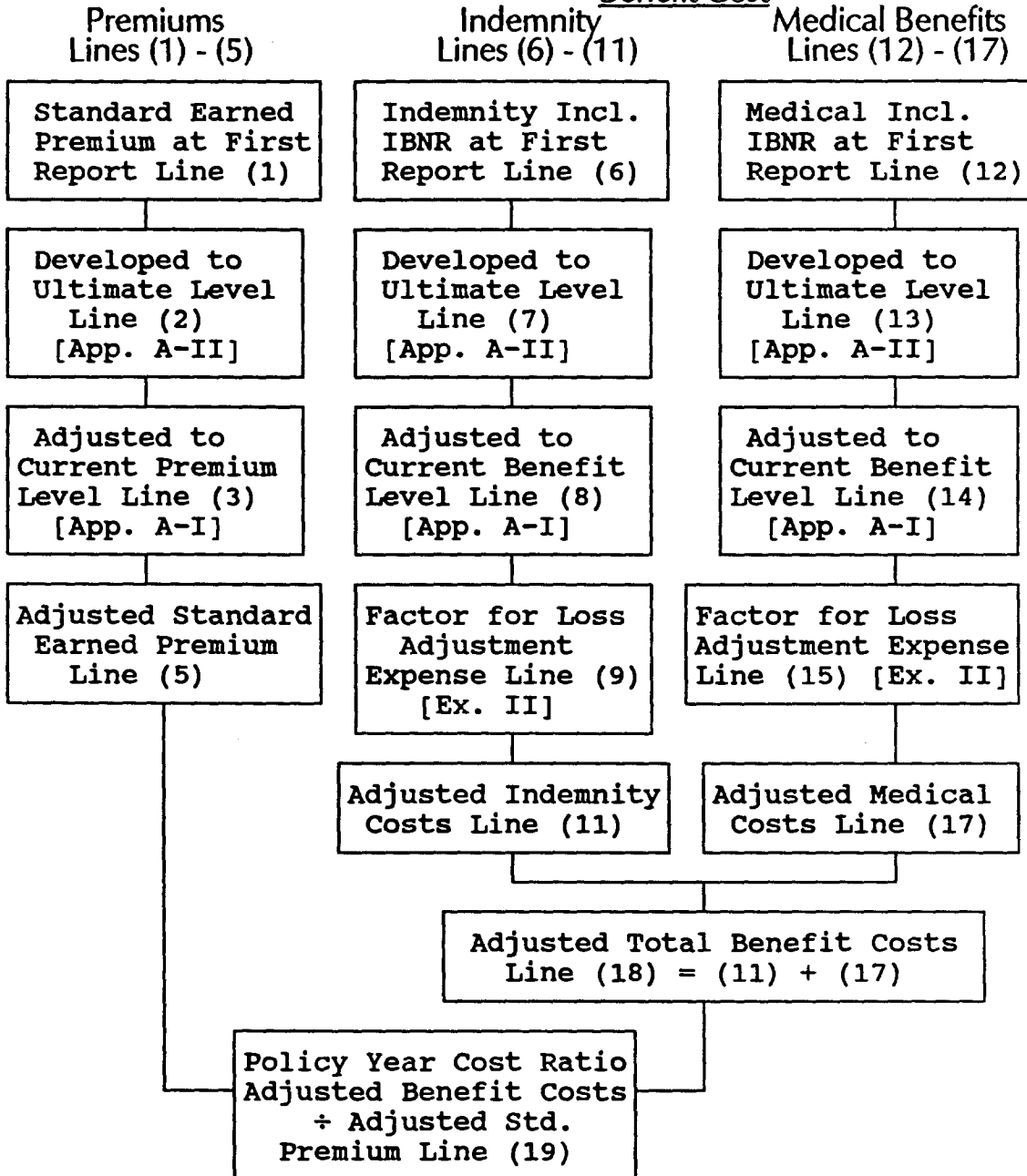


Figure 3

NCCI RATEMAKING PROCEDURES CHAPTER 2 -STANDARD METHODOLOGY

To estimate the policy year cost ratio, we proceed as outlined below:

1. Premiums

Standard Earned Premiums at First Report compiled from the financial calls is the starting point in the calculation of the Policy Year Cost Ratio. Each company reports premium at the Designated Statistical Reporting (DSR) level.

a. Policy Year Premium Development Factors

Standard Earned Premiums at First Report are developed to an ultimate basis using the premium development factor in line (2) Exhibit I-A. The premium development factor is intended to reflect expected future changes in policy year premiums from the first report to the fifth report. The implicit assumptions are that future premium growth from the first to fifth report will be similar to older policy years when they were at similar maturities and that premiums will not change after the fifth report.

The calculations used to derive the premium development factor are described in Appendix A-II of the sample filing.

Development factors are calculated by dividing reported premiums at the later evaluation point by the premiums reported for the same companies twelve months previously. Companies which had not reported valid data are excluded from both totals used in any development factor calculation. This is to ensure that a true indication based on matched companies is achieved. Due to the adjustments required for matching companies, the development factor exhibits are likely to contain two different totals for a particular policy period at each evaluation point. One total will exclude the companies that do not have valid data at that report and those that do not have valid data at the prior evaluation. The other total excludes the companies without valid data at that report and companies without valid data at the subsequent report.

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Age to age development factors to adjust from one evaluation point to the next for each set of maturities are generally calculated using data for the three most recent years at each maturity. Three years of data are used to calculate two development factors for each maturity.

In the Illinois sample filing, Appendix A-II two first to second report development factors are calculated. One divides the premiums for policy year 1986 at second report by the premiums for policy year 1986 at first report. The second factor comes from dividing policy year 1987 premiums at second report by policy year 1987 premiums at first report. The simple unweighted average of these two factors is used to estimate the premium development factor from first report to second report. The selection of an unweighted average reflects an assumption that the most recent year's development pattern and the prior year's pattern are equally predictive of future development for policy year 1988 premiums.

Cumulative development factors are then derived by multiplying all of the selected age to age development factors. That is, the first to fifth development factor used in Exhibit I-A of the NCCI filing reflects the expected development from first to second report, from second to third report, from third to fourth report and from fourth to fifth report. These factors are obtained from Sections A and B of Appendix A-II of the sample filing and are used on line (2) of Exhibit I-A.

b. Factor to Adjust Premium to Current Level

The purpose of the current level factor used on line (3) of Exhibit I-A is to adjust premiums to reflect rate level changes which have occurred since the policies were written. During this process, NCCI also removes premium due to expense constants and the impact of the trend factor contained in the current rates.

The calculation of the policy year on level factors in the sample filing is presented on the first page of Appendix A-I. The Illinois sample filing contains

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calculations related to rate level changes for assigned risks (Section A), and the voluntary market (Section B), which are then combined in Section C of Appendix A-I. Our discussion will focus on the general approach to calculating factors to adjust premiums to current levels. The concept is the same, however, whether talking about the voluntary or assigned risk premiums.

First, an index is set up for each period in which there have been different rate levels. The earliest period is set as the base with an index of 1.0. Each succeeding change is measured relative to the level that previously existed and a cumulative index is created. Next, the proportion of the year's earned premium written at each rate level is determined. Then an average is calculated by multiplying each relevant index by its proportionate weight. Finally, the cumulative index at the most recent rate level change is divided by the weighted average index to produce the adjustment factor to apply to developed reported premium.

To estimate the weights at which past premiums were earned, an assumed distribution of premium by month is used. This distribution is based on NCCI studies of premiums by anniversary date. The use of the same distribution in most states reflects the observation that the distribution of policy effective dates does not usually vary significantly by state.

If rate level changes apply to new and renewal policies, all premiums assumed to be written before the proposed effective date are modified. In certain cases benefit level changes are applicable to all outstanding policies. In this case all premiums earned after the effective date are assumed to be at the revised rate level.

NCCI makes an estimate of the amount of premium collected from the expense constant. In most states this is a relatively small amount. For the sample filing it amounts to 0.9% of standard premium. (See Column 6 of Section A of Appendix A-I).

Each fall, NCCI produces its proposed expense provisions for the coming year's rate filings. NCCI uses the latest available policy counts and reported standard earned

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premiums to estimate the percentage of future premiums to be received from the expense constant. See our report, Section II-B, Subsection 2, for more details.

The expense offset of .991 used in the current level factor calculations in Appendix A-I in the Illinois sample filing reflects the expected impacted of a \$60 expense constant. The calculation utilizes data from the 1982 expense study by size of loss which includes 2,040,675 policies with \$11,191,930,042 of premium. An inflationary adjustment is required since flat charges per policy do not increase with inflation but overall premiums do. The inflation factor underlying this calculation, which is based on differences between 1982 average wage levels and 1988 average wage levels, is 1.264. The calculation is documented below.

$$[.991 = 1 - (60 \times 2,040,675 / 11,191,930,042 (1.264))]$$

The premium adjustment factor is also modified by dividing it by the trend factor in the current rates. This is different than the treatment provided trend in many other ratemaking systems. (These differences will be discussed further, below). In the Illinois sample filing, the adjustment for trend is introduced in line (9) of Section C of Appendix A-I.

The factor to adjust premium to current level used in line (3) of Exhibit I-A is actually the combined effect of these factors: past premium level changes, the removal of the expense constant premium and the exclusion of the trend factor in the current rates.

In more commonly used ratemaking systems, the adjusted and developed losses would be multiplied by a trend factor to represent the cost level expected to exist while the new rates are in effect. These projected losses would then be divided by the full premium expected to be earned at current rates.

NCCI has chosen not to directly multiply the adjusted and developed losses by the trend factor and instead removes the provision for trend from the current rate. Algebraically, the result is the same.

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$$\text{Trended Loss Ratio} = \frac{\text{Standard Non-NCCI Method}}{\text{Premiums}} = \frac{\text{NCCI Method}}{\text{Premiums} \div \text{Trend Factor}}$$

Losses x Trend Factor Losses

As a later step in the ratemaking process, NCCI will introduce an adjustment to reflect the effect of a change in trend. Since the current rates reflect the provision for trend included in the previous filing and the NCCI ratemaking methodology has adjusted for this trend, it will only be necessary to incorporate a change in trend.

2. Benefit Costs (Losses)

As with premiums, policy year losses at first report are the starting point in the development of the cost ratios on Exhibit I-A. Indemnity losses (line (6)) are developed separately from medical losses (line (12)) and then the developed losses added together (line (18)). The methodology to develop losses to their ultimate values is comparable to the process used to estimate ultimate standard premiums.

a. Policy Year Loss Development Factors

When a rate filing is prepared, the NCCI actuaries consider which of five types of loss data to use as a basis for their ultimate loss projections. Projections based on any of the following types of data are considered part of the standard methodology by NCCI:

- Incurred losses including IBNR
- Incurred losses excluding IBNR
- Incurred losses excluding all bulk reserves
- Paid losses to the fourth report with incurred losses including IBNR thereafter
- Paid losses to the eighth report with incurred losses including IBNR thereafter.

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An assumption in the use of loss development factors is that historical patterns are predictive of future development. Therefore, data which exhibits consistent and stable development patterns generally is preferable.

NCCI selects the data expected to best predict future claim costs. The decision is based on a review of the projections produced by each type of data. Patterns of changes in age to age development factors are also considered. In addition, tests are performed by NCCI of historical accuracy of the various methods by state.

NCCI also consider ratios which are useful for identifying situations where changes in reserving adequacy might cause the use of incurred loss data to produce distorted results. These ratios are designed to identify situations where loss reserving levels are changing. NCCI reports that they also consider the expected impact of benefit changes, legal decisions and economic conditions on the validity of projections using each type of data. Ultimately, the NCCI decision of which data to use is based on their judgment. The selection of the type of data to use for medical and indemnity losses could differ within a filing.

The filing does not contain the documentation of the tests NCCI may have made before selecting the data used for making ultimate loss estimates. If a method other than incurred including IBNR is chosen, the filing discusses the reasons for using the selected method. For further information on the uses of loss development factors by NCCI, see the M&R Report on Section II-B, Part 1.

In the sample filing, NCCI selected incurred losses including IBNR. The selected indemnity and medical first to ultimate factors are used on lines (7) and (13) of Exhibit I-A and come from Section D of Appendix A-II. However in the following two sections, we will briefly discuss the methodology used by NCCI to calculate incurred and paid loss development factors.

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(1) Incurred Data

Age to age loss development factors through the eighth report are calculated using methodologies similar to those described in the premium development section. These calculations are documented in Appendix A-II, Section A and B of the sample filing. The product of the seven age to age factors represents the projected development from the first report used in the rate filing to the eighth report.

(2) Tail Projection - Development Beyond the Eighth Report

In Appendix A-II, Section C of the sample filing, two sets of eighth to ultimate factors are calculated. These factors are referred to as tail factors. The selected factor used in the loss projections is the unweighted average of the indications from each set. NCCI has tested various periods to use in determining eighth to ultimate factors.⁶ The use of an unweighted average assumes the two most recent years are equally predictive of the future development.

The derivation of the tail factor is a two step process:

First, convert projected losses at eighth report to an incurred (including IBNR) basis. The general methodology uses a two year average of:

$$\frac{\text{Incurred (Including IBNR) at eighth report}}{\text{Reported at eighth report}}$$

Reported at eighth report reflects the loss type being developed, i.e., paid, incurred excluding IBNR, etc. In the sample filing which uses incurred losses including IBNR, this factor is not reported since its value would be 1.0.

Second, calculate the eighth to ultimate tail (incurred including IBNR) as follows:

6 Minutes of Actuarial Committee Meeting of June 23, 1987.

NCCI RATEMAKING PROCEDURES CHAPTER 2 - STANDARD METHODOLOGY

Calendar Year (Incurred) Loss Development for all
maturities beyond eighth report
Average of most recent three years' incurred
losses at eighth report

The denominator (three year average) reflects a fairly recent modification to the NCCI's tail factor calculation. It is a reflection of the fact that the previous approach, which used only the most recent year's incurred losses at eighth report, understates the tail when the loss base is growing over time as has been the case in most states.

(3) Paid Loss Data

When the loss development factors are calculated using paid losses either four or eight years of payment data may be used. NCCI decides whether paid losses developed to four or eight years are expected to provide more reasonable estimates. NCCI will use only four years of paid loss development unless reserve level distortions after the fourth report are observed. This reflects an NCCI assumption that projections based on incurred development are generally more reliable than those based on paid development.

If four years of paid losses are used, the paid losses developed to a fourth report are adjusted to an estimated incurred at the fourth report. This is done by applying an assumed ratio of Incurred to Paid Losses at a fourth report. To calculate this assumed ratio, data for the most recent two years which are currently at a fourth report are used. The unweighted average is generally used unless a different selection is recommended by NCCI. This incurred to paid factor incorporates the expected reserves at the fourth report level and assumes that the ratios for these two years are predictive of the ratio which will occur in the future. Incurred loss development factors are then used to adjust losses from the fourth report to the eighth report.

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If eight years of payment data are used, seven age to age paid development factors are calculated. An incurred to paid factor is then calculated to adjust paid losses at the eighth report to incurred losses at the eight report. This is based upon the average ratio of paid plus IBNR at eighth report to losses paid at eighth report . This ratio introduces a provision for the expected eighth report reserves and assumes the ratios for the two most recent years are equally valid for predicting these reserves. For this approach, the factor to develop losses beyond the eighth report is identical to the tail factor used for the incurred loss projection.

b. Current Benefit Level Factors

Exhibit I-A, line (8) (indemnity) and line (14) (medical) show the factors to adjust losses to current benefit levels. These factors are documented on page 2 of Appendix A-I, Sections D and E of the sample rate filing. Separate calculations are made for medical and indemnity losses since benefit level changes generally have a different impact on these two components of benefit costs. The process is similar in concept to that used for bringing premiums to current level.

First, the calculation of the adjustment factors involves assigning the oldest benefit level in effect a base value of 1.0 and introducing a factor which measures the impact of each benefit change relative to what previously had been in effect. Cumulative indices are calculated for all benefit levels by multiplying all prior indices since the base period.

Next, the proportion of incurred losses which were incurred at each benefit level is estimated. The distribution of losses by period reflects the assumed policy anniversary distribution for policies written in each policy year. For any one policy, losses are assumed to occur evenly over the year.

Finally, the cumulative index for the current benefit level is divided by the weighted average index for benefits incurred during the policy period to produce the required adjustment factor. The purpose of this adjustment factor

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is to bring the past losses to the cost level expected based on the benefit level contemplated by the current rates.

c. Claim Adjustment Expense Provision

On Exhibit I-A, lines (9) and (15), a provision is introduced to include claim adjustment expenses as a percentage of losses. The standard NCCI procedure is to apply the claim adjustment expense factor underlying current rates here and then in Exhibit I-F, (change in expenses) to include the change in the loss adjustment expense factor along with the change in other expenses. However, in the sample filing the current loss adjustment expense factor of 1.12 is the same as the proposed factor. The determination of the loss adjustment expense provision is presented in Exhibit II-C of the filing. The proposed factor of 1.12 is the average of three years of incurred loss and loss adjustment expense ratios. Provisions for claim adjustment expenses are currently based on countrywide data. Both stock and mutual company experience is utilized in the calculations. In recent years, NCCI has also used the results of a special call to obtain loss adjustment expenses and losses paid on a direct basis by accident year. This is to avoid the problem that can occur in using net of reinsurance data where the effect of reinsurance can be different for losses and loss adjustment expense.

The use of a multiplicative factor applied to losses assumes that claim adjustment expenses will change proportionally as loss levels change.

3. Policy Year Cost Ratio

Adjusted policy year premiums (Exhibit I-A line (5)) are calculated by multiplying reported premiums by premium development factors and current level factors. These premiums represent the expected ultimate premium if policies had been written at current rate levels excluding the trend provision and the effect of the expense constants.

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The adjusted indemnity benefit cost (line (11)) is calculated by multiplying the policy year reported indemnity cost by the indemnity development factor, the indemnity current benefit level factor and the claim adjustment expense factor. These benefit costs are the projected ultimate indemnity amounts for all losses under the current benefit provisions and with the current claim adjustment provision included.

Similarly, the adjusted medical benefit cost (line (17)) is calculated by multiplying the reported policy year medical amount by the medical development factor, the medical current benefit level factor and the current claim adjustment expense ratio. The adjusted total benefit cost (line 18) is the sum of the adjusted indemnity and medical costs.

The Policy Year Cost Ratio (line (19)) is calculated by dividing adjusted total benefit costs (line (18)) by adjusted policy year standard premiums (line (5)). This ratio reflects the proportion of standard premiums at the current premium level, excluding trend and expense constant premiums, which would be available to cover projected losses and claim adjustment expense at the current benefit levels.

C. Cost Ratio Based on Calendar-Accident Year Experience

The methodology used to calculate cost ratios based on calendar-accident year experience shown in Exhibit I-B is very similar to the methodology used for policy year experience. This report will not repeat the explanation of the factors common to both.

1. Premium

NCCI assumes that calendar-accident year standard earned premiums require no development adjustment. Calendar year 1989 will reflect premiums from 1988 and 1989 policies as well as possible adjustments on 1987 and prior policies. NCCI assumes the calendar year premium will produce a reasonably accurate match with the accident year exposures. The validity of the assumption that calendar-accident

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year premium does not need to be developed will be commented on more fully in Section II-B, Part 1 of M&R's report to the NAIC.

Line (2) of Exhibit I-B shows the factor to adjust calendar-accident year premiums to current levels. This factor is calculated in Section A, B and C of Appendix A-III in the sample filing. The methodology and underlying actuarial assumptions are analogous to the policy year calculations.

2. Benefit Cost (Losses)

Accident year development factors are calculated in Appendix A-IV of the sample rate filing. The first to ultimate development factors for accident year losses for indemnity and medical are derived in Section D of Appendix A-IV and are used on lines (5) and (11) of Exhibit I-B.

The calculations and underlying actuarial assumptions are comparable to those used for policy year data. For the Illinois sample filing, both sets of calculations use incurred loss including IBNR data. In some NCCI rate filings, the data which is selected as most appropriate for policy year data may not be selected for accident year data.

Appendix A-III, Sections D and E shows the calculation of factors to bring indemnity and medical accident year losses to the present benefit level. These factors are used on lines (6) and (12) of Exhibit I-B. Again, the methodology is comparable to that used in adjusting the policy year benefit data.

3. Calendar-Accident Year Cost Ratio

The calendar-accident cost ratio is calculated in Exhibit I-B on line (17) by dividing the sum of accident year adjusted indemnity and medical losses (line (16)) by the calendar year's adjusted standard earned premium (line (3)). This cost ratio represents the proportion of calendar year 1989 premium at the current premium level, excluding trend and expense constant premiums, which would be available to cover projected accident-year 1989 claim costs, assuming the current benefit levels.

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D. Average Cost Ratio and Indicated Change Based on Experience

1. Average Cost Ratio

Exhibit I-C calculates the average of the policy year and calendar-accident year cost ratios. The average cost ratio gives equal weight to the cost ratio based on policy year experience and the cost ratio based on calendar-accident year experience.

The use of one policy year and one accident-year of experience reflects an NCCI assumption that the most recent year is a better predictor than an average of a number of years and, furthermore, that policy year experience and accident-year experience are equally good predictors.

2. Target Cost Ratio

The current target cost ratio represents the proportion of premium expected to remain after the provision for expenses other than claim adjustment expenses and the provision for profit and contingencies have been removed. An average cost ratio exactly equal to the target cost ratio would indicate that the current premium excluding trend provisions was exactly at a level to cover projected losses, claim adjustment expenses, general expenses and profits. The derivation of the target cost ratio is documented in Exhibit II-A.

The expense provisions (Exhibit II-B) underlying the target cost ratios are selected to be indicative of the expense requirements for the first \$5,000 of standard premium excluding estimated premiums from the application of expense constants.

The target cost ratio considers provisions for production costs, general expenses, taxes, licenses and fees other than federal income taxes and profit and contingencies. These provisions are obtained from Exhibit II of the prior rate filing. Proposed adjustments in any of these provisions filing are introduced in later sections of the rate level calculation.

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3. Indicated Change Based On Experience

The indicated change based on experience is calculated in Exhibit I-D by dividing the average cost ratio by the current target cost ratio contemplated by the current rates.

E. Impact of Changes in Trend

NCCI's indicated change based on experience is calculated using untrended losses and assuming the trend factor in current rates will continue at its current level. A trend factor of 1.122 is contained in the current rates for the Illinois sample filing. When NCCI updates the trend indication from this year's rate revision, only the change in the indicated trend factor needs to be introduced.

The calculation of indicated rate levels should include an adjustment of indemnity and medical losses to reflect expected changes in the trend factor. This is shown in Exhibit I-E. Trend factors reflect estimated changes in benefit cost levels between the experience period and the period the proposed rates are expected to be in effect. In workers compensation, since the exposure is based on payroll, trends actually reflect the expected increase of medical and indemnity losses relative to the expected payroll growth.

The calculation of the policy year trend factor is documented in Appendix A-V of the sample rate filing. The trending procedures of NCCI are documented in a memorandum on trend procedures.⁷

1. Data Utilized in Trend Calculations

The calculation of the trend factors generally utilizes five years of policy year data from the financial calls. The most recent year corresponds to the year used to calculate the indicated change based on experience. The selection of a five year period assumes that this period will be predictive and medical trends have been used

⁷ NCCI Memorandum on New Trend Procedures

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since 1983 to respond to the differing influence of outside factors on medical and indemnity losses. The calculation considers countrywide experience as well as individual state data.

2. Trend Data Adjustments

Premiums for each policy year are developed to current levels using the same procedures which were discussed in the policy year premium section of this chapter. The on-level premium for the most recent year is identical to the value used in the calculation of the policy year cost ratio. The derivation of the factors for the other years is not contained in the current rate filing but is available from NCCI if requested.

For indemnity losses, reported amounts are developed to ultimate levels and adjusted to current benefit levels. The development factors used in this calculation are calculated in Appendix A-II of the sample filing.

Indemnity and medical losses are adjusted to current benefit levels using factors which reflect changes since the earliest year in the five year policy period. It is essential to have all losses on the same benefit level so that benefit changes do not distort the measurement of any trend. The methodology and assumptions of these calculations are identical to those discussed above in the current benefit level factors section. Only the factors applied to the most recent policy period are documented in the sample filing. Again, NCCI can provide the complete documentation if requested.

For indemnity and medical losses, the values for the most recent year used in trend calculations do not agree with the value contained in the average cost ratio projection since the provision for claim adjustment expenses is not included in the trend calculation.

In addition to state data, the selected trend factor may rely, in part, on countrywide trend indications. The weighting of state and countrywide trend indications assumes that in states where trends are not considered fully credible countrywide data is a good indicator of the expected trend in the state.

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Two trends are calculated from countrywide medical data. One trend is based on experience from states that have either no medical fee schedule or a medical fee schedule which NCCI considers ineffective. The second countrywide medical trend is based on data from states that NCCI considers to have effective medical fee schedules. The use of separate trends reflects the expectation that medical costs may show different trend patterns if an effective medical fee schedule is in use.

3. Calculation of Trend Factors

Loss ratios at current rate and benefit levels for each of the five most recent policy years are calculated by dividing adjusted indemnity or medical losses by adjusted premiums. This is documented in Sections D and E of Appendix A-V. The use of loss ratios for trend indications measures the difference between claim cost growth and payroll growth.

Linear least squares regression techniques are used to fit a line through the adjusted loss ratios for the five policy years. A linear least squares regression fits a line which minimizes the sum of the square distances between the actual adjusted loss ratios and the loss ratios on the fitted line. This fitted line is used to project costs to the midpoint of the period that the rates are assumed to be effective. Generally, each set of proposed rates is assumed to be effective for one year.

Trends projected using linear regression assume that loss ratios are changing by a uniform amount each year.

4. Credibility of Trend Indications

The credibility which is assigned to trend indications based on state data depends on how closely the data fits the straight line projection fitted by the linear regression. More credibility is assigned when the actual data is close to the projected trend line. The assignment of partial credibilities is based on standards selected by the Actuarial Committee of NCCI and is designed to give full credibility if there is a 90% chance

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that loss ratios will be within 5% of the fitted loss ratios at the midpoint of the experience period.

A detailed discussion of the methodologies and concepts underlying the determination of trend factors and credibility for trend calculations is included in Section II-B, Part 4 of our report to the NAIC on NCCI ratemaking.

5. Change in Trend

The indicated overall trend factor is derived by weighting the medical and indemnity trends by the respective policy year medical and indemnity losses used in the filing. This overall factor is divided by the trend factor underlying the current rates to produce the change in trend factor introduced in Exhibit I-E of the rate filing.

As explained above, the projected cost ratios have had the provision for trend included in existing rates removed. That is, the projected premiums are not at the level traditionally used for "premiums at current rates" in other lines of insurance. Rather, they are the premiums that would be collected if the current rates were charged but without the provision for trend contained in the current rates.

In the sample filing, the indicated trend from the midpoint of the experience period to the midpoint of the policy effective period is 1.128. The trend factor in the prior filing was 1.122. The effect of the change in trend is 1.005, or an increase of 0.5%. which is calculated by dividing the new trend factor by the old trend factor.

F. Effect of Changes in Expenses

The NCCI method of presenting rate level changes isolates the effects of each change in expense provisions. In the sample filing, changes in general expenses are introduced in Exhibit I-F. Provisions for changes in taxes are introduced in Exhibit I-H. Finally, the proposed change in the expense constant is introduced in Exhibit I-K. The change in expense constant is intended to have an effect on the changes in the proposed manual rates but not the proposed premium level.

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The sample filing does not have any changes in production expenses, claim adjustment expenses, assessments or the provisions for profits and contingencies. If there had been any, changes in production expenses or claim adjustment expenses would have been included in Exhibit I-F. Changes in assessments would have been introduced in Exhibit I-I.

1. Illustrative Example of Expense Changes

The discussion of the expense changes in the Illinois sample filing shown below does not follow the NCCI presentation in Exhibit II-B. Rather it is designed to clarify the links between the three expense changes in the sample filing.

The sample filing is really changing three components for expenses:

- a. A reduction in the general expense provisions in the current rates from 6.7% to 6.6% assuming no change in the expense constant of \$60. (See columns A and B of Exhibit II-B and line 9 of that Exhibit.)
- b. A change in the provision for taxes that NCCI believes is necessitated by assessments for the Illinois Guaranty Fund. (See line 3, column C of Exhibit II-B of the sample filing).
- c. A change in the expense program triggered by changing the expense constant from \$60 to \$75 per policy. Since more premiums will be collected by levying the higher expense constant, a smaller percentage loading is required for general expenses. Specifically, coincident with the increase in the expense constant from \$60 to \$75 policy, the general expense premium can be reduced from 6.60% to 6.40% per premium.

2. Data Utilized in the Analysis

NCCI reviews expense provisions annually. The review process has the NCCI staff compiling the data and making recommendations to the Actuarial Committee. This

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Committee then discusses and votes on what to include as expense and profit provisions in the coming year's filings. Countrywide data compiled from the Insurance Expense Exhibits is used in this review in most states. The Insurance Expense Exhibit data is adjusted for expense constant revenue, premium discounts, schedule rating, and carrier deviation. A further adjustment is made to remove the effect of servicing carrier allowances in order to put expenses on a direct basis with respect to pool reinsurance.

NCCI assumes that countrywide data is more appropriate than state data because the allocation of expenses by state is not practical due to the relatively large proportion of the total premium for interstate policies. In a few states, including Illinois, state data is used at the regulators' request.

Separate tabulations are made of expense data for participating stock companies, non-participating stock companies, mutual companies and reciprocal insurers. The expense provisions used in NCCI rate level calculations are those estimated to be appropriate for stock companies. NCCI indicates that stock companies generally write the smaller policies and historically their experience has been the basis for determining the expense provisions in the rate structure.

3. Provision for Production Expense

The provision for production expenses including commissions, other acquisition, field supervision and collection expense is not calculated directly from actual production expenses being incurred by insurers but is included as a budgetary provision. This provision, which is generally 15% of the first five thousand dollars of standard premium, has existed for many years. NCCI indicates that the combined production expense experience of a group of carriers would not be meaningful since commission levels are based on competitive factors and the result of a wide variety of individually negotiated contracts. NCCI does, however, believe that stock company data supports the reasonableness of the current provision for production expenses.

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4. Provision for General Expenses

About 60% of the income generated by the expense constant is designated to be used to pay general expenses. This reduces the otherwise required general expense provision which must be collected as a percentage of premium.

In the filing, a reduction in the general expense provision in the current rates from 6.70% to 6.60% is being proposed while maintaining the present expense constant of \$60. This change has the -0.1% effect on premium level derived on line (9) of Exhibit II-B. This expense adjustment, which is carried over to Exhibit I-F of the sample filing, does not include the additional reduction of the general expense provision from 6.60% to 6.40% of standard premium which could result from the increase in the expense constant from \$60 to \$75. The documentation showing how the general expense provision could be reduced by increasing the expense constant to \$75 is contained in Exhibit II-D. The effect of this change on rate level is introduced in Section I-K of the sample filing.

5. Provisions for Profit and Contingencies

A provision for profit and contingencies is included in the target expense level used to calculate rate level change indications. Historically, the provision for profit and contingencies used in calculating workers' compensation rates has been 2.5%. The objective of NCCI in filing this provision is to produce an underwriting profit of 2.5% of premium before federal income taxes. This provision is not derived in the rate filing but NCCI routinely supplies documentation to support the 2.5% provision.

The issue of what constitutes a reasonable provision for profit and contingencies has been a subject that has been receiving increased scrutiny over the past several years. Any discussion of profit and contingency provisions is outside the scope of this review.

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G. Adjustments for Changes in Benefits

Up to this point in the sample filing, NCCI has estimated future benefit costs based on the level of benefits that became effective on July 15, 1989. It is common for NCCI to encounter situations where because of the logistics of preparing a rate filing, revisions in statutory benefits become effective subsequent to initiating the work on a filing. In these cases, NCCI will perform its analysis based on the statutory benefits in effect prior to the revision. Subsequent benefit revisions will have their impact reflected separately from the experience review. As will be seen later, these revisions are also incorporated in a final step prior to computing proposed rates. Three sets of benefit changes became effective in 1990 that are not yet reflected in the January 1, 1991 rate level indication. These three benefit changes and their estimated impact on benefit costs are:

January 15, 1990	+0.03%
July 1, 1990	+0.40%
July 15, 1990	+0.03%

The changes are the result of increases in the minimum and maximum weekly benefits. These minimums and maximums are tied to semi-annual changes in the state's average weekly wages as posted and published by the Illinois Industrial Commission. The combined effect of these three changes is estimated by NCCI to be an increase of 0.4%. This is the effect incorporated in Exhibit I-G of the Illinois sample filing.

NCCI provides documentation of its estimate of these changes in three separate "Illinois Law Memos"; Appendices C-I, C-II, and C-III, respectively of the filing. Because of their similarities, we have only included Appendix C-1 in the sample filing included as part of this report. The documentation of the effect of the January 15, 1990 benefit revision by type of injury is shown in Exhibit II-A of the NCCI's Appendix C-1.

A discussion of the technical concepts underlying the evaluation of changes in claim costs due to benefit revisions is beyond the scope of this part of our report. These

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aspects of benefit level evaluation as well as a discussion of other types of benefit evaluations are covered in Section II-B, Part 5 of M&R's overall report on the examination of NCCI ratemaking.

H. Changes in Taxes and Assessments

Tax and Assessment changes are introduced in Exhibit I-H and Exhibit I-I of the NCCI ratemaking calculations. These adjustments are developed in Exhibit II of the filing.

1. Effect of Change in Taxes

The NCCI rate level filing incorporates a provision for changes in premium taxes, licenses, and fees. The provisions for these three components in the current rates and underlying the proposed rates are presented in Exhibit II-A of the sample filing.

The provision for premium taxes is generally based on the statutory rate for foreign insurance companies. Other tax considerations such as those imposed by retaliatory tax provisions are not reflected. No recognition is made to reflect if domestic insurance companies have premium tax exemptions.

Miscellaneous taxes are assumed to be 0.8% of premiums. This provision for miscellaneous taxes is adjusted periodically based on a review of experience reported in the Insurance Expense Exhibits. No change in miscellaneous taxes is proposed in the sample filing.

NCCI generally introduces guaranty fund fees, or indeed any assessment calculated as a percent of premium, as a tax. The sample filing includes a change in insurance guaranty fund taxes. The provision underlying current rates of .15% is shown on line 3(b) of Exhibit II-A. The .52% provision underlying proposed rates is also presented on line 3(b). The effect of this change is calculated on line (12) of Exhibit II-B and then carried over to be displayed on line (2) of Exhibit I-H.

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Premium-based assessment provisions are generally calculated from the most recent actual assessment levied by the governing body controlling the funds. When the guaranty fund assessment can be credited against the premium taxes incurred, no provision for such assessment is made in the rate level calculation.

2. Effect of Changes in Assessments

Assessments payable as a percent of indemnity payments or total paid or incurred losses are introduced through the benefit adjustment factors. The provisions for assessments on losses are presented on line (8) of Exhibit II-A. In the sample filing the Second Injury and Compensation Rate Adjustment Funds are .125% and .50% of losses respectively. Since no change was introduced, the values in all columns of line (8) are identical and no provisions for changes in assessments are applied in Exhibit I-I.

Many jurisdictions have assessments on individual injury types such as fatal claims. Such assessments are included in reported losses.

I. Distribution of Premium Change to Industry Groups

In most states there are three industry groups. Each class is assigned to either the manufacturing, contracting or all other industry group. The use of these categories assumes that the factors affecting premiums and benefit costs may be operating differently between these three industry groups.

The distribution of the overall premium level change to industry groups is shown in Exhibit I-J of the sample filing. This distribution is done through industry group differentials that are calculated in Appendix A-VII in the NCCI sample filing.

Because the industry group differentials rely on WCSP data, a considerable number of adjustments must be made to that data to be consistent with the financial call data used to determine overall premium levels. Consequently, we will explain these adjustments in a subsequent section of this chapter discussing classification rates.

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J. Effect of New Expense Program

The final adjustment is in Exhibit I-K of the rate filing; that is the introduction of the factor to reflect the new expense program. This factor is calculated in Exhibit II-B of the filing and reflects the effect of increasing the expense constant. This adjustment is applied uniformly to the indicated premium level changes by industry group to produce the indicated rate level change by industry group.

The effect on premium level for the new expense program is calculated by comparing columns C and D in Exhibit II-B in the sample filing. The general expense provision is reduced to adjust for the additional income from the increased expense constant. In the sample filing the increase in the expense constant from \$60 to \$75 reduces the general expense provision from 6.6% to 6.4%. This, in turn, permits a 0.3% reduction in overall manual rate level without affecting the overall premium level.

Additional information on issues relating to the expense program is contained in Section II-B, Part 2 of the M&R report on NCCI ratemaking.

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III. CLASSIFICATION RATEMAKING FOR INDUSTRIAL CLASSES

As we have seen, the NCCI's standard methodology bases the overall proposed statewide premium level change on its analyses of financial call data for premium, and losses. Premiums and losses are state specific while expenses more frequently are analyzed on a countrywide basis.

The key to understanding the NCCI's methodology at the classification level is keeping in mind two factors:

1. the data utilized for industry group and class ratemaking differs from the data used to calculate the overall premium level change; and
2. the class and industry group ratemaking emphasizes distributing the overall statewide change rather than developing rates directly from the class data.

In the Illinois sample filing, the proposed overall premium level was derived from the experience of policy year 1988 and calendar-accident year 1989 with both sets of data being evaluated as of December 31, 1989.

The data used for industry group differentials and classification ratemaking comes from the WCSP. This body of data differs from the financial call data in a number of significant ways.

1. It is at a greater level of detail. It provides payroll, premium and loss data by class for each insured employer; with the losses being reported by type of injury;
2. It is older. The sample filing uses WCSP data for policies effective between April 1, 1985 and March 31, 1988 with valuation dates being from October 1, 1988 through September 30, 1989; and

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3. The WCSP data is used not only for classification ratemaking but is the same data base NCCI uses in deriving experience rating modifications for each eligible insured.

For additional information on the differences and inter-relationship in the data between the financial calls and WCSP, please see our report in Section I of this examination.

It is clear though that the greater level of detail provided by WCSP and its more extensive use for such things as experience rating suggests a longer and more complex task to capture and to be able to use this data. Because of this, it is important to also remember that the financial call and WCSP data may not be compiled for ratemaking at the same time by NCCI.

As mentioned in the preceding section of this chapter, NCCI's presentation calls for calculating industry group differentials as one of the last steps in presenting the overall statewide premium level change. This is only for presentation purposes. Algebraically, it could just as easily be presented as the first step in developing the classification rates without having an effect on the overall premium level proposed.

Stated another way, the calculation of industry group differentials may be viewed as the process for bridging the indications from the financial call data and the indications that would be developed solely from the WCSP data. Achieving the proposed statewide premium level change is of primary importance in the NCCI's methodology.

In the next section of this chapter, we will focus first on the methodology and assumptions used by NCCI to develop the industry group differentials. We will then proceed to discuss the development of the class rates.

One final note, we have previously mentioned that NCCI has supporting workpapers for calculations not completely documented in the filing. Some of these workpapers are critical to understanding how the WCSP data is used. Consequently, we have created Appendix D to the sample filing. Appendix D incorporates some of the more

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important NCCI workpapers and will be referred to specifically in the discussion that follows.

A. Industry Group Differentials

The industry group differentials derived by NCCI in Appendix A-VII of the sample filing depend upon comparing the level of expected, or permissible, losses in the current premium structure with the indicated losses derived from the WCSP data.

1. Expected Losses

NCCI derives the expected losses by multiplying the premiums at current manual rates shown in column (1) of Appendix A-VII by the ratio of earned to manual premiums and target cost ratio.

The premiums at current manual rates are before the effect of the experience rating plan. NCCI's objective is to estimate the required change in standard premium levels; that is manual premium after the effect of the experience rating plan. NCCI uses the ratio of earned to manual premium to make this adjustment.

a. Ratio of Earned to Manual

The calculation of these factors by industry group are shown in the supporting NCCI workpapers. Appendix D-I shows the calculation for the sample filing. The derived ratios from line 4 are:

Manufacturing	0.987
Contracting	0.989
All Other	<u>0.993</u>
Total	0.991

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The ratio is the three year average of the reported standard earned premium to the premium at manual rates for each industry group. The premiums used in the calculation are the actual reported amounts for manual and standard earned premium from the WCSP system. In the WCSP, there is no adjustment of the reported manual or standard earned premiums to reflect current rate levels in the calculation of the ratio of earned to manual. In the sample filing, a special loss ratio adjustment program applicable only to the Contracting Group was in existence. A modification to the standard procedure is incorporated for this special plan before developing the final earned to manual ratio for the Contracting Group.

NCCI believes that the introduction of the earned to manual ratio is necessary to reflect the off-balance that results from the application of the experience rating plan. The ratio of "earned to manual" is usually less than 1.00 reflecting the general tendency for the experience rating plan to provide more credits than debits. In estimating overall premium level changes, NCCI begins with policy year data from the financial calls that is already at the standard premium level.

b. Target Cost Ratio

The percentage of the current level standard premiums available to pay loss and loss adjustment expenses is 72.85%. This value is from the first column of Exhibit II and reflects the expense level of the prior rate filing.

c. Expected Losses

As an example, the expected losses for the Manufacturing Group shown in Appendix A-VII are calculated as follows:

Premiums at 9/1/90 level	\$1,461,651,768
Ratio of earned to manual	0.987
Target Cost Ratio	72.85%
Expected Losses (1)x(2)x(3)	1,050,870,740

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This value is shown in column (2) of the second page of Appendix A-VII.

2. Indicated Losses

The NCCI procedure for developing the indicated losses in column (3) of Appendix A-VII involves adjusting WCSP losses in four steps:

- a. Adjust the losses to current benefit level,
- b. Develop the losses to ultimate,
- c. Adjust the losses to Level of 1987 policy year aggregate and calendar-accident year 1988 exposure as of December 31, 1988.
- d. Wage Trend Differential Adjustment.

Each of these steps is described below.

a. Adjust Losses to Current Benefit Level

The losses shown in Appendix A-VII have been brought to the same benefit level, July 15, 1989, as that used in Exhibit I of the sample filing to estimate overall premium levels. The process for calculating these on-level factors is the same as that described earlier in this chapter. However, at the class and industry group level, the process is applied by type of injury. This is because the WCSP system provides loss data by type of injury (fatal, permanent total, etc.). NCCI evaluates the impact of benefit changes by type of injury. The factors used in Exhibit I for each benefit level change are only the weighted average of the effects estimated by type of injury by NCCI. Since each class may have a different distribution of losses by type of injury, NCCI's methodology for class and industry group ratemaking uses benefit level

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adjustments by type of injury for each class. The factors actually used in the sample filing are shown on the first page for Appendix B-1, Section B.(a).

b. Develop the Losses to Ultimate

As with the benefit level adjustments, in concept, the methodology to develop losses to ultimate is comparable to that explained in connection with overall premium level determination. Again though, the development factors are applied to the WCSP losses at a more refined level.

Separate loss development factors are calculated to be applied to the following categories of WCSP losses by class.

<u>INDEMNITY</u>		<u>MEDICAL</u>	
<u>SERIOUS</u>	<u>NON-SERIOUS</u>	<u>SERIOUS</u>	<u>NON-SERIOUS</u>

Under WCSP, serious losses are from fatal, permanent total and major permanent partial injuries and non-serious losses are from minor permanent partial, temporary total, and medical only. WCSP requires the losses by type of injury be reported separately for indemnity and medical.

Development factors for first to fifth reports are derived directly from WCSP data. In going from the fifth to ultimate, NCCI uses the average indemnity and medical development factors that it derives for use in the overall rate level.

In going from the fifth report to ultimate, NCCI assumes that any development of incurred losses occurs only on serious losses. If the total fifth to ultimate indemnity loss development was 1.05 and serious losses made up 80% of the indemnity losses in the WCSP data, then the fifth to ultimate factor of 1.063 for serious indemnity losses would be calculated as follows:

$$80\% \text{ of } x + 20\% \text{ of } 1.00 = 1.05$$

$$x = 1.063$$

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A similar calculation is made for serious medical losses.

The development factors applied to each policy year of WCSP data are shown in Appendix B-I, Section B.(b). However, someone tracing NCCI's calculations would find the need to incorporate another factor into the loss developments in order to derive the factors shown in Section B.(b) of Appendix B-I. That is, the factor described in the next sub-section of this report.

- c. Adjust the losses to Level of 1987 policy year aggregate and calendar-accident year 1988 exposure as of December 31, 1988.

The manual rates currently in effect, which are the basis for deriving the expected losses by industry group, were the result of a prior experience review. In the sample filing, that would have been the rates projected based on experience from policy year 1987 and calendar-accident year 1988, both valued at December 31, 1988.

The current rates, therefore, specifically include a provision for trend factors for indemnity and medical losses as well as the effect of introducing calendar-accident year data into the overall rate level. These factors are not yet reflected in the WCSP data. To bring the WCSP data to the same level of costs reflected in the current rates, NCCI returns to the last overall experience review and takes the policy year adjusted cost ratio that it developed last year and adjusts it to reflect any subsequent premium and benefit revisions. For example, in the sample filing, using the prior experience review, and bringing it to the same rate and benefit level used in this year's overall premium indication based on experience, NCCI workpapers show a policy year 1988 adjusted cost ratio of 0.7050.

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i. Policy Year Adjustment Factor

The January 1, 1990 rates also contemplated an overall trend factor of 1.122, comprised of 1.100 for indemnity and 1.169 for medical. These were documented in Appendix A-V, Section F of the prior filing and, as we shall see, in Appendix B-I, Section B, (e).

The WCSP adjusted cost ratio is calculated from the premium and loss data shown in Appendix A-VII after adjusting for the ratio of earned to manual.

(1)	Loss Ratio from Appendix A-VII (3,265.6 ÷ 5,746.8)	.568
(2)	Ratio of Earned to Manual (See Section A.1.a)	.991
(3)	Loss Ratio on Standard Premium Basis (1) ÷ (2)	.5734

These three factors are then combined to develop the policy year adjustment factor as follows:

(1)	Policy Year 1988 Adjusted Cost Ratio	.7050
(2)	Current Overall Trend Factor	1.1220
(3)	WCSP Adjusted Cost Ratio	0.5734
(4)	Adjustment Factor [(1) ÷ (2)] ÷ (3)	1.096

The policy year adjustment factor of 1.096 is then used to bring the WCSP loss ratio to the same level as that contemplated by last year's financial call data. It is incorporated into NCCI's methodology by

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applying it uniformly to all the loss development factors that would otherwise be used to develop WCSP losses.

ii. Calendar-Accident Year Adjustment Factor

In a similar fashion, the effect that calendar-accident year 1988 had on premium levels from the last experience review must be included. The overall premium level change is a 50-50 weighting of separate policy year and calendar-accident year indications.

From the prior experience review, the average cost ratio adjusted to the same rate and benefit level contemplated in this year's analysis is 0.7185. The affect of incorporating the calendar-accident year into last year's review is 1.019 (.7185+.7050).

The 1.019 factor is presented in Appendix B-I Section B. Subsection (b). NCCI does not also disclose the policy year aggregate adjustment factor of 1.096. We believe they should.

d. Wage Trend Differential Adjustment

The goal of using industry group differentials is to adjust for differences in loss ratios between the three industry groups. The statewide rate level change indications assume the same rate of change of indemnity and medical costs relative to wage costs for all segments of the business.

Specific adjustments have been introduced recently to adjust for differences in average wage growth rates for the three industry groups. The development of the current methodology is based on analysis and testing by the NCCI Actuarial Committee during 1988 and 1989. Several memoranda document the

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discussions and testing which were performed before this change was introduced.⁸

The Illinois sample filing does not include any documentation of the calculation of industry group trends. Sample pages provided by NCCI which support the trend factor adjustments are included in Appendix D-II, which is bound with the sample rate filing. The average wage data and trend indications are presented on Appendix D-II Page 1.

The calculation of the factor to adjust the industry group differential for differences in wage growth involves trending average weekly wages for each industry group. The average weekly wage values by industry group are compiled by NCCI from state Bureau of Labor Statistics data by occupation. The industry group trends are calculated to measure the difference between the midpoint of the experience period and the midpoint of the most recent year. Industry group wage trends are calculated by fitting a linear least squares regression to five years of data on average weekly earnings by industry group. The linear trend assumes that the dollar amount of change per year is uniform. Industrywide wage trends are calculated by weighting the industry group trends using the expected losses from Appendix A-VII as weights.

For each industry group, the wage trend differential is calculated by dividing the average trend by the industry group trend. This calculation is shown on page 2 of Appendix D-II. In the sample filing, the manufacturing and contracting trends are slightly lower than the overall trend and the all other trend is higher than the average.

An adjustment factor is then calculated for each industry group to modify indicated losses to reflect the differences in wage trends. To calculate this factor, indicated medical losses multiplied by the wage trend differential are added to indicated indemnity losses. This wage trend differential increases the medical losses used in the industry group differentials for groups with lower

8 Minutes to Actuarial Committee meetings dated December 1 and 2 1988, February 6 and 7, 1989, and October 10, 1989.

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than average wage growth rates. The sum of modified medical losses and unmodified indemnity losses is divided by unmodified medical and indemnity losses to produce the adjustment factor. This method of calculating the adjustment reflects the assumption that indemnity costs will follow wage costs, but that medical costs are not directly related to wage costs.

Adjustment factors are then normalized to assure that the overall ratio is 1.000 so that the adjustment has no overall rate impact. These normalized adjustment factors are multiplied by total indicated losses to produce adjusted indicated losses by industry group.

3. Calculation of Industry Group Differentials

The industry group differentials are calculated by dividing the adjusted indicated losses by expected losses. Generally, NCCI expects the industry group differentials to be between .9 and 1.1. In the sample filing the ratios range from .98 to 1.01. Any situation where industry group differentials fall outside the expected range is examined by NCCI to determine whether there is a reason to permit such deviation. If no reason is found for a change outside the range, indicated differentials are adjusted to the upper or lower bound. When the industry group differential for one group is limited, the other industry group differentials are adjusted in the opposite direction to produce changes by industry group that balance to 1.0.

B. Derivation of Rates or Loss Costs by Class

Rates or loss costs by class are calculated by distributing the industry group rate level change in a manner which reflects differences in experience by class within the industry group. The revised class rates are based upon the recent experience in the class, the indicated changes by industry group and the relative experience by class based on national experience. The credibility or weight assigned to each indication depends upon the expected losses of the class.

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Our discussion follows the order of presentation contained in Appendices B-I, B-II and B-III of the sample filing which document the calculation of the final advisory rates or loss costs. Calculations are illustrated using class 2014 which is the example used in Appendix B-IV of the Illinois sample filing.

APPENDIX B-I, SECTION A: THE DATA

The primary data used to calculate class rates is the exposure and loss data reported under the WCSP. NCCI prepares NC-235 reports which summarize WCSP experience for each policy year used in the rate filing by class. These reports are the underlying information used in the class ratemaking process. A sample of the NC-235 reports for class 2014 is presented in Appendix D-III. Both limited and unlimited reports are produced if any claims are subject to the per claim limitation. NCCI calculates pure premiums for each class from the NC-235 reports for the state.

For class ratemaking, individual large losses and total losses for accidents involving multiple claimants are limited to reduce distortions in individual class rate indications. For classification ratemaking, it is common actuarial practice to place claim limitations on the losses used.

Individual losses are limited to five times the average serious case in the state. Claims with multiple claimants are limited to twice the individual claim limitation. The average serious claim for the state is calculated based on three years of experience plus one year of three year fixed rate policy data. As will be seen later in this section, the effect of the loss limitation by industry group is built into the final rates by a test correction factor. This factor ensures that the overall premium level by industry group and state is achieved.

APPENDIX B-I, SECTION B: ADJUSTMENTS TO DATA

1. Benefit Level

Reported losses for each class are adjusted to the benefit level used in the current rate filing for the experience portion of overall premium level. The factors to adjust losses

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to the July 15, 1989 benefit level are presented in Section B subsection (a) of Appendix B-I of the sample filing.

Adjustments to reflect the costs of later benefit level changes that need to be introduced are incorporated separately in the final rate calculations.

2. Loss Development

Adjustments are also made for projected development to reflect the ultimate expected cost for data from each policy period. The factors are shown in Section B Subsection (b) of Appendix B-I of the sample filing. The process for deriving these development factors was described in the preceding section on industry group differentials.

In the Illinois sample filing, the development factors also include the policy year adjustment factor of 1.096, which represents the difference between the financial data policy year cost ratio in the prior filing and the cost ratio developed based on WCSP data for this filing. The derivation of that factor was shown above when discussing the industry group differentials.

3. Combined Conversion Factors

Additional adjustments are included in Appendix B-I, Section B in lines (c) through (f) leading to the composite factors shown on line (g). They are: the current assessments that are calculated as a percent of losses; an adjustment for differences between the policy year loss ratio used in last year's experience review and the average of policy year and accident year data (the calendar-accident year adjustment); the medical and indemnity trends in current rates; and the provision for loss adjustment expenses. The end result of applying all these adjustments to WCSP reported losses is to have them at the same level as the experience indications developed from the financial call data in Exhibit I of last year's filing.

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APPENDIX B-I, SECTION C: FORMULA PURE PREMIUMS

As we shall see, there are five pure premiums calculated in Appendix B-II.

1. Indicated pure premiums
2. Underlying present rates
3. Present on rate level
4. Indicated by national relativities
5. Derived by Formula

Derived by formula pure premiums are the credibility weighted averages of three of these pure premiums: the indicated; indicated by national relativities; and the present on rate level.

Separate sections below address the calculation of each of the pure premiums and the determination of credibility values used as weights. The derivation of formula pure premiums are shown on the classification pure premium exhibits, also referred to as A-sheets, which are included as Appendix B-II in the rate filing. We have provided only the A-sheet page containing class code 2014 in the sample filing.

When proposed manual rates are calculated, additional adjustments are made to the formula pure premiums to introduce the changes based on experience, trend, expenses and the latest benefit levels from this year's review.

1. Indicated Pure Premiums

Indicated pure premiums are derived from the state experience for the class. They are calculated from payrolls and adjusted and developed losses. The payrolls and modified losses and loss adjustment expenses by component are shown at the top of each A-sheet report in Appendix B-II. On the A-sheets, the indicated pure premium

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is shown on the total line. The A-sheet does not label this value as the indicated pure premium.

Reported payrolls are summed without adjustment for any expected additional payroll development. This assumes that there are no significant differences in premium development by classification.

An explanation of the how the A-sheet values for class 2014 are developed from NC-235 reports follows. The NC-235 reports for class 2014 are included as Appendix D-III of the supplementary material. The A-sheet for class 2014 is in Appendix B-II of the sample filing. A table of injury types follows to clarify the allocation of experience to serious and non-serious categories and the references to experience by injury type in the calculations:

<u>Injury Code</u>	<u>Injury Type</u>	<u>Classification</u>
11	Death	Serious
12	Permanent Total Disability	Serious
13	Major Permanent Partial Disability	Serious
14	Minor Permanent Partial Disability	Non-serious
15	Temporary Total Disability	Non-serious
16	Medical Only	Non-serious
17	Contract Medical	Non-serious

For the WCSP policy year beginning April 1987, the payroll on the class 2014 A-sheet equals the NC-235 value of \$46,896,281.

The number of serious indemnity claims is 8 for major permanent partial claims, since no other serious claims were reported. The count of 76 for non-serious indemnity is the sum of the 26 minor permanent partial claims and the 50 temporary total claims.

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The serious indemnity amount of \$826,023 is the reported limited serious permanent partial value of \$362,768 times the major permanent partial combined conversion factor of 2.277 from Appendix B-I Section B, Subsection (2). For non-serious indemnity, the \$421,640 value is the minor permanent partial value of \$221,814 times the combined conversion factor of 1.394 plus the \$81,002 of temporary total loss times the factor of 1.388. The medical amount of \$875,473 is the limited serious medical amount of \$285,105 times 1.544 plus the non-serious permanent partial, temporary total and medical only amounts of \$116,156, \$84,222 and \$69,809, respectively, times 1.611.

Similar calculations are performed for the other policy periods used for class ratemaking calculations. The partial pure premiums are calculated from these totals.

The class 2014 total modified serious amount of \$3,109,172 from Appendix B-II is divided by the total payroll (\$161,193,339) in hundreds of dollars to produce the total serious pure premium of \$1.929. The other indicated pure premiums are calculated by dividing the total modified losses for non-serious and medical losses by the same total payroll in hundreds of dollars.

2. Pure Premiums Underlying Present Rate

We have reversed the sequence that NCCI uses to present these pure premiums in Appendix B-II. We did this because the pure premium underlying the present rate is needed before the pure premium present on rate level can be derived.

The pure premiums underlying present rates can be calculated in a straight forward manner from the partial pure premiums developed in connection with the previous rate filing. Each of the three partial pure premiums from the previous rate filing is multiplied by adjustment factors which reflect the factors which are introduced after pure premiums are derived in developing rates. These factors include law amendments enacted after the rate analysis, any change in loss adjustment expense ratios, the change in the ratio of manual to earned premium, and the removal of the normalized adjustment applied to industry group differentials in the previous rate level.

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The derivation of the class 2014 serious pure premium underlying present rates of \$2.204 is described below. The serious pure premium of \$2.171 from last year's filing is multiplied by the manufacturing group manual to earned premium change ratio of 1.017 which introduces the current experience rating plan off balance. The 1.017 factor to adjust for changes in the manual to earned premium level is calculated as follows. Class 2014 is a manufacturing class. The current manual to earned premium ratio for manufacturing classes, developed in Appendix D-I, is 1.013. The factor in the previous filing was 1.030. The adjustment factor of 1.017 is the ratio of the prior ratio and the current ratio ($1.017 = 1.030/1.013$). The 1.017 factor is multiplied by the serious pure premium of \$2.171 resulting in a product of \$2.208.

The result (\$2.208) is divided by the normalizing adjustment of 1.002 for the manufacturing group which is developed in Appendix D-II. Removal of this adjustment allows pure premiums to be at the level they would have been without wage growth differential changes. There were no late benefit adjustments or loss adjustment expense changes in the sample filing. ($2.204 = \$2.208 / 1.002$)

3. Pure Premiums Present on Rate Level

The pure premiums on rate level refer to the rate level that is now indicated by using the experience from the last review. It will be shown later in this sub-section that the effects of this year's overall experience review is reflected not in the pure premium exhibits but rather as a final step in calculating this year's manual rates.

The indicated pure premiums had the WCSP losses brought to a level such that those adjusted and developed losses would equal 71.85% of the current manual rates (See Section A.2.c.ii, above).

The pure premiums underlying the current manual rates were designed to produce a loss ratio of 72.85%. (See Exhibit II). To bring the pure premiums underlying the current rates to a level consistent with the apparent indicated change from last year's

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experience review, a reduction of 1.4% is required $\{[(.7185 \div .7285) - 1.0] \times 100\%$. This is the calculation that produces the indicated premium level change factor of 0.986.

However, a second adjustment is needed to reflect the result of this year's WCSP review by industry group. These industry group differentials were derived in Appendix A-VII and represent the current relative need for rate correction by industry group. These two factors make up the Present on Rate Level Factors documented by NCCI in Appendix B-I, Section C, sub-section (c). For a manufacturing class, the present on rate level factor is 0.996 (0.986 x 1.010).

In the above example, for class 2014, the \$2.195 serious pure premium present on rate level is calculated by multiplying the underlying present rate serious pure premium of \$2.204 by .996 since class 2014 is a manufacturing class.

4. Pure Premiums Indicated by National Relativities

Pure premiums indicated by national relativities reflect countrywide experience adjusted to the approximate level expected for the state under review. This process is done separately for each partial pure premium: serious, non-serious, and medical.

In March of each year, a national database is produced using payroll and losses for all states where NCCI compiles workers compensation data. Individual state losses and exposures which are entered into the database are those obtained from the most recently filed rate filing available at the time. This data continues to be used for all state filings during the next twelve month period, and is not adjusted during the year to include updated experience. The sample filing which was effective on January 1, 1991 used indicated pure premiums from state filings which had effective dates between November 1988 and July 1990. The objective of NCCI's use of national relativities is to obtain an alternate estimate of the state's pure premium by class based on data from all other NCCI states. Use of this alternate estimate assumes that other state's experience by class can be adjusted to the level expected for the state.

In the sample filing for Illinois, NCCI calculates the indicated pure premium for each class with Illinois exposure. The indicated pure premiums by class are also calculated

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for every other state. For each of these other states, a theoretical statewide average pure premium is derived. This average pure premium is the result of weighting each individual class pure premium in the state by the Illinois payroll distribution by class.

The ratio of the statewide average pure premium for Illinois is then taken to each and every other state's average pure premium. This ratio is then assumed to represent the average loss cost differential between Illinois and the other states. In other words, for each NCCI state, the NCCI data base now contains a factor that represents the average loss cost differential between Illinois and that state.

This factor, representing the average difference in loss costs between Illinois and each state, is then used as a multiplier to bring the pure premium for each class in the state to the approximate Illinois cost levels.

Then for each class, a countrywide average pure premium, adjusted to Illinois loss cost levels, is calculated. The countrywide average pure premium at Illinois cost levels for each class is the weighted average of each state's pure premium adjusted to Illinois cost levels with the weights being the payroll by state for that class.

This countrywide average excludes the state for which this filing is being prepared; in this case Illinois. The countrywide pure premium adjusted to Illinois cost levels is the pure premium indicated by national relativity.

NCCI recently became aware of a problem with this procedure, especially involving state special classifications. The problem arises in calculating the average loss cost differential for the state under review compared to each and every other NCCI state. If the class under review has payroll in a particular state but the other states do not, the pure premium for that class has been assumed to be zero but was weighted by that class' payroll in the state under review in calculating the statewide average pure premium.

To eliminate this problem, starting in 1991, NCCI will eliminate payroll from state special classifications in the calculation of national pure premium. In addition, the

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calculation will balance the national pure premiums to the state's pure premium for each industry group in the state under review.

More detailed information on this process can be obtained from our report on Section II-B, Subsection 4 to the NAIC.

5. Pure Premium Derived by Formula

The derived by formula pure premium is calculated as a credibility weighted average of each of three partial pure premiums: the indicated, the present on rate level and the pure premium indicated by national relativity.

Credibility is an actuarial concept used to determine how much weight to assign to a particular body of data. Credibility factors are designed to assign weights in proportion to how well the data is expected to project future experience.

The usual first step in determining credibility values is to set a level at which the experience is assumed to be fully credible. In workers compensation classification ratemaking, NCCI sets separate standards for serious, non-serious and medical experience. The actual process of establishing 100% credibility standards is a two step operation.

First, for the serious pure premium calculation, the full credibility standard is set at twenty-five times the average serious loss. For non-serious pure premium calculations, the credibility standard is 300 times the average non-serious case. For medical pure premium calculations, the standard is a dollar amount equal to 80% of the non-serious full credibility standard. The calculation of the average serious and non-serious case is one of the early steps in rate level calculations. The documentation of this calculation is not in the rate filing but is contained in Form J of the workpapers provided by NCCI. Form J is presented in Appendix D-IV page 1. The claim counts and losses and loss adjustment expenses used in the average claim calculations are included as pages 2 to 5 of Appendix D-IV.

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NCCI applies a second adjustment before setting the standard for 100% credibility. This adjustment is made in recognition that the credibility assigned to a class' partial pure premium will depend on its level of expected losses. The expected losses for a class equals the class payroll times the partial pure premium underlying the present rate.

The average costs per claim by component are derived directly from the WCSP data. As we have already seen, these losses are not at the same level that went into determining the overall rate level. Thus, an adjustment factor is calculated in column (10) of Form J to bring the average claim cost indications to the same level of costs contemplated by the expected losses by class.

Once full credibility standards are established, expected losses corresponding to other credibility levels are calculated. The expected losses required for a class which has lower expected losses than the full credibility standard is calculated for each credibility value by multiplying the expected losses for the full credibility standard by the square root of the cube of the credibility value. For example, in the Illinois sample filing, the standard for full credibility of serious losses is \$2,466,410. For a serious credibility value of .50, a class would need \$872,008 of expected serious losses. [$872,008 = (.5)^{3/2} \times 2,466,410$]. If the credibility for a particular expected loss amount is calculated, the formula uses the two thirds power of expected losses divided by the credibility standard [$.5 = (872,008/2,466,410)^{2/3}$]. Credibilities are calculated to two decimals and are truncated rather than rounded.

If the statewide experience for a class is not assigned full credibility, a credibility for national experience is also calculated. This calculation also involves two steps. The first step determines the indicated credibility based on the national experience. This initial national credibility depends upon the number of claims for the class included in the national experience. Specifically, the full credibility standards are:

- 25 serious cases for serious;
- 300 non-serious cases for non-serious; and
- 300 serious and non-serious cases for medical.

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Partial credibilities for national experience by class are based on the same formula used for state partial credibilities by class.

The second step in the determination of credibility for national relativities is to limit the national credibility to no more than one-half the complement of the credibility assigned to state experience. NCCI imposed this limit on the maximum credibility assigned to national data to ensure that rates depend predominantly on data for the state for which the proposed rates are being calculated. Finally, the present on rate level pure premium is assigned a credibility equal to 1.00 minus the credibility for indicated pure premium and the credibility for the pure premium based on national relativities.

Credibilities by class are shown on the A-sheets in Appendix B-II. For class 2014 the state credibility for both serious and medical pure premiums is equal to 1.00. The derived by formula pure premium for these components is equal to the indicated pure premium. For non-serious, the state credibility is 99%, the national credibility is 0%, and the credibility for pure premiums underlying current rates is 1%. The pure premium of \$.736 derived by formula is calculated as .99 times \$.735 plus .01 times \$.795.

Class 2016 in Appendix B-II demonstrates the limitation on the credibility given to national relativities. For serious pure premiums, the state credibility is 32%. One half the remaining credibility or 34% is assigned to national experience (.68 x .5). If the national experience had supported a credibility lower than 34%, then the lower value would have been used. For class 2016, the serious pure premium underlying present rates is assigned the remaining weight of 34% (.34 = 1.00 - .32 - .34). The derived by formula serious pure premium of \$0.519 is calculated by weighting the pure premiums using these credibilities ($0.519 = .32 \times .345 + .34 \times .687 + .34 \times .514$).

Classes assigned zero credibilities for all three components based on both state and national data are referred to as non-reviewed classes. The ratemaking methodology for non-reviewed classes is discussed in the final sub-section of this discussion of class ratemaking.

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APPENDIX B-III: COMPUTATION OF FINAL RATE OR LOSS COST

1. Reviewed Classes

Additional adjustments are applied to the derived by formula pure premiums to produce proposed loss costs or rates. The derivation of these adjustments is documented in Appendix B-III of the filing.

The first adjustments lead to composite factors which combine the financial data adjustment factor, the offset for changes in the minimum premium multiplier, and a test correction factor.

a. Financial Data Adjustment Factor

The financial data adjustment factor is calculated by dividing the average cost ratio derived in Exhibit I of the current filing by the average cost ratio from the financial call data developed in the previous filing. It was previously explained that the classification experience is adjusted to the premium levels implicit in the rates from the last experience review. It is now time to bring the classification experience to the indications from this year's experience review. The derivation of the 0.7185 on line (b) of the first section of Appendix B-III was explained on Page 64 of this chapter.

b. Minimum Premium Offset

A factor to offset the increase in premium that will result from a proposed change in minimum premium multipliers is introduced. The sample filing does not provide the documentation that shows how rates can be reduced by 0.04% while maintaining no change in premium levels. More information about minimum premium rules can be obtained from our report in Section II-B, Part 8.

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c. Rates - Test Correction Factor

The Test Correction Factor is applied to the formula pure premium and is intended to ensure that the overall change in manual premium level calculated in Exhibit I has been achieved. Two major factors contribute to the need for a Test Correction Factor by industry group.

First, in developing the classification experience, limitations were placed on the amount of losses from any one claim or from any one accident with multiple claimants. The Test Correction Factor in effect spreads the impact of the loss limitation uniformly over each class within each industry group.

Second, as will be seen below, there are swing limits that apply to the amount of change that can occur from one revision to the next.

d. Other Factors

Parts (4)-(9) of Appendix B-III identify a number of other factors that need to be considered in calculating manual rates. Some of the more important actuarial considerations follow.

Separate factors are calculated for medical and indemnity trends by dividing the current trend provisions by the provisions in the previous filing. This year's indicated medical and indemnity trends are displayed in the sample filing in Section F of Appendix A-V. The medical and indemnity trend values in the current rates and incorporated in the classification experience are shown in Appendix B-I, Section B, line (e). The effects of changing the trends then, are:

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	(1) <u>Current Rates</u>	(2) <u>Proposed Rates</u>	(3) Effect <u>(2) ÷ (1)</u>
Serious (Indemnity)	1.100	1.097	.997
Non-Serious (Indemnity)	1.100	1.097	.997
Medical	1.169	1.193	1.021

There have been a number of benefit changes that have been enacted since the last rate filing which also were not incorporated in this year's experience review. They are shown on part 5 of Appendix B-III.

Part 6 of Appendix B-III is necessary since the classification experience excludes the effect of the experience rating plan. The required overall premium level change derived in Exhibit I of the filing was in terms of the change in standard premium; that is, manual premiums after the application of the experience rating modification factors.

The assumption is that the future rates will have an average modification equal to the latest ratio of earned to manual. For the Illinois Manufacturing group that would be an earned to manual ratio of 0.987. Thus, if the proposed pure premium is multiplied by 1.013 when calculating the manual rates, then when those manual premiums are brought to a standard premium level by applying the average experience rating modification of 0.987, the manual rates will produce the desired standard premium level.

Pure premiums are converted to rates by dividing by the proposed target cost ratio. This target loss ratio was developed in Exhibit II of the sample filing and

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reflects the proportion of future premiums expected to be available to cover losses and loss adjustment expenses.

NCCI limits changes in rates from one filing to the next to avoid extreme fluctuations for individual classes. In most states, the limitation equals the industry group change plus or minus 25%. If necessary, the rates of all classes with changes within the limitations are adjusted to produce the overall premium level change.

This sample filing produces both advisory rates and advisory loss costs. The loss costs do not include any provisions for expenses or profits and contingencies.

The advisory loss cost is calculated by removing from the advisory rates the provisions for underwriting expenses and profit, loss adjustment expense, and assessments. In other states, the components which may be included in loss costs may differ. If only loss costs are developed, the expense adjustments will not be introduced. A discussion of the provisions included in loss cost filings is included in a separate section of our report.⁹

2. Non-Reviewed Classes

Classes for which neither state experience nor national experience is given any credibility are referred to as non-reviewed. The calculation of the rate for a non-reviewed class rate is similar in concept to the reviewed class calculations with full credibility assigned to the pure premiums underlying the last approved rate. The revised pure premiums or rates are based on the last approved pure premiums. Industry group change factors are applied. An adjustment is introduced to reflect changes in manual to earned premium ratios and other adjustments since the pure premiums were calculated.

9 Implementation of Loss Costs, Section III of NCCI Examination, February 22, 1991.

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Only a very small number of classes are currently non-reviewed since an assignment of credibility to any of the three pure premium components in the national data base would result in the classification being a reviewed class. NCCI periodically evaluates non-reviewed classes for discontinuance or merger into other classes.

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IV. DETERMINATION OF FACTORS TO ADJUST INDIVIDUAL PREMIUMS

The final premiums paid by individual insureds depend on certain characteristics of the individual insured as well as rating rules that apply to all risks. An overview of these additional considerations are as follows:

- Expense Constants - All risks are subject to expense constants designed to cover expenses which are incurred on a per policy basis.
- Minimum Premiums - Small risks are subject to minimum premiums to reflect the exposure of the insurer for even the smallest insured.
- Premium Discount Factors - The expense provision is reduced for larger insureds by using premium discount factors which reflect differences in expenses by size of risk.
- Experience Rating Plan - The experience rating plan modifies premiums based on the employer's loss record.
- Ex-Medical Ratios
- Retrospective Rating Plan - The premium may further be adjusted through optional retrospective rating plans.

As previously mentioned, Schedule Rating Plans and Dividend Plans will not be discussed in this report.

Each of these items is discussed below.

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A. Expense Constants

The expense constant is a provision for expenses which are not expected to vary by policy size. Fixed expenses associated with policy issue and recording are the primary components of the expense constant. The use of an expense constant is expected to make the allocation of expenses between insureds more equitable and to make insurers more willing to write small policies.

Countrywide expense constant indications are determined by NCCI using data from a 1982 study of expenses by size of risk. The indications are updated annually to recognize the impact of inflation on these expenses using trend factors based on consumer price index data. A more detailed discussion of expense constants is included in our report on Section II-B, Part 2.

B. Minimum Premiums

The minimum premium for each class is contained on Exhibit III of the Illinois sample filing. This minimum premium is calculated by multiplying the advisory rate by the minimum premium multiplier, adding the expense constant and checking that the value does not exceed the maximum minimum premium. The minimum premium multiplier in the sample filing is 105. The minimum premium for class 2014 of \$734 is calculated by multiplying the rate of \$6.28 by 105 and adding the \$75 expense constant.

The maximum minimum premium is a dollar amount which limits the impact of the minimum premium multiplier for classes with high rates per \$100 of payroll. The minimum premium for class 2014 is not limited since the calculation produces a value less than the maximum minimum premium of \$750 in the sample filing.

NCCI has indicated that its goal is to have the minimum premium multiplier produce a premium equal to the cost of insuring one employee for one year who earned the state average wage. To achieve this, the minimum premium multiplier would need to

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be equal to the average annual wage divided by \$100. Current multipliers are substantially below this level in most states. For example, in the sample filing, the January 15, 1990 average weekly wage used to calculate benefit level adjustments is \$458.23 which translates to an annual wage of \$23,828, and a minimum premium multiplier of 238. The actual minimum premium multiplier is 105, or less than half the indicated amount.

C. Premium Discount Factors

Premium discount factors reflect the reduction of expected expenses on a percentage basis as the size of the premium increases. They are applied for any risk with a total annual standard premium in all NCCI states in excess of \$5,000.

Two schedules of premium discount factors are presented in the Miscellaneous Values section of Exhibit III of the sample filing. The first set is designed to be used by stock companies. The second set, which contains smaller discounts, is designed for non-stock companies. All insurers have the option of using either schedule. The lower discounts for non-stock companies reflect an expectation that policyholders of non-stock insurers will also receive dividends after the policies have expired.

A more detailed technical discussion of expense issues including premium discount factors is included in Section II-B, Part 2 of our report to the NAIC.

D. Experience Rating Plan

The state specific values used in the NCCI experience rating plan are revised in connection with each rate level analyses. A detailed explanation of the derivation of the experience rating plan factors is contained in an article prepared by NCCI.¹⁰ The key values derived are:

10 "Calculation of Experience Rating Values and Plan Parameters" by William R. Gillam dated February 28, 1990.

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1. State Reference Point
2. Expected Loss Rates
3. D-Ratios
4. Ballast & Weighting factors

These state specific values are shown in Exhibit III of an NCCI filing. The Expected Loss Rates and D-Ratios vary by class and are shown on the rate pages. The state reference point is documented in the Table of Weighting Values also contained in Exhibit III.

1. State Reference Point

The experience rating modification factor for individual risks is calculated based on three years of WCSP detail data. The insured's losses used in experience rating are limited based on the state reference point (SRP). Individual losses are limited to 10% of the SRP and multiple claim accidents are limited to 20% of the SRP. The SRP is two hundred fifty times the state average cost per case rounded to the nearest \$5,000.

Statewide average claim costs used in calculating loss limitations are based on the three most recent years of WCSP data and utilize all types of claims. No development factors are applied in calculating the SRP since the loss limitation is compared to reported experience by insured which also has not been developed. A trend factor is introduced to adjust for differences between the experience period used in determining rating values and the period used in calculating the experience rating modification. The trend period generally varies between one and two years depending on the length of time between the rate level calculations and the proposed effective date of the filing. The trend is based on the countrywide average cost per case using combined medical and indemnity data.

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To limit volatility and reflect the expectation that claim costs generally increase with inflation, the calculated values of SRP may be judgmentally modified. The SRP is not allowed to decrease between filings unless there has been a significant benefit reduction. Changes in excess of 20% are investigated to determine whether changes of this magnitude are reasonable.

2. Calculation of Expected Loss Rates

Expected Loss Rates (ELR's) by class are used to determine total expected losses in the experience rating plan. The ELR's that are shown in Exhibit III are the result of applying factors to the proposed manual rates. For example, the ELR for class 2014 shown in Exhibit III is \$2.31. This was calculated by multiplying the advisory rate of \$6.28 by a factor of .368. For an employer with \$1,000,000 of class 2014 payroll in the three years used in experience rating, that employer's expected losses would be \$23,100 ($\$23,100 = 2.31 \times 1,000,000/100$).

The factors used to derive the ELR's vary by hazard group. There are four hazard groups. The hazard groups are the NCCI's attempt to identify classes with different propensities to generate severe losses. The hazard group concept has been used for years in the NCCI's retrospective rating plans.

The experience rating modification is based on comparing the insured's actual reported losses during the three year experience period with the losses that the average insured could be expected to have reported. The NCCI ELR is intended to provide the estimate of the average insured's expected losses during the experience period.

To do this, NCCI begins with the proposed manual rate which is intended to provide funds for the losses and expenses to be incurred in the future. Thus the proposed manual rates are based on losses that are fully developed, brought to the latest known benefit levels, and trended to a date one year after the effective date of the rates.

The individual insured's losses that are used in calculating the insured's experience rating modification (ERM) are the reported losses under the WCSP Plan. The

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proposed rates were assumed to be effective January 1, 1991 and to be effective for one year. ERM's calculated in 1991 will use the latest three policy years of experience evaluated and reported to NCCI prior to the 1991 renewal date.

For example, a risk renewing on July 1, 1991 would have the following WCSP data used in its ERM calculation:

<u>Policy Period</u>	<u>Evaluation Date</u>	<u>Report</u>
July 1, 1987-88	December 31, 1990	Third
July 1, 1988-89	December 31, 1990	Second
July 1, 1989-90	December 31, 1990	First

The losses for each policy year would be at the benefit level that existed at the time the claim was incurred.

NCCI's procedure for calculating the ELR's then is based on unwinding from the proposed manual rates the average amount of loss development, benefit level adjustments and trends originally applied to the WCSP data to construct the manual rates.

Some other considerations must be included in the process. The expenses and profit contemplated in the rates must be removed from the rate when calculating the ELR. The ERM calculation is based only on losses and not loss adjustment expense. Therefore, the loss adjustment expense provision is also removed.

NCCI also has a provision in the process for calculating ELR's that relates to the off-balance of the experience rating plan. It was previously noted in this report that the average overall effect of the experience rating plan is to generate more credits than debits. The NCCI procedure for calculating ELR's includes a factor of 1.01 as an off-balance adjustment factor. Studies by the NCCI Actuarial Committee indicate that an experience rating plan correct in aggregate will still result in an average modification below 1.00. The 1.01 factor serves to bring the off-balance closer to 1.00.

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Finally, NCCI's procedure attempts to measure the percentage of losses that will not be incorporated in experience rating because of the per claim limitations. To do this, they use a similar procedure to that used to calculate excess loss premium factors for the optional retrospective rating plans. Therefore, this adjustment reflects the Hazard Group assignment of each class.

To sum up this discussion, the expected loss rate of \$2.31 per hundred dollars of payroll for class 2014 found in the sample filing is the NCCI's estimate of the average amount of WCSP losses expected to be reported for policies incepting in 1987-1989 at a third, second, and first report evaluation. These expected losses reflect a per claim limitation of \$88,000 and do not include any provision for loss adjustment expenses.

3. Calculation of D-Ratios by Class

The experience rating plan splits losses into a "primary" piece and an "excess" piece. The experience rating formulas handle aggregate primary and aggregate excess losses separately.

Discount Ratio Factors (D-Ratios) are ratios of expected primary losses to expected total losses for each class. Class D-Ratios multiplied by expected losses equal the expected primary losses used in experience rating plan calculations. The class D-Ratios are calculated by weighting serious, non-serious and medical D-Ratio factors. An exhibit documenting the derivation of the partial D-Ratio factors is included as Appendix D-V.

To calculate D-Ratios, statewide losses are separated between primary and excess using the experience rating plan definitions. Under the current experience rating plan, also referred to as the revised experience rating plan, (RERP), all losses under \$5,000 are primary as are the first \$5,000 of all other losses. Excess losses can be calculated as the difference between total reported losses and primary amounts for these losses.

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In determining the primary and excess portion of losses, medical and indemnity components of a loss are summed. The first \$5,000 of the combined loss is considered primary. Estimated primary amounts for indemnity are calculated by multiplying \$5,000 by the ratio of indemnity to total loss for the claim. The primary medical loss is equal to \$5,000 times the medical proportion of the total loss. In this calculation, NCCI assumes the overall medical/indemnity split does not differ for primary and excess losses.

Average D-Ratio factors are calculated from the most recent policy year of WCSP data. This data is at the first report level. Use of data at a first report, where the full severity of serious cases is less likely to be known, may understate the excess proportion of losses and thus distort D-Ratio calculations. No per claim limitations are applied which are expected to increase the D-Ratio factor. NCCI indicates that the use of unlimited losses tends to overstate the excess component of losses. These two factors will tend to balance each other. An exact evaluation of the relative impact of the two factors was not provided by NCCI.

For class 2014 in the sample filing, the D-Ratio is .29. This value is calculated by multiplying the serious, non-serious and medical D-Ratio factors calculated in connection with the sample filing by the adjusted pure premiums in Appendix B-IV of the sample filing and dividing by the total pure premium (.29 = [.053 x 2.122 + .609 x .805 + .449 x 1.583] / 4.51).

Average D-Ratios are examined for reasonableness. Inflation is expected to cause D-Ratios to decrease if the dollar value used to separate primary and excess losses remains fixed. Increases or decreases of over 10% are investigated since these ratios are expected to remain relatively stable. Under the revised experience rating plan, the minimum D-Ratio is .25 and the maximum D-Ratio is .90 based on the assumption that no class is expected to have more than 75% of total losses or less than 10% of total losses in the excess layer.

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4. Calculation of the Factors Used in the Experience Rating Plan

In Exhibit III of the rate filing, tables of ballast factors (B) and weighting factors (W) which are used in experience rating plan modification calculations are shown.

The W factor determines the weight assigned to the excess loss experience in the experience modification formula. The B factor provides stability and ensures that no risk has full credibility assigned to its excess losses. In the current experience rating plan formula, the B factor increases with expected losses but at a slower rate. Consequently, as a percentage of expected losses, the B factor decreases with size. The weighting and ballast factors are calculated based on the state reference point previously discussed.

A more technical discussion of the actuarial concepts in the NCCI's experience rating is contained in Section II-B, Part 7 of the M&R report on NCCI ratemaking.

E. Ex-Medical Ratios

Ex-medical ratios are used when a workers compensation policy is written which does not provide medical coverage. Most of the ex-medical policies, which represent a very small proportion of total premium, are for hospitals which are in the position to provide medical care to their own injured employees.

The ex-medical premium is calculated by multiplying the total class pure premium by 1.0 minus the ex-medical ratio. For class 2014 in the sample filing, which has an ex-medical ratio of .25, an ex-medical policy would cost \$4.71 per \$100 of payroll ($4.71 = 6.28 \times (1-.25)$).

The ex-medical ratio is developed by multiplying the medical pure premium for the class by 0.7 and dividing by the total class pure premium. Only 70% of the medical losses are assumed to be eliminated with an ex-medical policy to recognize the possibility that a small amount of residual medical exposure may remain with the insurance company in the event that the insured cannot pay the statutory benefits.

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From Appendix B-IV, the adjusted medical pure premium for Class 2014 is \$1.583 and the total pure premium is \$4.51. This results in an ex-medical ratio of .25 as shown below:

$$\frac{.70 \times 1.583}{4.51} = .25$$

F. Retrospective Rating Plans

NCCI maintains retrospective rating plans. These plans are reserved for the optional use of those larger insureds who meet the premium size eligibility requirements.

In essence under a retrospectively rated policy, the insured agrees to pay a final premium that is a direct and linear function of his claims experience under the policy. This experienced based indicated retrospective premium is subject to a pre-specified minimum and maximum. The minimum and maximum are specified as percentages of standard premium.

NCCI's retrospective rating plans include tables of insurance charges and savings that vary by the size of premium of insured. The tables are intended to reflect the percentage of total losses expected to be incurred by insureds exceeding the maximum ("charge") and the percentage of total losses expected to be incurred by insureds having losses below the specified minimum ("saving").

Since the lowest possible maximum premium is the standard premium, the insured is, in effect, risking the amount of premium discount he would have received under a guaranteed cost program.

In addition to pre-specified minimum and maximum premiums another optional insurance feature is the advance election of a maximum single chargeable loss from any one occurrence. If the insured elects to have a loss limitation provision apply to

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the policy, then a separate charge for this is made, referred to as "excess loss premium".

The optional use of retrospective rating is not expected to have any impact on NCCI's ratemaking procedures. The full losses of any retrospectively rated risks are reported to NCCI in the same manner as guaranteed cost insureds. While the final retrospective premium is reported to NCCI, the premium that is used in the ratemaking system is standard premium. That is, the premium under the policy prior to any deviations, premium discounts, schedule rating, or retrospectively rated provisions which may affect the final premium paid by the insured.

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V. "F" CLASS RATEMAKING METHODOLOGIES

"F" classifications are those which include exposure under the U.S. Longshoremen's and Harborworkers' Compensation Act (USL&HW Compensation Act). The USL&HW Compensation Act provides for payment of compensation and other benefits to employees such as longshoremen, harbor workers, and ship repairmen while working on navigable waters in the United States. Injured individuals in "F" classifications often have the choice of receiving coverage under either federal or state laws. The state component of losses are referred to as state act losses. According to NCCI, approximately 70% of loss amounts for "F" class business are under the USL&HW Compensation Act. The "F" classification rate calculations in the sample filing are documented in Appendix B-V.

A-Sheets containing "F" class pure premium indications are produced at the same time of year for all states, since the evaluation involves the use of data for all states. The completion of "F" class rates for a particular state occurs at the same time as ratemaking for the industrial classes in that state and is included in the same rate filing package. State experience used in "F" class rate calculations may be based on a different experience period and may be developed to reflect different trend and benefit levels than were used in calculating rates for industrial classes.

Unlike the industrial classifications, no target rate level change based on financial data is used for "F" classifications. The "F" class rate level change is determined after the preliminary individual rates have been calculated. The rate level indication is derived by extending the payroll by the preliminary individual rates and the current rates and comparing the resulting premiums. Subsequent modification to the preliminary rates are made due to swing limits.

The pure premiums for "F" classes are calculated following procedures similar to those used for industrial class rates which have previously been described. Areas where changes are made to the methodology are discussed below.

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In calculating indicated pure premiums, state act losses are brought to the current state benefit level and state assessment level, and federal act losses are brought to the most recent federal benefit level and federal assessment level.

A. Data Utilized

"F" class rate level indications are based on WCSP data. Because of historical data problems with the results of the special calls, no aggregate "F" class data from financial calls is used. Statewide experience is used to calculate "F" class rates. In states with separate voluntary and assigned risk rates for industrial classes, the same factors are applied to "F" class rates.

B. Adjustment to Reported Premium and Loss Data

Separate development factors and loss limits for ratemaking and experience rating are calculated for "F" classes. The development factors are based on countrywide "F" class data excluding Louisiana. Louisiana has the largest volume of "F" class data in the country. Since Louisiana experience varies substantially from countrywide data, NCCI indicated that Louisiana would distort indications for other states if it was included.

For development factor calculations, data through fifth reports is based on WCSP reports. Later development factors are based on a weighted average of state industrial class financial call data and District of Columbia financial call data. For the years under consideration, the District of Columbia used Federal benefit levels.

Trend adjustments are not incorporated in current "F" class calculations. A major benefit and coverage change was introduced in 1984 which distorts the data which was previously used to calculate separate "F" class trends. Five years of data will soon be available which would allow trend calculations to be performed again. Since the data used in "F" class filings is WCSP data, the lag between data and premium effective period is even longer than for overall ratemaking or class ratemaking.

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Introduction of appropriate trends would be expected to produce more valid "F" class rate levels.

The reported insured experience for large insureds which are now self-insured may be removed from the rate level calculations, if it is expected to cause distortions.

C. Determination of Indicated Change

Indications derived from national experience pure premiums are based on the sum of losses for each state adjusted to a specific federal benefit level with a specified loss adjustment expense ratio. The national pure premium for each state is calculated by adjusting national pure premiums to state conditions. This adjustment reflects the percentage of state act losses, payroll limitations, loss adjustment expenses and state specific loss assessments. For states with only limited credibility, the countrywide federal-state split is used. A state currently is classified as a small credibility state if the three year total projected ultimate losses are less than one million dollars.

A derived by formula pure premium is calculated as a credibility weighted average of the pure premiums indicated by state experience (both federal and state benefits), the pure premiums indicated by national experience, and the underlying pure premium. State credibility is applied to the state experience, national credibility is applied to the national experience, and the residual credibility is applied to the underlying pure premium.

The derived by formula pure premium is adjusted to assure that the rates for these classifications reflect national experience. Adjustments are made if the derived by formula pure premium differs by more than 25% from the national experience pure premium in either direction. If the underlying pure premium is inside the range and the derived by formula pure premium is outside the range, or if the underlying pure premium and the derived by formula pure premium are both outside the range, but on opposite sides, then the boundary closest to the derived by formula pure premium is selected. If the underlying pure premium and the derived by formula pure

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premium both exceed the limitation on the same side, then the one closest to the limitation is selected. If there is no national experience for a particular classification (e.g. a state special classification), then the derived by formula pure premium is used without adjustment.

D. Computation of Final Rate

1. Effects of Change in Indemnity Assessment

A U.S. Department of Labor loss assessment applies to claims made under the USL&HW Act. In some states, claims made under the state act require payment of a state loss assessment. The U.S. Department of Labor Assessment also applies to the Non-Appropriated Instrumentalities Act classification (9077F).

Loss assessments and benefit level factors are applied separately to federal and state losses where available. Weighted changes in loss assessments and benefit changes are applied to pure premiums where necessary since they reflect combined federal and state experience.

2. Manual to Earned Premium Adjustments

Separate ratios of manual to earned premiums are calculated for shipbuilding and repairs, stevedoring, and non-appropriated fund instrumentalities to reflect differences in the experience rating offset for these groups. These ratios are based on countrywide data excluding Louisiana to provide sufficient volume for credible indications.

3. Expense Allowance

In states where the rules of application for taxes on premium differ for federal classes, the target cost ratio for "F" classes differs from the ratio used for industrial classes.

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4. Aggregate Update Factor

An aggregate update factor is introduced which reflects the ratio of unlimited to limited losses and development from fifth to ultimate reports. An adjustment for loss limitations is required since the final results are not balanced to a financial data indication based on unlimited losses. The factor used reflects a weighting of state fifth to ultimate factors and countrywide fifth to ultimate factors using losses as weights. The countrywide factor uses standard fifth to ultimate development factors developed based on data from the District of Columbia.

5. Test Correction Factor

Once all the appropriate factors have been applied to the derived by formula pure premiums, the payrolls are extended by the rates presently in effect and by the indicated rates. This determines the proposed rate level change. Swing limits of plus or minus 25% of the proposed rate level are then applied. An iterative process is initiated which continuously tests the indicated rates including the test correction factor until the required change in manual premium is obtained.

6. Federal-State Comparisons

A comparison is made between "F" classifications and the corresponding state act code. Since federal benefits are higher than most state benefits, it is assumed that the federal pure premiums should exceed the state pure premiums. If the total pure premium for an "F" classification is lower than its associated industrial classification, and federal benefits are higher than state benefits, an average pure premium is calculated by weighting the state and federal pure premiums using payroll as the weighting factor. This average pure premium is used to calculate the "F" class rate and its associated industrial class rate. A slight reduction in industrial class premium results with a corresponding premium increase for "F" classification. Percentagewise the impact on industrial classes is less than the impact on "F" classes due to relative premium volumes.

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E. USL&H Factors

The USL&H factor is applied to the rate of insureds in non-"F" class businesses to reflect the portion of their exposure to the USL&H act benefits. The factor is intended to reflect the average benefit difference between the state act and the USL&H act benefits. The model used to estimate the impact of benefit level changes determines the factor as the ratio of the federal benefit cost divided by the state benefit cost. Interim updates are done by multiplying the existing factor by any federal benefit changes and dividing by any state benefit changes.

The USL&H factor is applied to the rate of insureds in non-"F" class businesses to reflect the portion of their exposure to the USL&H act benefits. The factor is intended to reflect the average benefit difference between the state act and the USL&H act benefits. The model used to estimate the impact of benefit level changes determines the factor as the ratio of the federal benefit cost divided by the state benefit cost. Interim updates are done by multiplying the existing factor by any federal benefit changes and dividing by any state benefit changes.

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CHAPTER 3 - ALTERNATIVE NCCI RATEMAKING METHODOLOGIES

In the majority of states, the determination of the overall rate level change and class rates follows the standard methodologies. The type of data utilized and the factors selected may differ.

This chapter of the report discusses alternative methodologies, factors and data used in recent NCCI rate filings. The reasons behind the selection of the alternative methodologies and the implications of these changes are also discussed.

Alternate methodologies are often introduced when the standard methodology is expected to produce distorted results in a state. The choice of methods is based upon the judgment of NCCI. In addition, the selection of methods may reflect input from the state Classification and Rates Committee or a review of projections using alternative approaches.

Other changes in methodology, data or factors are often dictated by the Insurance Department or the insurance regulations of the state. This report only discusses the changes introduced by regulators which are expected to have the most impact on the NCCI ratemaking process.

State exceptions such as differences in minimum premiums, expense constants, provisions for expenses or differences in rules are not considered to be differences in methodologies or assumptions and hence are not discussed in this section.

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I. OVERALL RATE LEVEL INDICATIONS

A. Premiums and Loss Data Used

The standard filing uses one year of policy year and one calendar-accident year of experience to determine overall rate level change indications based on experience. The cost ratios based on these two types of data are given equal weight.

Some filings include two years of policy year experience in addition to one calendar-accident year of experience. Results based on the two policy years are averaged. The policy year average ratio is then given the same weight as the calendar-accident year ratio. This is generally done in small states on the recommendation of NCCI. The additional year of experience is expected to lend stability to the indications.

The average date of loss of the experience used in determining rate level change indications is earlier if two policy years of data are used than with the standard data. In the sample filing, the average date of loss for policy year 1988 was January 1, 1989. The average date of loss for calendar-accident year 1989 was July 1, 1989. Experience underlying the overall average rate level change had an average date of loss of April 1, 1989 (the average of January 1, 1989 and July 1, 1989). If policy years 1987 and 1988 had been used, the average date for policy years 1987 and 1988 would have been July 1, 1988. The overall average would have been January 1, 1989 (the average of July 1, 1988 and July 1, 1989) which is three months earlier than the average date with only one policy year of data.

B. Separate Treatment of State Fund Experience

For states with a competitive state fund which writes a large portion of the business, a separate analysis of state fund data is often performed. The areas where separate treatment is utilized reflect areas in which the state funds operate substantially differently from the private carriers.

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This separation is actuarially indicated since state fund distributions of policies by anniversary date are often substantially different from those occurring in commercial carrier experience. Adjustments to reflect these differences are addressed in the subsection on current level factors.

In some states, premium and loss development patterns and trend indications based on state fund data differ substantially from those experienced by private carriers in the state. The subsections on development factors and trend discuss the methods used to separately analyze and then combine the state fund and private carrier indications.

C. Separate Treatment of Assigned Risk Experience

In some states, the rates used to calculate assigned risk premiums are identical to those used for the voluntary market. In a number of states, a flat percentage differential is applied to the voluntary rates to obtain the assigned risk rates. Rate level increases have a similar effect on a percentage basis for both segments of the business in either of these cases unless the differentials are changed at the time of the filing. Other states modify assigned risk and voluntary rates separately based on the separate experience of these two segments of the business.

The sample filing illustrates an approach taken for a state which has had separate rate level changes for assigned risk business since 1983. The current level factor adjusts all premiums to the current voluntary rate level. This requires the calculation of separate current level factors for assigned risk and voluntary earned premiums. An additional adjustment is required to remove the cumulative assigned risk differential which has resulted due to differences in rate level changes since 1983. The current combined voluntary and assigned risk level factor in the sample Illinois filing is the weighted average of the voluntary and assigned risk current level factors with an additional adjustment to bring assigned risk premiums to the current voluntary rate levels.

This adjusts all premiums to the current voluntary rate level and market share. A more detailed description of assigned risk rating is contained in Section II-B subsection 8 of our analysis of NCCI ratemaking.

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D. Premium and Loss Development Factors

Selected age to age development factors are generally calculated by taking the average of the two factors which reflect experience in the two most recent experience periods at the appropriate maturity. After examining the two year indications, NCCI may decide to use more years of experience, eliminate the development factors for a particular year, or otherwise apply judgment in selecting factors.

In the 1990 filing cycle, rate levels based on a three year average were selected for one state even though the standard two year average had been used in the prior filing. The three years of data provided greater stability. The additional factors would have limited the impact of development patterns in the two most recent years if they contained distortions. The selection of the number of years of factors to use should be based on an actuarial review of the experience and the underlying forces influencing claim costs in the state.

In one of the filings in the most recent cycle the selected factors for first to second report medical development used only the most recent year's development factor. The development factor for the prior period was considered unreliable since it showed an unusual degree of loss development due to major reserving changes. The excluded factor was more than 20% higher than the selected factor. Use of a straight two year average would have increased the indicated calendar-accident year medical claim costs by 10%.

In some cases, development patterns may change so dramatically that none of the calculated development factors are expected to be appropriate. In these cases, NCCI makes judgmental selections. Such judgements might be required when a benefit change was expected to have a significant impact on claim payout and reserving levels. When development factor indications show a definite trend over time, and there were reasons to expect such trends to continue, judgmentally selected factors may reflect these trends.

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E. Treatment of Trend in Factors to Adjust Premiums to Current Levels

In most filings, the on-level factor includes an adjustment which removes the provision for trend contained in the prior rate level filing. Some filings use current level factors that do not remove trend.

The overall indicated rate level change does not depend upon which method is selected. When the current level factor does not remove trend, the trend factor introduces the full trend impact rather than the change in trend.

Filings with downward trend indications are most likely to exclude the trend factor removal from the current level calculation. NCCI indicated that negative trend adjustments are likely to cause confusion if they are presented in the standard manner. Their alternate method of presentation may also be confusing, since the standard wording such as, "indicated change based on experience" includes different components than in a filing following standard methodology.

The example below illustrates the differences which would result in the presentation if the downward trend was introduced in the standard manner and the equivalency of the results. In this example, the prior year trend from the average experience date to the average effective date is .90 and the current year trend for this period is .95 which produces an indicated change in trend of 1.056.

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	<u>Standard Presentation</u>	<u>NCCI Presentation</u>
A. Policy Year Adjusted Earned Premium	315,000	350,000
B. Policy Year Adjusted Incurred Losses	330,000	330,000
C. Policy Year Cost Ratio (B)/(A)	1.048	.943
D. Calendar Accident Year Adjusted Earned Premium	340,000	377,778
E. Calendar-Accident Year Adjusted Incurred Loss	350,000	350,000
F. Calendar-Accident Year Cost Ratio (E)/(D)	1.029	.926
G. Average Cost Ratio $1/2[(C)+(F)]$	1.0385	.9345
H. Target Cost Ratio	.700	.700
I. Indicated Change	1.484	1.335
J. Trend Adjustment	.950	1.056
K. Indicated Change Modified to Reflect Change in Trend (G)x(H)	1.410	1.410

F. Distribution of Policies Underlying Current Level Factors

Most NCCI rate filings use the countrywide distribution of policies by anniversaries to calculate current level factors.

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NCCI has tested for differences in policy effective dates by state.¹¹ Except for states where the state fund writes a large proportion of the business with common anniversary dates, they found no significant differences.

Many state funds write all policies or a large proportion of policies with a common expiration date. This changes the impact of rate level and benefit changes substantially. For example, if all policies expire on a particular date, the experience for a policy year beginning one year prior will be fully earned at that date rather than requiring the traditional twenty four months to be earned. Separate state fund current level factors are calculated for states where the state fund has a large market share and the state fund anniversary distribution differs from the overall distribution.

A few states require the use of distributions based on experience for that state only. According to NCCI, unless the differences from the statewide distribution are significant, use of state data will have little impact on overall rate level indications.

G. Calculation of Indicated Change Based on Experience

In states where state fund experience is analyzed separately, the private carrier and state fund average ratios are weighted based on their respective shares of calendar year standard earned premiums during the experience period. The combined rate level is proposed for both state fund and private carrier experience.

A simplified example of such a situation follows. In this example, the state fund writes half of the premium and has an average cost ratio 10% higher than the overall experience.

11 Memorandum on Effect of Distribution of Policy Effective Dates on On-Level Factors

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	<u>State Fund</u>	<u>Private Carriers</u>	<u>Total</u>
Earned Premium	\$1,000,000	\$1,000,000	\$2,000,000
Projected Average Cost Ratio	.990	.810	.900
Target Cost Ratio	.750	.750	.750
Indicated Change	1.320	1.080	1.200
Implemented Change	1.200	1.200	1.200
Expected Loss Ratio	.825	.675	.750

If the indicated 20% increase is implemented for all carriers, the State Fund is expected to have a loss ratio of 82.5% and the private carriers are expected to have a loss ratio of 67.5%. These ratios may or may not be appropriate for private carriers or the state fund depending upon their expense and profitability needs which may differ.

H. Calculation of Trend Indications

Trend factors are generally based on five years of policy year data. A larger number of years of data may be used in some state filings at the request of NCCI or the regulator.

Accident year data rather than policy year data is used for trend calculations in some states in response to requests by regulators. NCCI indicated that policy year data is more reliable.

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In some filings, separate trend factors are calculated based on state fund and private industry data. A weighted average trend is used in the rate level change calculations. If the trends differ widely, the combination may lead to rate levels which are adequate in the aggregate but do not reflect the expected costs for either segment of the business. If different trend factors were applied to each segment, the magnitude of the expected differences in experience between groups would be more clear.

The determination of the appropriate trend factor for a state which has recently introduced a medical fee schedule requires the modification of standard methodologies. Medical trends are lower in states which have an effective medical fee schedule than in states without a medical fee schedule. A "bent-line" trend factor is calculated which uses two separate trend factors with the change in trend occurring at the date of the implementation of the medical fee schedule. The trend based on state experience with no medical fee schedule is used for periods prior to the implementation of the fee schedule. The trend factor for periods after implementation of a medical fee schedule is based on the countrywide trend for states with an effective fee schedule modified to reflect the ratio of the state trend prior to the fee schedule to the countrywide trend for states with no fee schedule.

To illustrate the "bent-line" trend, we will assume that the state being evaluated had a medical fee schedule adopted on January 1, 1990. The state medical experience supports a medical trend of 12% which was 20% higher than the 10% countrywide trend for states with no fee schedule. In this example the countrywide trend factor for states with effective medical fee schedules is 5%. The state trend used for the period after the fee schedule is implemented will be 6%. ($5\% \times 12\%/10\% = 6\%$). In calculating rate level indications, experience will be projected to January 1, 1990 levels using the 12% trend and then projected to the average effective date for proposed rates using the 6% trend factor.

In certain states which have had downward trend indications, regulators do not permit credibility weighting of state trend indications with the countrywide trends. In these cases, NCCI uses a trend of unity which assumes that losses grow at exactly the same rate as payrolls.

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In certain circumstances, such as significant legal or economic changes in the state, the trend factors may be judgmentally modified. Actuarial judgment must be introduced when the historical indications cannot be adjusted to reflect changes in conditions.

I. Evaluation of Provisions for Profit and Contingencies

For many years, the standard provision for profit and contingencies in an NCCI rate filing has been 2.5% of premium. Today many states do not permit the use of the standard profit and contingencies margin of 2.5%. Some states specify the formulas to be used in calculating the indicated provisions. Others specify a percentage provision for profit and contingencies in the filing approval order.

NCCI has developed an internal rate of return model for testing the profit and contingency provisions in rate level proposals. This model is designed to project all cash flows associated with a group of policies written uniformly during the policy effective year with \$1 million of net earned premium.

NCCI has also developed a cost of capital model which examines a number of financial ratios for selected commercial casualty companies and uses their experience to evaluate target rates of return.

The material supporting the internal rate of return and target rate of return projections are included with some filings and are provided on request in other states. Regulators in some states have not accepted the NCCI's methodologies and have required that other approaches be used.

Except for the relatively brief reference on this page, which was included for the sake of completeness, the M&R examination of NCCI did not analyze the NCCI's methodology for determining profit and contingency loadings. M&R and the states conducting this examination agree that this topic is important in workers compensation ratemaking.

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This agreed-upon importance notwithstanding, the states conducting this examination chose not to include this topic within the scope of the work to be performed by contractors engaged in the NCCI examination. The states made this decision based on their perception of potential costs and also based on their perception that any such study would be likely to only add to the literature in the area, rather than provide definite direction to regulators and to NCCI.

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II. CLASSIFICATION RATEMAKING

A. Calculation of Industry Group Differentials

Certain states do not use industry group differentials. For a state that does not have a credible amount of experience in one or more of the industry groups, the use of industry group differentials may not improve rate equity.

A few states specify that selected classes be reclassified to a different industry group than the one generally assigned by NCCI in order to reflect the type of business performed for insureds in these classes in the state. An additional industry group was developed in Alaska for the oil and gas industry. In Alaska, these classes represent a credible subset of the state experience which is subject to substantially different economic forces. In most states, these classes would probably not have enough experience to produce credible indications.

B. Calculation of Class Rates

The credibility standards for assigning full credibility to national experience generally require 25 serious cases and 300 non-serious cases. In Alaska, NCCI uses 50 serious and 600 non-serious cases for full credibility of national experience. The standard for full medical credibility in Alaska is a total of 600 actual serious and non-serious cases. A special study performed for the Alaska Division of Insurance indicated that a specified number of claims from the state would be expected to better predict state losses than an equal number of adjusted countrywide claims.

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C. Modification of Swing Limits

Lower swing limits than the standard 25% are used in several states at the request of the insurance department. In the 1990 rating cycle, a number of states required lower swing limits.

The limitation of class rate level changes using swing limits does not change the overall premium income. Whenever classes have their rate changes limited, the remaining classes will have their existing rate indications adjusted through the application of the test correction factor.

A simple example may clarify the impact of varying the level of swing limits.

	<u>Class A</u>	<u>Class B</u>	<u>Total</u>
Premium	\$200,000	\$800,000	\$1,000,000
Indicated Change	1.430	1.0175	1.100
Modified for 25% swing limit	1.350	1.0375	1.100
Modified for 10% swing limit	1.200	1.0750	1.100

If a 25% limitation is applied, class A will have a rate level increase of 35% since the total (industry group) increase is 10%. Class B will have a rate increase of 3.75%. This is the amount required to produce the overall 10% increase. The adjustment required to produce the indicated overall change is relatively small.

If a 10% limitation were applied, class A would have an increase of 20% and class B would have a 7.5% increase.

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Some loss cost states do not permit the imposition of swing limits. It is then the responsibility of the individual insurers to introduce limitations and adjust premiums for all classes to produce the selected overall rate level.

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III. INDIVIDUAL RISK MODIFICATIONS

A. Assigned Risk Premium Modifications

In recent years, a number of programs have been developed to more equitably allocate costs between voluntary business and assigned risks.

Some states use lower premium discount factors or no premium discount factors for insureds written through the assigned risk plan. This creates the situation where larger insureds in an assigned risk pool will end up paying a relatively greater penalty. Reasons for this treatment sometimes include:

- a. Many regulators feel that smaller insureds have fewer alternatives available to them in terms of how their insurance is placed; hence it is "fairer" that larger insureds, which ostensibly have more control, are assessed a larger assigned risk penalty.
- b. Many regulators feel that smaller insureds are often placed in assigned risk plans without a thorough underwriting review, where large insureds are much more likely to have been closely reviewed prior to declination. If one accepts these presumptions, then it would appear that larger insureds in an assigned risk plan might tend to be of relatively poorer quality than smaller insureds.

We did not undertake to confirm these or similar presumptions, or attempt any study of indicated differentials by size of risk. We are aware that the entire assigned risk area, including consideration of questions like these, is the recipient of ongoing scrutiny by both NCCI and the regulatory community.

Other states include premium discount factors for those in the assigned risk plan only if they qualify based on the size of their experience rating modification factor. Under such a plan, a risk with a .80 experience rating modification would receive

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premium discounts, but a risk with a 1.20 modification would not. The large risks with favorable experience are given the benefit of premium discounts.

Several states have adopted an additional experience rating plan for the assigned risk program. This program, known as the Assigned Risk Adjustment Program (ARAP), introduces an additional debit on risks whose actual losses were higher than expected losses which have already been modified by the experience rating plan. Surcharges are limited based on the size of the risk. For risks with expected losses of \$2,500 the maximum additional charge is 9%. A maximum surcharge of 49% is imposed for risks with over \$40,000 of expected losses.

A second program, the Assigned Risk Rating Plan (ARRP) has also been accepted in some states. This program develops premium surcharges for assigned risks over \$50,000 that have poor loss experience. For more details on how residual markets affect ratemaking, please see our report in Section II-B, Subsection 8.

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Master - Final Pass Rates
Merit Rating
Midterm Cancellation
Minimum Premium
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MIP
Monopolistic State
National Data Base
NC-235's
NCCI
Net Premium
New Business
Non-Free Flow
Non-Rated Risk

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On-level Factor
On-level Losses
On-level Premium
Outstanding (Excluding IBNR) Losses
Payroll/Loss Detail (P/L Detail)
PEMIP
Per Capita Classification
Permissible Loss Ratio
PICS
POC State
Policy Effective Date
Policy Register
Policy Year
Policy Year Call
Policy Year Data
Premium Threshold
Primary Loss
Profile System
Proof of Coverage Card
Proof of Coverage State
Pure Premiums (A-Sheets)
 Indicated by Experience
 Underlying Present Rates
 Present on Rate Level
 Indicated by National Relativity
 Derived by Formula
Pure Premiums Underlying Rates
 Present
 Proposed
Rate Filing
Rate Level Adjustment Factor (RLAF)
Rate Projection Period
Rated Risk
Rated Size Policy
Ratemaking
Ratio of Manual to Earned Premium

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Report, Carrier Forms
Report, Duplicate
Report, Rejection
Reported Data
Retrospective Rating
Retrospective Rating Eligibility Requirements
Retrospective Rating Plan Manual for Workers Compensation and Employers Liability
Revised Experience Rating Plan (RERP)
Risk ID
Risk Study
SAWW
Schedule Z
Second Report, Third Report, Etc. (Financial Calls)
Seconds, Thirds, Fourths, Fifths (WCSP)
Self-Rating Point
Severity
SL2 Process
Standard Exclusions
Standard Premium
State Reference Point
Statistical Plan
Stevedoring Classifications
Subsequent Reports
Swing Limits
Target Cost Ratio (TCR)
Test Correction Factor (TCF)
Three-Year Fixed Rate Policy
Trend
Turnaround Document
Ultimate Cost
Unit Cards
Unit Record Card
Unit Report Control (URC)
Unit Report System (URS)
United States Longshoremen's and Harbor Workers' Compensation Act (USL&HW
Comp. Act)

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United States Longshoremen's and Harbor Workers' Percentage (USL&HW %)

Unreported Data

Valuation Date

Workers Compensation Statistical Plan (WCSP)

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a-RATES ("GUIDE" a-RATES)

Classifications whose diversification of experience cannot warrant normal manual rating are 'a'-rated. Estimated rates are obtained from NCCI or another licensed rating organization until an inspection of the insured's activities can be made.

A-SHEET CONVERSION FACTORS

These factors are calculated by injury type for the latest three report policy periods and one three-year fixed rate policy period. They are applied to the corresponding NC-235 losses for each class code to obtain A-Sheet losses. They contain amendment factors, loss development to an ultimate report, loss assessments (if applicable), policy and calendar-accident year adjustment, trend(s) (if applicable), and loss adjustment expense (when applicable).

A-SHEETS (PURE PREMIUM EXHIBITS)

This exhibit contains, for each classification, payrolls, losses on current level (see A-Sheet Conversion Factors), credibilities for state and national partial pure premiums, as well as the following pure premiums (see Pure Premiums) by serious indemnity, non-serious indemnity and medical parts:

1. Indicated by Experience
2. Present on Rate Level
3. Underlying Present Rates
4. Indicated by National Relativity
5. Derived by Formula

ACCIDENT YEAR

A loss accounting definition whereby experience is summarized by the calendar year in which an accident occurred.

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ACCIDENT YEAR CALL

A request for premium and loss experience reported by accident year. (Reference: Financial Call).

BASIC MANUAL ON WORKERS COMPENSATION INSURANCE AND EMPLOYERS LIABILITY

This manual contains the rules in use in Workers Compensation and Occupational Disease and a description of each rule. It also contains the following:

- Administrative Bureau Rules and Procedures
- Premium Discount Tables
- Cancellation Tables
- Classifications
- Underwriting Guide
- Interpretation Section: Classifications, Auditing, Basis of Premium, Manual Rules, Miscellaneous, Overtime, Payroll Limitation, Premium Discounts, Experience Rating, Retrospective Rating
- Manual Supplement - Treatment of Disease Coverage
- Rates and Rating Values Including Special Classifications

BULK RESERVES

Those outstanding reserves for general case reserve inadequacy, supplemental case reserves, cases that may reopen, or other (non IBNR) reserves which are not associated to specific claims. (Reference: Financial Call).

NCCI RATEMAKING PROCEDURES GLOSSARY

CALENDAR YEAR CALL

A request for companies to submit aggregate data for the specified calendar year. (Reference: Financial Call).

CASE RESERVES

Those outstanding reserves established for specific known cases.

CONTRACT MEDICAL OR HOSPITAL ALLOWANCE

A payment made by an insurance company to cover medical costs provided to the injured worker by the employer. Injury code #17 on the WCSP NC-235's.

"CORR" FILE

A temporary correction file used to store financial call data corrections when determination of a state's rate level is in progress.

CREDIBILITY

A weight, ranging from 0 to 1, assigned to a certain body of data. NCCI applies credibility in its trend methodology, its classification ratemaking methodology, and its experience rating methodology.

CREDIBILITY COMPLEMENT

Unity less credibility.

NCCI RATEMAKING PROCEDURES GLOSSARY

CRITICAL VALUE

The amount of indemnity losses determining whether a permanent partial claim is classified as major or minor. If the indemnity portion is greater than or equal to the critical value, then the injury type is major permanent partial. If the indemnity portion is less than the critical value, then the injury type is minor permanent partial.

"D" RATIO

Represents the ratio of expected primary losses to total expected losses for a given classification.

"D" RATIO FACTORS

Used in the "D" ratio formula, these factors are calculated for application to serious, non-serious, and medical pure premiums. (Reference: "D" Ratio Formula).

"D" RATIO FORMULA

As follows:

$$\begin{aligned} & [(\text{Serious "D" ratio factor} \times \text{Serious pure premium}) \\ & + (\text{Non-serious "D" ratio factor} \times \text{Non-serious pure premium}) \\ & + (\text{Medical "D" ratio factor} \times \text{Medical pure premium})] \\ & \div \text{Total Pure Premium.} \end{aligned}$$

"D" ratios are limited to plus or minus .1 from the last approved rate's "D" ratio. In most states, "D" ratios cannot be less than .25; nor can they exceed .90.

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DATA REQUEST FORM

Describes the workers compensation statistical plan policy periods to be used in the upcoming state experience filing. Also denotes critical values, current A sheet Loss Limitation (to limit NC-235 losses), current master and the Phase I Volume Checks.

DETAILED CLAIM INFORMATION

Information on an individual claim basis which provides detail on the components of the loss. This is obtained through a separate call on a sample basis.

DEVELOPMENT FACTOR

Ratio of losses (premium) at a given age divided by losses (premium) at a prior age.

EX-MEDICAL RATE

Policies may be endorsed to exclude medical coverage (e.g. hospitals). The carrier does not provide medical payment for this coverage, and a manual rate is calculated.

Formula: $(1 - \text{Ex-Medical Ratio}) \times \text{Rate}$

EX-MEDICAL RATIO

Ratio used to calculate Ex-Medical Rate.

Formula: $.7 \times \text{Proposed Medical Pure Premium} / \text{Proposed Total Pure Premium}$

(Note: The .7 assumes the carrier is still liable for some portion of the medical on an ex-medical policy. It also assumes that the loss adjustment expense and the general expense will be the same for an ex-medical policy as for a full coverage policy, but production, taxes and profit will be lower for an ex-medical policy).

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EXCESS LOSS FACTORS (ELF)

Excess Loss Factors are percentages of standard premium paid by the policyholder in lieu of being charged for losses above a selected limit per accident. The charges vary by hazard group to reflect the differences in expected frequency and size of claim. Excess Loss Factors are only used in the Retrospective Rating Plan.

EXPECTED ANNUAL TREND

Estimated annual amount of increase in loss ratio. It is used to the extent that the indemnity and/or medical trend indications based on an individual state's experience is not credible. It is based on the sum of the data for states where the NCCI calculates trend factors.

EXPECTED LOSS RATES (ELR)

ELR's are used in the experience rating calculation. An ELR estimates average loss levels (losses per \$100 of payroll) of a classification for the experience rating plan experience period. The ELR factor is calculated for each hazard group and is applied to the manual rate to obtain the expected loss rate.

EXPECTED LOSSES

1. In classification ratemaking: the class payroll in hundreds multiplied by the partial pure premium underlying the current rate (not the A-Sheet pure premiums). Used to calculate state credibility.
2. In experience rating: the payroll in hundreds multiplied by the expected loss rate.

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EXPERIENCE MODIFICATION (MOD)

A factor calculated from actual case loss experience (unit cards) used to adjust an insured's manual premiums (up or down) based on the insured's loss experience relative to the average underlying the manual premiums.

EXPERIENCE PERIOD FOR RATEMAKING

The time interval from which the loss and premium data was extracted.

EXPERIENCE PERIOD FOR TREND

The time interval from which the indemnity (medical) loss ratio data was extracted.

EXPERIENCE RATING

A mandatory form of individual risk rating which takes into consideration the loss experience of the particular insured (or "risk") relative to the industry average. (Applies only to insureds meeting Premium Eligibility Requirements).

EXPERIENCE RATING ELIGIBILITY REQUIREMENTS

In states where Item E-1215 is effective the minimum premium required for experience rating eligibility is approximately equal to the standard earned premium generated from ten average workers. The state average earned rate and the state average wage are used in determination of the eligibility requirements.

NCCI RATEMAKING PROCEDURES GLOSSARY

EXPERIENCE RATING PLAN MANUAL FOR WORKERS COMPENSATION AND EMPLOYERS LIABILITY

Contains the rules that govern the Experience Rating plan in connection with Workers Compensation and Employers Liability insurance.

EXPOSURE

For most classifications, the total dollar amount of covered payroll in units of \$100. Number of employee years is used instead of payroll for "per capita" classifications.

EXTENDED TERM

A policy that extends past 12 months and 15 days in length. Unit statistical cards are required separately for the first 12 month period and each subsequent period of 12 months or less.

FINANCIAL CALL

A request for financial information from the carrier. Financial calls are required for each state. This information is used to generate aggregate rate level indicators, reconcile reported data for expense analysis and for certain state specific calculations and regulatory reports. There are three primary financial calls - Accident year, Calendar year and Policy year.

FINANCIAL DATA

Policy year, accident year, and calendar year data are collected on an overall basis and are referred to as financial data because they can be reconciled to a company's annual statement.

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FINANCIAL DATA ADJUSTMENT FACTOR

The factor to adjust the financial data loss ratio used in the A-Sheets to the final loss ratio. The factor is used in the calculation of the Rate Level Adjustment Factor.

FIRST REPORT (FINANCIAL CALL)

For the accident year financial call, the first report is as of the end of the accident year (i.e. 12 months). For the policy year financial call, the first report is as of 24 months after the start of the policy year.

FIRST REPORT (WCSP)

For the first Workers Compensation Statistical Plan unit report filing; the first report contains policy year payroll, premiums and claims valued as of the 18th month after the policy became effective.

FORM H

Displays by classification the payroll, premium at current manual rate, expected losses and credibilities by parts.

FORM J

Determines the amount of expected serious, non-serious and medical losses necessary for full state credibility. This exhibit is included in the Workers Compensation Statistical Plan data request.

NCCI RATEMAKING PROCEDURES GLOSSARY

FORM R

Totals by industry group and policy period, showing payroll and premium at current manual rates. Part of the Workers Compensation Statistical Plan data request.

FREE FLOW

Unit card data which can be processed without manual intervention through the experience rating system.

FREQUENCY

Number of claims divided by exposures in a given period.

INCURRED BUT NOT REPORTED (IBNR)

IBNR refers to losses estimated for events that will result in claims but have not yet been reported to insurers. It also may include "bulk" reserves for estimated future development of case reserves. Carriers are required to report IBNR on the financial calls.

INDEXING

The process of assigning a risk ID to a unit card.

INJURY TYPE

NCCI classifies injuries as one of the following:

1. death
2. permanent total

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3. major permanent partial
4. minor permanent partial
5. temporary total
6. medical only.
7. contract medical

INTERSTATE RISK

Policyholder with payroll (exposure) in more than one state where interstate rating has been adopted.

INVESTMENT INCOME

That part of a company's income that stems from the interest and dividends earned on the stocks and bonds it owns or the return on any other investment in which it has put its funds.

LAW AMENDMENT FACTOR

Factor that adjusts losses for any changes in the law.

LOSS ADJUSTMENT EXPENSE (LAE)

Includes the cost of investigating cases, representing the employer before claims adjudicating bodies, defending law suits and so forth. The allowance for loss adjustment expense includes both allocated and unallocated expense since workers compensation reported losses exclude all loss adjustment expense (except Coverage B employers liability claims).

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LOSS COST

The portion of workers compensation rates consisting of projected losses. Expenses and profits are not included in loss cost.

LOSS RATIO

Losses divided by premium in a given period.

LOSS RATIO ADJUSTMENT PROGRAM (LRAP)

A plan that increases the Experience Rating Plan's responsiveness to an individual construction employer's actual claim experience through the application of additional premium credits or surcharges. LRAP was applicable in Illinois, Maryland, Nebraska, and Oregon but has since been discontinued.

MANUAL PREMIUM

Payroll, in hundreds of dollars, multiplied by the manual rate.

MANUAL RATE

The unit cost which is multiplied by the employer's payroll to determine manual premium.

MASTER-FINAL PASS RATES

The final computer printout listing class codes, run and effective date of rates, approved updated pure premiums by serious, non-serious, medical and total, approved rates, disease elements and "D" ratios. This printout of classification code

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rates and rating values is used as the base upon which the next proposed rate change is run.

MERIT RATING

State mandated program to provide a factor for premium adjustment based on past loss experience of a risk. Merit rating differs from experience rating in that merit ratings are determined for policies with premiums below the Experience Rating threshold.

MIDTERM CANCELLATION

One party cancels the insurance contract after the effective date but before the expiration date.

MINIMUM PREMIUM

The minimum price for writing a workers compensation policy based upon the following formula:

Rate (including disease loading) x Minimum Premium Multiplier + Expense Constant.

(Note: This formula does not apply to per capita classes).

MINIMUM PREMIUM MULTIPLIER

The minimum premium multiplier is a component of the minimum premium formula. It was originally calculated to reflect the state average annual worker's wage ((average weekly earnings x 52 weeks)/100), but limited to a maximum annual increase of 10 units.

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For example, the minimum premium multiplier in Alabama should be the average annual workers wage in hundreds rounded to the nearest 5 $((294.79 \times 52)/100 = 150)$. The Alabama minimum premium multiplier is, however, subject to the maximum increase of 10. Since the May 1, 1986 minimum premium multiplier is 105, the June 1, 1987 minimum premium multiplier cannot increase to 150. It is limited to 115.

MIP

Monetary Incentive Program or fining program used by NCCI to encourage timely and accurate submission of experience by carriers. Also known as PEMIP.

MONOPOLISTIC STATE

State where workers compensation coverage is written by a state fund with no competition from commercial carriers.

NATIONAL DATA BASE

A compilation of the latest approved indicated A-Sheet experience for every state. It is used to derive the pure premiums indicated by the National Relativity.

NC-235's

Compilations of Workers Compensation Statistical Plan data which show payroll, earned and manual premiums, number of cases and indemnity and medical losses by injury type. For individual class NC-235's, losses from individual claims are limited to 20% of the self-rating point, and for multiple claims are limited to 40% of the self-rating point. (Under SERA the A-sheet limitation point will no longer be called the self-rating point).

NCCI RATEMAKING PROCEDURES GLOSSARY

NCCI

National Council on Compensation Insurance.

NET PREMIUM

Premium resulting from the application of premium discounts and retrospective adjustments to standard premium.

NEW BUSINESS

Policies newly written by an insurance carrier.

NON-FREE FLOW

Unit card data which requires manual intervention to continue processing through the experience rating system.

NON-RATED RISK

An insured risk which is not subject to experience modification of policy premium.

ON-LEVEL FACTOR

Factor that adjusts premium (losses) to the current premium or law level.

ON-LEVEL LOSSES

Losses from a prior period multiplied by the on-level factor to arrive at losses on the same base as those in the current period.

NCCI RATEMAKING PROCEDURES GLOSSARY

ON-LEVEL PREMIUM

Premium from a prior period multiplied by the on-level factor to arrive at premium on the same base as those in the current period.

OUTSTANDING (EXCLUDING IBNR) LOSSES

In the financial calls, this definition is intended to capture case reserves and bulk reserves (see separate definitions of these two reserve components). For some carriers, this item will include case reserves only. (Reference: Financial Call).

PAYROLL/LOSS DETAIL (P/L DETAIL)

The individual class records, taken from unit cards, for a particular state and policy period. The class records are separated into exposure (usually payroll) and loss records.

PEMIP

Performance Evaluation Monetary Incentive Program or fining program used by NCCI to encourage timely and accurate submission of experience by carriers. Also known as MIP.

PER CAPITA CLASSIFICATION

A classification which uses the number of worker years rather than payroll as the exposure base. Private residence workers (servants, drivers) fall into this category. Per capita classification rates are rounded to a whole number, and the minimum premium is usually the rate plus the expense constant.

NCCI RATEMAKING PROCEDURES GLOSSARY

PERMISSIBLE LOSS RATIO

The target cost ratio excluding loss adjustment expense.

PICS

NCCI database of carrier policy information (Policy Issue Capture System).

POC STATE

Proof of Coverage State. States that use NCCI database to verify workers compensation coverage.

POLICY EFFECTIVE DATE

Effective date of coverage for a policy; starts WCSP unit reporting cycle.

POLICY REGISTER

A record of key data (number, effective date, coverage states, etc.) for all policies maintained in a carrier database.

POLICY YEAR

A premium and loss accounting definition whereby experience is summarized for all policies with effective dates in a given calendar year period.

NCCI RATEMAKING PROCEDURES GLOSSARY

POLICY YEAR CALL

A request for premium and loss experience reported by policy year. (Reference: Financial Call).

POLICY YEAR DATA

The premium and loss associated with policies with effective dates in a given calendar year period.

PREMIUM THRESHOLD

Annual or two-year average premium payment level that qualifies a risk for experience modification. Each state sets its own threshold.

PRIMARY LOSS

Used in experience rating. Under the revised experience rating plan, it is the portion of a loss up to \$5,000. The prior experience rating plan contained a formula to produce primary losses. The effective date for the new \$5,000 threshold varies by state. Primary losses are used to avoid unreasonable effects of very large losses on an insured's experience modification factor in the experience rating plan.

PROFILE SYSTEM

NCCI system containing the last calculated experience rating and unit reports received since the last rating.

NCCI RATEMAKING PROCEDURES GLOSSARY

PROOF OF COVERAGE CARD

Document sent to the state notifying it of a company's workers compensation coverage.

PROOF OF COVERAGE STATE

States that use the NCCI database to verify workers compensation coverage.

PURE PREMIUM DEPARTMENT

The actuarial department within NCCI that calculates development factors, industry group differentials and cost ratios and produces certain exhibits for class ratemaking. The Pure Premium Department produces the A-Sheets (using calculated loss development factors, industry group differentials and other factors) and certain exhibits for class ratemaking.

PURE PREMIUMS (A-SHEETS)

1. Indicated by Experience - Workers Compensation Statistical Plan experience from class NC-235's adjusted to current level of benefits, and to reflect loss adjustment expense, trend and financial data, developed to an ultimate and divided by payroll in units of one hundred dollars.
2. Underlying Present Rates - On A-Sheets, the pure premiums from the last rate revision, adjusted for the most recent off-balance of the Experience Rating Plan and any subsequent law changes since the last rate revision.
3. Present on Rate Level - The A-Sheet underlying pure premiums adjusted to the level of the current financial data.

NCCI RATEMAKING PROCEDURES GLOSSARY

4. Indicated by National Relativity - See Frank Harwayne's paper, "Use of National Experience Indications in Workers Compensation Classification Ratemaking." (PCAS, Vol. LXIV, 1977, p. 74). Pure premiums reflect the countrywide experience as indicated by the latest available individual classification experience for all states for which the National Council compiles data.
5. Derived by Formula - Weighted combination of indicated present on rate level and indicated by national relativity pure premiums.

(state credibility x indicated pure premium) + (national credibility x pure premium indicated by national relativity) + [(1 - state credibility - national credibility) x pure premium on present rate level]

PURE PREMIUMS UNDERLYING RATES

1. Present: These are the serious, non-serious and medical pure premiums underlying the rates currently in effect. They are obtained from the master, and are used to obtain pure premiums on the next set of A-sheets.
2. Proposed: These are the serious, non-serious and medical pure premiums underlying the proposed rates, obtained by rate calculations. (Note: Not to be confused with A-Sheet Pure Premiums.)

RATE FILING

The annual request for workers compensation rate changes filed with a state.

NCCI RATEMAKING PROCEDURES GLOSSARY

RATE LEVEL ADJUSTMENT FACTOR (RLAF)

Allows for any factors to be applied to a reviewed classification rate calculation (RLAF x Test Correction Factor = Composite Factor) that are not applied elsewhere in a rate filing, as well as an adjustment of financial data.

RATE PROJECTION PERIOD

This is the time period from the average accident date in the experience period for ratemaking to the average accident date for the policy year starting on the effective date stated in the rate filing.

RATED RISK

An insured risk that is subject to experience rating modification of policy premium.

RATED SIZE POLICY

A policy which has enough premium to meet state threshold amounts for experience modification. Policies with premium within \$500 of this threshold are also included in this group.

RATEMAKING

The actuarial process of establishing premium rates to be charged to policyholders. Ratemaking is performed annually on a state-by-state basis.

NCCI RATEMAKING PROCEDURES GLOSSARY

RATIO OF MANUAL TO EARNED PREMIUM

1. The present ratio of manual premium to earned premium divided by the proposed ratio of manual premium to earned premium is applied in A-Sheets to obtain pure premiums underlying manual rates.
2. The new (proposed) ratio of manual premium to earned premium (after any adjustments - e.g., revised eligibility) is applied in the rate calculation.

REPORT, CARRIER FORMS

Summarizes each carrier's overall timeliness with unit reports.

REPORT, DUPLICATE

A facsimile of all unit reports that are rejected due to identical key information to records already on PICS.

REPORT, REJECTION

A facsimile of unit reports that fail edit criteria.

REPORTED DATA

Carrier data that has been reported to a bureau on a unit report.

RETROSPECTIVE RATING

A voluntary rating system setting forth conditions whereby the premium actually paid by an insured depends upon the loss experience generated by the insured during the

NCCI RATEMAKING PROCEDURES GLOSSARY

time the policy is in force, subject to maximum and minimum limits. The Retrospective Rating Plan offers five Rating Options.

RETROSPECTIVE RATING ELIGIBILITY REQUIREMENTS

A risk is eligible for Retrospective Rating if it satisfies the following standard premium requirements:

1. One-Year Plan - A risk is eligible for a one-year plan if the estimated standard premium is at least \$25,000.
2. Three-Year Plan - A risk is eligible for a three-year plan if the estimated standard premium for 3 years is at least \$50,000. Exception: Eligibility for Rating Option V is at least \$75,000.

RETROSPECTIVE RATING PLAN MANUAL FOR WORKERS COMPENSATION AND EMPLOYERS LIABILITY

Contains the rules that govern the Retrospective Rating Plan in connection with Workers Compensation and Employers Liability policies.

REVISED EXPERIENCE RATING PLAN (RERP)

A modification to the experience rating plan introduced in 1989 using updated parameters to more accurately predict the loss experience of an eligible employer.

RISK ID

A unique number used by NCCI to identify a rated risk.

NCCI RATEMAKING PROCEDURES GLOSSARY

RISK STUDY

A printout of risk, payroll, earned and manual premium and indemnity and medical losses by premium size for stock and non-stock companies by industry group on a first report basis. Also contains list of risks with premium greater than \$99,999 by carrier and class code.

SAWW

Statewide Average Weekly Wage.

SCHEDULE Z

A compilation of unadjusted Workers Compensation Statistical Plan experience by policy period and by class, which underlies the A-sheets. Losses are not limited in any way. The same data on NC-235's is available on Schedule Z.

SECOND REPORT, THIRD REPORT, ETC. (FINANCIAL CALLS)

Premium and loss data evaluated 12 months, 24 months, etc. after the first report.

SECONDS, THIRDS, FOURTHS, FIFTHS (WCSP)

Subsequent WCSP reports occurring 12, 24, 36 and 48 months after the first report for a policy.

SELF-RATING POINT

In experience rating, the self-rating point is the amount of expected losses necessary for a risk's own experience to solely determine its experience modification. (Under SERA, however, the concept of self-rating will no longer exist.) It is also used to limit

NCCI RATEMAKING PROCEDURES GLOSSARY

the losses considered in experience rating to 10% and 20% of the self-rating point for single and multiple claims respectively. (Under SERA, losses for experience rating will be limited using the State Reference Point).

The self-rating point is 25 times the serious average cost per case averaged with the previous self-rating point.

In the Pure Premium Exhibits (the A-sheets), losses are limited to 20% and 40% of the self-rating point for single and multiple claims, respectively.

SEVERITY

Volume of losses divided by claims in a given period.

SL2 PROCESS

Current NCCI process of requesting late records that should be replaced by the Unit Report Control turnaround process.

STANDARD EXCLUSIONS

Any classification code whose experience is not found on the A-Sheets (e.g., Federal classifications, Maritime classifications, "a"-rated classifications, Explosive classifications, Non-Ratable Element Codes). These codes are listed on the master as industry group "7".

STANDARD PREMIUM

Premium resulting from the application of experience rating and expense constants to manual premium.

NCCI RATEMAKING PROCEDURES GLOSSARY

STATE REFERENCE POINT

This number will be used in the new SERA plan and is equal to 250 times the state average cost per case. The State Reference Point will be used to determine loss limitations for experience rating.

STATISTICAL PLAN

The rules that govern how workers compensation statistics must be reported to NCCI.

STEVEDORING CLASSIFICATIONS

Stevedoring classes are those involving the loading and unloading of cargo from ships in port, and are Federal classifications.

NC-235 Grand Totals Excluding or Including Stevedoring classifications refer to totals with or without all Federal Classifications (Shipbuilding, Stevedoring and United States Armed Services Risks - Class Code 9077F), not only Stevedoring Classifications.

SUBSEQUENT REPORTS

All Workers Compensation Statistical Plan unit cards after the First Report.

SWING LIMITS

Swing limits are used to control the change in rates by classification. For example, a swing limit of 25% implies that Maximum Deviation = Effect of the final change in rate level by industry group plus or minus 25% rounded to the nearest 1%.

NCCI RATEMAKING PROCEDURES GLOSSARY

TARGET COST RATIO (TCR)

Represents the percentage of each dollar of standard premium available for payment of benefits including loss adjustment expense.

TEST CORRECTION FACTOR (TCF)

Used to determine if the required change in manual premium level has been achieved. An iterative process continually tests the proposed rates including tentative TCF's until the required change is obtained. This process also adjusts for the effect of classes limited by the upper and lower swing limits.

THREE-YEAR FIXED RATE POLICY

Established to permit the underwriting of small size insureds at less cost. An insured whose estimated premium is not over \$700 per year may be written for a period of three years at the manual rate, provided the risk is not eligible for the Experience Rating Plan on the effective date of the policy. This rate will not change unless there is an adjustment of outstanding policies in excess of 10% as a result of a law amendment.

TREND

Factor applied to indemnity (medical) loss ratio to adjust for future inflation in loss ratios.

TURNAROUND DOCUMENT

A Listing or Report sent from the bureau to the carrier and then returned to the bureau with the appropriate Carrier Response Codes.

NCCI RATEMAKING PROCEDURES GLOSSARY

ULTIMATE COST

The total paid losses to date plus an estimate of all future costs required to close the claim.

UNIT CARDS

Standard reporting forms completed by insurance companies for each insured supplying information about payroll and premium by classification, and losses for individual claims above a minimum size. Small claims are reported on an aggregate basis. Unit cards are received by the National Council and compiled for each state under the Workers Compensation Statistical Plan.

UNIT RECORD CARD

Report of premiums and/or claims to the state workers compensation body or rating bureau.

UNIT REPORT CONTROL (URC)

Production system that will trigger requests for unit reports for experience rated sized policies, provide information necessary to assess fines against carriers for late unit card reporting and provide information on overall performance in delivering unit reports on time.

UNIT REPORT SYSTEM (URS)

Future system which will provide an on-line database to store all unit reports and to serve as a foundation for improvements to data validation, Experience Rating, and Class Ratemaking.

NCCI RATEMAKING PROCEDURES GLOSSARY

UNITED STATES LONGSHOREMEN'S AND HARBOR WORKERS' COMPENSATION ACT (USL&HW COMP. ACT)

Provides for payment of compensation and other benefits to employees such as longshoremen, harbor workers, ship repairmen, etc. Applicable to employees while working on navigable waters of the United States.

UNITED STATES LONGSHOREMEN'S AND HARBOR WORKERS' PERCENTAGE (USL&HW %)

Ratio comparison of federal to state indemnity benefit provisions expressed as an overall percentage. The USL&HW % is applied to the rates for classifications that do not normally reflect coverage under the USL&HW Act. Such increased rates apply only to payroll of employers engaged in operations subject to the USL&HW Act (i.e., non-"F" Classifications).

UNREPORTED DATA

Carrier data that has not been reported to a bureau on a unit report.

VALUATION DATE

The point at which the costs of claims to date are estimated. (Reference: First Report, Second Report, etc.).

WORKERS COMPENSATION STATISTICAL PLAN (WCSP)

The reporting method by which the National Council compiles its payroll, premium and loss information through unit card summarization. The WCSP used to be referred to as the Unit Statistical Plan (USP).

(As part of an NAIC examination of NCCI, Milliman & Robertson, Inc. has prepared a report which describes the workers compensation ratemaking procedures utilized by NCCI. The purpose of this technical supplement is to provide reference material supporting this report).

**RATEMAKING PROCEDURES
DESCRIPTION OF NCCI RATEMAKING METHODOLOGIES**

**NCCI EXAMINATION
VOLUME II - SECTION IIA
NCCI RATEMAKING PROCEDURES
TECHNICAL SUPPLEMENT**

December 6, 1991

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SECTION IIA NCCI RATEMAKING PROCEDURES TECHNICAL SUPPLEMENT

As part of an NAIC examination of NCCI, Milliman & Robertson, Inc. has prepared a description of the workers compensation ratemaking procedures utilized by NCCI.

The purpose of this Technical Supplement is to provide reference material including selected sections of a sample rate filing and additional support for classification ratemaking.

I. SAMPLE NCCI RATE FILING

The sample rate filing was prepared by the National Council on Compensation Insurance for the state of Illinois to be effective January 1, 1991.

The sample filing is subdivided into three main section as follows:

- Introductory Material
- Part I - Primary Exhibits
- Part II - Supporting Appendices

A brief outline of each of these areas follows.

A. Introductory Material

The introductory material includes:

1. Cover Letter

The filing begins with a cover letter which presents the proposed rate level change, the proposed effective data and other pertinent background information.

**SECTION IIA
NCCI RATEMAKING PROCEDURES
TECHNICAL SUPPLEMENT**

2. Summary of Indicated Change by Component

The filing contains a two page summary of rate level indications for industrial classes which are developed in the filing. The proposed changes are shown in two ways; first by what NCCI refers to as by component and then by industry groups.

3. Table of Contents

The filing includes a Table of Contents indicating where pertinent materials in support of the filing can be found.

B. Part I - Primary Exhibits

The Part I Primary Exhibits includes:

- Exhibit I - Determination of indicated change in Statewide premium level
- Exhibit II - Workers Compensation Expense Program
- Exhibit III - Proposed Advisory Rates and Rating Values

C. Part II - Supporting Appendices

The Part II Supporting Appendices includes:

- Appendix A - Factors Underlying Rate Revisions
- Appendix B - Computation of Advisory Rates
- Appendix C - Law, Assessment and Tax Memoranda

**SECTION IIA
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II. APPENDIX D - NCCI SUPPORTING MATERIAL

In our report on the ratemaking procedures utilized by NCCI, we describe each of the above sections. We have found it necessary to add an Appendix D. This is not part of the NCCI filing. Rather, it contains NCCI workpapers to document or clarify their methodology.

**SECTION IIA
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**SECTION IIA
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I. SAMPLE NCCI RATE FILING

A. Introductory Material

1. Cover Letter
2. Summary of Indicated Change by Component
3. Table of Contents

B. Part I - Primary Exhibits

C. Part II - Supporting Appendices

Appendix A: Factors Underlying Rate Revision

- A-I: Factors Adjusting 1988 Policy Year Premium and Losses to Current Level
- A-II: Calculation of Policy Year Development Factors
- A-III: Factors Adjusting 1989 Calendar-Accident Year Premiums and Losses to Current Levels
- A-IV: Calculation of Calendar-Accident Year Development Factors
- A-V: Calculation of Policy Year Trend Factor
- A-VI: Carriers Not Included in Policy Year and Calendar Year Data
- A-VII: Determination of Industry Group Differentials

Appendix B: Computation of Advisory Rates

- B-I: Distribution of Premium Level Change to Classification
- B-II: Individual Classification Experience
- B-III: Computation of Final Advisory Rate
- B-IV: Sample Advisory Rate Calculation

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B-V: "F" Class Premium Level Change

Appendix C: Law, Assessment and Tax Memoranda

- C-I: Change Resulting from Increase in the Minimum and Maximum Weekly Benefits, Effective January 15, 1990
- C-IV: Longshore and Harbor Workers' Act - Special Fund
- C-V: Longshore and Harbor Workers' Act - Special Fund Assessment
- C-VI: Derivation and Support for Tax - Insurance Guaranty Fund

II. APPENDIX D - NCCI SUPPORTING MATERIAL

- D-I: Ratio of Earned to Manual Premiums
- D-II: Calculation of Wage Trend Factors
- D-III: NC235's for Class 2014
- D-IV: Credibility Criteria: Form J and Supporting Experience
- D-V: Calculation of Discount Ratio Factors

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TECHNICAL SUPPLEMENT**

**TECHNICAL SUPPLEMENT
INTRODUCTORY MATERIAL**

**SECTION IIA
NCCI RATEMAKING PROCEDURES
TECHNICAL SUPPLEMENT**



National
Council
on Compensation
Insurance

Government, Consumer &
Industry Affairs
Illinois

Larry E. Hochstetler
Director

October 3, 1990

The Honorable Zack Stamp
Director of Insurance
State of Illinois
Insurance Department
320 West Washington Street
Springfield, IL 62767

Re: Workers Compensation Advisory Rates and Rating Values - Advisory Loss
Costs - Effective January 1, 1991
Illinois Voluntary Market

Dear Director Stamp:

In accordance with Section 457(2) of the Illinois Insurance Code, I am filing on behalf of the National Council on Compensation Insurance (NCCI) advisory rates, advisory loss costs, and certain advisory rating values which are being distributed to the NCCI members and subscribers writing workers compensation insurance for the voluntary market in Illinois. NCCI members and subscribers will not be required to adhere to these advisory rates or loss costs.

I am also filing on behalf of NCCI and its members and subscribers, certain rating values that are part of the NCCI rating plan to which NCCI members and subscribers are required to adhere.

The loss costs were determined by removing all allowances for expenses from the rates and rating values proposed to become effective January 1, 1991. Specifically, these values exclude allowances for the following expenses: Acquisition and Field Supervision; General Expense; Taxes, Licenses and Fees other than Federal Income Tax; Profit and Contingencies and Loss Adjustment Expense. Additionally, there are no provisions in these loss costs for any Illinois assessments such as the Second Injury Fund, the Compensation Rate Adjustment Fund, and the Insurance Guaranty Fund Tax.

We are including both the advisory rates and advisory loss costs (i.e., pure premium rates). Carriers may wish to adopt either the advisory rates which are based on the NCCI's compilations of expense data or the advisory loss costs and apply their own expense provisions to calculate rates.

This advisory filing represents an average overall increase in premium level of +8.5% for industrial classifications in the voluntary market from the current advisory premium level (i.e., based on the advisory rate filing effective January 1, 1990). The breakdown of the components of this filing is shown on the Summary Page.

The attached advisory rates and rating values and pure premium rates are proposed for use as of January 1, 1991.

A circular will be sent to all NCCI members and subscribers notifying them that these advisory rates and rating values and pure premium rates have been filed.

The Honorable Zack Stamp
October 3, 1990
Page 2

In addition, the circular will advise NCCI members and subscribers to be cognizant of the possible impact of Senate Bill 1200 regarding the use of the advisory rates and rating values.

Advisory rate and loss cost information filed, to which adherence is not required, includes the following enclosed information and material:

1. Advisory Rates and Loss Costs, Including Disease
2. Minimum Premiums
3. Expense Constants
4. Ex-Medical Ratios
5. Premium Discount Percentages included in Miscellaneous Values tables
6. United States Longshore and Harbor Workers' Compensation Coverage Percentage included in Miscellaneous Values table
7. Tables of Retrospective Rating Values, Expected Loss Ratios and Tax Multipliers used in connection with the various retrospective rating plans
8. Excess Loss Premium and Pure Premium Factors (both state and federal)
9. Retrospective Rating Development Factors
10. Table of Specific Disease Loadings

The following material and information require adherence by NCCI members and subscribers authorized by Section 457(2) of the Illinois Insurance Code:

1. Expected Loss Rates
2. D Ratios
3. Basis of Premium applicable in accordance with the footnote instructions for Code 7370 contained in the Miscellaneous Values table
4. Maximum Remuneration applicable in accordance with Basic Manual Rule IX-A-4-b, etc., contained in the Miscellaneous Values table
5. Minimum Remuneration applicable in accordance with Basic Manual Rule IX-A-4-a contained in the Miscellaneous Values table
6. Table III - W and B Values of the Experience Rating Plan Manual

This filing is being made to satisfy the requirements for NCCI as a rating organization as outlined in Illinois Senate Bill 1496.

If you have any questions or if you need additional information, please call us.

Very truly Yours,

NATIONAL COUNCIL ON COMPENSATION INSURANCE



Larry Hochstetler, Director
Government, Consumer & Industry Affairs

LH/ba

Enclosures



ILLINOIS - ADVISORY RATES

Effective Date

January 1, 1991

I. INDUSTRIAL CLASSIFICATIONS

Overall Proposed Change in Premium Level

- New and Renewal Policies + 8.5%

A. By Component

	<u>Premium Level Changes</u>
Experience	+ 7.2%
Trend Change	+ 0.5%
Expense Change	- 0.1%
Benefit Change	+ 0.4%
<u>Tax Change</u>	<u>+ 0.5%</u>
Overall	+ 8.5%

B. By Industry Group

Manufacturing	+ 9.6%
Contracting	+ 6.2%
<u>All Other</u>	<u>+ 9.3%</u>
Overall	+ 8.5%

Offset Factor

New Expense Program - 0.3%

Overall Proposed Change in Rate Level

- New and Renewal Policies + 8.2%

II. "F" CLASSIFICATIONS

Overall Proposed Change in Premium Level

- New and Renewal Policies - 0.9%

By Component

	<u>Premium Level Changes</u>
Experience	- 3.5%
Expense Change	- 0.1%
Benefit Change	+ 0.3%
Tax Change	+ 0.5%
<u>Assessment Change</u>	<u>+ 2.0%</u>
Overall	- 0.9%

Offset Factor

New Expense Program - 0.3%

Overall Proposed Change in Rate Level

- New and Renewal Policies - 0.9%



III. COAL MINE CLASSIFICATIONS

Overall Proposed Change in Premium Level
- New and Renewal Policies

Surface Mines	- 5.3%
Underground Mines	
Large Mines	+ 4.4%
Small Mines	+ 4.8%
New Mines	+ 3.6%
 <u>Change in Disease</u>	
Surface Mines	0.0%
Underground Mines	
Large Mines	- 0.1%
Small Mines	
New Mines	
 <u>Change in Traumatic</u>	
Surface Mines	-10.1%
Underground Mines	
Large Mines	+ 7.5%
Small Mines	+ 7.4%
New Mines	+ 7.4%

IV. SUMMARY OF MISCELLANEOUS CHANGES

	<u>Current</u>	<u>Proposed</u>
A. Expense Constant	\$60	\$75
B. Minimum Premium Multiplier	\$95	\$105
C. USL&HW %	32%	31%
D. Retrospective Rating Plan Tax Multiplier:		
Industrial Classes	1.057	1.052
"F" Classes	1.158	1.153

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PART I - PRIMARY EXHIBITS

EXHIBIT I

**SECTION IIA
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TECHNICAL SUPPLEMENT**

December 6, 1991

NCCI Examination - Volume II - Section IIA

MILLIMAN & ROBERTSON, INC.



ILLINOIS

EXHIBIT I

Exhibit I-A - Policy Year 1988 Experience

Premium:

(1) Standard Earned Premium valued as of December 31, 1989 (first report)		\$1,732,388,628
(2) Factor to develop premium (See Appendix A-II)	1.032	(+3.2%)
(3) Factor to adjust premium to current premium level (See Appendix A-I)	1.007	(+0.7%)
(4) Composite adjustment factor - (2)x(3)	1.039	(+3.9%)
(5) Adjusted Standard Earned Premium - (1)x(4)		\$1,799,951,784

Benefit Cost:

(6) Indemnity Including IBNR Benefit Cost valued as of December 31, 1989 (first report)		\$766,043,020
(7) Factor to develop indemnity benefit cost (See Appendix A-II)	1.061	(+6.1%)
(8) Factor to adjust indemnity benefit cost to current benefit level (See Appendix A-I) ...	1.015	(+1.5%)
(9) Factor to include claim adjustment cost	1.120	(+12.0%)
(10) Composite adjustment factor - (7)x((8)x(9))	1.206	(+20.6%)
(11) Adjusted Indemnity Benefit Cost - (6)x(10)		\$923,847,882



DETERMINATION OF
INDICATED PREMIUM
LEVEL CHANGE

ILLINOIS

EXHIBIT I

Benefit Cost (Contd.):

(12) Medical Including IBNR Benefit Cost valued as of December 31, 1989 (first report)	\$437,015,594
(13) Factor to develop medical benefit cost (See Appendix A-II) .....	.904 (-9.6%)
(14) Factor to adjust medical benefit cost to current benefit level (See Appendix A-I) ...	1.000 (0.0%)
(15) Factor to include claim adjustment cost	1.120 (+12.0%)
(16) Composite adjustment factor = (13)x((14)x(15))	1.012 (+1.2%)
(17) Adjusted Medical Benefit Cost = (12)x(16)	\$442,259,781
(18) Adjusted Total Benefit Cost = (11)+(17)	\$1,366,107,663

Cost Ratio:

(19) Cost Ratio =	Adj. Total Benefit Cost	Line (18)	
	-----	-----	= .759 (75.9%)
	Adj. Premium	Line (5)	

ILLINOIS

EXHIBIT I

Exhibit I-B - Calendar-Accident Year 1989 Experience

Premium:

(1) Standard Earned Premium	\$1,865,510,976
(2) Factor to adjust premium to current premium level (See Appendix A-III) .....	.989 (-1.1%)
(3) Adjusted Standard Earned Premium - = (1)x(2)	\$1,844,990,355

Benefit Cost:

(4) Indemnity Including IBNR Benefit Cost valued as of December 31, 1989 (first report)	\$846,266,029
(5) Factor to develop indemnity benefit cost (See Appendix A-IV)	1.044 (+4.4%)
(6) Factor to adjust indemnity benefit cost to current benefit level (See Appendix A-III)...	1.011 (+1.1%)
(7) Factor to include claim adjustment cost	1.120 (+12.0%)
(8) Composite adjustment factor = (5)x((6)x(7))	1.182 (+18.2%)
(9) Adjusted Indemnity Benefit Cost = (4)x(8)	\$1,000,286,446



ILLINOIS

EXHIBIT I

Benefit Cost (Contd.):

(10) Medical Including IBNR Benefit Cost valued as of December 31, 1989 (first report)		\$464,070,367
(11) Factor to develop medical benefit cost (See Appendix A-IV) .....	.927	(-7.3%)
(12) Factor to adjust medical benefit cost to current benefit level (See Appendix A-III)...	1.000	(0.0%)
(13) Factor to include claim adjustment cost	1.120	(+12.0%)
(14) Composite adjustment factor = (11)x((12)x(13))	1.038	(+3.8%)
(15) Adjusted Medical Benefit Cost = (10)x(14)		\$481,705,041
(16) Adjusted Total Benefit Cost = (9)+(15)		\$1,481,991,487

Cost Ratio:

(17) Cost Ratio =	Adj. Total Benefit Cost	Line (16)	
	-----	-----	= .803 (80.3%)
	Adj. Premium	Line (3)	

Exhibit I-C - Average Cost Ratio

(1) Policy Year 1988 Adjusted Cost Ratio .....	.759	(75.9%)
(2) Calendar-Accident Year 1989 Adjusted Cost Ratio .....	.803	(80.3%)
(3) Average Cost Ratio =	$\frac{(1)+(2)}{2}$	.781 (78.1%)

ILLINOIS

EXHIBIT I

Exhibit I-D - Indicated Change Based Upon Experience

(1) Average Cost Ratio .....	.781	(78.1%)
(2) Current Target Cost Ratio (See Exhibit II) .....	.7285	(72.85%)
(3) Indicated Change Based Upon Experience = (1)/(2)	1.072	(+7.2%)

Exhibit I-E - Application of Change in Trend Factor

(1) Indicated Premium Level Change from Experience	1.072	(+7.2%)
(2) Effect of Change in Trend Factor (See Appendix A-V)	1.005	(+0.5%)
(3) Indicated Change Modified to Reflect Change in Trend Factor = (1) x (2)	1.077	(+7.7%)

Exhibit I-F - Application of Change in Expenses

(1) Indicated Premium Level Change	1.077	(+7.7%)
(2) Effect of Change in Expenses (See Exhibit II) .....	.999	(-0.1%)
(3) Indicated Change Modified to Reflect Change in Expenses = (1) x (2)	1.076	(+7.6%)

Exhibit I-G - Application of Change in Benefit Provisions

(1) Indicated Premium Level Change	1.076	(+7.6%)
(2) Effect of Change in Benefit Provisions	1.004	(+0.4%)
(3) Indicated Change Modified to Reflect Change in Benefits = (1) x (2)	1.080	(+8.0%)



ILLINOIS

EXHIBIT I

Exhibit I-H - Application of Change in Taxes

(1) Indicated Premium Level Change	1.080	(+8.0%)
(2) Effect of Change in Taxes (See Exhibit II)	1.005	(+0.5%)
(3) Indicated Change Modified to Reflect Change in Taxes = (1) x (2)	1.085	(+8.5%)

Exhibit I-I - Application of Change in Assessment Provision

(1) Indicated Premium Level Change	1.085	(+8.5%)
(2) Effect of Change in Assessment (See Exhibit II)	N/A	N/A
(3) Indicated Change Modified to Reflect Change in Assessment = (1) x (2)	1.085	(+8.5%)

ILLINOIS

EXHIBIT I

Exhibit I-J - Distribution of Final Overall Premium Level Change to Industry Groups

Industry group differentials (See Appendix A-VII):

Manufacturing	1.010
Contracting .....	.979
All Other	1.007

Applying these industry group differentials to the final overall premium level change produces the changes in premium level proposed for each group, as shown:

	(1) Final Overall Indicated Change in Premium Level	(2) Industry Group Differential	(3) - (1)x(2) Final Premium Level Change by Industry Group	
Manufacturing	1.085	1.010	1.096	(+9.6%)
Contracting	1.085	.979	1.062	(+6.2%)
All Other	1.085	1.007	1.093	(+9.3%)
Overall	1.085	1.000	1.085	(+8.5%)

ILLINOIS

EXHIBIT I

Exhibit I-K - Effect of New Expense Program

	(1) Final Premium Level Change by Industry Group	(2) Factor to-Reflect New Expense Program	(3) - (1)x(2) Final Rate Level Change by Industry Group
Manufacturing	1.096	.997	1.093 (+9.3%)
Contracting	1.062	.997	1.059 (+5.9%)
All Other	1.093	.997	1.090 (+9.0%)

Overall	1.085	.997	1.082 (+8.2%)

**SECTION IIA
NCCI RATEMAKING PROCEDURES
TECHNICAL SUPPLEMENT**

PART I - PRIMARY EXHIBITS

EXHIBIT II

**SECTION IIA
NCCI RATEMAKING PROCEDURES
TECHNICAL SUPPLEMENT**

December 6, 1991

NCCI Examination - Volume II - Section IIA

MILLIMAN & ROBERTSON, INC.

ILLINOIS

EXHIBIT II

Exhibit II-A - Determination of Target Cost Ratio

Overhead expense provisions are itemized below. These figures are expressed as percentages of standard premium (excluding expense constants) and are indicative of the expenses of the first \$5,000 of policy premium. Taken together, these allowances represent that portion of the standard premium dollar necessary to operate the benefit system. The complementary portion, therefore, corresponds to the portion of the premium dollar available to finance benefits and claims adjustment expense. This percentage is referred to as the "target cost ratio".

	Provisions Underlying Current Rates	Provisions Underlying Proposed Rates	
		Current Expense Program	Proposed Expense Program
1) Production Cost	15.00%	15.00%	15.00%
2) General Expense	6.70%	6.60%	6.40%
3) Taxes, Licenses and Fees other than Federal Income Tax			
(a) Privilege Tax	2.00%	2.00%	2.00%
(b) Insurance Guaranty Fund	0.15%	0.52%	0.52%
(c) Miscellaneous Tax	0.80%	0.80%	0.80%
4) Profit and Contingencies	2.50%	2.50%	2.50%
5) Total Overhead Provisions (1)+(2)+(3)+(4)	27.15%	27.42%	27.22%
6) Target Cost Ratio (100% - (5))	72.85%	72.58%	72.78%
Other Important Expense Values:			
7) Claim Adjustment Expense as a percentage of Incurred Benefit Costs	12.0%	12.0%	12.0%
8) Assessments on Losses			
Second Injury Fund on indemnity incurred losses	0.125%	0.125%	0.125%
Comp. Rate Adj. Fund on indemnity incurred losses	0.50%	0.50%	0.50%
9) Expense Constant	\$60	\$60	\$75

ILLINOIS

EXHIBIT II

Exhibit II-B - Calculation of Change in Expense Provisions

	A	B	C	D
	<u>Current Expenses</u>	<u>Col A with proposed Prod. Gen. & Clms Exp</u>	<u>Col B with proposed Taxes & Assessments</u>	<u>Col C with proposed Exp Prgrm</u>
1) Production	15.00%	15.00%	15.00%	15.00%
2) General Expense	6.70%	6.60%	6.60%	6.40%
3) Taxes	2.95%	2.95%	- 3.32%	3.32%
4) P&C	<u>2.50%</u>	<u>2.50%</u>	<u>2.50%</u>	<u>2.50%</u>
5) Total Provisions (1)+(2)+(3)+(4)	27.15%	27.05%	27.42%	27.22%
6) TCR (100%-(5))	72.85%	72.95%	72.58%	72.78%
7) Clms Adj Exp	12.0%	12.0%	12.0%	12.0%
8) Expense Constant	\$60	\$60	\$60	\$75
9) Change in Production and General Expense (6A)/(6B)			0.999	(-0.1%)
10) Change in Claims Adjustment Expense [1.0+(7B)]/[1.0+(7A)]			N/A	
11) Change in Expenses (10)x(11)			0.999	(-0.1%)
12) Change in Taxes (6B)/(6C)			1.005	(+0.5%)
13) Offset for Change in Expense Program (6C)/(6D)			0.997	(-0.3%)

ILLINOIS

Exhibit II

Exhibit II-C - Determination of Loss Adjustment Expense Provision

	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>Total</u>
1. Incurred Losses	965,377,374	1,039,837,111	1,199,916,547	3,205,131,032
2. Loss Adjustment Expense	119,891,302	124,007,801	140,255,131	384,154,234
3. L.A.E. Ratio (2)/(1)	0.124	0.119	0.117	0.120

ILLINOIS

Exhibit II

Exhibit II-D - Section 1 - Determination of General Expense Provision *

	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>Total</u>
1) Standard Earned Premium	1,410,910,841	1,548,337,640	1,680,133,927	4,639,382,408
2) Expense Constant Offset	0.989	0.989	0.989	xxx
3) Expense Constant Premium (1) x (1.000 - (2))	15,520,019	17,031,714	18,481,473	51,033,206
4) S.E.P. from Manual Rates (1)-(3)	1,395,390,822	1,531,305,926	1,661,652,454	4,588,349,202
5) General Expense	67,950,754	70,069,884	77,954,355	215,974,993
6) General Expense included in Expense Constant (3) x .594	9,218,891	10,116,838	10,977,995	30,313,724
7) General Expense (excluding general expense included in expense constant (5)-(6))	58,731,863	59,953,046	66,976,360	185,661,269
8) Provision for General Expense excluding effect of Expense Gradation (7)/(4)	0.042	0.039	0.040	0.040
9) Effect of Expense Gradation Attributable to General Expense (Exhibit II-D Sec. 2)	0.024	0.024	0.024	0.024
10) Provision for General Expense ((7)/(4))+(9)	0.066	0.063	0.064	0.064

* \$75 Expense Constant

ILLINOIS

Exhibit II

Exhibit II-D - Section 2 - Effect of Expense Gradation

<u>Portion of Standard Premium</u>	<u>Percentage of Premium(a)</u>	<u>Gen. Exp. Gradation</u>
First \$5,000	24.06%	0.00%
Next \$95,000	39.98%	2.60%
Next \$400,000	16.99%	2.80%
Over \$500,000	18.97%	4.40%
Total or Average	100.00%	2.35%

(a) Countrywide distribution based on Policy Period 1986-1987



ILLINOIS

EXHIBIT II

Exhibit II-E - Table of Premium Discounts

<u>Division of Standard Premium</u>		<u>Stock Cos Discounts</u>	<u>Non-Stock Cos Discounts</u>
First	\$5,000	---	---
Next	\$95,000	10.9%	3.5%
Next	\$400,000	12.6%	5.0%
Over	\$500,000	14.4%	7.0%

Application of the appropriate discount schedule to the standard premium produces a dollar discount that is subtracted from the standard premium.

Exhibit II-F Expense Provisions After Application of Premium Discounts

Reproduced below are the graduated expense provisions and the schedule of stock discounts. Also displayed is a countrywide distribution of standard premium earned by carriers according to size of policy premiums. Based upon that distribution an overall premium discount for this state is found as well as average provisions for production and general expenses as percentages of standard premium.

<u>Gradation of Standard Premium Based on Policy Period 1986-87</u>		<u>Gradation of Expense Provisions</u>		
<u>Division of Premium</u>	<u>Percentage of Premium</u>	<u>Production</u>	<u>General</u>	<u>Discount</u>
First \$5,000	24.06%	15.00%	6.40%	---
Next \$95,000	39.98%	7.50%	3.80%	10.9%
Next \$400,000	16.99%	6.00%	3.60%	12.6%
Over \$500,000	18.97%	6.00%	2.00%	14.4%
	100.00%			
Average weighted by premium:		8.77%	4.05%	9.11%

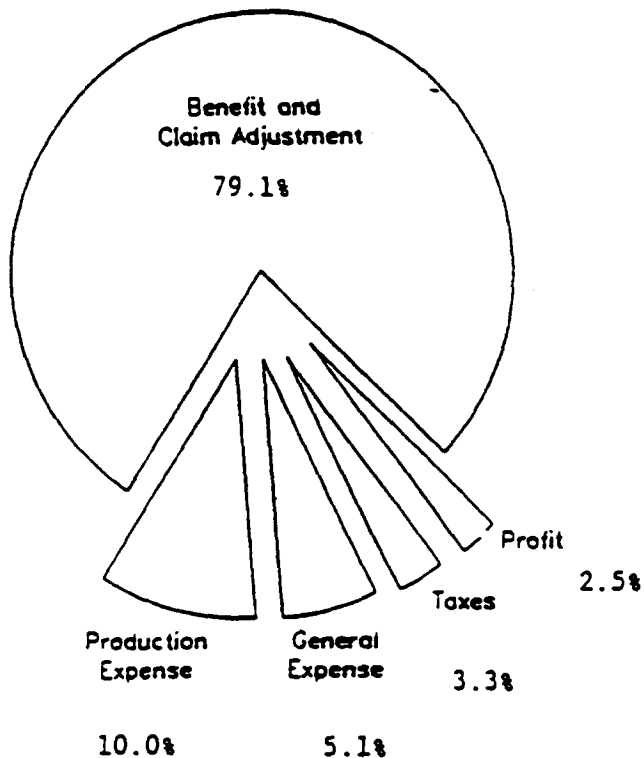
The above average provisions for production and general expense are based upon standard, pre-discount premium. One may use the the average premium discount just determined for this state to calculated the expense provision as percentages of premium after the application of premium discounts.

ILLINOIS

EXHIBIT II

Exhibit II-F - Illinois Expense Provisions including the effect of Premium Discounts and Expense Constants

The exhibit below illustrates the allocation of the final premium dollar after the application of Premium Discounts and Expense Constants based on Illinois expense provisions.



Conclusion:

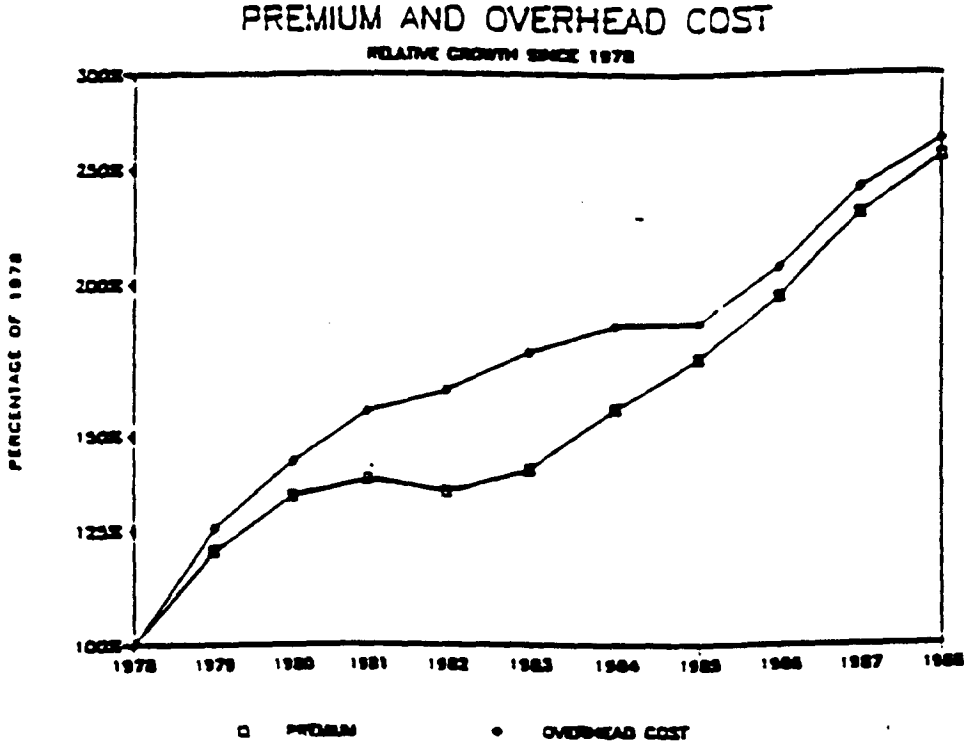
The system is efficient in that 79.1% of the final premium income in Illinois is utilized for benefit and claims adjustment costs.

ILLINOIS

EXHIBIT II

Exhibit II-G - Relative Growth of Premium and Overhead Cost Since 1978

The following chart displays percentage changes since 1978 of both earned premiums and overhead costs (excluding profit and contingencies).



The underlying data for this exhibit is taken from Insurance Expense Exhibits. The premium has been adjusted to exclude the average effect of schedule rating and carrier deviations. It is important to observe that, despite tremendous increases in benefit levels and wages over the period covered (1978-1988), growth in overhead expenses has consistently tracked that for premiums.

This justifies the technique of providing for overhead expense in the rate structure as a percentage of premium excluding expense constants.

* Note the use of a nonuniform vertical scale. It is customary when displaying a picture of relative growth to employ such a scale (termed semi-log") designed so that the vertical change corresponding to the doubling from 100% to 200% is seen equal to that for the doubling from 200% to 400%.

**SECTION IIA
NCCI RATEMAKING PROCEDURES
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PART I - PRIMARY EXHIBITS

EXHIBIT III

**SECTION IIA
NCCI RATEMAKING PROCEDURES
TECHNICAL SUPPLEMENT**

EXHIBIT III

ADVISORY RATES AND RATING VALUES EFFECTIVE JANUARY 1, 1991

CLASS CODE	ADVISORY RATE INCL. DIS.	ADVISORY LOSS COST INCL. DIS.	MINIMUM PREMIUM	EXP. LOSS RATE	D RATIO	EX. MED. RATIO
1430	10.30	6.66	750	3.79	.31	.26
1438	9.19	5.95	750	3.38	.36	.26
1452	4.31	2.79	528	1.59	.32	.25
1463	16.76	10.84	750	6.17	.25	.13
1470	9.55	6.18	750	3.51	.29	.21
1472	9.20	5.95	750	3.39	.29	.25
1624E	14.12	9.14	750	5.17	.25	.19
1642	6.68	4.32	750	2.46	.26	.18
1654	6.52	4.22	750	2.40	.30	.20
1655	8.81	5.70	750	3.24	.26	.19
1699	4.48	2.90	545	1.65	.35	.27
1701	6.72	4.35	750	2.47	.27	.20
1710E	13.42	8.68	750	4.90	.28	.28
1741E	7.59	4.91	750	2.35	.27	.22
1747	3.80	2.46	474	1.40	.25	.19
1748	4.68	3.03	566	1.72	.35	.25
1803D	14.76	9.55	750	4.91	.29	.22
1852D	12.15	7.86	750	4.38	.27	.18
1853	6.86	4.44	750	2.69	.30	.23
1860	4.59	2.97	557	1.80	.34	.24
1924	11.90	7.70	750	4.66	.38	.34
1925	8.91	5.76	750	3.28	.38	.28
2001	7.08	4.58	750	2.78	.31	.22
2002	8.66	5.60	750	3.39	.33	.24
2003	5.48	3.55	650	2.02	.34	.25
2014	6.28	4.06	734	2.31	.29	.25
2016	2.03	1.31	288	.80	.34	.22
2021	3.88	2.51	482	1.52	.32	.22
2030	8.56	5.54	750	3.15	.27	.22
2039	4.80	3.11	579	1.88	.34	.25
2041	6.04	3.91	709	2.42	.36	.24
2065	5.36	3.47	638	2.10	.31	.23
2070	10.98	7.10	750	4.04	.25	.19
2081	14.56	9.42	750	5.71	.39	.30
2089	8.45	5.47	750	3.31	.39	.26



ILLINOIS

EXHIBIT III

ADVISORY RATES AND RATING VALUES EFFECTIVE JANUARY 1, 1991

UNDERGROUND COAL MINE CLASSIFICATION

CODE	ADVISORY RATE INCL. DIS.*	ADVISORY LOSS COST INCL. DIS.**	MINIMUM PREMIUM	EXP. LOSS RATE	D RATIO	EX. MED. RATIO	EX. MED. FACTOR
1016 Large Mines	33.52	23.91	750	9.16	.25	.05	1.30
1016 Small Mines	38.63	27.55	750	**	**	.05	**
1016 New Mines	26.70	19.05	750	**	**	.05	**

* Includes a non-ratable disease element of \$12.92.

** Includes a non-ratable disease element of \$9.20.

** For newly developed underground coal mines not previously in operation and small underground coal mines - refer to National Council on Compensation Insurance - Midwestern Division.

ILLINOIS

- A. Minimum Premium \$100 per ginning location for policy minimum premium computation.
- F. Advisory Rate provides for coverage under the United States Longshore and Harbor Workers' Compensation Act.
- N. A separate statistical code number is assigned for the non-ratable element for this code. This statistical code and corresponding advisory rate are applied in addition to the basic classification when determining premium.

<u>Class Code</u>	<u>Non-ratable Element Code</u>
4770	0770
4773	0773
4774	0774
4775	0775
4776	0776
4779	0779
4799	0799
7323F	0763F
7405	7445
7431	7453

- * 7720 - For special procedure applicable in connection with "Detective or Patrol Agencies," 7720, see the classification pages of the Basic Manual.



ILLINOIS - APPLICABLE TO CARRIERS ADOPTING ADVISORY RATES

MISCELLANEOUS VALUES

Basis of Premium applicable in accordance with the footnote instructions for Code 7370 - "Taxicab Co.":

Employee operated vehicles	\$30,521.00
Leased or rented vehicles	\$20,347.00

Advisory Expense Constant applicable in accordance with Basic Manual Rule

VI - E - 2	\$75.00
------------------	---------

Maximum Remuneration applicable in accordance with Basic Manual Rule IX-A-4-b - "Executive Officers" and the footnote instructions for Code 9178 - "Athletic Team: Non-Contact Sports," Code 9179 - "Athletic Team: Contact Sports" and Code 9186 - "Carnival - Traveling"

\$1,600.00

Minimum Remuneration applicable in accordance with Basic Manual Rule IX-A-4-a - "Executive Officers"

\$196.00

Per Passenger Seat Surcharge - In accordance with the footnote instructions for Classification Code 7421, the surcharge is

\$ 100 per passenger seat
\$1,000 maximum surcharge
per aircraft

Premium Determination for Partners and Sole Proprietors in accordance with Basic Manual Rule IX-B-5

\$26,200.00

Advisory Premium Discount Percentages (See Basic Manual Rule VII-D). The following premium discounts are applicable to Standard Premiums:

			<u>Stock</u>	<u>Non-Stock</u>
First	\$ 5,000 -	-	-
Next	95,000	..... "a"	10.9%	3.5%
Next	400,000	..... "b"	12.6	5.0
Over	500,000	..... "c"	14.4	7.0

Advisory United States Longshore and Harbor Workers' Compensation Coverage Percentage applicable only in connection with Rule XII-D-3 "U.S. Longshore and Harbor Workers' Compensation Act" of the Basic Manual.....

31%

(Multiply a Non-"F" classification advisory rate by a factor of 1.31)



National
Council on
Compensation
Insurance

EFFECTIVE JANUARY 1, 1991

ILLINOIS - APPLICABLE TO CARRIERS ADOPTING ADVISORY RATES

RETROSPECTIVE RATING PLANS
Advisory Rating Values

1. Table of Rating Values for
Rating Options I-II-III-IV

<u>One</u>	<u>Three</u>
<u>Year</u>	<u>Year</u>
XXXVII	XXXVIII

2. Tax Multipliers

a. State (non-F classes)	1.052*
b. Federal classes, or non-F classes where advisory rate is increased by the USL & HW Act Percentage	1.153*

* Includes 1.3% residual market subsidy provision.

3. Expected Loss Ratio

.610

4. Table of Expense Ratios
Stock Non-Stock

XII-A XII-B

5. 1990 - Table of Expected Loss Ranges
Effective July 1, 1990

6a. Excess Loss Factors
(Applicable to New and Renewal Policies)

	<u>Per Accident</u> <u>Limitation</u>	<u>Hazard Groups</u>			
		<u>I</u>	<u>II</u>	<u>III</u>	<u>IV</u>
\$	25,000	.308	.329	.387	.421
	30,000	.281	.303	.365	.400*
	35,000	.259	.281	.343	.376
	40,000	.241	.261	.321	.360*
	50,000	.208	.227	.288	.329*
	75,000	.144	.163	.218	.259
	100,000	.107	.122	.166	.200*
	125,000	.085	.097	.132	.163
	150,000	.071	.080	.110	.138
	175,000	.061	.069	.095	.120
	200,000	.053	.061	.083	.105
	250,000	.043	.049	.067	.085
	300,000	.036	.041	.055	.072
	500,000	.022	.025	.033	.043
	1,000,000	.012	.012	.017	.021

* Also applicable to Underground Coal Mine Classifications.



ILLINOIS - APPLICABLE TO CARRIERS ADOPTING ADVISORY RATES

RETROSPECTIVE RATING PLANS (CONTD.)

6b. Excess Loss Pure Premium Factors
(Applicable to New and Renewal Policies)

APPLICABLE TO CARRIERS ADOPTING ADVISORY LOSS COSTS

<u>Per Accident Limitation</u>	<u>Hazard Groups</u>			
	<u>I</u>	<u>II</u>	<u>III</u>	<u>IV</u>
\$ 25,000	.473	.506	.596	.648
30,000	.432	.466	.562	.615*
35,000	.398	.431	.527	.579
40,000	.369	.400	.494	.554*
50,000	.319	.348	.442	.506*
75,000	.220	.249	.334	.397
100,000	.163	.186	.253	.307*
125,000	.129	.147	.202	.249
150,000	.107	.121	.168	.210
175,000	.091	.104	.144	.182
200,000	.079	.091	.126	.160
250,000	.063	.073	.101	.129
300,000	.053	.060	.083	.108
500,000	.032	.036	.049	.063
1,000,000	.017	.018	.024	.029

* Also applicable to Underground Coal Mine Classifications.

7. Retrospective Development Factors

<u>With Loss Limit</u>			<u>Without Loss Limit</u>			<u>4th & Subsequent Adjustment</u>
<u>1st Adj.</u>	<u>2nd Adj.</u>	<u>3rd Adj.</u>	<u>1st Adj.</u>	<u>2nd Adj.</u>	<u>3rd Adj.</u>	
.06	.04	.01	.13	.08	.03	.00

8. State Special Classifications by Hazard Group

<u>Code No.</u>	<u>Hazard Group</u>	<u>Code No.</u>	<u>Hazard Group</u>
3561	II	4750	III
3571	II	4940	III
4716	II	9553	III
4730	III		



EFFECTIVE JANUARY 1, 1991

ILLINOIS

TABLE OF WEIGHTING VALUES

EXPECTED LOSSES		WEIGHTING VALUES	EXPECTED LOSSES		WEIGHTING VALUES
0 -	21,504	.07	516,547 -	553,434	.37
21,505 -	31,304	.08	553,435 -	593,349	.38
31,305 -	40,649	.09	593,350 -	636,680	.39
40,650 -	50,015	.10	636,681 -	683,884	.40
50,016 -	59,565	.11	683,885 -	735,507	.41
59,566 -	69,383	.12	735,508 -	792,200	.42
69,384 -	79,523	.13	792,201 -	854,748	.43
79,524 -	90,029	.14	854,749 -	924,109	.44
90,030 -	100,939	.15	924,110 -	1,001,461	.45
100,940 -	112,289	.16	1,001,462 -	1,088,268	.46
112,290 -	124,115	.17	1,088,269 -	1,186,379	.47
124,116 -	136,455	.18	1,186,380 -	1,298,155	.48
136,456 -	149,349	.19	1,298,156 -	1,426,666	.49
149,350 -	162,837	.20	1,426,667 -	1,575,974	.50
162,838 -	176,967	.21	1,575,975 -	1,751,574	.51
176,968 -	191,787	.22	1,751,575 -	1,961,081	.52
191,788 -	207,351	.23	1,961,082 -	2,215,366	.53
207,352 -	223,720	.24	2,215,367 -	2,530,504	.54
223,721 -	240,959	.25	2,530,505 -	2,931,307	.55
240,960 -	259,139	.26	2,931,308 -	3,458,204	.56
259,140 -	278,344	.27	3,458,205 -	4,181,806	.57
278,345 -	298,661	.28	4,181,807 -	5,237,550	.58
298,662 -	320,192	.29	5,237,551 -	6,922,244	.59
320,193 -	343,050	.30	6,922,245 -	10,036,370	.60
343,051 -	367,362	.31	10,036,371 -	17,739,724	.61
367,363 -	393,273	.32	17,739,725 -	68,581,835	.62
393,274 -	420,946	.33	68,581,836	AND ABOVE	.63
420,947 -	450,568	.34			
450,569 -	482,352	.35			
482,353 -	516,546	.36			

- (A) STATE PER CLAIM ACCIDENT LIMITATION 88,000
- (B) STATE MULTIPLE CLAIM ACCIDENT LIMITATION 176,000
- (C) U.S.L. & H.W. PER CLAIM ACCIDENT LIMITATION 159,000
- (D) U.S.L. & H.W. MULTIPLE CLAIM ACCIDENT LIMITATION 318,000
- (E) EMPLOYERS LIABILITY ACCIDENT LIMITATION 55,000
- U.S.L. & H.W. ACT - EXPECTED LOSS FACTOR - NON-F CLASSES 33%



National Council on Compensation Insurance

EFFECTIVE : JANUARY 1, 1991
ILLINOIS
TABLE OF BALLAST VALUES

EXPECTED LOSSES	BALLAST VALUES	EXPECTED LOSSES	BALLAST VALUES	EXPECTED LOSSES	BALLAST VALUES
0 -	9,376	586,614 -	604,103	1,198,929 -	1,216,425
9,377 -	18,825	604,104 -	621,593	1,216,426 -	1,233,923
18,826 -	32,401	621,594 -	639,084	1,233,924 -	1,251,420
32,402 -	47,999	639,085 -	656,575	1,251,421 -	1,268,918
47,999 -	64,454	656,576 -	674,066	1,268,919 -	1,286,416
64,455 -	81,309	674,067 -	691,558	1,286,417 -	1,303,914
81,310 -	98,376	691,559 -	709,051	1,303,915 -	1,321,411
98,377 -	115,566	709,052 -	726,544	1,321,412 -	1,338,909
115,567 -	132,834	726,545 -	744,037	1,338,910 -	1,356,407
132,835 -	150,154	744,038 -	761,530	1,356,408 -	1,373,905
150,155 -	167,511	761,531 -	779,024	1,373,906 -	1,391,403
167,512 -	184,894	779,025 -	796,518	1,391,404 -	1,408,901
184,895 -	202,297	796,519 -	814,012	1,408,902 -	1,426,400
202,298 -	219,714	814,013 -	831,507	1,426,401 -	1,443,898
219,715 -	237,144	831,508 -	849,001	1,443,899 -	1,461,396
237,145 -	254,584	849,002 -	866,496	1,461,397 -	1,478,894
254,585 -	272,031	866,497 -	883,991	1,478,895 -	1,496,393
272,032 -	289,484	883,992 -	901,487	1,496,394 -	1,513,891
289,485 -	306,942	901,488 -	918,982	1,513,892 -	1,531,389
306,943 -	324,405	918,983 -	936,478	1,531,390 -	1,548,888
324,406 -	341,872	936,479 -	953,974	1,548,889 -	1,566,386
341,873 -	359,342	953,975 -	971,470	1,566,387 -	1,583,885
359,343 -	376,815	971,471 -	988,966	1,583,886 -	1,601,383
376,816 -	394,290	988,967 -	1,006,462	1,601,384 -	1,618,882
394,291 -	411,767	1,006,463 -	1,023,958	1,618,883 -	1,636,380
411,768 -	429,246	1,023,959 -	1,041,455	1,636,381 -	1,653,879
429,247 -	446,727	1,041,456 -	1,058,951	1,653,880 -	1,671,375
446,728 -	464,209	1,058,952 -	1,076,448		
464,210 -	481,692	1,076,449 -	1,093,945		
481,693 -	499,177	1,093,946 -	1,111,442		
499,178 -	516,662	1,111,443 -	1,128,939		
516,663 -	534,149	1,128,940 -	1,146,436		
534,150 -	551,636	1,146,437 -	1,163,933		
551,637 -	569,125	1,163,934 -	1,181,431		
569,126 -	586,613	1,181,432 -	1,198,928		

FOR EXPECTED LOSSES GREATER THAN \$1,671,250, THE BALLAST VALUE CAN BE CALCULATED USING THE FOLLOWING FORMULA (ROUNDED TO THE NEAREST 1):

$$\text{BALLAST} = (.10)(\text{EXPECTED LOSSES}) + (2500)(\text{EXPECTED LOSSES})(3.50) \\ \text{(EXPECTED LOSSES} + 700(3.50))$$



ILLINOIS COAL MINERS EXPERIENCE RATING PLAN

EFFECTIVE JANUARY 1, 1991

TABLE III - TABLE OF W AND B VALUES

STATE AVERAGE D & P.T. VALUE 167500

EXPECTED LOSSES	W	B	EXPECTED LOSSES	W	B
0			891250	0.53	326474
25001	0.00	38750	907749	0.54	325220
49750	0.01	50614	924249	0.55	323719
66249	0.02	62230	940749	0.56	321970
82749	0.03	73599	957249	0.57	319974
99249	0.04	84720	973749	0.58	317730
115749	0.05	95594	990249	0.59	315239
132249	0.06	106220	1006749	0.60	312500
148749	0.07	116599	1023249	0.61	309514
165249	0.08	126730	1039749	0.62	306280
181749	0.09	136614	1056249	0.63	302799
198249	0.10	146250	1072749	0.64	299070
214749	0.11	155639	1089249	0.65	295094
231249	0.12	164780	1105749	0.66	290870
247749	0.13	173674	1122249	0.67	286399
264249	0.14	182320	1138749	0.68	281680
280749	0.15	190719	1155249	0.69	276714
297249	0.16	198870	1171749	0.70	271500
313749	0.17	206774	1188249	0.71	266039
330249	0.18	214430	1204749	0.72	260330
346749	0.19	221839	1221249	0.73	254374
363249	0.20	229000	1237749	0.74	248170
379749	0.21	235914	1254249	0.75	241719
396249	0.22	242580	1270749	0.76	235020
412749	0.23	248999	1287249	0.77	228074
429249	0.24	255170	1303749	0.78	220880
445749	0.25	261094	1320249	0.79	213439
462249	0.26	266770	1336749	0.80	205750
478749	0.27	272199	1353249	0.81	197814
495249	0.28	277380	1369749	0.82	189630
511749	0.29	282314	1386249	0.83	181199
528249	0.30	287000	1402749	0.84	172520
544749	0.31	291439	1419249	0.85	163594
561249	0.32	295630	1435749	0.86	154420
577749	0.33	299574	1452249	0.87	144999
594249	0.34	303270	1468749	0.88	135330
610749	0.35	306719	1485249	0.89	125414
627249	0.36	309920	1501749	0.90	115250
643749	0.37	312874	1518249	0.91	104839
660249	0.38	315580	1534749	0.92	94180
676749	0.39	318039	1551249	0.93	83274
693249	0.40	320250	1567749	0.94	72120
709749	0.41	322214	1584249	0.95	60719
726249	0.42	323930	1600749	0.96	49070
742749	0.43	325399	1617249	0.97	37174
759249	0.44	326620	1633749	0.98	25030
775749	0.45	327594	1650249	0.99	12639
792249	0.46	328320	1666749	1.00	0
808749	0.47	328799	1683249		
825249	0.48	329030	1700000		
841749	0.49	329014			
858249	0.50	328750			
874749	0.51	328239			
891249	0.52	327480			

GREATER THAN



ILLINOIS

TABLE OF SPECIFIC DISEASE LOADINGS

DISEASE SYMBOLS

Code No.	Asb - Asbestos		S - Silica		Disease Symbol
	Specific Disease Loading for Advisory Rates		Specific Disease Loading for Advisory Loss Costs		
0059D	.61		.39		S
0065D	.11		.07		S
0066D	.12		.08		S
0067D	.12		.08		S
1164E	.12		.08		S
1165E	.06		.04		S
1624E	.06		.04		S
1710E	.10		.06		S
1741E	.78		.50		S
1803D+	.54		.35		S
1852D+	.25		.16		Asb
3081D	.12		.08		S
3082D	.15		.10		S
3085D	.12		.08		S
3175D	.06		.04		S
4024E	.07		.05		S
5508D+	.06		.04		S
6251D+	.11		.07		S
6252D+	.10		.06		S

+ See Manual Supplement - Treatment of Disease Coverage.

**SECTION IIA
NCCI RATEMAKING PROCEDURES
TECHNICAL SUPPLEMENT**

PART II - SUPPORTING APPENDICES

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NCCI RATEMAKING PROCEDURES
TECHNICAL SUPPLEMENT**

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- Section B - Voluntary Premium - 1988
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- Section D - Indemnity Losses - 1988
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CALCULATION OF 1988 POLICY YEAR ON LEVEL FACTORS

SECTION A - Factor Adjusting 1988 Policy Year Assigned Risk Premium to Present
Assigned Risk Premium Level

Date	(1) Std. Premium Level Change	(2) Cumulative Index	(3) Weight	(4) Product (2)X(3)	(5) Adj.Fac: Present Index/Sum Col. (4)	(6) Adj.For Expense Constant Removal@	(7) Premium Adjustment Factor (5)x(6)
1/1/88	Base	1.000	1.000	<u>1.000</u>	1.325	.991	1.313
NR 7/1/89	1.204	1.204		1.000			
NR 1/1/90	1.087	1.309					
NR 9/1/90	1.012	1.325					

SECTION B - Factor Adjusting 1988 Policy Year Voluntary Premium to Present Voluntary
Premium Level

Date	(1) Std. Premium Level Change	(2) Cumulative Index	(3) Weight	(4) Product (2)X(3)	(5) Adj.Fac: Present Index/Sum Col (4)	(6) Adj.For Expense Constant Removal@	(7) Premium Adjustment Factor (5)x(6)
1/1/88	Base	1.000	1.000	<u>1.000</u>	1.147	.991	1.137
NR 1/1/89	1.030	1.030		1.000			
NR 1/1/90	1.100	1.133					
NR 9/1/90	1.012	1.147					

SECTION C - Factor Adjusting 1988 Policy Year Assigned Risk Premium
and Voluntary Premium to Present Level

(1)	Assigned Risk Market Share FY 1988	.151
(2)	Voluntary Market Share FY 1988	.849
(3)	Assigned Risk Std. Premium Adjustment Factor (Sec.A)	1.313
(4)	Voluntary Premium Adjustment Factor (Sec.B)	1.137
(5)	Cumulative Assigned Risk Premium Level Change since 1/1/83	1.962
(6)	Cumulative Voluntary Premium Level Change since 1/1/83	1.635
(7)	Differential in Voluntary Premium Level Change and Assigned Risk Premium Level Change since 1/1/83 = ((5)/(6))	1.200
(8)	Premium Adjustment Factor = (2)x(4)+(1)x((3)/(7))	1.130
(9)	Premium Adjustment Factor excluding trend*	1.007

R - New and renewal business

@ - Eliminates premium derived from expense constants

* - Trend factor in current voluntary rates (effective 1/1/90) is 1.122 (1.007 - 1.130 / 1.122)



CALCULATION OF POLICY YEAR ON LEVEL FACTORS

SECTION D - Factor Adjusting 1988 Policy Year Indemnity Losses to Present Benefit Level

Date	(1) Benefit Level Change	(2) Cumulative Index	(3) Weight	(4) Product (2)x(3)	(5) Adj. Factor Pres.Index/ Sum Col.(4)	(6) Assess- ment	(7) Final Adj. Factor (5)x(6)
7/15/87	Base	1.000	.008	.008	1.009	1.00625	1.015
1/15/88	1.0004	1.000	.175	.175			
7/1/88	1.002	1.002	.026	.026			
7/15/88	1.001	1.003	.421	.422			
1/15/89	1.001	1.004	.286	.287			
7/1/89	1.006	1.010	.013	.013			
7/15/89	1.002	1.012	.071	<u>.072</u>			
				1.003			

SECTION E - Factor Adjusting 1988 Policy Year Medical Losses to Present Benefit Level

Date	(1) Benefit Level Change	(2) Cumulative Index	(3) Weight	(4) Product (2)x(3)	(5) Adj. Factor Pres.Index/ Sum Col.(4)	(6) Assess- ment	(7) Final Adj. Factor (5)x(6)
7/15/87	Base	1.000	.008	.008	1.000	1.00000	1.000
1/15/88	1.000	1.000	.175	.175			
7/1/88	1.000	1.000	.026	.026			
7/15/88	1.000	1.000	.421	.421			
1/15/89	1.000	1.000	.286	.286			
7/1/89	1.000	1.000	.013	.013			
7/15/89	1.000	1.000	.071	<u>.071</u>			
				1.000			

ILLINOIS

APPENDIX A-II

SECTION A - CALCULATION OF POLICY YEAR DEVELOPMENT FACTORS (1st TO 4th REPORT)

	(1)	(2)	(3)	(4)	(5)
Premium and Indemnity & Medical Incl.	IBNR Losses for Matching Companies as per:				Development
	1st Report	2nd Report	3rd Report	4th Report	Factor
1984 Std. Prem.	xxx	xxx	936,199,987	936,774,130	1.001
Ind. Losses	xxx	xxx	499,412,371	505,730,594	1.013
Med. Losses	xxx	xxx	-225,384,209	224,618,975	.997
1985 Std. Prem.	xxx	xxx	990,321,481	990,062,165	1.000
Ind. Losses	xxx	xxx	536,935,522	545,178,328	1.015
Med. Losses	xxx	xxx	250,351,258	240,933,048	.962
1985 Std. Prem.	xxx	1,038,319,802	1,038,553,263	xxx	1.000
Ind. Losses	xxx	535,076,301	558,584,869	xxx	1.044
Med. Losses	xxx	267,381,289	260,534,519	xxx	.974
1986 Std. Prem.	xxx	1,326,367,204	1,320,018,191	xxx	.995
Ind. Losses	xxx	610,669,209	641,743,611	xxx	1.051
Med. Losses	xxx	318,752,043	309,761,196	xxx	.972
1986 Std. Prem.	1,327,441,098	1,365,458,334	xxx	xxx	1.029
Ind. Losses	615,284,022	626,887,071	xxx	xxx	1.019
Med. Losses	327,198,217	328,447,672	xxx	xxx	1.004
1987 Std. Prem.	1,457,370,772	1,512,127,208	xxx	xxx	1.038
Ind. Losses	679,205,988	703,434,831	xxx	xxx	1.036
Med. Losses	373,537,207	379,376,803	xxx	xxx	1.016

UNWEIGHTED AVERAGE DEVELOPMENT FACTORS

	1st/2nd	2nd/3rd	3rd/4th
Std. Prem.	1.034	.998	1.001
Ind. Losses	1.028	1.048	1.014
Med. Losses	1.010	.973	.980

APPENDIX A-II

SECTION B - CALCULATION OF POLICY YEAR DEVELOPMENT FACTORS (4th TO 8th REPORT)

	(1)	(2)	(3)	(4)	(5)	(6)
Premium and Indemnity & Medical Incl. IBNR Losses for Matching Companies as per:	4th Report	5th Report	6th Report	7th Report	8th Report	Development Factor
1980 Ind. Losses	xxx	xxx	xxx	395,888,577	395,367,039	.999
Med. Losses	xxx	xxx	xxx	146,887,855	146,982,743	1.001
1981 Ind. Losses	xxx	xxx	xxx	366,780,520	366,408,984	.999
Med. Losses	xxx	xxx	xxx	142,182,986	141,090,542	.992
1981 Ind. Losses	xxx	xxx	391,010,695	391,868,756	xxx	1.002
Med. Losses	xxx	xxx	154,453,443	151,858,537	xxx	.983
1982 Ind. Losses	xxx	xxx	364,075,955	357,200,607	xxx	.981
Med. Losses	xxx	xxx	150,393,515	147,922,696	xxx	.984
1982 Ind. Losses	xxx	397,161,716	397,210,651	xxx	xxx	1.000
Med. Losses	xxx	166,456,650	164,963,006	xxx	xxx	.991
1983 Ind. Losses	xxx	413,546,515	409,705,277	xxx	xxx	.991
Med. Losses	xxx	186,457,601	183,536,435	xxx	xxx	.984
1983 Std. Prem.	832,934,755	832,279,275	xxx	xxx	xxx	.999
Ind. Losses	446,753,921	445,981,547	xxx	xxx	xxx	.998
Med. Losses	208,455,896	199,916,002	xxx	xxx	xxx	.959
Std. Prem.	882,694,677	881,862,735	xxx	xxx	xxx	.999
Ind. Losses	475,945,275	476,667,586	xxx	xxx	xxx	1.002
Med. Losses	212,108,745	207,505,261	xxx	xxx	xxx	.978

UNWEIGHTED AVERAGE DEVELOPMENT FACTORS

	4th/5th	5th/6th	6th/7th	7th/8th
Std. Prem.	.999	xxx	xxx	xxx
Ind. Losses	1.000	.996	.992	.999
Med. Losses	.969	.988	.984	.997

APPENDIX A-II

SECTION C - CALCULATION OF POLICY YEAR DEVELOPMENT FACTORS (8th TO ULTIMATE REPORT)

	INDEMNITY -----	MEDICAL -----
(1) Losses for policy year 1977 valued as of 12-31-85	315,885,287	93,887,878
(2) Losses for policy year 1978 valued as of 12-31-86	362,414,469	113,502,508
(3) Losses for policy year 1979 valued as of 12-31-87	380,491,484	126,293,983
(4) Average ((1)+(2)+(3))/3	352,930,413	111,228,123
(5) Ratio (4)/(3)	.928	.881
(6) Losses for policy year 1979 valued as of 12-31-87	387,276,934	128,611,616
(7) Losses for all policy years prior to 1979 valued as of 12-31-87	2,287,065,291	797,826,878
(8) Losses for all policy years prior to 1980 valued as of 12-31-88	2,662,973,360	929,353,799
(9) Loss development factor from 8th to ultimate report for all years prior to 1980 (1 + ((8)-(7)-(6))/((6)x(5)))	.968	1.026

(1), (2) and (3) include only data for matching companies for 12/31/85, 12/31/86 and 12/31/87 valuations.

(6), (7) and (8) include only data for matching companies for 12/31/87 and 12/31/88 valuations.

SECTION C - CALCULATION OF POLICY YEAR DEVELOPMENT FACTORS (8th TO ULTIMATE REPORT) - CONTD.

	INDEMNITY -----	MEDICAL -----
(10) Losses for policy year 1978 valued as of 12-31-86	389,698,249	119,418,741
(11) Losses for policy year 1979 valued as of 12-31-87	405,615,746	134,390,288
(12) Losses for policy year 1980 valued as of 12-31-88	367,842,396	136,435,966
(13) Average ((10)+(11)+(12))/3	387,718,797	130,081,665
(14) Ratio (13)/(12)	1.054	.953
(15) Losses for policy year 1980 valued as of 12-31-88	335,293,976	127,609,628
(16) Losses for all policy years prior to 1980 valued as of 12-31-88	2,545,026,907	890,773,230
(17) Losses for all policy years prior to 1981 valued as of 12-31-89	2,880,177,591	1,015,147,618
(18) Loss development factor from 8th to ultimate report for all years prior to 1981 (1 + ((17)-(16)-(15))/((15)x(14)))	1.000	.973
(19) Unweighted average 8th to ultimate loss development factor ((9)+(18))/2	.984	1.000

(10), (11) and (12) include only data for matching companies for 12/31/86, 12/31/87 and 12/31/88 valuations.

(15), (16) and (17) include only data for matching companies for 12/31/88 and 12/31/89 valuations.

APPENDIX A-II

SECTION D - SUMMARY OF POLICY YEAR DEVELOPMENT FACTORS

	(1) 1st/2nd	(2) 2nd/3rd	(3) 3rd/4th	(4) 4th/5th	(5) 3rd/5th (3)x(4)	(6) 2nd/5th (2)x(5)	(7) 1st/5th (1)x(6)
Std. Prem.	1.034	.998	1.001	.999	1.000	.998	1.032
Ind. Losses	1.028	1.048	1.014	1.000	xxx	xxx	xxx
Med. Losses	1.010	.973	.980	.969	xxx	xxx	xxx

	(8) 5th/6th	(9) 6th/7th	(10) 7th/8th	(11) 5th/8th (8)x((9)x(10))	(12) 8th/Ult.
Ind. Losses	.996	.992	.999	.987	.984
Med. Losses	.988	.984	.997	.969	1.000

	(13) 5th/Ult. (11)x(12)	(14) 4th/Ult. (4)x(13)	(15) 3rd/Ult. (3)x(14)	(16) 2nd/Ult. (2)x(15)	(17) 1st/Ult. (1)x(16)
Ind. Losses	.971	.971	.985	1.032	1.061
Med. Losses	.969	.939	.920	.895	.904



CALCULATION OF 1989 CALENDAR YEAR ON LEVEL FACTORS

SECTION A - Factor Adjusting 1989 Calendar Year Assigned Risk Premium to Present Assigned Risk Premium Level

Date	(1) Std. Premium Level Change	(2) Cumulative Index	(3) Weight	(4) Product (2)X(3)	(5) Adj.Fac: Present Index/Sum Col. (4)	(6) Adj.For Expense Constant Removal@	(7) Premium Adjustment Factor (5)x(6)
1/1/88	Base	1.000	.856	.856	1.288	.992	1.278
NR 7/1/89	1.204	1.204	.144	<u>.173</u>			
NR 1/1/90	1.087	1.309		1.029			
NR 9/1/90	1.012	1.325					

SECTION B - Factor Adjusting 1989 Calendar Year Voluntary Premium to Present Voluntary Premium Level

Date	(1) Std. Premium Level Change	(2) Cumulative Index	(3) Weight	(4) Product (2)X(3)	(5) Adj.Fac: Present Index/Sum Col (4)	(6) Adj.For Expense Constant Removal@	(7) Premium Adjustment Factor (5)x(6)
1/1/88	Base	1.000	.401	.401	1.127	.992	1.118
NR 1/1/89	1.030	1.030	.599	<u>.617</u>			
NR 1/1/90	1.100	1.133		1.018			
NR 9/1/90	1.012	1.147					

SECTION C - Factor Adjusting 1989 Calendar Year Assigned Risk Premium and Voluntary Premium to Present Level

(1)	Assigned Risk Market Share CY 1989	.145
(2)	Voluntary Market Share CY 1989	.855
(3)	Assigned Risk Std. Premium Adjustment Factor (Sec.A)	1.278
(4)	Voluntary Premium Adjustment Factor (Sec.B)	1.118
(5)	Cumulative Assigned Risk Premium Level Change since 1/1/83	1.962
(6)	Cumulative Voluntary Premium Level Change since 1/1/83	1.635
(7)	Differential in Voluntary Premium Level Change and Assigned Risk Premium Level Change since 1/1/83 - ((5)/(6))	1.200
(8)	Premium Adjustment Factor - (2)x(4)+(1)x((3)/(7))	1.110
(9)	Premium Adjustment Factor excluding trend*	.989

NR - New and renewal business

@ - Eliminates premium derived from expense constants

* Trend factor in current voluntary rates (effective 1/1/90) is 1.122 (0.989 - 1.110 / 1.122)



CALCULATION OF CALENDAR-ACCIDENT YEAR ON LEVEL FACTORS

SECTION D - Factor Adjusting 1989 Accident Year Indemnity Losses to Present Benefit Level

Date	(1) Benefit Level Change	(2) Cumulative Index	(3) Weight	(4) Product (2)x(3)	(5) Adj. Factor Pres.Index/ Sum Col.(4)	(6) Assess- ment	(7) Final Adj. Factor (5)x(6)
7/15/88	Base	1.000	.039	.039	1.005	1.00625	1.011
1/15/89	1.001	1.001	.461	.461			
7/1/89	1.006	1.007	.039	.039			
7/15/89	1.002	1.009	.461	<u>.465</u>			
				1.004			

SECTION E - Factor Adjusting 1989 Accident Year Medical Losses to Present Benefit Level

Date	(1) Benefit Level Change	(2) Cumulative Index	(3) Weight	(4) Product (2)x(3)	(5) Adj. Factor Pres.Index/ Sum Col.(4)	(6) Assess- ment	(7) Final Adj. Factor (5)x(6)
7/15/88	Base	1.000	.039	.039	1.000	1.00000	1.000
1/15/89	1.000	1.000	.461	.461			
7/1/89	1.000	1.000	.039	.039			
7/15/89	1.000	1.000	.461	<u>.461</u>			
				1.000			

APPENDIX A-IV

SECTION A - CALCULATION OF CALENDAR-ACCIDENT YEAR DEVELOPMENT FACTORS (1st TO 4th REPORT)

	(1)	(2)	(3)	(4)	(5)
Indemnity & Medical Incl. IBNR Losses for Matching Companies as per:	1st Report	2nd Report	3rd Report	4th Report	Development Factor
1985 Ind.Losses	xxx	xxx	514,435,047	528,826,825	1.028
Med.Losses	xxx	xxx	246,240,500	244,603,020	.993
1986 Ind.Losses	xxx	xxx	606,877,660	623,394,362	1.027
Med.Losses	xxx	xxx	-292,623,774	280,902,900	.960
1986 Ind.Losses	xxx	583,043,520	613,835,534	xxx	1.053
Med.Losses	xxx	301,033,725	296,178,684	xxx	.984
1987 Ind.Losses	xxx	631,129,410	665,234,657	xxx	1.054
Med.Losses	xxx	345,477,972	338,603,078	xxx	.980
1987 Ind.Losses	657,708,964	637,641,993	xxx	xxx	.969
Med.Losses	336,804,826	348,919,147	xxx	xxx	1.036
1988 Ind.Losses	733,675,421	730,559,210	xxx	xxx	.996
Med.Losses	391,579,367	418,177,149	xxx	xxx	1.068

UNWEIGHTED AVERAGE DEVELOPMENT FACTORS

	1st/2nd	2nd/3rd	3rd/4th
Ind.Losses	.983	1.054	1.028
Med.Losses	1.052	.982	.977

APPENDIX A-IV

SECTION B - CALCULATION OF CALENDAR-ACCIDENT YEAR DEVELOPMENT FACTORS (4th TO 8th REPORT)

	(1)	(2)	(3)	(4)	(5)	(6)
Indemnity & Medical Incl. IBNR Losses for Matching Companies as per:						Development
	4th Report	5th Report	6th Report	7th Report	8th Report	Factor
1981 Ind.Losses	xxx	xxx	xxx	387,358,216	384,678,314	.993
Med.Losses	xxx	xxx	xxx	150,011,078	147,073,064	.980
1982 Ind.Losses	xxx	xxx	xxx	386,983,519	381,558,359	.986
Med.Losses	xxx	xxx	xxx	158,649,581	155,624,445	.981
1982 Ind.Losses	xxx	xxx	397,670,824	405,655,979	xxx	1.020
Med.Losses	xxx	xxx	166,957,221	167,028,875	xxx	1.000
1983 Ind.Losses	xxx	xxx	379,121,717	377,457,192	xxx	.996
Med.Losses	xxx	xxx	168,710,404	166,466,153	xxx	.987
1983 Ind.Losses	xxx	411,053,426	401,482,020	xxx	xxx	.977
Med.Losses	xxx	187,029,277	178,066,817	xxx	xxx	.952
1984 Ind.Losses	xxx	470,950,551	469,151,718	xxx	xxx	.996
Med.Losses	xxx	203,648,264	198,839,650	xxx	xxx	.976
1984 Ind.Losses	487,084,742	492,916,046	xxx	xxx	xxx	1.012
Med.Losses	216,914,299	212,124,377	xxx	xxx	xxx	.978
1985 Ind.Losses	516,467,277	523,030,793	xxx	xxx	xxx	1.013
Med.Losses	240,042,102	234,945,852	xxx	xxx	xxx	.979

UNWEIGHTED AVERAGE DEVELOPMENT FACTORS

	4th/5th	5th/6th	6th/7th	7th/8th
Ind.Losses	1.013	.987	1.008	.990
Med.Losses	.979	.964	.994	.981

SECTION C - CALCULATION OF CALENDAR-ACCIDENT YEAR
DEVELOPMENT FACTORS (8th TO ULTIMATE REPORT)

	INDEMNITY -----	MEDICAL -----
(1) Losses for accident year 1978 valued as of 12-31-85	348,384,006	107,837,031
(2) Losses for accident year 1979 valued as of 12-31-86	382,011,925	126,281,830
(3) Losses for accident year 1980 valued as of 12-31-87	361,696,958	127,655,899
(4) Average ((1)+(2)+(3))/3	364,030,963	120,591,587
(5) Ratio (4)/(3)	1.006	.945
(6) Losses for accident year 1980 valued as of 12-31-87	372,014,573	132,764,256
(7) Losses for all accident years prior to 1980 valued as of 12-31-87	2,384,980,814	834,725,808
(8) Losses for all accident years prior to 1981 valued as of 12-31-88	2,746,002,920	970,844,091
(9) Loss development factor from 8th to ultimate report for all years prior to 1981 (1 + ((8)-(7)-(6))/((6)x(5)))	.971	1.027

(1), (2) and (3) include only data for matching companies for 12/31/85,
12/31/86 and 12/31/87 valuations.

(6), (7) and (8) include only data for matching companies for 12/31/87
and 12/31/88 valuations.

SECTION C - CALCULATION OF CALENDAR-ACCIDENT YEAR
DEVELOPMENT FACTORS (8th TO ULTIMATE REPORT) - CONTD.

	INDEMNITY -----	MEDICAL -----
(10) Losses for accident year 1979 valued as of 12-31-86	414,131,310	133,532,025
(11) Losses for accident year 1980 valued as of 12-31-87	381,173,313	135,089,760
(12) Losses for accident year 1981 valued as of 12-31-88	364,225,822	137,990,886
(13) Average ((10)+(11)+(12))/3	386,510,148	135,537,557
(14) Ratio (13)/(12)	1.061	.982
(15) Losses for accident year 1981 valued as of 12-31-88	333,313,818	130,636,897
(16) Losses for all accident years prior to 1981 valued as of 12-31-88	2,674,318,364	947,098,594
(17) Losses for all accident years prior to 1982 valued as of 12-31-89	3,005,803,881	1,073,801,142
(18) Loss development factor from 8th to ultimate report for all years prior to 1982 (1 + ((17)-(16)-(15))/((15)x(14)))	.995	.969
(19) Unweighted average 8th to ultimate loss development factor ((9)+(18))/2	.983	.998

(10), (11) and (12) include only data for matching companies for 12/31/86,
12/31/87 and 12/31/88 valuations.

(15), (16) and (17) include only data for matching companies for 12/31/88
and 12/31/89 valuations.



APPENDIX A-IV

SECTION D - SUMMARY OF CALENDAR-ACCIDENT YEAR DEVELOPMENT FACTORS

	(1) 1st/2nd	(2) 2nd/3rd	(3) 3rd/4th	(4) 4th/5th		
Ind. Losses	.983	1.054	1.028	1.013		
Med. Losses	1.052	.982	.977	.979		
	(5) 5th/6th	(6) 6th/7th	(7) 7th/8th	(8) 5th/8th (5)x((6)x(7))	(9) 8th/Ult.	
Ind. Losses	.987	1.008	.990	.985	.983	
Med. Losses	.964	.994	.981	.940	.998	
	(10) 5th/Ult. (8)x(9)	(11) 4th/Ult. (4)x(10)	(12) 3rd/Ult. (3)x(11)	(13) 2nd/Ult. (2)x(12)	(14) 1st/Ult. (1)x(13)	
Ind. Losses	.968	.981	1.008	1.062	1.044	
Med. Losses	.938	.918	.897	.881	.927	

APPENDIX A-V

CALCULATION OF POLICY YEAR TREND FACTOR

SECTION A - STANDARD EARNED PREMIUM

(1)	(2)	(3)	(4)	
Policy Year	Std. Earned Premium	Dev. Factor to Fifth Report	On Level Factor	
			Premium On Level (1)x((2)x(3))	
1984	904,885,903	1.000	1.381	1,249,647,432
1985	1,004,501,969	.999	1.383	1,388,221,721
1986	1,332,526,005	1.000	1.178	1,569,715,634
1987	1,529,409,256	.998	1.149	1,754,232,417
1988	1,732,388,628	1.032	1.007	1,799,951,784

SECTION B - INDEMNITY LOSSES

(1)	(2)	(3)	(4)	
Policy Year	Indemnity Losses	Dev. Factor to Ultimate Report	On Level Factor	
			Ind. Losses On Level (1)x((2)x(3))	
1984	491,367,335	.971	1.023	487,927,764
1985	554,331,443	.971	1.029	553,777,112
1986	646,873,900	.985	1.025	653,342,639
1987	711,051,926	1.032	1.020	748,737,678
1988	766,043,020	1.061	1.015	825,028,333

SECTION C - MEDICAL LOSSES

(1)	(2)	(3)	(4)	
Policy Year	Medical Losses	Dev. Factor to Ultimate Report	On Level Factor	
			Med. Losses On Level (1)x((2)x(3))	
1984	213,337,356	.969	1.000	206,723,898
1985	244,333,974	.939	1.000	229,429,602
1986	312,596,793	.920	1.000	287,589,050
1987	384,088,230	.895	1.000	343,758,966
1988	437,015,594	.904	1.000	395,062,097

CALCULATION OF POLICY YEAR TREND FACTOR (CONTD.)

SECTION D - DATA FOR INDEMNITY TREND FACTOR

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Policy Year	Time Index	Premium On Level (See App. A-V Sect.A)	Ind.Losses On Level (See App. A-V Sect.B)	Ind. Loss Ratio (4)/(3)	(2)x(2)	(2)x(5)	Ind. Loss Ratio On Line ((9)x(2))+ (10)
1984	1	1,249,647,432	487,927,764	.390	1	.390	.386
1985	2	1,388,221,721	553,777,112	.399	4	.798	.402
1986	3	1,569,715,634	653,342,639	.416	9	1.248	.418
1987	4	1,754,232,417	748,737,678	.427	16	1.708	.434
1988	5	1,799,951,784	825,028,333	.458	25	2.290	.450
Total	15	xxxx	xxx	2.090	55	6.434	xxx

SECTION E - DATA FOR MEDICAL TREND FACTOR

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Policy Year	Time Index	Premium On Level (See App. A-V Sect.A)	Med.Losses On Level (See App. A-V Sect.C)	Med. Loss Ratio (4)/(3)	(2)x(2)	(2)x(5)	Med. Loss Ratio On Line ((9)x(2))+ (10)
1984	1	1,249,647,432	206,723,898	.165	1	.165	.158
1985	2	1,388,221,721	229,429,602	.165	4	.330	.172
1986	3	1,569,715,634	287,589,050	.183	9	.549	.186
1987	4	1,754,232,417	343,758,966	.196	16	.784	.200
1988	5	1,799,951,784	395,062,097	.219	25	1.095	.214
Total	15	xxxx	xxx	.928	55	2.923	xxx

SECTIONS D AND E, CONTD. - CALCULATION OF INDEMNITY AND MEDICAL TREND FACTORS

	INDEMNITY (See Section D)	MEDICAL (See Section E)
(9) Annual Increment in Loss Ratio: $(n \text{ Sum}(7) - \text{Sum}(2)\text{Sum}(5)) / (n \text{ Sum}(6) - \text{Sum}(2)\text{Sum}(2))$	.016	.014
(10) Loss Ratio at Base: $(\text{Sum}(5) - (9)\text{Sum}(2)) / n$	.370	.144
(11) Midpoint of Experience in Filing is 4-1-89. Time Index for 4-1-89 is:	5.250	5.250
(12) Midpoint of Period during which Proposed Rates Effective is 1-1-92. Time Index for 1-1-92 is:	8.000	8.000
(13) Trend Factor prior to Credibility: $((10) + (9)x(12)) / ((10) + (9)x(11))$	1.097	1.174
(14) E - Sum of Squares of $((5) - (8))$	.000142	.000148
(15) Credibility (Limited to 100%): $(.0011 / ((14) / ((10) + (9)X3.00)**2))**5$	100%	51%
(16) Annual Expected Trend	.050	.077
(17) Credibility Weighted Trend Factor: $(1.000 - (15)) x (1.000 + (16)x((12) - (11))) + ((13)x(15))$	1.097	1.193

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APPENDIX A-V

CALCULATION OF POLICY YEAR TREND FACTOR (CONTD.)

SECTION F - DETERMINATION OF OVERALL TREND FACTOR

(1) Adjusted Indemnity Losses for Policy Year 1988 valued as of 12-31-89 (See Appendix A-V - Section B)	825,028,333
(2) Adjusted Medical Losses for Policy Year 1988 valued as of 12-31-89 (See Appendix A-V - Section C)	395,062,097
(3) Indemnity Trend Factor	1.097
(4) Medical Trend Factor	1.193
(5) Indicated Overall Trend Factor ((1)x(3)) + ((2)x(4)) ----- (1) + (2)	1.128

SECTION G - DERIVATION OF EFFECT OF TREND FACTOR

Policy year 1988 with an average accident date of January 1, 1989 (Exhibit I-A) and calendar-accident year 1989 with an average accident date of July 1, 1989 (Exhibit I-B) are used in the determination of the indicated change based upon experience (Exhibit I-D). This experience reflects, on average, conditions as of April 1, 1989. The midpoint of the time period for which the revised rates are being proposed is January 1, 1992. The premium level must therefore reflect experience levels which will exist 33 months later than the midpoint of the experience on which the current indication has been derived. The indicated trend factor is 1.128 which represents a trend factor of approximately 4.7% on an annual basis. Since the present rates include a factor of 1.122, the appropriate factor to incorporate the effect of trend into the overall change in premium level is the ratio of these two trend factors: 1.005 (1.005 = 1.128 / 1.122).

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APPENDIX A-VI

The National Council conducts extensive programs to insure both the completeness and accuracy of experience reported. Occasionally a particular carrier's report is not available at the time of preparation of the rate filing. The data is excluded only if its omission would have no significant effect on the proposed rates. The carriers for which data is not included in this filing are listed below. The listing is separated between policy year and calendar-accident year aggregate data.

SECTION A

CARRIERS NOT INCLUDED IN 1988 POLICY YEAR EXPERIENCE VALUED AS OF 12-31-89

Name of Carrier -----	Percent of Premium Volume -----
Argonaut-Midwest Insurance Company	1.4%
Petroleum Casualty Company	0.3
Allianz Insurance Company	0.1
Intercontinental Insurance Company	<u>0.1</u>
Total	1.9%

Total volume present in policy year experience valued as of 12-31-89 is 98.1% (98.1% - 100.0% - 1.9%).

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APPENDIX A-VI (CONTD.)

SECTION B

CARRIERS NOT INCLUDED IN 1989 CALENDAR-ACCIDENT YEAR
EXPERIENCE AS OF 12-31-89

Name of Carrier -----	Percent of Premium Volume -----
Petroleum Casualty Company	0.3%
Allianz Insurance Company	0.1
Intercontinental Insurance Company	0.1
National American Insurance Company	<u>0.1</u>
 Total	 0.6%

Total volume present in 1989 calendar-accident year experience as of 12-31-89 is 99.4% (99.4% = 100.0% - 0.6%).

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APPENDIX A-VII

Determination of Industry Group Differentials**

<u>Policies Becoming Effective During Period</u>	(1) <u>Premiums At 1/1/90 Manual Rates</u>	(2) <u>Losses and Loss Adjustment Expense on 7/15/89 Law Level</u>
--	---	---

Manufacturing Group - Schedules 5 - 25 Inclusive++

4/1/85-3/31/86	477,869,426	255,764,147
4/1/86-3/31/87	487,001,116	281,769,844
4/1/87-3/31/88*	496,719,627	297,060,792
1985+	61,599	40,224
TOTAL	1,461,651,768	834,635,007

Contracting Group - Schedules 26 and 27++

4/1/85-3/31/86	528,978,319	279,715,023
4/1/86-3/31/87	557,578,887	321,326,032
4/1/87-3/31/88*	597,078,472	333,672,184
1985+	52,529	3,325
TOTAL	1,683,688,207	934,716,564

All Other Group - Other Schedules Except Schedules 28, 29, and 30++

4/1/85-3/31/86	835,494,116	444,859,960
4/1/86-3/31/87	866,681,136	507,774,132
4/1/87-3/31/88*	898,644,218	542,437,487
1985+	685,380	1,213,232
TOTAL	2,601,504,850	1,496,284,811

All Industry Groups

4/1/85-3/31/86	1,842,341,861	980,339,130
4/1/86-3/31/87	1,911,261,139	1,110,870,008
4/1/87-3/31/88*	1,992,442,317	1,173,170,463
1985+	799,508	1,256,781
TOTAL	5,746,844,825	3,265,636,382

- * Last one-year policy expired March 31, 1989.
- ** Workers Compensation Statistical Plan Data.
- + Three-Year Fixed-Rate Policies, last policy expired December 31, 1988.
- ++ Schedules are those set forth in the Classification Codes Book issued by the National Council on Compensation Insurance.

APPENDIX A-VII (CONTD.)

In order to obtain the premium level by industry group, the overall premium level change must be distributed by industry group using policy year differentials.

The expected losses, column (2), are calculated by multiplying the premium at current manual rates by the ratio of earned premium to manual premium to recognize the effect of the Experience Rating Plan and by the target cost ratio. The indicated losses, column (3), are the losses and loss adjustment expense on the current law level derived from the Workers Compensation Statistical Plan, and include an adjustment to the level of the 1987 policy year aggregates valued as of December 31, 1988 and calendar-accident year experience for the twelve months ending December 31, 1988. In addition, an adjustment has been made to the indicated losses to account for the change in industry group wages relative to the change in medical losses.

(1)	(2)	(3)	(4)	(5)
<u>Industry Group</u>	<u>Expected Losses</u>	<u>Indicated Losses</u>	<u>Ratio (3)/(2)</u>	<u>Group Differentials (4)/0.988</u>
Manufacturing	1,050,970,740	1,048,725,564	.998	1.010
Contracting	1,213,074,623	1,173,306,706	.967	.979
All Other	1,881,929,909	1,872,588,471	.995	1.007
Overall	4,145,975,272	4,094,620,741	.988	1.000

**SECTION IIA
NCCI RATEMAKING PROCEDURES
TECHNICAL SUPPLEMENT**

PART II - SUPPORTING APPENDICES

APPENDIX B

**SECTION IIA
NCCI RATEMAKING PROCEDURES
TECHNICAL SUPPLEMENT**

December 6, 1991

NCCI Examination - Volume II - Section IIA

MILLIMAN & ROBERTSON, INC.



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APPENDIX B-I

Distribution of Change in Manual Premium Level
To Occupational Classification

After determining the required changes in manual premium level (see Exhibit I) the next step in the ratemaking procedure is to distribute these changes among the various occupational classifications.

Section A - The Data

The attached exhibit (Appendix B-II) of classification statistics shows, in detail, the experience for each classification in this state. The data shown in these exhibits are from third reports under the Workers Compensation Statistical Plan for the earliest policy period, second reports under the Workers Compensation Statistical Plan for the middle policy period, and first reports for the latest policy period; the experience of the three-year fixed-rate policies is equivalent to a third report for the first twelve months of experience, a second report for the second twelve months of experience, and a first report for the latest twelve months of experience. Individual claim amounts are subject to a maximum limit based on five times the historical average serious cost per case. The limit utilized in this filing is \$306,000. The actual incurred losses for each multiple claim accident are limited such that the total loss for the accident does not exceed two times the individual claim loss limitation. This limit is \$612,000.

Section B - Adjustment of Data

The losses are adjusted to the July 15, 1989 benefit level and include development and loss adjustment expense. The losses are further modified to reflect calendar-accident year experience for twelve months ending December 31, 1988. These factors are shown below. The development factors are based on Workers Compensation Statistical Plan data and include an adjustment to the level of the 1987 policy year aggregates valued as of December 31, 1988.

(a) Factors to Adjust Losses to Benefit Level
Effective July 15, 1989

<u>Policy Period</u>	<u>Death</u>	<u>P.T.</u>	<u>Major</u>	<u>Minor</u>	<u>Temporary</u>	<u>Medical</u>
4/1/85-3/31/86	1.038	1.064	1.021	1.019	1.006	1.000
4/1/86-3/31/87	1.025	1.044	1.019	1.017	1.005	1.000
4/1/87-3/31/88	1.018	1.032	1.011	1.009	1.004	1.000
1985+	1.029	1.053	1.018	1.017	1.005	1.000

+ Three-Year Fixed-Rate Policies.



APPENDIX B-I (CONTD.)

(b) Development Factors:

<u>Policy Period</u>	<u>Indemnity</u>		<u>Medical</u>	
	<u>Serious</u>	<u>Non-Serious</u>	<u>Serious</u>	<u>Non-Serious</u>
4/1/85-3/31/86	1.222	1.099	1.058	1.101
4/1/86-3/31/87	1.434	1.130	1.093	1.139
4/1/87-3/31/88	1.783	1.094	1.158	1.207
1985+	1.480	1.108	1.103	1.149

- (c) Assessment Factor - Indemnity: 1.00625
- Medical: 1.000
- (d) Calendar-Accident Year Adjustment: 1.019
- (e) Current Trend - Indemnity: 1.100
- Medical: 1.169
- (f) Loss Adjustment Expense: 1.120

(g) Combined Conversion Factors*

<u>Policy Period</u>	<u>Death</u>	<u>P.T.</u>	<u>Major</u>	<u>Minor</u>	<u>Temp. Total</u>	<u>Serious Medical</u>	<u>Non-Serious Medical</u>
4/1/85-3/31/86	1.602	1.642	1.575	1.415	1.397	1.411	1.469
4/1/86-3/31/87	1.856	1.891	1.845	1.452	1.435	1.458	1.520
4/1/87-3/31/88	2.293	2.324	2.277	1.394	1.388	1.544	1.611
1985+	1.923	1.968	1.903	1.424	1.407	1.472	1.533

* (a) x (((((b) x (c)) x (d)) x (e)) x (f))
 + Three-Year Fixed-Rate Policies.

The effects of subsequent changes determined after the compilation of the pure premiums have been excluded entirely from these exhibits of classification experience. Appropriate factors reflecting these changes will be introduced in Appendix B-III.

Section C - Calculation of the Derived by Formula Pure Premiums

The pure premiums shown at the right on these classification exhibits are as follows:

- (a) Indicated: The line of figures for each classification captioned "Total" shows the pure premium indicated by the combined experience for this state for the policy periods as indicated above.

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- (b) Underlying Present Rates: These are the partial pure premiums underlying the current manual rates. The pure premiums are updated to reflect the current off-balance in the Experience Rating Plan. The partial pure premiums "Underlying Present Rates" are shown in the attached Appendix B-II.
- (c) Present on Rate Level: These are the pure premiums underlying present rates (see paragraph "b" above) brought to the proposed premium level by the application to the partial pure premiums of the factors representing the combined effect of the experience of policy year 1987 valued as of December 31, 1988 and calendar-accident year experience for the twelve months ending December 31, 1988. The derivation of the present on rate level factors is as follows:

	(1) Indicated Premium <u>Level Change</u>	(2) Industry Group <u>Differentials</u>	(3) Present on Rate Level Factors <u>(1)x(2)</u>
Manufacturing	.986	1.010	.996
Contracting	.986	.979	.965
All Other	.986	1.007	.993

- (d) Indicated by National Relativity: These pure premiums reflect the countrywide experience for each classification as indicated by the latest available individual classification experience for all states for which the National Council compiles workers compensation data.

Countrywide data is adjusted to Illinois conditions in three steps. First, statewide indicated pure premiums are determined for Illinois. Second, using Illinois payrolls as weights, corresponding statewide average pure premiums are computed for each remaining state. Third, the ratios of Illinois statewide pure premiums to those for other states are used as adjustment factors to convert losses for other states to a basis concomitant with the Illinois indicated pure premiums. The quotient of the countrywide total of such adjusted losses divided by the total countrywide payroll for the classification is the pure premium indicated by national relativity. Serious, non-serious and medical pure premiums are computed separately.

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- (e) Derived by Formula: As for the preceding pure premiums, separate computations are performed for each partial pure premium: serious, non-serious and medical. Each partial formula pure premium is derived by the weighting of the indicated partial pure premium, the present on rate level partial pure premium, and the partial pure premium indicated by national relativity. The weight assigned to the policy year indicated pure premium varies in one percent intervals from zero percent to one hundred percent, depending upon the volume of expected losses (i.e., the product of the underlying pure premiums and the payroll in hundreds). To achieve full state credibility, a classification must have expected losses of at least:

\$ 2,466,410 for serious;
1,263,710 for non-serious; and
1,010,968 for medical.

Partial credibilities are determined by a three-halves formula; that is, the product of the square root of the cube of any given credibility value and the full credibility standard determines the minimum volume of expected losses necessary to achieve the given credibility value. For the pure premiums indicated by national relativity, credibility is determined from the number of cases. Full credibility standards are:

25 serious cases	- serious;
300 non-serious cases	- non-serious; and
300 serious and non-serious cases	- medical.

Partial credibilities are assigned in accordance with the same three-halves formula. In no case is the national credibility permitted to exceed 50% of the complement of the state credibility. The residual credibility (100% less the sum of the state and national credibilities) is assigned to the present on rate level pure premium.

For example, if the state credibility is 40%, the pure premium indicated by national relativity is assigned a credibility of 30% $((100 - 40) / 2)$; the remaining 30% is assigned to the present on rate level pure premium.

The total pure premium shown on the attached Appendix B-II is obtained by adding the partial pure premiums obtained above and rounding the sum to two decimal places.

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For purposes of rate calculation, classifications are separated into reviewed and non-reviewed categories. The reviewed classifications are those whose experience is of sufficient volume to merit some degree of credibility. The recognition of reviewed classification experience requires that test correction factors be applied in the rate computation to ensure that the required changes in premium level developed in Exhibit I are actually realized. Non-reviewed classifications (those with neither state nor national credibility) are calculated directly from present rates and do not require application of test correction factors.

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CLASS 2003 BAKERIES

LOSSES AND LOSS ADJUSTMENT EXPENSE								PURE PREM PER \$100 OF PAYROLL					
POLICY PER	PAYROLL	# CASES	SERIOUS	AMOUNT	# CASES	NON-SERIOUS	AMOUNT	MEDICAL AMT.	TOTAL AMOUNT	SERIOUS	NON-SERIOUS	MEDICAL	TOTAL
85-86	189979504	42	2332870		423	1692602		2147339	6172811	100%	100%	100%	325
86-87	201688824	39	3120948		456	2018975		2817956	7957879	STATE CRED 0%	STATE CRED 0%	STATE CRED 0%	395
87-88	203816899	25	2599640		455	1841922		2682878	7124440	NAT CRED	NAT CRED	NAT CRED	350
TOTAL	595485227	106	8053458		1334	5553499		7648173	21255130	1352	933	1284	357
P.P. PRESENT ON RATE LEVEL										1627	1059	1489	418
P.P. UNDERLYING PRESENT RATE										1634	1063	1495	419
P.P. INDICATED BY NAT'L REL.										1531	931	1197	366
P.P. DERIVED BY FORMULA										1352	933	1284	357

CLASS 2014 GRAIN MILLING

LOSSES AND LOSS ADJUSTMENT EXPENSE								PURE PREM PER \$100 OF PAYROLL					
POLICY PER	PAYROLL	# CASES	SERIOUS	AMOUNT	# CASES	NON-SERIOUS	AMOUNT	MEDICAL AMT.	TOTAL AMOUNT	SERIOUS	NON-SERIOUS	MEDICAL	TOTAL
85-86	62060595	23	1405730		109	500560		855451	2761741	100%	99%	100%	445
86-87	52236463	9	877419		68	263229		557993	1698641	STATE CRED 0%	STATE CRED 0%	STATE CRED 0%	325
87-88	46896281	8	826023		76	421640		875473	2123136	NAT CRED	NAT CRED	NAT CRED	453
TOTAL	161193339	40	3109172		253	1185429		2288917	6583518	1929	735	1420	408
P.P. PRESENT ON RATE LEVEL										2195	792	1391	438
P.P. UNDERLYING PRESENT RATE										2204	795	1397	440
P.P. INDICATED BY NAT'L REL.										2776	1206	1857	584
P.P. DERIVED BY FORMULA										1929	736	1420	409

CLASS 2016 BREAKFAST FOOD MFG

LOSSES AND LOSS ADJUSTMENT EXPENSE								PURE PREM PER \$100 OF PAYROLL					
POLICY PER	PAYROLL	# CASES	SERIOUS	AMOUNT	# CASES	NON-SERIOUS	AMOUNT	MEDICAL AMT.	TOTAL AMOUNT	SERIOUS	NON-SERIOUS	MEDICAL	TOTAL
85-86	31052669	3	310440		26	82445		144987	537872	32%	45%	54%	173
86-87	27023760				9	49833		76733	126566	STATE CRED 34%	STATE CRED 27%	STATE CRED 23%	47
87-88	31837530				8	29271		23504	52775	NAT CRED	NAT CRED	NAT CRED	17
TOTAL	89913959	3	310440		43	161549		245224	717213	345	180	273	80
P.P. PRESENT ON RATE LEVEL										514	435	456	141
P.P. UNDERLYING PRESENT RATE										516	437	458	141
P.P. INDICATED BY NAT'L REL.										687	677	714	208
P.P. DERIVED BY FORMULA										519	386	417	132

CLASS 2021 SUGAR REFINING

LOSSES AND LOSS ADJUSTMENT EXPENSE								PURE PREM PER \$100 OF PAYROLL					
POLICY PER	PAYROLL	# CASES	SERIOUS	AMOUNT	# CASES	NON-SERIOUS	AMOUNT	MEDICAL AMT.	TOTAL AMOUNT	SERIOUS	NON-SERIOUS	MEDICAL	TOTAL
85-86	664419							169	169	5%	6%	8%	03
86-87	1725365									STATE CRED 47%	STATE CRED 47%	STATE CRED 46%	00
87-88	1104606				2	2165		1041	3206	NAT CRED	NAT CRED	NAT CRED	29
TOTAL	3494390				2	2165		1210	3375	000	062	035	10
P.P. PRESENT ON RATE LEVEL										947	574	714	224
P.P. UNDERLYING PRESENT RATE										951	576	717	224
P.P. INDICATED BY NAT'L REL.										1382	745	1015	314
P.P. DERIVED BY FORMULA										1104	624	798	253

CLASS 2030 BEET SUGAR MFG

LOSSES AND LOSS ADJUSTMENT EXPENSE								PURE PREM PER \$100 OF PAYROLL					
POLICY PER	PAYROLL	# CASES	SERIOUS	AMOUNT	# CASES	NON-SERIOUS	AMOUNT	MEDICAL AMT.	TOTAL AMOUNT	SERIOUS	NON-SERIOUS	MEDICAL	TOTAL
85-86										0%	0%	0%	00
86-87										STATE CRED 50%	STATE CRED 38%	STATE CRED 42%	00
87-88										NAT CRED	NAT CRED	NAT CRED	00
TOTAL										000	000	000	00
P.P. PRESENT ON RATE LEVEL										3837	1107	1668	661
P.P. UNDERLYING PRESENT RATE										3852	1111	1675	664
P.P. INDICATED BY NAT'L REL.										1878	787	1815	448
P.P. DERIVED BY FORMULA										2858	985	1730	557

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APPENDIX B-III

COMPUTATION OF FINAL ADVISORY RATE

The following items are combined with the derived by formula pure premium to obtain the indicated advisory rate:

(1) Financial Data Adjustment Factor

The derived by formula pure premiums do not recognize the effect of policy year 1988 experience for twelve months ending December 31, 1989 and have been calculated prior to the availability of experience for calendar-accident year 1989 valued as of December 31, 1989. An adjustment factor is derived below and must be applied to the derived by formula pure premiums.

(a) Unweighted average of policy year and calendar-accident year cost ratios (See Exhibit I-C)	.781
(b) Unweighted average of policy year and calendar-accident year cost ratios used in pure premium exhibits	.7185
(c) Financial data adjustment factor (a)+(b)	1.087

(2) Offset for the New Minimum Premium Multiplier

A factor of .9996 must be applied to offset the increase in premium collected as a result of the change in the minimum premium formula from the present 95 to 105 times the class advisory rate plus any applicable expense constant.

(3) Rates - Test Correction Factor

The payrolls are now extended by the advisory rates presently in effect and by the indicated proposed advisory rates to determine if the required change in manual premium level as calculated in Exhibit I has been achieved. Since at first this calculation may not yield the required results, an iterative process is initiated which continuously tests the proposed advisory rates including tentative test correction factors until the required change in manual premium level is obtained. The test correction factor is applied to the derived by formula pure premiums.

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APPENDIX B-III (CONTD.)

The factors referred to in (1), (2) and (3) are set out as follows:

	(1) Fin. Data Adj. Factor	(2) Offset for the New Min. Prem. Mult.	(3) Product (1)x(2)	(4) Test Corr. Factor	(5) Composite Factor (3)x(4)
Manufacturing	1.087	.9996	1.087	1.005	1.092
Contracting	1.087	.9996	1.087	1.050	1.141
All Other	1.087	.9996	1.087	1.027	1.116

(4) Change In Trend Factors

See Appendix A-V for an explanation of these factors. The classification experience shown in Appendix B-II has been compiled excluding the change in trend factors. It is necessary to bring in these factors before translating the derived by formula pure premiums to advisory rates.

(5) Effect of the January 15, 1990, July 1, 1990 and the July 15, 1990 benefit changes

The partial pure premiums are multiplied by the effects of the January 15, 1990, July 1, 1990 and the July 15, 1990 benefit changes.

The factors referred to in (4) and (5) are set out as follows:

	(1) Change in Trend Factors	(2) Effect of the January 15, 1990 Benefit Change	(3) Effect of the July 1, 1990 Benefit Change	(4) Effect of the July 15, 1990 Benefit Change	(5) Product (((1)x(2)) x(3))x(4)
Serious	.997	1.001	1.007	1.001	1.006
Non-Serious	.997	1.0002	1.004	1.0002	1.001
Medical	1.021	1.000	1.000	1.000	1.021

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(6) Ratios of Manual to Earned Premiums

The ratios of manual to earned premiums by industry group have also been excluded from the classification experience, and it is necessary to apply these factors to the derived by formula pure premiums.

<u>Industry Group</u>	<u>Ratio of Manual to Earned Premiums</u>
Manufacturing	1.013
Contracting	1.011
All Other	1.007

(7) Expense Allowance

The expense allowance is introduced into the advisory rate by dividing the product of the proposed pure premium and the appropriate factors above by the proposed target cost ratio of .7278. (See Exhibit II-A for derivation of this factor.) This operation produces the proposed advisory rate prior to the addition of a disease loading, if any.

(8) Disease Loadings

The proposed advisory rates shown in this filing include specific disease loadings for those classifications where they apply. The proposed specific disease loadings are shown in the Table of Specific Disease Loadings.

(9) Swing Limits

As a further step a test is made to make certain that the proposed advisory rates fall within the following departures from the present advisory rates:

Manufacturing	from 34% above to 16% below
Contracting	from 31% above to 19% below
All Other	from 34% above to 16% below

These limits have been calculated in accordance with the following formula:

Max. Deviation = Effect of the final change in rate level by industry group plus or minus 25% rounded to the nearest 1%

The classifications which have been so limited are listed at the end of this exhibit.

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APPENDIX B-III (CONTD.)

An illustrative example showing the calculation of the proposed advisory rate for Code 2014 is attached as Appendix B-IV. This example demonstrates the manner in which the partial pure premiums are combined to produce a total pure premium, and shows the steps in the calculation at which rounding takes place. Revised advisory rates for other classifications are calculated in the same manner.

List of Classifications Limited by Upper Swing

1463	2388	3365	4240	4568	5402	7422	8044	9505
1624	2402	3373	4244	4693	6045	7515	8046	9519
1699	2836	3548	4360	4717	7230	7605	8227	
2081	3004	3561	4431	4823	7231	7610	9179	
2131	3040	3726	4459	5069	7382	8032	9182	

List of Classifications Limited by Lower Swing

1925	3082	3315	4101	4750	5610	6206	8601	9186
2157	3175	3571	4470	5037	6204	7601	8745	

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APPENDIX B-IV

CALCULATION OF PROPOSED ADVISORY RATE - CODE 2014 - MANUFACTURING

	<u>Serious</u>	<u>Non-Serious</u>	<u>Medical</u>	<u>Total</u>
1. Derived by formula pure premiums	1.929	.736	1.420	4.09
2. Composite factor*	1.092	1.092	1.092	xx
3. Adjusted pure premiums, unrounded (1)x(2)	2.106468	.803712	1.550640	xx
4. Effect of the January 15, 1990, July 1, 1990 and July 15, 1990 benefit changes and change in trend factors*	1.006	1.001	1.021	xx
5. Proposed pure premiums (3)x(4)	2.119	.805	1.583	4.507
6. Adjusted pure premiums to rounded total	2.122	.805	1.583	4.51
7. Ratio of manual to earned premium*				1.013
8. Target cost ratio*				.7278
9. Advisory rate (6)x(7)/(8)				6.28
10. Advisory Loss Cost (9) x .647+				4.06

* See Appendix B-III.

+ .647 = (.7278/1.12)/1.004



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APPENDIX B-V

"F" CLASSIFICATIONS

This filing represents an average decrease of 0.9% in the overall level of "F" classification advisory premium presently in force. Since "F" classification premium comprises 0.3% of the overall premium volume in this state, there will be no change in the statewide overall premium level (.000 = .003 x -.009). The -0.9% reflects the following considerations:

1. The latest available workers compensation experience indicates the need for a 3.5% decrease in premium level.

2. The change in general expense from 6.7% to 6.6% will decrease the premium level by 0.1%.

3. The federal benefit change, effective October 1, 1990, is estimated to increase compensation costs by 0.2% on the average for Longshore and Harbor Workers. The state benefit changes, effective January 15, 1990, July 1, 1990, and July 15, 1990 are estimated to increase compensation costs for state losses 0.5% on the average for Longshore and Harbor Workers. As state losses are 47.0% of total losses, the weighted effect of these changes is an overall increase of 0.3%.

4. The change in taxes from 2.95% to 3.32% will increase the premium level by 0.5%.

5. The United States Longshore and Harbor Workers' Compensation Act Special Fund assessment on federal losses has been increased from 20.1% to 24.2% on total losses. The weighted effect of this change is an increase of 2.0% in compensation costs for "F" classifications.

The combined effect of these changes is a decrease in advisory premium level of 0.9% (.991 = (((.965 x .999) x 1.003) x 1.005) x 1.020)).

The rate impact of the change in expense constant from \$60 to \$75 is .997.

The effect of this change is a decrease in advisory rate level of 1.2% (.988 = .991 x .997).

While the average change in "F" classification advisory rates is a decrease of 1.2%, changes in individual classification advisory rates will vary from the average depending upon the volume and character of the particular classification experience.

The advisory rates are proposed effective January 1, 1991. These advisory rates are applicable to new and renewal policies only.

Details of the calculations of the proposed advisory rates are outlined in the following exhibits:

- Appendix B-V-I - Calculation of Proposed Pure Premiums
- Appendix B-V-II - Individual Classification Experience
- Appendix B-V-III - Calculation of Proposed Advisory Rates
- Appendix B-V-IV - Sample Calculation of Proposed Advisory Rate - Code 7309F - Stevedoring
- Appendix B-V-V - Applied Effects of the Federal and State Benefit Changes

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APPENDIX B-V-I

CALCULATION OF PROPOSED PURE PREMIUMS

The attached exhibits (Appendix B-V-II) show in detail the experience for each classification. The state losses are at the July 15, 1988 state benefit level while federal losses are at the October 1, 1988 federal benefit level. All losses include development factors based on countrywide "F" classification experience and the loss adjustment expense provision. The state losses reflect the effect of the Second Injury Fund and Compensation Rate Adjustment assessments, namely 0.625% based upon indemnity losses. The federal losses reflect the effect of the United States Longshore and Harbor Workers' Compensation Act Special Fund assessment, namely 25.7% based upon indemnity losses only.

The pure premiums shown at the right on these classification exhibits are as follows:

A. Indicated: These pure premiums have been adjusted to the law level and assessment level shown above. The losses are developed to a fifth report using countrywide "F" classification Workers Compensation Statistical Plan data. Losses are limited to five times the average serious cost per case for single claim accidents. The limit utilized in this filing is \$314,000. For multiple claim accidents, the losses are limited to ten times the average serious cost per case. This limit is \$628,000. The line of figures for each classification captioned "Total" shows the pure premium indicated by the policies becoming effective during the period from February 1, 1982 through January 31, 1985. The three-year indicated pure premium is obtained by dividing the total serious, non-serious, and medical losses by the total payroll in hundreds.

B. Underlying Present Rates: These are the pure premiums underlying the "F" classification advisory rates currently in force. These pure premiums have been adjusted to the law level and assessment level shown above.

C. Indicated by National Relativity: The losses used to determine the national pure premiums are the sum of the losses for each state adjusted to an October 1, 1988 federal benefit level. The payrolls for each state are converted to a total payroll rule basis and then summed to determine the national payroll. A national pure premium for Illinois is calculated by adjusting the countrywide national pure premiums to state conditions. Illinois' national pure premiums reflect the same benefit level and loss assessments as the indicated and underlying present rate pure premiums.



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D. Derived by Formula: As for the preceding pure premiums, separate computations are performed for each partial pure premium: serious, non-serious and medical. Each partial formula pure premium is derived by the weighting of the indicated partial pure premium, underlying partial pure premium, and the partial pure premium indicated by national relativity. The weight assigned to the policy year indicated pure premium varies in one percent intervals from zero to one hundred percent, depending upon the volume of expected losses (i.e., the product of the underlying pure premiums and the payroll in hundreds). To achieve full state credibility, a classification must have expected losses of at least:

\$2,028,908 for serious;
679,392 for non-serious; and
543,514 for medical.

Partial credibilities are determined by a three-halves formula; that is, the product of the square root of the cube of any given credibility value and the full credibility standard determines the minimum volume of expected losses necessary to achieve the given credibility value. For the pure premiums indicated by national relativity, credibility is determined from the number of cases. Full credibility standards are:

25 serious cases	- serious;
300 non-serious cases	- non-serious; and
300 serious and non-serious cases	- medical.

Partial credibilities are assigned in accordance with the same three-halves formula. In no case is the national credibility permitted to exceed 50% of the complement of the state credibility. The residual credibility (100% less the sum of the state and national credibilities) is assigned to the underlying pure premium.

For example, if the state credibility is 40%, the pure premium indicated by national relativity is assigned a credibility of 30% $((100 - 40) / 2)$; the remaining 30% is assigned to the underlying pure premium.

The total pure premium shown on the attached Appendix B-V-II is obtained by adding the partial pure premiums obtained above and rounding the sum to two decimal places.



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E. Adjustment of Derived by Formula Pure Premium
Based on National Experience:

For each individual classification a range is established by using 25% below and 25% above the total pure premium indicated by national relativity. The following rules (1) through (6) are applied to determine if any adjustment for the derived by formula pure premium is necessary:

1. If the underlying pure premium and the derived by formula pure premium both fall within the range, the derived by formula pure premium is proposed without further adjustment.
2. If the underlying pure premium falls inside the range and the derived by formula pure premium falls outside the range, the proposed pure premium will be limited to the pure premium establishing the boundary of the range.
3. If the underlying pure premium is outside the range and the derived by formula pure premium falls inside the range, the derived by formula pure premium is used without further adjustment.
4. If both the underlying and the derived by formula pure premium fall outside the range (on the same side), the underlying pure premium is retained if the derived by formula pure premium is further away from the range; if the derived by formula pure premium is closer to the range, then the proposed pure premium is the derived by formula pure premium without adjustment.
5. If both the underlying and the derived by formula pure premium fall outside the range (on opposite sides) then the range boundary (nearest the derived by formula pure premium) is the proposed pure premium.
6. If the pure premium indicated by the national relativity is zero, the derived by formula pure premium is used without further adjustment.

When the selected pure premium is other than the derived by formula pure premium, the distribution of partial pure premiums underlying the derived by formula pure premium is used in determining the adjusted serious, non-serious, and medical pure premiums.

The derived by formula pure premiums have been adjusted for the following classification:

7309F

CLASS: 6801F BOAT BUILDING WOOD NOC

LOSSES AND LOSS ADJUSTMENT EXPENSE

POLICY PERIOD	PAYROLL	SERIOUS		NON-SERIOUS		MEDICAL TOTAL	PURE PREM. PER \$100 OF PAYROLL			
		CASES	AMOUNT	CASES	AMOUNT		SERIOUS	NON-SERIOUS	MEDICAL	TOTAL
82-83	0	0	0	0	0	0	0%	STATE CRED.	STATE CRED.	0.00
83-84	0	0	0	0	0	0	24%	NAT. CRED.	23%	0.00
84-85	0	0	0	0	0	0	0.0000	NAT. CRED.	25%	0.00
TOTAL	0	0	0	0	0	0	0.0000	NAT. CRED.	0.0000	0.00
								P.P. UNDERLYING PRESENT RATE		8.17
								P.P. INDICATED BY NAT. REL.		3.59
								P.P. DERIVED BY FORMULA		7.07

CLASS: 6824F BOAT BUILDING CONSTRUCTION OR REPAIRING 150 FEET

LOSSES AND LOSS ADJUSTMENT EXPENSE

POLICY PERIOD	PAYROLL	SERIOUS		NON-SERIOUS		MEDICAL TOTAL	PURE PREM. PER \$100 OF PAYROLL			
		CASES	AMOUNT	CASES	AMOUNT		SERIOUS	NON-SERIOUS	MEDICAL	TOTAL
82-83	1934950	1	13998	7	20554	13125	17%	STATE CRED.	21%	2.46
83-84	1715686	0	0	5	9645	17275	41%	NAT. CRED.	39%	1.57
84-85	1457821	0	0	3	1840	5448	0.274	NAT. CRED.	34%	0.50
TOTAL	5108457	1	13998	15	32039	35848	0.274	NAT. CRED.	0.627	1.60
								P.P. UNDERLYING PRESENT RATE		6.12
								P.P. INDICATED BY NAT. REL.		2.76
								P.P. DERIVED BY FORMULA		5.37

CLASS: 6826F MARINAS WATERFRONT OPERATION

LOSSES AND LOSS ADJUSTMENT EXPENSE

POLICY PERIOD	PAYROLL	SERIOUS		NON-SERIOUS		MEDICAL TOTAL	PURE PREM. PER \$100 OF PAYROLL			
		CASES	AMOUNT	CASES	AMOUNT		SERIOUS	NON-SERIOUS	MEDICAL	TOTAL
82-83	156194	0	0	0	0	94	10%	STATE CRED.	12%	0.06
83-84	761743	0	0	2	7767	3234	45%	NAT. CRED.	44%	1.44
84-85	1436227	1	29121	1	852	14326	1.237	NAT. CRED.	0.366	3.08
TOTAL	2354164	1	29121	3	8619	17654	2.922	NAT. CRED.	1.319	2.35
								P.P. UNDERLYING PRESENT RATE		6.12
								P.P. INDICATED BY NAT. REL.		5.40
								P.P. DERIVED BY FORMULA		5.30

CLASS: 6843F SHIP BUILDING IRON STEEL NOC

LOSSES AND LOSS ADJUSTMENT EXPENSE

POLICY PERIOD	PAYROLL	SERIOUS			NON-SERIOUS			MEDICAL TOTAL			PURE PREM. PER \$100 OF PAYROLL		
		CASES	AMOUNT	AMOUNT	CASES	AMOUNT	AMOUNT	AMOUNT	AMOUNT	SERIOUS	NON-SERIOUS	MEDICAL	TOTAL
82-83	0	0	0	0	0	0	0	0	0	0%	STATE CRED. 50%	STATE CRED. 50%	0.00
83-84	0	0	0	0	0	0	0	0	0	50%	NAT. CRED.	NAT. CRED.	0.00
84-85	0	0	0	0	0	0	0	0	0	0.000	0.000	0.000	0.00
TOTAL	0	0	0	0	0	0	0	0	0	5.709	1.966	1.865	9.54
										7.556	0.947	2.604	11.11
										6.633	1.457	2.235	10.33

CLASS: 6845F SHIP BUILDING BATTLESHIPS ETC

LOSSES AND LOSS ADJUSTMENT EXPENSE

POLICY PERIOD	PAYROLL	SERIOUS			NON-SERIOUS			MEDICAL TOTAL			PURE PREM. PER \$100 OF PAYROLL		
		CASES	AMOUNT	AMOUNT	CASES	AMOUNT	AMOUNT	AMOUNT	AMOUNT	SERIOUS	NON-SERIOUS	MEDICAL	TOTAL
82-83	0	0	0	0	0	0	0	0	0	0%	STATE CRED. 50%	STATE CRED. 50%	0.00
83-84	0	0	0	0	0	0	0	0	0	50%	NAT. CRED.	NAT. CRED.	0.00
84-85	0	0	0	0	0	0	0	0	0	0.000	0.000	0.000	0.00
TOTAL	0	0	0	0	0	0	0	0	0	3.910	1.632	1.448	6.99
										3.255	0.831	2.203	6.29
										3.583	1.232	1.826	6.64

CLASS: 6872F SHIP REPAIR OR CONVERSION

LOSSES AND LOSS ADJUSTMENT EXPENSE

POLICY PERIOD	PAYROLL	SERIOUS			NON-SERIOUS			MEDICAL TOTAL			PURE PREM. PER \$100 OF PAYROLL		
		CASES	AMOUNT	AMOUNT	CASES	AMOUNT	AMOUNT	AMOUNT	AMOUNT	SERIOUS	NON-SERIOUS	MEDICAL	TOTAL
82-83	11311376	6	603404	175799	82	241615	1020818	100%	STATE CRED. 78%	STATE CRED. 100%	STATE CRED. 100%	9.02	
83-84	10237870	17	2046588	132037	82	496471	2675096	0%	STATE CRED. 11%	STATE CRED. 11%	STATE CRED. 11%	26.13	
84-85	9659742	5	462828	71723	31	163688	698239	0%	NAT. CRED.	NAT. CRED.	NAT. CRED.	7.23	
TOTAL	31208988	28	3112820	379559	195	901774	4394153	9.974	1.216	2.889	2.889	14.08	
								9.919	1.500	2.601	3.497	13.94	
								9.301	1.137	3.497	2.889	14.10	
								9.974	1.239	2.889	2.889	14.10	

CLASS: 6874F PAINTING SHIP HULLS

POLICY PERIOD	PAYROLL	LOSSES AND LOSS ADJUSTMENT EXPENSE				PURE PREM. PER \$100 OF PAYROLL			
		SERIOUS	NON-SERIOUS	MEDICAL	TOTAL	SERIOUS	NON-SERIOUS	MEDICAL	TOTAL
		CASES	AMOUNT	CASES	AMOUNT	AMOUNT	AMOUNT	AMOUNT	AMOUNT
82-83	0	0	0	0	0	0%	STATE CRED.	STATE CRED.	0.00
83-84	0	0	0	0	0	38%	NAT. CRED.	NAT. CRED.	0.00
84-85	0	0	0	0	0	0.000	0.000	0.000	0.00
TOTAL						15.316	3.938	4.116	23.37
						5.439	2.622	4.193	12.25
						11.563	3.635	4.136	19.33

CLASS: 7309F STEVEDORING NOC

POLICY PERIOD	PAYROLL	LOSSES AND LOSS ADJUSTMENT EXPENSE				PURE PREM. PER \$100 OF PAYROLL			
		SERIOUS	NON-SERIOUS	MEDICAL	TOTAL	SERIOUS	NON-SERIOUS	MEDICAL	TOTAL
		CASES	AMOUNT	CASES	AMOUNT	AMOUNT	AMOUNT	AMOUNT	AMOUNT
82-83	2529460	2	287797	14	42570	70%	STATE CRED.	STATE CRED.	18.43
83-84	3264176	2	70650	6	15783	15%	NAT. CRED.	NAT. CRED.	2.97
84-85	2861878	4	204578	9	16502	6.505	0.865	2.976	11.61
TOTAL	8655514	8	563025	29	74855	13.871	1.858	3.261	18.99
						16.736	2.313	5.842	24.89
						9.145	1.622	3.543	14.31
						11.932	2.116	4.622	18.67

CLASS: 7313F COAL DOCK OPERATION

POLICY PERIOD	PAYROLL	LOSSES AND LOSS ADJUSTMENT EXPENSE				PURE PREM. PER \$100 OF PAYROLL			
		SERIOUS	NON-SERIOUS	MEDICAL	TOTAL	SERIOUS	NON-SERIOUS	MEDICAL	TOTAL
		CASES	AMOUNT	CASES	AMOUNT	AMOUNT	AMOUNT	AMOUNT	AMOUNT
82-83	3889263	1	14820	5	5675	28%	STATE CRED.	STATE CRED.	0.84
83-84	4148362	1	19875	5	23723	36%	NAT. CRED.	NAT. CRED.	1.29
84-85	1330956	2	85643	3	20621	1.284	0.534	0.388	2.21
TOTAL	9368581	4	120338	13	50019	3.281	1.275	1.294	5.85
						2.544	0.519	1.198	4.26
						2.457	0.788	0.937	4.18

CLASS: 7317F STEVEDORING HAND OR HAND TRUCKS

POLICY PERIOD	PAYROLL	LOSSES AND LOSS ADJUSTMENT EXPENSE			PURE PREM. PER \$100 OF PAYROLL			
		SERIOUS	NON-SERIOUS	MEDICAL TOTAL	SERIOUS	NON-SERIOUS	MEDICAL TOTAL	
82-83	2516726	0	63097	53286	35%	33%	47%	
83-84	1948967	2	47151	112490	32%	33%	26%	
84-85	2433305	2	6580	86664	NAT. CRED.	NAT. CRED.	NAT. CRED.	
TOTAL	6898998	4	116828	252440	5.955	1.693	3.659	
			P.P. UNDERLYING PRESENT RATE			6.273	1.877	2.570
			P.P. INDICATED BY NAT. REL.			4.655	0.767	1.651
			P.P. DERIVED BY FORMULA			5.644	1.450	2.843

CLASS: 7323F STEVEDORING HANDLING EXPLOSIVES

POLICY PERIOD	PAYROLL	LOSSES AND LOSS ADJUSTMENT EXPENSE			PURE PREM. PER \$100 OF PAYROLL			
		SERIOUS	NON-SERIOUS	MEDICAL TOTAL	SERIOUS	NON-SERIOUS	MEDICAL TOTAL	
82-83	0	0	0	0	0%	0%	0%	
83-84	0	0	0	0	24%	17%	19%	
84-85	0	0	0	0	NAT. CRED.	NAT. CRED.	NAT. CRED.	
TOTAL	0	0	0	0	0.000	0.000	0.000	
			P.P. UNDERLYING PRESENT RATE			9.703	3.969	1.148
			P.P. INDICATED BY NAT. REL.			2.698	0.348	0.597
			P.P. DERIVED BY FORMULA			8.022	3.353	1.043

CLASS: 7327F STEVEDORING CONTAINERIZED SYSTEM

POLICY PERIOD	PAYROLL	LOSSES AND LOSS ADJUSTMENT EXPENSE			PURE PREM. PER \$100 OF PAYROLL			
		SERIOUS	NON-SERIOUS	MEDICAL TOTAL	SERIOUS	NON-SERIOUS	MEDICAL TOTAL	
82-83	9942	0	0	0	0%	0%	0%	
83-84	0	0	0	0	50%	50%	50%	
84-85	0	0	0	0	NAT. CRED.	NAT. CRED.	NAT. CRED.	
TOTAL	9942	0	0	0	0.000	0.000	0.000	
			P.P. UNDERLYING PRESENT RATE			5.660	1.715	10.28
			P.P. INDICATED BY NAT. REL.			7.972	1.214	2.166
			P.P. DERIVED BY FORMULA			6.816	2.060	1.941

CLASS: 7350F FREIGHT HANDLING NOC

POLICY PERIOD	PAYROLL	LOSSES AND LOSS ADJUSTMENT EXPENSE				PURE PREM. PER \$100 OF PAYROLL			
		SERIOUS	NON-SERIOUS	MEDICAL	TOTAL	SERIOUS	NON-SERIOUS	MEDICAL	TOTAL
CASES	AMOUNT	CASES	AMOUNT	AMOUNT	AMOUNT	18%	20%	18%	23%
82-83	867932	1	45183	3	831	22169	68183	STATE CRED.	STATE CRED.
83-84	1050031	0	0	4	16079	19513	35592	41%	38%
84-85	1477017	0	0	0	0	0	0	NAT. CRED.	NAT. CRED.
TOTAL	3394980	1	45183	7	16910	41682	103775	1.331	0.498
					P.P. UNDERLYING PRESENT RATE				
					P.P. INDICATED BY NAT. REL.				
					P.P. DERIVED BY FORMULA				

CLASS: 8709F STEVEDORING TALLYMEN OR CHECKING CLERKS

POLICY PERIOD	PAYROLL	LOSSES AND LOSS ADJUSTMENT EXPENSE				PURE PREM. PER \$100 OF PAYROLL			
		SERIOUS	NON-SERIOUS	MEDICAL	TOTAL	SERIOUS	NON-SERIOUS	MEDICAL	TOTAL
CASES	AMOUNT	CASES	AMOUNT	AMOUNT	AMOUNT	8%	7%	8%	9%
82-83	1203959	0	0	1	0	437	437	STATE CRED.	STATE CRED.
83-84	991886	1	19059	1	378	8537	27974	46%	46%
84-85	1085101	0	0	1	5083	3804	8887	NAT. CRED.	NAT. CRED.
TOTAL	3280946	1	19059	3	5461	12778	37298	0.581	0.166
					P.P. UNDERLYING PRESENT RATE				
					P.P. INDICATED BY NAT. REL.				
					P.P. DERIVED BY FORMULA				

CLASS: 8726F STEAMSHIP LINES OR AGENCIES PORT EMPLOYEES

POLICY PERIOD	PAYROLL	LOSSES AND LOSS ADJUSTMENT EXPENSE				PURE PREM. PER \$100 OF PAYROLL			
		SERIOUS	NON-SERIOUS	MEDICAL	TOTAL	SERIOUS	NON-SERIOUS	MEDICAL	TOTAL
CASES	AMOUNT	CASES	AMOUNT	AMOUNT	AMOUNT	21%	25%	21%	36%
82-83	1914875	1	32452	6	20493	36821	89766	STATE CRED.	STATE CRED.
83-84	1636139	3	187993	19	25008	82516	295517	39%	32%
84-85	4070494	4	338296	30	38587	122179	499062	NAT. CRED.	NAT. CRED.
TOTAL	7621508	8	558741	55	84088	241516	884345	7.331	1.103
					P.P. UNDERLYING PRESENT RATE				
					P.P. INDICATED BY NAT. REL.				
					P.P. DERIVED BY FORMULA				

CLASS: 9077F U S ARMED SERVICE RISKS ALL EMPLOYEES

LOSSES AND LOSS ADJUSTMENT EXPENSE

POLICY PERIOD	PAYROLL	SERIOUS			NON-SERIOUS			MEDICAL TOTAL			PURE PREM. PER \$100 OF PAYROLL		
		CASES	AMOUNT	AMOUNT	CASES	AMOUNT	AMOUNT	CASES	AMOUNT	AMOUNT	SERIOUS	NON-SERIOUS	MEDICAL	TOTAL
82-83	924712	0	0	210	8	210	218	218	218	2%	STATE CRED.	STATE CRED.	0.02
83-84	402122	0	0	69	1274	69	1343	1343	49%	NAT. CRED.	48% CRED.	47% CRED.	0.33
84-85	0	0	0	0	0	0	0	0	0%	0.000	NAT. CRED.	NAT. CRED.	0.00
TOTAL	1326834	0	0	279	1282	279	1561	1561	2%	0.000	0.097	0.021	0.12
					P.P. UNDERLYING PRESENT RATE						0.414	0.591	1.55
					P.P. INDICATED BY NAT. REL.						1.906	1.473	4.01
					P.P. DERIVED BY FORMULA						1.201	0.977	2.69

CLASS:

LOSSES AND LOSS ADJUSTMENT EXPENSE

POLICY PERIOD	PAYROLL	SERIOUS			NON-SERIOUS			MEDICAL TOTAL			PURE PREM. PER \$100 OF PAYROLL		
		CASES	AMOUNT	AMOUNT	CASES	AMOUNT	AMOUNT	CASES	AMOUNT	AMOUNT	SERIOUS	NON-SERIOUS	MEDICAL	TOTAL
82-83											STATE CRED.	STATE CRED.	
83-84											NAT. CRED.	NAT. CRED.	
84-85													
TOTAL													

P.P. UNDERLYING PRESENT RATE
P.P. INDICATED BY NAT. REL.
P.P. DERIVED BY FORMULA

CLASS:

LOSSES AND LOSS ADJUSTMENT EXPENSE

POLICY PERIOD	PAYROLL	SERIOUS			NON-SERIOUS			MEDICAL TOTAL			PURE PREM. PER \$100 OF PAYROLL		
		CASES	AMOUNT	AMOUNT	CASES	AMOUNT	AMOUNT	CASES	AMOUNT	AMOUNT	SERIOUS	NON-SERIOUS	MEDICAL	TOTAL
82-83											STATE CRED.	STATE CRED.	
83-84											NAT. CRED.	NAT. CRED.	
84-85													
TOTAL													

P.P. UNDERLYING PRESENT RATE
P.P. INDICATED BY NAT. REL.
P.P. DERIVED BY FORMULA



ILLINOIS

APPENDIX B-V-III

CALCULATION OF PROPOSED ADVISORY RATES

The following items are combined with the proposed pure premiums (derived by formula) to obtain the final advisory rates.

A. Effects of the State and Federal Benefit Changes

The proposed partial pure premiums (derived by formula) as shown on Appendix B-V-II are multiplied by the weighted effects of the October 1, 1989 and October 1, 1990 federal benefit changes and the January 15, 1989 through July 15, 1990 state benefit changes.

The weighted effects of these factors are:

Serious: 1.011
 Non-Serious: 1.007
 Medical: 1.000

except for Code 9077F.

The federal benefits for Code 9077F are administered under the Non-Appropriated Fund Instrumentality Employees Longshore and Harbor Workers' Compensation Act. The separate effects are, by parts, serious 1.003, non-serious 1.005, and medical 1.000.

B. Effects of Change in Indemnity Assessment

The proposed partial pure premiums are multiplied by the weighted effects of the change in the United States Longshore and Harbor Workers' Compensation Act Special Fund assessment from 25.7% to 31.2% on indemnity losses only.

The weighted effects of this factor are:

Serious: 1.026
 Non-Serious: 1.026
 Medical: 1.000

except for Code 9077F.

The federal assessment for Code 9077F is administered under the Non-Appropriated Fund Instrumentality Employees Longshore and Harbor Workers' Compensation Act. The separate effects are, by parts, serious 1.044, non-serious 1.044, and medical 1.000.

The factors referred to in A and B are set out as follows:

	(1) Effect of State and Federal <u>Benefit Changes</u>	(2) Effect of Change in <u>Indemnity Assess.</u>	(3) Product <u>(1)x(2)</u>
Serious	1.011	1.026	1.037
Non-Serious	1.007	1.026	1.033
Medical	1.000	1.000	1.000

C. Ratio of Manual to Earned Premiums

The ratio of manual to earned premium is based upon a comparison of policy year manual premiums for "F" classifications with standard earned premiums (manual premiums modified to include the effects of experience rating).

Ratios of manual to earned premiums have been calculated on a national basis separately for three groups of "F" classifications. The three groups are "Shipbuilding and Repair" (includes Codes 6801F, 6803F, 6824F, 6825F, 6826F, 6827F, 6828F, 6829F, 6843F, 6845F, 6846F, 6869F, 6872F, 6873F, 6874F), "Stevedoring" (includes Codes 7309F, 7313F, 7317F, 7323F, 7327F, 7350F, 8709F, and 8726F) and "Non-Appropriated Fund Instrumentalities" (Code 9077F). The ratios, which are applied to the modified pure premiums, are:

Shipbuilding & Repair	1.017
Stevedoring	1.020
Non-App. Fund Inst.	.999

D. Expense Allowance

The expense allowance is introduced into the advisory rate by dividing the product of the derived by formula pure premium and the appropriate factors above by the proposed target cost ratio of .7278. This operation produces the indicated advisory rate.

E. Aggregate Update Factor

Loss development beyond a fifth report and excess losses above the accident limitations must be included at this time in the advisory rate calculation. The effect of the losses above the accident limitation is 1.049. The factor to reflect loss development beyond a fifth report is 1.061. The combined effect of the factors produces an Aggregate Update Factor of 1.113 ($1.113 = 1.049 \times 1.061$).

F. Test Correction Factor

The payrolls are now extended by the advisory rates presently in effect and by the indicated advisory rates. This determines the proposed advisory rate level change. Swing limits are then applied (Section G). The resulting advisory rates may not yield the proposed advisory rate level change. An iterative process is initiated which continuously tests the indicated advisory rates including test correction factors until the required change in manual premium is obtained. The test correction factor is 1.008.

APPENDIX B-V-III (CONTD.)

G. Swing Limits

As a further step a test is made to make certain that each proposed advisory rate falls within a Maximum Deviation from the present advisory rate of not more than 24% above and not less than 26% below. These limits have been calculated in accordance with the following formula:

$$\text{Maximum Deviation} = \text{Effect of final change in advisory rate level plus or minus 25\% rounded to the nearest 1\%}.$$

The classifications which have been so limited are listed at the end of this exhibit.

H. Federal-State Comparison

As a final step, a comparison is made between certain "F" classes and their corresponding state act codes. The comparison criteria is that the federal total pure premium should be greater than or equal to the corresponding state total pure premium, since federal benefits are higher than state benefits. If a class code fails to meet the above criteria, a payroll weighted combination of the federal and state total pure premium is computed. This produces no significant change in the overall statewide premium level. The following class codes were adjusted due to the Federal-State Comparison.

<u>Federal</u>		<u>State</u>	
6824F	7350F	6834	7360
6826F	8709F	6836	8719

LIST OF CLASSIFICATIONS LIMITED BY UPPER SWING

8726F	9077F
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LIST OF CLASSIFICATIONS LIMITED BY LOWER SWING

7313F



ILLINOIS

APPENDIX B-V-IV

CALCULATION OF PROPOSED ADVISORY RATE - CODE 7309F - STEVEDORING

	<u>Serious</u>	<u>Non-Serious</u>	<u>Medical</u>	<u>Total</u>
1. Adjusted derived by formula pure premiums	11.932	2.116	4.622	18.67
2. Weighted effect of benefit changes and change in indemnity assessment*	1.037	1.033	1.000	xx
3. Proposed pure premium (1)x(2)	12.373	2.186	4.622	19.181
4. Modified pure premium to rounded total	12.372	2.186	4.622	19.18
5. Ratio of manual to earned premium*				1.020
6. Target cost ratio*				.7278
7. Indicated advisory rate (4)x(5)/(6)				26.88
8. Aggregate update factor*				1.113
9. Test correction factor*				1.008
10. Proposed advisory rate ((7)x(8))x(9)				30.16
11. Proposed advisory loss cost (10) x .575+				17.34

* See Appendix B-V-III.

+ .575 = .7278/1.120/1.131

ILLINOIS

APPENDIX B-V-V

APPLIED EFFECTS OF THE FEDERAL AND STATE BENEFIT CHANGES

<u>Effective Date</u>	<u>Fatal</u>	<u>Perm. Total</u>	<u>Major P.P.</u>	<u>Minor P.P.</u>	<u>Temp.</u>	<u>Ser.</u>	<u>N. Ser.</u>	<u>Medical</u>	<u>Overall</u>
U.S. LONGSHORE AND HARBOR WORKERS' COMPENSATION ACT									
10-1-89	1.006	1.002	1.0002	1.0003	1.002	1.001	1.002	1.000	1.001
10-1-90	1.011	1.004	1.001	1.001	1.004	1.002	1.003	1.000	1.002
U.S. LONGSHORE AND HARBOR WORKERS' COMPENSATION ACT (NON-APPROPRIATED FUND)									
10-1-89	1.007	1.003	1.0005	1.001	1.003	1.001	1.002	1.000	1.001
10-1-90	1.011	1.004	1.001	1.001	1.004	1.002	1.003	1.000	1.002
STATE ACT									
1-15-89	1.005	1.009	1.0002	1.0003	1.001	1.001	1.001	1.000	1.001
7-1-89	1.000	1.000	1.008	1.007	1.000	1.007	1.004	1.000	1.004
7-15-89	1.009	1.015	1.0003	1.0004	1.002	1.002	1.001	1.000	1.001
1-15-90	1.002	1.005	1.0001	1.0001	1.0003	1.001	1.0002	1.000	1.0003
7-1-90	1.000	1.000	1.008	1.007	1.000	1.007	1.004	1.000	1.004
7-15-90	1.002	1.004	1.0001	1.0001	1.0004	1.001	1.0002	1.000	1.0003

**SECTION IIA
NCCI RATEMAKING PROCEDURES
TECHNICAL SUPPLEMENT**

PART II - SUPPORTING APPENDICES

APPENDIX C

**SECTION IIA
NCCI RATEMAKING PROCEDURES
TECHNICAL SUPPLEMENT**

December 6, 1991

NCCI Examination - Volume II - Section IIA

MILLIMAN & ROBERTSON, INC.

APPENDIX C-I

ILLINOIS LAW MEMO

INCREASE IN THE MAXIMUM AND MINIMUM WEEKLY BENEFITS



ILLINOIS LAW MEMO

Increase in the Maximum and Minimum Weekly Benefits

EFFECTIVE 01/15/1990

Change in the Minimum/Maximum Weekly Benefit for:

Fatal Injury and	from	\$226.78/\$604.73
Permanent Total Disability	to	\$229.12/\$610.97

Change in the Maximum Weekly Benefit for:

Temporary Total Disability	from	\$604.73
	to	\$610.97

Permanent Partial Disability:

Dismemberment	from	\$604.73
	to	\$610.97

TOTAL EFFECT: + 0.03 %

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- Exhibit II-A - Overall Effect Due to the Increase in the Maximum and Minimum Weekly Benefits, Effective 01/15/1990
- Exhibit III - Determination of the Monetary Cost and Effect of Amendments on Fatal Benefits
- Exhibit III-A - Valuation of Fatal Benefits, Effective 07/15/1989
- Exhibit III-B - Valuation of Fatal Benefits, Effective 01/15/1990
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- Exhibit III-D - Calculation of Remarriage Award for 206 Cases of Widow with Child(ren) Age 36 with Benefit Less Than \$240.38/week, Effective 07/15/1989
- Exhibit III-E - Calculation of Remarriage Award for 184 Cases of Widow Alone Age 51 with Benefit Greater Than \$240.38/week, Effective 07/15/1989
- Exhibit III-F - Calculation of Remarriage Award for 221 Cases of Widow with Child(ren) Age 36 with Benefit Greater Than \$240.38/week Effective 07/15/1989
- Exhibit III-G - Calculation of Remarriage Award for 172 Cases of Widow Alone Age 51 with Benefit Less Than \$240.38/week, Effective 01/15/1990
- Exhibit III-H - Calculation of Remarriage Award for 206 Cases of Widow with Child(ren) Age 36 with Benefit Less Than \$240.38/week, Effective 01/15/1990
- Exhibit III-I - Calculation of Remarriage Award for 184 Cases of Widow Alone Age 51 with Benefit Greater Than \$240.38/week, Effective 01/15/1990
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EXHIBIT I

Summary of the Principal Benefit Provisions Due to the Increase in the Maximum and Minimum Weekly Benefits, Effective 01/15/1990

	Effective 07/15/1989	Effective 01/15/1990
FATAL		
Rate of Compensation		66 2/3%
Minimum Weekly Benefit		
widow/children	50% SAWW*	50% SAWW**
others++		\$80.90
Maximum Weekly Benefit	133 1/3% SAWW*	133 1/3% SAWW**
Duration:		
widow/parent		Life, or remarriage
child		Age 18, or 25 if a student
other		5 years
Remarriage (widow alone only)		2-yr lump sum
Funeral Allowance		\$1,750
Maximum Aggregate		\$250,000 or benefits for 20 years, whichever is greater
TOTAL DISABILITY		
<u>Permanent Total</u>		
Rate of Compensation		66 2/3%
Minimum Weekly Benefit	50% SAWW*	50% SAWW**
Maximum Weekly Benefit	133 1/3% SAWW*	133 1/3% SAWW**
Duration		Life
<u>Temporary Total</u>		
Rate of Compensation		66 2/3%
Minimum Weekly Benefit++		Varies with dependency
Maximum Weekly Benefit	133 1/3% SAWW*	133 1/3% SAWW**
Waiting Period/Retro. After		3 days/13 days
PERMANENT PARTIAL DISABILITY		
<u>SCHEDULE</u>		
Rate of Compensation		60%
Duration		As per schedule
Minimum Weekly Benefit++		Varies with dependency
Maximum Weekly Benefit	133 1/3% SAWW* for amputation or enucleation,	133 1/3% SAWW** for amputation or enucleation,



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EXHIBIT I (CONTD.)

Summary of the Principal Benefit Provisions Due to the Increase in the Maximum and Minimum Weekly Benefits, Effective 01/15/1990

	Effective 07/15/1989	Effective 01/15/1990
PERMANENT PARTIAL DISABILITY (CONTD.)		
NON-SCHEDULE		
% Rate of Compensation		60%
Minimum Weekly Benefit++		Varies with dependency
Maximum Weekly Benefit		Same as for Schedule
Duration+ (exclusive of Healing Period)		2/3 of disability x 500 weeks
Healing Period Benefit		Same as Temporary Total

NOTES:

* Actual State Average Weekly Wage (SAWW) as of 07/15/1989 = \$453.55
 50% of \$453.55 = \$226.78
 133 1/3% of \$453.55 = \$604.73

** Actual SAWW as of 01/15/1990 = \$458.23
 50% of \$458.23 = \$229.12
 133 1/3% of \$458.23 = \$610.97

SAWW changes each January 15 and July 15; posted and published by Industrial Commission.

+ An injured worker may choose wage loss benefits, which are 66.6667% of his wage loss for the duration of his wage loss.

++ If the employee wage is less than the minimum, the employee receives his wage.

** On July 1 of each year, beginning in 1987, the maximum weekly compensation rate shall be determined as follows: If during the preceding twelve-month period there shall have been an increase in the State's average weekly wage in covered industries under 'The Unemployment Insurance Act,' the weekly compensation rate shall be proportionately increased by the same percentage as the percentage of increase in the State's average weekly wage in covered industries under 'The Unemployment Insurance Act' during such period.

*** (01/15/1989 SAWW)/(01/15/1988 SAWW) = 1.048 = \$435.67/\$415.70
 \$333.26 = \$318.00 x 1.048

EXHIBIT II

Impact by Type of Injury Due to the Increase in the Maximum and Minimum Weekly Benefits, Effective 01/15/1990

Type of Injury	Percentage of Losses*	Effect(%)
Fatal	3.0%	+ 0.2
Permanent Total	3.7%	+ 0.5
Major Permanent Partial	39.6%	+ 0.01
Minor Permanent Partial	11.0%	+ 0.01
Temporary Total	9.9%	+ 0.03
Indemnity	67.2%	+ 0.05**
Medical	32.8%	+ 0.0
Total	100.0%	+ 0.03**

* Losses for policies becoming effective during the 24-month period ending 03/31/1987 on the 07/15/1989 law level and developed to an ultimate basis by type of injury.

** Weighted Average.

EXHIBIT II-A

Overall Effect Due to the
Increase in the Maximum and Minimum Weekly Benefits, Effective 01/15/1990

Type of Injury	(1) Losses*	(2) Effect	(3) Modified Losses (1)x(2)
Fatal	60,809,118	1.002	60,930,736
Permanent Total	73,867,038	1.005	74,236,373
Major Permanent Partial (Serious)	799,186,946 (933,863,102)	1.0001 (1.001)	799,266,865 (934,433,974)
Minor Permanent Partial	220,877,755	1.0001	220,899,843
Temporary Total (Non-Serious)	198,661,642 (419,539,397)	1.0003 (1.0002)	198,721,240 (419,621,083)
Medical	659,520,211	1.000	659,520,211
Total/Effect	2,012,922,710	1.0003	2,013,575,268

* Losses for policies becoming effective during the 24-month period ending 03/31/1987 on the 07/15/1989 law level and developed to an ultimate basis by type of injury.

EXHIBIT III

Determination of the Monetary Cost and Effect of Amendments on Fatal Benefits

	<u>07/15/1989</u>	<u>01/15/1990</u>
1. Cost of Dependency	142,646,212	142,966,332
2. Remarriage Award*	1,188,742	1,190,807
3. Burial Cost (1000 Cases)	1,750,000	1,750,000
4. Total Cost (1) + (2) + (3)	145,584,954	145,907,139
5. Effect		1.002

*	203,539 (Exh. III-C)	204,701 (Exh. III-G)
	259,031 (Exh. III-D)	259,567 (Exh. III-H)
	324,392 (Exh. III-E)	324,559 (Exh. III-I)
	401,780 (Exh. III-F)	401,980 (Exh. III-J)
	<u>1,188,742</u>	<u>1,190,807</u>



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EXHIBIT III-A

Valuation of Fatal Benefits,
Effective 07/15/1989

(1) No. of Cases*	(2) Person Receiving Comp.	(3) No. of Dep.	(4) Average Pension Age	(5) Annuity Symbol†	(6) Annuity Value	(7) Average Weekly Benefit‡	(8) Monetary Cost (1)x(6)x(7)
147	None	None	xx	xxx	xxx	xxx	xxx
172	Widow Alone- Benefit less than \$240.38/wk	1	28	$\bar{a}'_{28}:\overline{21.1309/}$	570.21	227.52	22,314,279
184	Widow Alone- Benefit greater than \$240.38/wk	1	28	$\bar{a}'_{28}:\overline{20.0000/}$	554.08	342.67	34,935,453
206	Widow with Child(ren) - Benefit less than \$240.38/wk, after 8 years	3**	29	$8/\bar{a}'_{29}:\overline{13.1309/}$	270.49	227.52	12,677,628
221	Widow with Child(ren) - Benefit greater than \$240.38/wk, after 8 years	3**	29	$8/\bar{a}'_{29}:\overline{12.0000/}$	253.61	342.67	19,205,903
427	Widow with Child(ren), 1st 8 years	1 2**	29 10	a $\overline{416/}$	363.80	286.65	44,528,956
16	Orphan	1	11	$\bar{a} \ 11:\overline{7.0000/}$	323.10	286.65	1,481,866
10	Orphans	2	11	a $\overline{364/}$	323.59	286.65	927,571
7	Orphans	3	11	a $\overline{364/}$	323.59	286.65	649,300
3	Orphans	4	11	a $\overline{364/}$	323.59	286.65	278,271
1 (more than 4)	Orphans	5**	11	a $\overline{364/}$	323.59	286.65	92,757

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EXHIBIT III-A (Cont.)

Valuation of Fatal Benefits,
Effective 07/15/1989

(1) No. of Cases*	(2) Person Receiving Comp.	(3) No. of Dep.	(4) Average Pension Age	(5) Annuity Symbol†	(6) Annuity Value	(7) Average Weekly Benefit‡	(8) Monetary Cost (1)x(6)x(7)
6	Parent - Benefit less than \$240.38/wk	1	61	$\bar{a} 61:28.3139/$	673.93	169.80	686,600
7	Parent - Benefit greater than \$240.38/wk	1	61	$\bar{a} 61:20.0000/$	609.32	342.67	1,461,570
8	Parents - Benefit less than \$240.38/wk	2	50	$\bar{a} 50:28.3139/$	809.71	169.80	1,099,910
9	Parents - Benefit greater than \$240.38/wk	2	50	$\bar{a} 50:20.0000/$	687.71	342.67	2,120,918
1	Brother or Sister	1	23	$\bar{a} 23:5.0000/$	238.12	259.28	61,740
	Other Dependednts	1*	21	$\bar{a} 21:5.0000/$	238.14	259.28	123,490
							142,646,212

* 356 cases of widow alone, 427 cases of widow with child(ren), 13 cases of 1 parent, and 17 cases of parents are partitioned into those cases with weekly benefit less than/greater than:

$$\$240.38/\text{week} = [\$250,000.00] / [(52 \text{ weeks/year}) \times (20 \text{ years})]$$

according to worker percentages used to derive their respective average weekly benefits in Exhibit VIII.

+ In cases of widow and parent(s) with weekly benefit less than \$240.38, benefit duration is determined from:

$$21.1309 \text{ years} = [\$250,000.00] / [(52 \text{ weeks/year}) \times (\$227.52/\text{week})]$$

$$28.3139 \text{ years} = [\$250,000.00] / [(52 \text{ weeks/year}) \times (\$169.80/\text{week})]$$

‡ Exhibit VIII.

** Average.



EXHIBIT III-B

Valuation of Fatal Benefits,
Effective 01/15/1990

(1) No. of Cases*	(2) Person Receiving Comp.	(3) No. of Dep.	(4) Average Pension Age	(5) Annuity Symbol+	(6) Annuity Value	(7) Average Weekly Benefit@	(8) Monetary Cost (1)x(6)x(7)
147	None	None	xx	xxx	xxx	xxx	xxx
172	Widow Alone- Benefit less than \$240.38/wk	1	28	$\bar{a}'_{28} \overline{20.9833/}$	568.18	229.12	22,391,201
184	Widow Alone- Benefit greater than \$240.38/wk	1	28	$\bar{a}'_{28} \overline{20.0000/}$	554.08	342.85	34,953,804
206	Widow with Child(ren) - Benefit after 8 years	3**	29	$8/\bar{a}'_{29} \overline{12.9833/}$	268.36	229.12	12,666,248
221	Widow with Child(ren) - Benefit after 8 years	3**	29	$8/\bar{a}'_{29} \overline{12.0000/}$	253.61	342.85	19,215,992
427	Widow with Child(ren), 1st 8 years	1 2**	29 10	$a \overline{416/}$	363.80	287.99	44,737,115
16	Orphan	1	11	$\bar{a} \overline{11:7.0000/}$	323.10	287.99	1,488,793
10	Orphans	2	11	$a \overline{364/}$	323.59	287.99	931,907
7	Orphans	3	11	$a \overline{364/}$	323.59	287.99	652,335
3	Orphans	4	11	$a \overline{364/}$	323.59	287.99	279,572
1	Orphans (more than 4)	5**	11	$a \overline{364/}$	323.59	287.99	93,191

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EXHIBIT III-B (Cont.)

Valuation of Fatal Benefits,
Effective 01/15/1990

(1) No. of Cases*	(2) Person Receiving Comp.	(3) No. of Dep.	(4) Average Pension Age	(5) Annuity Symbol†	(6) Annuity Value	(7) Average Weekly Benefit‡	(8) Monetary Cost (1)x(6)x(7)
6	Parent - Benefit less than \$240.38/wk	1	61	$\bar{a} 61:28.3139/$	673.93	169.80	686,600
7	Parent - Benefit greater than \$240.38/wk	1	61	$\bar{a} 61:20.0000/$	609.32	342.85	1,462,338
8	Parents - Benefit less than \$240.38/wk	2	50	$\bar{a} 50:28.3139/$	809.71	169.80	1,099,910
9	Parents - Benefit greater than \$240.38/wk	2	50	$\bar{a} 50:20.0000/$	687.71	342.85	2,122,032
1	Brother or Sister	1	23	$\bar{a} 23: 5.0000/$	238.12	259.37	61,761
	Other Dependednts	1*	21	$\bar{a} 21: 5.0000/$	238.14	259.37	123,533
							142,966,332

* 356 cases of widow alone, 427 cases of widow with child(ren), 13 cases of 1 parent, and 17 cases of parents are partitioned into those cases with weekly benefit less than/greater than:

$$\$240.38/\text{week} = [\$250,000.00] / [(52 \text{ weeks/year}) \times (20 \text{ years})]$$

according to worker percentages used to derive their respective average weekly benefits in Exhibit VIII.

+ In cases of widow and parent(s) with weekly benefit less than \$240.38, benefit duration is determined from:

$$\begin{aligned} 20.9833 \text{ years} &= [\$250,000.00] / [(52 \text{ weeks/year}) \times (\$229.12/\text{week})] \\ 28.3139 \text{ years} &= [\$250,000.00] / [(52 \text{ weeks/year}) \times (\$169.80/\text{week})] \end{aligned}$$

‡ Exhibit VIII.

** Average.

EXHIBIT III-C

Calculation of Remarriage Award for 172 Cases
of Widow Alone
Age 51 with Benefit Less than \$240.38/week,
Effective 07/15/1989

n	Age at Remarriage	Remarriage Factor++	Lump Sum+	Cost (2) x (3)
0	51.5	0.3477	23,662	8,227
1	52.5	0.9726	23,662	23,014
2	53.5	1.1007	23,662	26,045
3	54.5	1.0311	23,662	24,398
4	55.5	0.9189	23,662	21,743
5	56.5	0.6241	23,662	14,767
6	57.5	0.5454	23,662	12,905
7	58.5	0.4766	23,662	11,277
8	59.5	0.4161	23,662	9,846
9	60.5	0.3628	23,662	8,585
10	61.5	0.3166	23,662	7,491
11	62.5	0.2753	23,662	6,514
12	63.5	0.2387	23,662	5,648
13	64.5	0.2073	23,662	4,905
14	65.5	0.1798	23,662	4,254
15	66.5	0.1551	23,662	3,670
16	67.5	0.1329	23,662	3,145
17	68.5	0.1142	23,662	2,702
18	69.5	0.0967	23,662	2,288
19	70.5	0.0827	19,295	1,596
20	71.5	0.0696	7,464	519
21	72.5	0.0589	0	0
				203,539

+ 104 weeks x \$227.52 Lump Sum; beyond 20 years, benefit is limited by maximum aggregate payable of \$250,000.00.

++ At age 51 + n + 0.5 = 172 x [(R(51+n) - R(51+n+1))/D(51)].

EXHIBIT III-D

Calculation of Remarriage Award for 206 Cases of Widow with Child(ren) Age 36 with Benefit Less than \$240.38/week, Effective 07/15/1989

n	Age at Remarriage	Remarriage Factor++	Lump Sum+	Cost (2) x (3)
0	36.5	1.8448	0	0
1	37.5	4.6921	0	0
2	38.5	4.9836	0	0
3	39.5	4.3893	0	0
4	40.5	3.6981	0	0
5	41.5	2.6617	0	0
6	42.5	2.3035	0	0
7	43.5	1.9964	0	0
8	44.5	1.7333	23,662	41,013
9	45.5	1.5069	23,662	35,656
10	46.5	1.3113	23,662	31,028
11	47.5	1.1433	23,662	27,053
12	48.5	0.9974	23,662	23,600
13	49.5	0.8702	23,662	20,591
14	50.5	0.7608	23,662	18,002
15	51.5	0.6644	23,662	15,721
16	52.5	0.5817	23,662	13,764
17	53.5	0.5086	23,662	12,034
18	54.5	0.4448	23,662	10,525
19	55.5	0.3888	19,295	7,502
20	56.5	0.3406	7,464	2,542
21	57.5	0.2976	0	0
				259,031

+ 104 weeks x \$227.52 Lump Sum; beyond 20 years, benefit is limited by maximum aggregate payable of \$250,000.00. Lump Sum is not awarded if children are dependent at time of remarriage.

++ At age 36 + n + 0.5 = 206 x [(R(36+n) - R(36+n+1))/D(36)].

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EXHIBIT III-E

Calculation of Remarriage Award for 184 Cases of Widow Alone
Age 51 with Benefit Greater than \$240.38/week, Effective 07/15/1989

n	Age at Remarriage	Remarriage Factor++	Lump Sum+	Cost (2) x (3)
0	51.5	0.3719	35,638	13,254
1	52.5	1.0405	35,638	37,081
2	53.5	1.1775	35,638	41,964
3	54.5	1.1030	35,638	39,309
4	55.5	0.9830	35,638	35,032
5	56.5	0.6677	35,638	23,795
6	57.5	0.5834	35,638	20,791
7	58.5	0.5098	35,638	18,168
8	59.5	0.4451	35,638	15,862
9	60.5	0.3881	35,638	13,831
10	61.5	0.3387	35,638	12,071
11	62.5	0.2945	35,638	10,495
12	63.5	0.2553	35,638	9,098
13	64.5	0.2217	35,638	7,901
14	65.5	0.1924	35,638	6,857
15	66.5	0.1660	35,638	5,916
16	67.5	0.1421	35,638	5,064
17	68.5	0.1221	35,638	4,351
18	69.5	0.1034	26,728	2,764
19	70.5	0.0885	8,909	788
20	71.5	0.0745	0	0
				324,392

+ 104 weeks x \$342.67 Lump Sum; beyond 20 years, benefit is limited by maximum aggregate payable of \$250,000.00.

++ At age 51 + n + 0.5 = 184 x [(R(51+n) - R(51+n+1))/D(51)].

EXHIBIT III-F

Calculation of Remarriage Award for 221 Cases of Widow with Child(ren) Age 36 with Benefit Greater than \$240.38/week, Effective 07/15/1989

n	Age at Remarriage	Remarriage Factor++	Lump Sum+	Cost (2) x (3)
0	36.5	1.9792	0	0
1	37.5	5.0337	0	0
2	38.5	5.3465	0	0
3	39.5	4.7089	0	0
4	40.5	3.9674	0	0
5	41.5	2.8555	0	0
6	42.5	2.4712	0	0
7	43.5	2.1417	0	0
8	44.5	1.8595	35,638	66,269
9	45.5	1.6166	35,638	57,612
10	46.5	1.4068	35,638	50,136
11	47.5	1.2265	35,638	43,710
12	48.5	1.0700	35,638	38,133
13	49.5	0.9336	35,638	33,272
14	50.5	0.8162	35,638	29,088
15	51.5	0.7128	35,638	25,403
16	52.5	0.6241	35,638	22,242
17	53.5	0.5456	35,638	19,444
18	54.5	0.4772	26,728	12,755
19	55.5	0.4171	8,909	3,716
20	56.5	0.3654	0	0
				401,780

+ 104 weeks x \$342.67 Lump Sum; beyond 20 years, benefit is limited by maximum aggregate payable of \$250,000.00. Lump Sum is not awarded if children are dependent at time of remarriage.

++ At age 36 + n + 0.5 = 221 x [(R(36+n) - R(36+n+1))/D(36)].

EXHIBIT III-G

Calculation of Remarriage Award for 172 Cases
of Widow Alone
Age 51 with Benefit Less than \$240.38/week,
Effective 01/15/1990

n	Age at Remarriage	Remarriage Factor++	Lump Sum+	Cost (2) x (3)
0	51.5	0.3477	23,828	8,285
1	52.5	0.9726	23,828	23,175
2	53.5	1.1007	23,828	26,227
3	54.5	1.0311	23,828	24,569
4	55.5	0.9189	23,828	21,896
5	56.5	0.6241	23,828	14,871
6	57.5	0.5454	23,828	12,996
7	58.5	0.4766	23,828	11,356
8	59.5	0.4161	23,828	9,915
9	60.5	0.3628	23,828	8,645
10	61.5	0.3166	23,828	7,544
11	62.5	0.2753	23,828	6,560
12	63.5	0.2387	23,828	5,688
13	64.5	0.2073	23,828	4,940
14	65.5	0.1798	23,828	4,284
15	66.5	0.1551	23,828	3,696
16	67.5	0.1329	23,828	3,167
17	68.5	0.1142	23,828	2,721
18	69.5	0.0967	23,828	2,304
19	70.5	0.0827	17,672	1,461
20	71.5	0.0696	5,758	401
21	72.5	0.0589	0	0
				204,701

+ 104 weeks x \$229.12 Lump Sum; beyond 20 years, benefit is limited by maximum aggregate payable of \$250,000.00.

++ At age 51 + n + 0.5 = 172 x [(R(51+n) - R(51+n+1))/D(51)].

EXHIBIT III-H

Calculation of Remarriage Award for 206 Cases of Widow with Child(ren) Age 36 with Benefit Less than \$240.38/week, Effective 01/15/1990

n	Age at Remarriage	Remarriage Factor++	Lump Sum+	Cost (2) x (3)
0	36.5	1.8448	0	0
1	37.5	4.6921	0	0
2	38.5	4.9836	0	0
3	39.5	4.3893	0	0
4	40.5	3.6981	0	0
5	41.5	2.6617	0	0
6	42.5	2.3035	0	0
7	43.5	1.9964	0	0
8	44.5	1.7333	23,828	41,301
9	45.5	1.5069	23,828	35,906
10	46.5	1.3113	23,828	31,246
11	47.5	1.1433	23,828	27,243
12	48.5	0.9974	23,828	23,766
13	49.5	0.8702	23,828	20,735
14	50.5	0.7608	23,828	18,128
15	51.5	0.6644	23,828	15,831
16	52.5	0.5817	23,828	13,861
17	53.5	0.5086	23,828	12,119
	54.5	0.4448	23,828	10,599
	55.5	0.3888	17,672	6,871
20	56.5	0.3406	5,758	1,961
21	57.5	0.2976	0	0
				259,567

+ 104 weeks x \$229.12 Lump Sum; beyond 20 years, benefit is limited by maximum aggregate payable of \$250,000.00. Lump Sum is not awarded if children are dependent at time of remarriage.

++ At age 36 + n + 0.5 = 206 x [(R(36+n) - R(36+n+1))/D(36)].



EXHIBIT III-I

Calculation of Remarriage Award for 184 Cases
of Widow Alone
Age 51 with Benefit Greater than \$240.38/week,
Effective 01/15/1990

n	Age at Remarriage	Remarriage Factor++	Lump Sum+	Cost (2) x (3)
0	51.5	0.3719	35,656	13,260
1	52.5	1.0405	35,656	37,100
2	53.5	1.1775	35,656	41,985
3	54.5	1.1030	35,656	39,329
4	55.5	0.9830	35,656	35,050
5	56.5	0.6677	35,656	23,808
6	57.5	0.5834	35,656	20,802
7	58.5	0.5098	35,656	18,177
8	59.5	0.4451	35,656	15,870
9	60.5	0.3881	35,656	13,838
10	61.5	0.3387	35,656	12,077
11	62.5	0.2945	35,656	10,501
12	63.5	0.2553	35,656	9,103
13	64.5	0.2217	35,656	7,905
14	65.5	0.1924	35,656	6,860
15	66.5	0.1660	35,656	5,919
16	67.5	0.1421	35,656	5,067
17	68.5	0.1221	35,656	4,354
18	69.5	0.1034	26,742	2,765
19	70.5	0.0885	8,914	789
20	71.5	0.0745	0	0
				324,559

+ 104 weeks x \$342.85 Lump Sum; beyond 20 years, benefit is limited by maximum aggregate payable of \$250,000.00.

++ At age 51 + n + 0.5 = 184 x [(R(51+n) - R(51+n+1))/D(51)].

EXHIBIT III-J

Calculation of Remarriage Award for 221 Cases of Widow with Child(ren) Age 36 with Benefit Greater than \$240.38/week, Effective 01/15/1990

n	Age at Remarriage	Remarriage Factor++	Lump Sum+	Cost (2) x (3)
0	36.5	1.9792	0	0
1	37.5	5.0337	0	0
2	38.5	5.3465	0	0
3	39.5	4.7089	0	0
4	40.5	3.9674	0	0
5	41.5	2.8555	0	0
6	42.5	2.4712	0	0
7	43.5	2.1417	0	0
8	44.5	1.8595	35,656	66,302
9	45.5	1.6166	35,656	57,641
10	46.5	1.4068	35,656	50,161
11	47.5	1.2265	35,656	43,732
12	48.5	1.0700	35,656	38,152
13	49.5	0.9336	35,656	33,288
14	50.5	0.8162	35,656	29,102
15	51.5	0.7128	35,656	25,416
16	52.5	0.6241	35,656	22,253
17	53.5	0.5456	35,656	19,454
18	54.5	0.4772	26,742	12,761
19	55.5	0.4171	8,914	3,718
20	56.5	0.3654	0	0
				401,980

+ 104 weeks x \$342.85 Lump Sum; beyond 20 years, benefit is limited by maximum aggregate payable of \$250,000.00. Lump Sum is not awarded if children are dependent at time of remarriage.

++ At age 36 + n + 0.5 = 221 x [(R(36+n) - R(36+n+1))/D(36)].



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EXHIBIT IV

Determination of the Monetary Cost and Effect
of Amendments on Permanent Total Benefits

	07/15/1989	01/15/1990
1. Average Weekly Benefit (Exh. VIII)	<u>286.65</u>	<u>287.99</u>
2. Effect		1.005



EXHIBIT V

Determination of the Monetary Cost and Effect
of Amendments on Permanent Partial Benefits

	Major Perm. Partial Law Effective	
	07/15/1989	01/15/1990
I. PERMANENT PARTIAL SCHEDULE INJURIES		
1. Cost in Units of Wks. Wages (Exh. V-A)		
a. Dismemberment	5,395	5,395
b. Loss of Use	49,362	49,362
2. Average Wkly. Benefit (Exh. VIII)		
a. Dismemberment	234.26	234.31
b. Loss of Use	220.67	220.67
3. Cost of Schedule Injuries (1a)x(2a) + (1b)x(2b)	12,156,545	12,156,815
II. PERMANENT PARTIAL NON-SCHEDULE INJURIES		
4. Cost in Units of Wks. Wages (Exh. V-A)	101,776	101,776
5. Average Wkly. Benefit (Exh. VIII)	220.67	220.67
6. Cost of Non-Schedule Injuries (4)x(5)	22,458,910	22,458,910
III. PERMANENT PARTIAL (HEALING PERIOD)		
7. Cost in Units of Wks. Wages (Exh. V-A)	30,848	30,848
8. Average Wkly. Benefit (Exh. VIII)	259.84	259.93
9. Cost of Healing Period (7)x(8)	8,015,544	8,018,321
TOTAL COST AND EFFECT		
10. Total Cost of Major Permanent Partial Benefits (3) + (6) + (9)	42,630,999	42,634,046
11. Effect		1.0001

Determination of the Monetary Cost and Effect
of Amendments on Permanent Partial Benefits

	Minor Perm. Partial Law Effective	
	07/15/1989	01/15/1990
A. PERMANENT PARTIAL SCHEDULE INJURIES		
1. Cost in Units of Wks. Wages (Exh. V-B)		
a. Dismemberment	4,638	4,638
b. Loss of Use	39,987	39,987
2. Average Wkly. Benefit (Exh. VIII)		
a. Dismemberment	234.26	234.31
b. Loss of Use	220.67	220.67
3. Cost of Schedule Injuries (1a)x(2a) + (1b)x(2b)	9,910,429	9,910,661
B. PERMANENT PARTIAL NON-SCHEDULE INJURIES		
4. Cost in Units of Wks. Wages (Exh. V-B)	56,000	56,000
5. Average Wkly. Benefit (Exh. VIII)	220.67	220.67
6. Cost of Non-Schedule Injuries (4)x(5)	12,357,520	12,357,520
C. PERMANENT PARTIAL (HEALING PERIOD)		
7. Cost in Units of Wks. Wages (Exh. V-B)	31,717	31,717
8. Average Wkly. Benefit (Exh. VIII)	259.84	259.93
9. Cost of Healing Period (7)x(8)	8,241,345	8,244,200
D. TOTAL COST AND EFFECT		
10. Total Cost of Minor Permanent Partial Benefits (3) + (6) + (9)	30,509,294	30,512,381
11. Effect		1.0001

EXHIBIT V-A

Valuation of Major Permanent Partial

(1) LAW EFFECTIVE 07/15/1989 and 01/15/1990	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Type of Benefit	Case freq.	Avg.% Loss	Sched. At 100%	Payable (3)x(4)	Com-muted+	Weeks Payable for Sched. (2)x(6)	Avg. H.P. (Wks)	Weeks Payable for H.P. (2)x(8)
A. SCHEDULE INJURIES								
Arm:								
Dism. above elbow	4	100%	275.00	275.00	251.50	1,006	33	132
Dism. below elbow	3	100%	235.00	235.00	217.69	653	18	54
Loss of use	81	53%	235.00	124.55	119.57	9,685	27	2,187
Hand:								
Dismemberment	5	100%	190.00	190.00	178.57	893	29	145
Loss of use	139	56%	190.00	106.40	102.75	14,282	20	2,780
Leg:								
Dism. above knee	6	100%	250.00	250.00	230.47	1,383	34	204
Dism. below knee	3	100%	200.00	200.00	187.37	562	39	117
Loss of use	145	53%	200.00	106.00	102.38	14,845	34	4,930
Foot:								
Dismemberment	3	100%	155.00	155.00	147.34	442	26	78
Loss of use	69	51%	155.00	79.05	77.02	5,314	25	1,725
Eye:								
Enucleation	3	100%	160.00	160.00	151.84	456	20	60
Loss of use	38	88%	150.00	132.00	126.42	4,804	14	532
Ears:								
Hearing (2 ears)	4	56%	200.00	112.00	107.96	432	3	12
Total Schedule Injuries								
	503	XX	XX	XX	XX	54,757	XX	12,956
Dismemberment						5,395		
Loss of Use						49,362		
B. OTHER MAJOR INJURIES								
	497	44%*	500.00	220.00	204.78	101,776	36	17,892
	<u>1,000</u>							<u>30,848</u>

+ Commuted if over 52 weeks.
* Average percent of disability.

EXHIBIT V-B

Valuation of Minor Permanent Partial

(1) LAW EFFECTIVE 07/15/1989 and 01/15/1990	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Type of Benefit	Case freq.	Avg.% Loss	Sched. At 100%	Payable (3)x(4)	Com-muted+	Weeks Payable for Sched. (2)x(6)	Avg. H.P. (Wks)	Weeks Payable for H.P. (2)x(8)
A. SCHEDULE INJURIES								
Thumb:								
Dism. 1 phalange	23	100%	35.00	35.00	35.00	805	6	138
Dism. 2 or more	5	100%	70.00	70.00	68.41	342	6	30
Loss of use	164	25%	70.00	17.50	17.50	2,870	4	656
Index Finger:								
Dism. 1 phalange	48	100%	20.00	20.00	20.00	960	5	240
Dism. 2 or more	18	100%	40.00	40.00	40.00	720	8	144
Loss of use	216	32%	40.00	12.80	12.80	2,765	4	864
Middle Finger:								
Dism. 1 phalange	32	100%	17.50	17.50	17.50	560	3	96
Dism. 2 or more	11	100%	35.00	35.00	35.00	385	7	77
Loss of use	152	29%	35.00	10.15	10.15	1,543	3	456
Ring Finger:								
Dism. 1 phalange	19	100%	12.50	12.50	12.50	238	4	76
Dism. 2 or more	8	100%	25.00	25.00	25.00	200	4	32
Loss of use	98	31%	25.00	7.75	7.75	760	3	294
Little Finger:								
Dism. 1 phalange	15	100%	10.00	10.00	10.00	150	2	30
Dism. 2 or more	8	100%	20.00	20.00	20.00	160	5	40
Loss of use	95	36%	20.00	7.20	7.20	684	3	285
Great Toe:								
Dism. 1 phalange	2	100%	17.50	17.50	17.50	35	6	12
Dism. 2 or more	1	100%	35.00	35.00	35.00	35	12	12
Loss of use	50	26%	35.00	9.10	9.10	455	4	200
Other Toes:								
Amputation	4	100%	12.00	12.00	12.00	48	9	36
Loss of use	21	29%	12.00	3.48	3.48	73	2	42
Ear:								
One ear	10	37%	50.00	18.50	18.50	185	3	30

EXHIBIT V-B (Cont.)

Valuation of Minor Permanent Partial

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
LAW EFFECTIVE 07/15/1989 and 01/15/1990			Weeks Duration			Weeks Payable for Sched.	Avg. H.P. (Wks)	Weeks Payable for H.P. (2)x(8)
Type of Benefit	Case freq.	Avg.% Loss	Sched. At 100%	Payable (3)x(4)	Com- muted+	(2)x(6)	(8)	(9)
MAJOR MEMBERS								
Arm	259	13%	235.00	30.55	30.55	7,912	10	2,590
Hand	308	13%	190.00	24.70	24.70	7,608	8	2,464
Leg	386	13%	200.00	26.00	26.00	10,036	13	5,018
Foot	202	13%	155.00	20.15	20.15	4,070	10	2,020
Eye	32	15%	150.00	22.50	22.50	720	4	128
Hearing (2 ears)	9	17%	200.00	34.00	34.00	306	3	27
Total Schedule Injuries	2,196	xx	xx	xx	xx	44,625	xx	16,037
Dismemberment						4,638		
Loss of Use						39,987		
OTHER MINOR INJURIES	1,120	10%*	500.00	50.00	50.00	56,000	14	15,680
	<u>3,316</u>							<u>31,717</u>

+ Commuted if over 52 weeks.

* Average percent of disability.



EXHIBIT VI

Determination of the Monetary Cost and Effect
of Amendments on Temporary Total Benefits

	07/15/1989	01/15/1990
1. Waiting Period (days)	3	3
2. Retroactive After (days)	13	13
3. Days Disability Based on (1)	2,776,360	2,776,360
4. Total Cases Based on (2)	42,105	42,105
5. Additional Days Based on (2) ((4) x (1))	126,315	126,315
6. Cost in Days ((3) + (5))	2,902,675	2,902,675
7. Cost in Weeks	414,668	414,668
8. Avg. Wkly. Benefit (Exh. VIII)	259.84	259.93
9. Monetary Cost (7) x (8)	107,747,333	107,784,653
10. Effect		1.0003



EXHIBIT VI-A

Temporary Total Accident Distribution According
to Duration of Disability

(1) Disability Period (Days)	(2) Total Cases	(3) Summation of Col. 2 Upward	(4) Days Disability Lasting Col. 1 and Over
1	8,973	103,371	3,060,329
2	8,198	94,398	2,956,958
3	6,236	86,200	2,862,560
4	7,077	79,964	2,776,360
5	6,437	72,887	2,696,396
6	5,156	66,450	2,623,509
7	4,854	61,294	2,557,059
8	2,351	56,440	2,495,765
9	2,407	54,089	2,439,325
10	2,865	51,682	2,385,236
11	2,665	48,817	2,333,554
12	2,156	46,152	2,284,737
13	1,891	43,996	2,238,585
14	2,860	42,105	2,194,589
15	1,563	39,245	2,152,484
16	1,621	37,682	2,113,239
17	1,703	36,061	2,075,557
18	1,486	34,358	2,039,496
19	1,096	32,872	2,005,138
20	888	31,776	1,972,266
21	2,009	30,888	1,940,490
22	854	28,879	1,909,602
23	910	28,025	1,880,723
24	961	27,115	1,852,698
25	762	26,154	1,825,583
26	590	25,392	1,799,429
27	467	24,802	1,774,037
28	1,480	24,335	1,749,235
29	532	22,855	1,724,900
30	604	22,323	1,702,045
31	655	21,719	1,679,722
32	603	21,064	1,658,003
33	437	20,461	1,636,939
34	376	20,024	1,616,478
35	894	19,648	1,596,454
36	389	18,754	1,576,806
37	390	18,365	1,558,052
38	442	17,975	1,539,687
39	424	17,533	1,521,712
40	287	17,109	1,504,179
41	274	16,822	1,487,070
42	1,160	16,548	1,470,248



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EXHIBIT VI-A (Cont.)

Temporary Total Accident Distribution According to Duration of Disability

(1) Disability Period (Days)	(2) Total Cases	(3) Summation of Col. 2 Upward	(4) Days Disability Lasting Col. 1 and Over
43 - 49	2,692	15,388	1,403,700 - 1,366,629
50 - 56	2,155	12,696	1,353,205 - 1,281,192
57 - 63	1,725	10,541	1,270,007 - 1,210,298
64 - 70	1,258	8,816	1,201,053 - 1,150,461
71 - 77	987	7,558	1,142,491 - 1,099,160
78 - 84	807	6,571	1,092,325 - 1,054,427
85 - 91	626	5,764	1,048,409 - 1,015,082
92 - 98	544	5,138	1,009,770 - 979,894
99 - 105	423	4,594	975,102 - 948,240
106 - 112	342	4,171	943,909 - 919,548
113 - 119	273	3,829	915,620 - 893,144
120 - 126	271	3,556	889,496 - 868,653
127 - 133	231	3,285	865,275 - 846,026
134 - 140	217	3,054	842,900 - 824,849
141 - 147	196	2,837	821,900 - 805,306
148 - 154	167	2,641	802,615 - 787,062
155 - 161	137	2,474	784,524 - 769,952
162 - 168	130	2,337	767,578 - 753,784
169 - 175	116	2,207	751,530 - 738,480
176 - 182	129	2,091	736,343 - 723,948
183 - 189	86	1,962	721,921 - 710,316
190 - 196	92	1,876	708,412 - 697,317
197 - 203	62	1,784	695,503 - 684,914
204 - 210	74	1,722	683,169 - 672,957
211 - 217	73	1,648	671,280 - 661,521
218 - 224	55	1,575	659,919 - 650,588
225 - 231	63	1,520	649,050 - 640,049
232 - 266	220	1,457	638,570 - 592,396
267 - 301	203	1,237	591,139 - 552,653
302 - 336	95	1,034	551,611 - 518,088
337 - 371	104	939	517,143 - 486,802
372 - 406	80	835	485,961 - 458,672
407 - 441	67	755	457,909 - 433,213
442 - 476	64	688	432,519 - 410,069
477 - 511	58	624	409,434 - 389,141
512 - 581	80	566	388,570 - 352,003
582 - 651	65	486	351,514 - 320,191
652 and Over	xx	421	319,770 - xxx



Calculation of Average Minimum Weekly Benefit
for Temporary Total and Permanent Partial Disability,
Effective 07/15/1989 and 01/15/1990

<u>Type of Dependency</u>	<u>Number of Cases</u>	<u>Temporary Total</u>	<u>Permanent Partial</u>
Worker alone	180	100.90	80.90
Worker and wife	356	105.50	83.20
Worker (wife) and child	152	108.30	86.10
Worker (wife) and two children	139	113.40	88.90
Worker (wife) and three children	89	117.40	91.80
Worker (wife) and four or more children	84	124.30	96.90
Total/Weighted Average	<u>1,000</u>	<u>108.83</u>	<u>85.94</u>



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EXHIBIT VIII

Average Weekly Benefits

Type of Injury	07/15/1989	01/15/1990
<u>Fatal Injuries:</u>		
<u>Widows (Exh. VIII-A, VIII-H)</u>		
Weekly benefit for split	240.38	240.38
Average weekly benefit below split	227.52	229.12
Average weekly benefit above split	342.67	342.85
<u>Parents (Exh. VIII-B, VIII-I)</u>		
Weekly benefit for split	240.38	240.38
Average weekly benefit below split	169.80	169.80
Average weekly benefit above split	342.67	342.85
Brother, Sister, Other (Exh. VIII-C, VIII-J)	259.28	259.37
<u>Permanent Total and Fatal:</u>		
Widow and Child(ren) (Exh. VIII-D, VIII-K)	286.65	287.99
<u>Temporary Total Disabilities:</u>		
All cases (Exh. VIII-E, VIII-L)	259.84	259.93
<u>Permanent Partial Disabilities:</u>		
Amputation or Enucleation (Exh. VIII-F, VIII-M)	234.26	234.31
Loss of Use (Exh. VIII-G, VIII-N)	220.67	220.67



EXHIBIT VIII-A

Calculation of Average Weekly Benefit
Effective 07/15/1989

1) Class of Injury	Fatal Widows
2) Nominal Rate of Compensation	0.6667
3) Minimum Weekly Compensation	226.78
4) Maximum Weekly Compensation	604.73
5) Average Weekly Wage for the 12 months ending 12/31/1988	391.29

(A) Wage Intervals	(B) Ratios to Average (A)/(5)	(C) Percentage in Interval of Workers	(D) Wages	(E) Average Wage in Interval	(F) Average Benefit in Interval
Benefits less than \$240.38:					
0.00 - 340.15	0.00 - 0.85	42.9709	26.6884	243.02	226.78
340.15 - 360.55	0.85 - 0.90	5.2612	4.5260	350.35	233.58*
Total/Average		48.2321			227.52
Benefits greater than \$240.38:					
360.55 - 907.05	0.90 - 2.30	50.1402	64.2256	501.21	334.16*
907.05 & over	2.30 & over	1.6277	4.5600	1096.20	604.73
Total/Average		51.7679			342.67

* (E)x(2) = Average wage within interval x nominal rate of compensation



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EXHIBIT VIII-B

Calculation of Average Weekly Benefit
Effective 07/15/1989

1) Class of Injury	Fatal Parents
2) Nominal Rate of Compensation	0.6667
3) Minimum Weekly Compensation	80.90
4) Maximum Weekly Compensation	604.73
5) Average Weekly Wage for the 12 months ending 12/31/1988	391.29

(A) Wage Intervals	(B) Ratios to Average (A)/(5)	(C) Percentage in Interval of Workers	(D) Interval of Wages	(E) Average Wage in Interval	(F) Average Benefit in Interval
Benefits less than \$240.38:					
0.00 - 80.90	0.00 - 0.20	1.4357	0.1903	51.86	51.86@
80.90 - 121.34	0.20 - 0.30	1.4701	0.3726	99.17	80.90
121.34 - 360.55	0.30 - 0.90	45.3263	30.6515	264.61	176.42*
		-----			-----
	Total/Average	48.2321			169.80
Benefits greater than \$240.38:					
360.55 - 907.05	0.90 - 2.30	50.1402	64.2256	501.21	334.16*
907.05 & over	2.30 & over	1.6277	4.5600	1096.20	604.73
		-----			-----
	Total/Average	51.7679			342.67

@ Average wage within interval.

* (E)x(2) = Average wage within interval x nominal rate of compensation



EXHIBIT VIII-C

Calculation of Average Weekly Benefit Effective 07/15/1989

1) Class of Injury	Fatal Brother, Sister, Other
2) Nominal Rate of Compensation	0.6667
3) Minimum Weekly Compensation	80.90
4) Maximum Weekly Compensation	604.73
5) Average Weekly Wage for the 12 months ending 12/31/1988	391.29

(A) Wage Intervals	(B) Ratios to Average (A)/(5)	(C) Percentage in Interval of Workers	(D) Interval of Wages	(E) Average Wage in Interval	(F) Average Benefit in Interval
0.00 - 80.90	0.00 - 0.20	1.4357	0.1903	51.86	51.86 ^e
80.90 - 121.34	0.20 - 0.30	1.4701	0.3726	99.17	80.90
121.34 - 907.05	0.30 - 2.30	95.4665	94.8771	388.87	259.26*
907.05 & over	2.30 & over	1.6277	4.5600	1096.20	604.73

Average Weekly Benefit [(Sum (C)x(F))/100]: 259.28

^e Average wage within interval.

* (E)x(2) = Average wage within interval x nominal rate of compensation



EXHIBIT VIII-D

Calculation of Average Weekly Benefit
Effective 07/15/1989

1) Class of Injury	Permanent Total and Fatal Widow and Child(ren)
2) Nominal Rate of Compensation	0.6667
3) Minimum Weekly Compensation	226.78
4) Maximum Weekly Compensation	604.73
5) Average Weekly Wage for the 12 months ending 12/31/1988	391.29

(A) Wage Intervals	(B) Ratios to Average (A)/(5)	(C) Percentage in Interval of Workers	(D) Interval of Wages	(E) Average Wage in Interval	(F) Average Benefit in Interval
0.00 - 340.15	0.00 - 0.85	42.9709	26.6884	243.02	226.78
340.15 - 907.05	0.85 - 2.30	55.4014	68.7516	485.58	323.74*
907.05 & over	2.30 & over	1.6277	4.5600	1096.20	604.73

Average Weekly Benefit $[(\text{Sum } (C) \times (F)) / 100]$: 286.65

* $(E) \times (2) = \text{Average wage within interval} \times \text{nominal rate of compensation}$

EXHIBIT VIII-E

Calculation of Average Weekly Benefit
Effective 07/15/1989

1) Class of Injury	Temporary Total All cases
2) Nominal Rate of Compensation	0.6667
3) Minimum Weekly Compensation	108.83
4) Maximum Weekly Compensation	604.73
5) Average Weekly Wage for the 12 months ending 12/31/1988	391.29

(A) Wage Intervals	(B) Ratios to Average (A)/(5)	(C) Percentage in Interval of Workers	(D) Interval of Wages	(E) Average Wage in Interval	(F) Average Benefit in Interval
0.00 - 108.83	0.00 - 0.30	2.9058	0.5629	75.80	75.80 ^a
108.83 - 163.24	0.30 - 0.40	1.8270	0.6544	140.15	108.83
163.24 - 907.05	0.40 - 2.30	93.6395	94.2227	393.73	262.50*
907.05 & over	2.30 & over	1.6277	4.5600	1096.20	604.73

Average Weekly Benefit [(Sum (C)x(F))/100]: 259.84

^a Average wage within interval.

* (E)x(2) = Average wage within interval x nominal rate of compensation



EXHIBIT VIII-F

Calculation of Average Weekly Benefit
Effective 07/15/1989

1) Class of Injury	Permanent Partial Amputation or Enuclation
2) Nominal Rate of Compensation	0.6000
3) Minimum Weekly Compensation	85.94
4) Maximum Weekly Compensation	604.73
5) Average Weekly Wage for the 12 months ending 12/31/1988	391.29

(A) Wage Intervals	(B) Ratios to Average (A)/(5)	(C) Percentage in Interval of Workers	(D) Interval of Wages	(E) Average Wage in Interval	(F) Average Benefit in Interval
0.00 - 85.94	0.00 - 0.20	1.4357	0.1903	51.86	51.86 ^a
85.94 - 143.23	0.20 - 0.35	2.3018	0.6490	110.33	85.94
143.23 - 1007.88	0.35 - 2.60	95.5903	96.8911	396.61	237.97*
1007.88 & over	2.60 & over	0.6722	2.2696	1321.14	604.73

Average Weekly Benefit [(Sum (C)x(F))/100]: 234.26

^a Average wage within interval.

* (E)x(2) = Average wage within interval x nominal rate of compensation

EXHIBIT VIII-G

Calculation of Average Weekly Benefit
Effective 07/15/1989

1) Class of Injury	Permanent Partial Loss of Use
2) Nominal Rate of Compensation	0.6000
3) Minimum Weekly Compensation	85.94
4) Maximum Weekly Compensation	333.26
5) Average Weekly Wage for the 12 months ending 12/31/1988	391.29

(A) Wage Intervals	(B) Ratios to Average (A)/(5)	(C) Percentage in Interval of Workers	(D) Interval of Wages	(E) Average Wage in Interval	(F) Average Benefit in Interval
0.00 - 85.94	0.00 - 0.20	1.4357	0.1903	51.86	51.86 ^a
85.94 - 143.23	0.20 - 0.35	2.3018	0.6490	110.33	85.94
143.23 - 555.43	0.35 - 1.40	80.8060	70.8932	343.29	205.97*
555.43 & over	1.40 & over	15.4565	28.2675	715.61	333.26

Average Weekly Benefit [(Sum (C)x(F))/100]: 220.67

^a Average wage within interval.

* (E)x(2) = Average wage within interval x nominal rate of compensation



Calculation of Average Weekly Benefit
Effective 01/15/1990

1) Class of Injury	Fatal Widows
2) Nominal Rate of Compensation	0.6667
3) Minimum Weekly Compensation	229.12
4) Maximum Weekly Compensation	610.97
5) Average Weekly Wage for the 12 months ending 12/31/1988	391.29

(A) Wage Intervals	(B) Ratios to Average (A)/(5)	(C) Percentage in Interval of Workers	(D) Percentage in Interval of Wages	(E) Average Wage in Interval	(F) Average Benefit in Interval
Benefits less than \$240.38:					
0.00 - 343.66	0.00 - 0.90	48.2321	31.2144	253.23	229.12
343.66 - 360.55	0.90 - 0.90	0.0000	0.0000	352.11	234.75*
Total/Average		48.2321			229.12
Benefits greater than \$240.38:					
360.55 - 916.41	0.90 - 2.35	50.3964	64.8225	503.30	335.55*
916.41 & over	2.35 & over	1.3715	3.9631	1130.68	610.97
Total/Average		51.7679			342.85

* (E)x(2) = Average wage within interval x nominal rate of compensation

EXHIBIT VIII-I

Calculation of Average Weekly Benefit Effective 01/15/1990

1) Class of Injury	Fatal Parents
2) Nominal Rate of Compensation	0.6667
3) Minimum Weekly Compensation	80.90
4) Maximum Weekly Compensation	610.97
5) Average Weekly Wage for the 12 months ending 12/31/1988	391.29

(A) Wage Intervals	(B) Ratios to Average (A)/(5)	(C) Percentage in Interval of Workers	(D) Interval of Wages	(E) Average Wage in Interval	(F) Average Benefit in Interval
Benefits less than \$240.38:					
0.00 - 80.90	0.00 - 0.20	1.4357	0.1903	51.86	51.86@
80.90 - 121.34	0.20 - 0.30	1.4701	0.3726	99.17	80.90
121.34 - 360.55	0.30 - 0.90	45.3263	30.6515	264.61	176.42*
Total/Average		48.2321			169.80
Benefits greater than \$240.38:					
360.55 - 916.41	0.90 - 2.35	50.3964	64.8225	503.30	335.55*
916.41 & over	2.35 & over	1.3715	3.9631	1130.68	610.97
Total/Average		51.7679			342.85

@ Average wage within interval.

* (E)x(2) = Average wage within interval x nominal rate of compensation



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EXHIBIT VIII-J

Calculation of Average Weekly Benefit
Effective 01/15/1990

1) Class of Injury	Brother, Sister, Other	Fatal
2) Nominal Rate of Compensation		0.6667
3) Minimum Weekly Compensation		80.90
4) Maximum Weekly Compensation		610.97
5) Average Weekly Wage for the 12 months ending 12/31/1988		391.29

(A) Wage Intervals	(B) Ratios to Average (A)/(5)	(C) Percentage in Interval of Workers	(D) Interval of Wages	(E) Average Wage in Interval	(F) Average Benefit in Interval
0.00 - 80.90	0.00 - 0.20	1.4357	0.1903	51.86	51.86 ^e
80.90 - 121.34	0.20 - 0.30	1.4701	0.3726	99.17	80.90
121.34 - 916.41	0.30 - 2.35	95.7227	95.4740	390.27	260.19*
916.41 & over	2.35 & over	1.3715	3.9631	1130.68	610.97

Average Weekly Benefit [(Sum (C)x(F))/100]: 259.37

^e Average wage within interval.

* (E)x(2) = Average wage within interval x nominal rate of compensation



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EXHIBIT VIII-K

Calculation of Average Weekly Benefit
Effective 01/15/1990

1) Class of Injury	Permanent Total and Fatal Widow and Child(ren)
2) Nominal Rate of Compensation	0.6667
3) Minimum Weekly Compensation	229.12
4) Maximum Weekly Compensation	610.97
5) Average Weekly Wage for the 12 months ending 12/31/1988	391.29

(A) Wage Intervals	(B) Ratios to Average (A)/(5)	(C) Percentage in Interval of Workers	(D) Interval of Wages	(E) Average Wage in Interval	(F) Average Benefit in Interval
0.00 - 343.66	0.00 - 0.90	48.2321	31.2144	253.23	229.12
343.66 - 916.41	0.90 - 2.35	50.3964	64.8225	503.30	335.55*
916.41 & over	2.35 & over	1.3715	3.9631	1130.68	610.97

Average Weekly Benefit $[(\text{Sum } (C) \times (F)) / 100]$: 287.99

* $(E) \times (2) = \text{Average wage within interval} \times \text{nominal rate of compensation}$



Calculation of Average Weekly Benefit
Effective 01/15/1990

1) Class of Injury	Temporary Total
	All cases
2) Nominal Rate of Compensation	0.6667
3) Minimum Weekly Compensation	108.83
4) Maximum Weekly Compensation	610.97
5) Average Weekly Wage for the 12 months ending 12/31/1988	391.29

(A) Wage Intervals	(B) Ratios to Average (A)/(5)	(C) Percentage in Interval of - Workers	(D) Interval of - Wages	(E) Average Wage in Interval	(F) Average Benefit in Interval
0.00 - 108.83	0.00 - 0.30	2.9058	0.5629	75.80	75.80 ^a
108.83 - 163.24	0.30 - 0.40	1.8270	0.6544	140.15	108.83
163.24 - 916.41	0.40 - 2.35	93.8957	94.8196	395.14	263.44*
916.41 & over	2.35 & over	1.3715	3.9631	1130.68	610.97

Average Weekly Benefit $[(\text{Sum } (C) \times (F)) / 100]$: 259.93

^a Average wage within interval.

* $(E) \times (2)$ = Average wage within interval x nominal rate of compensation



EXHIBIT VIII-M

Calculation of Average Weekly Benefit
Effective 01/15/1990

1) Class of Injury	Permanent Partial Amputation or Enucleation
2) Nominal Rate of Compensation	0.6000
3) Minimum Weekly Compensation	85.94
4) Maximum Weekly Compensation	610.97
5) Average Weekly Wage for the 12 months ending 12/31/1988	391.29

(A) Wage Intervals	(B) Ratios to Average (A)/(5)	(C) Percentage in Interval of - Workers	(D) Interval of - Wages	(E) Average Wage in Interval	(F) Average Benefit in Interval
0.00 - 85.94	0.00 - 0.20	1.4357	0.1903	51.86	51.86 ^e
85.94 - 143.23	0.20 - 0.35	2.3018	0.6490	110.33	85.94
143.23 - 1018.28	0.35 - 2.60	95.5903	96.8911	396.61	237.97*
1018.28 & over	2.60 & over	0.6722	2.2696	1321.14	610.97

Average Weekly Benefit [(Sum (C)x(F))/100]: 234.31

^e Average wage within interval.

* (E)x(2) = Average wage within interval x nominal rate of compensation



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EXHIBIT VIII-N

Calculation of Average Weekly Benefit
Effective 01/15/1990

1) Class of Injury	Permanent Partial Loss of Use
2) Nominal Rate of Compensation	0.6000
3) Minimum Weekly Compensation	85.94
4) Maximum Weekly Compensation	333.26
5) Average Weekly Wage for the 12 months ending 12/31/1988	391.29

(A) Wage Intervals	(B) Ratios to Average (A)/(5)	(C) Percentage in Interval of - Workers	(D) Interval of - Wages	(E) Average Wage in Interval	(F) Average Benefit in Interval
0.00 - 85.94	0.00 - 0.20	1.4357	0.1903	51.86	51.86e
85.94 - 143.23	0.20 - 0.35	2.3018	0.6490	110.33	85.94
143.23 - 555.43	0.35 - 1.40	80.8060	70.8932	343.29	205.97*
555.43 & over	1.40 & over	15.4565	28.2675	715.61	333.26

Average Weekly Benefit [(Sum (C)x(F))/100]: 220.67

Average wage within interval.

(E)x(2) = Average wage within interval x nominal rate of compensation



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EXHIBIT IX

Wage Distribution Table

- R = Ratio to Average Wage
 A = Percentage of workers receiving not more than the percentage of the average wage indicated by column R
 B = Percentage of wages received by the % of workers in column A

R	A	B	R	A	B	R	A	B
0.05	0.1068	0.0030	2.40	98.8248	96.4991	4.75	99.9210	99.5369
0.10	0.3511	0.0222	2.45	98.9702	96.8502	4.80	99.9245	99.5542
0.15	0.8384	0.0845	2.50	99.1283	97.2237	4.85	99.9277	99.5700
0.20	1.4357	0.1903	2.55	99.2172	97.4447	4.90	99.9290	99.5762
0.25	2.1432	0.3483	2.60	99.3278	97.7304	4.95	99.9316	99.5881
0.30	2.9058	0.5629	2.65	99.3962	97.9051	5.00	99.9337	99.5984
0.35	3.7375	0.8393	2.70	99.4464	98.0372	5.05	99.9357	99.6093
0.40	4.7328	1.2173	2.75	99.5127	98.2151	5.10	99.9390	99.6258
0.45	6.1073	1.8188	2.80	99.5551	98.3291	5.15	99.9415	99.6393
0.50	8.2201	2.8537	2.85	99.5867	98.4178	5.20	99.9438	99.6516
0.55	11.6032	4.6692	2.90	99.6240	98.5226	5.25	99.9453	99.6594
0.60	15.3290	6.7892	2.95	99.6515	98.6021	5.30	99.9483	99.6752
0.65	20.5672	10.1290	3.00	99.6742	98.6709	5.35	99.9488	99.6778
0.70	25.9600	13.7452	3.05	99.6888	98.7150	5.40	99.9498	99.6836
0.75	32.3089	18.2868	3.10	99.7116	98.7817	5.45	99.9508	99.6892
0.80	37.5110	22.2523	3.15	99.7288	98.8358	5.50	99.9539	99.7064
0.85	42.9709	26.6884	3.20	99.7427	98.8809	5.55	99.9552	99.7130
0.90	48.2321	31.2144	3.25	99.7614	98.9448	5.60	99.9559	99.7174
0.95	53.1109	35.7149	3.30	99.7825	99.0090	5.65	99.9569	99.7228
1.00	58.4036	40.9066	3.35	99.7922	99.0422	5.70	99.9584	99.7318
1.05	62.9643	45.6459	3.40	99.7995	99.0666	5.75	99.9607	99.7447
1.10	67.1858	50.1850	3.45	99.8141	99.1161	5.80	99.9623	99.7537
1.15	70.6767	54.0985	3.50	99.8211	99.1404	5.85	99.9656	99.7730
1.20	74.0989	58.1398	3.55	99.8308	99.1747	5.90	99.9674	99.7840
1.25	77.0678	61.7560	3.60	99.8403	99.2088	5.95	99.9684	99.7903
1.30	79.9516	65.5218	3.65	99.8457	99.2272	6.00	99.9701	99.8007
1.35	82.2534	68.5701	3.70	99.8511	99.2463	6.05	99.9712	99.8069
1.40	84.5435	71.7325	3.75	99.8575	99.2701	6.10	99.9722	99.8131
1.45	86.3620	74.3294	3.80	99.8616	99.2854	6.15	99.9727	99.8161
1.50	87.9326	76.6547	3.85	99.8657	99.3029	6.20	99.9734	99.8210
1.55	89.1240	78.4667	3.90	99.8731	99.3315	6.25	99.9753	99.8315
1.60	90.4193	80.4994	3.95	99.8774	99.3499	6.30	99.9758	99.8349
1.65	91.6370	82.4738	4.00	99.8800	99.3594	6.35	99.9763	99.8380
1.70	92.4497	83.8454	4.05	99.8835	99.3739	6.40	99.9775	99.8468
1.75	93.2448	85.2260	4.10	99.8871	99.3886	6.45	99.9780	99.8504
1.80	93.9290	86.4398	4.15	99.8949	99.4207	6.50	99.9816	99.8762
1.85	94.5674	87.5957	4.20	99.8970	99.4295	6.55	99.9831	99.8855
1.90	95.1329	88.6605	4.25	99.9000	99.4429	6.60	99.9848	99.8964
1.95	95.7436	89.8715	4.30	99.9033	99.4574	6.65	99.9851	99.8978
2.00	96.2339	90.8451	4.35	99.9058	99.4689	6.70	99.9861	99.9047
2.05	96.6383	91.6662	4.40	99.9086	99.4807	6.75	99.9871	99.9118
2.10	97.1239	92.6803	4.45	99.9091	99.4831	6.80	99.9877	99.9149
2.15	97.4920	93.4767	4.50	99.9122	99.4965	6.85	99.9892	99.9259
2.20	97.8424	94.2425	4.55	99.9142	99.5052	6.90	99.9897	99.9290
2.25	98.1208	94.8736	4.60	99.9155	99.5113	6.95	99.9902	99.9321
2.30	98.3723	95.4400	4.65	99.9173	99.5197	7.00	99.9917	99.9429
2.35	98.6285	96.0369	4.70	99.9197	99.5309			

APPENDIX C-IV

LONGSHORE AND HARBOR WORKERS COMPENSATION ACT



LONGSHORE AND HARBOR WORKERS' COMPENSATION ACT LAW MEMO

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- Exhibit VIII - Calculation of Average Weekly Benefits, Effective 10-1-90
- Exhibit IX - The 1973 Standard Wage Distribution Table

LONGSHORE AND HARBOR WORKERS' COMPENSATION ACT LAW MEMO

EXHIBIT I

Summary of the Principal Benefit Changes Due to the Increase in
the Minimum and Maximum Weekly Benefits, Effective 10-1-90

	<u>Effective 10-1-89</u>	<u>Effective 10-1-90</u>
<u>FATAL</u>		
% Rate of Compensation		
Widow Alone		50%
Widow and Children		66 2/3%
One Orphan		50%
Two or more Orphans		66 2/3%
Parent(s)		25% (each)
Brother(s)/Sister(s)/Others		20% (each)
Max. % Rate of Compensation		66 2/3%
Wage for Min. Weekly Benefit*	\$332.39	\$343.84
Maximum Weekly Benefit**	\$664.78	\$687.68
Duration:		Life or remarriage; Until age 18 for a child, or 23 if a student
Remarriage Award		2 year lump sum
Burial Allowance		\$3,000
Special Fund (Non-Dependency Cases)		\$5,000
Escalation****		Annual Percentage Increase in the NAWW limited to 5%
<u>PERMANENT TOTAL DISABILITY</u>		
% Rate of Compensation		66 2/3%
Min.***/Max. Weekly Benefit**	\$166.20 or AWW, whichever is less/\$664.78	\$171.92 or AWW, whichever is less/\$687.68
Duration		Length of Disability
Escalation****		Annual Percentage Increase in the NAWW limited to 5%
<u>TEMPORARY TOTAL DISABILITY</u>		
% Rate of Compensation		66 2/3%
Min.***/Max. Weekly Benefit **	\$166.20 or AWW, whichever is less/\$664.78	\$171.92 or AWW, whichever is less/\$687.68
Duration		Length of Disability
Waiting Period/Retro. after		3 days/14 days
<u>PERMANENT PARTIAL DISABILITY</u>		
<u>Schedule Injuries:</u>		
% Rate of Compensation		66 2/3%
Maximum Weekly Benefit**	\$664.78	\$687.68
Duration		As per Schedule
<u>Non-Schedule Injuries:</u>		
% Rate of Compensation		66 2/3% LOEC+
Maximum Weekly Benefit**	\$664.78	\$687.68
Duration		Length of Disability

Note: NAWW is the National Average Weekly Wage.
NAWW effective 10-1-90 = \$343.84 (Estimate).
NAWW effective 10-1-89 = \$332.39 (Estimate).
AWW is the Average Weekly Wage of the worker.

- * 100% of the NAWW.
- ** 200% of the NAWW.
- *** 50% of the NAWW.
- **** Annual Increase in the NAWW is Assumed to be 6.0%.
- + LOEC - Loss of Earning Capacity (Assumed LOEC = Wage Loss).

LONGSHORE AND HARBOR WORKERS' COMPENSATION ACT LAW MEMO

EXHIBIT II

Impact by Type of Injury Due to the Increase in the Minimum
and Maximum Weekly Benefits, Effective 10-1-90

<u>Type of Injury</u>	<u>Percentage of Losses*</u>	<u>Effect(%)</u>
Fatal	5.3%	+ 1.1
Permanent Total	8.3%	+ 0.4
Major Permanent Partial	54.0%	+ 0.1
Minor Permanent Partial	2.6%	+ 0.1
Temporary Total	7.5%	+ 0.4
Indemnity	77.7%	+ 0.2 **
Medical	22.3%	0.0
Total	100.0%	+ 0.2 **

* Nationwide+ losses under Longshore and Harbor Workers' Act, excluding Non-Appropriated Fund Instrumentality losses, for the two-year policy period ending 1-31-86 on the 10-1-89 law level and developed to an ultimate report by serious, non-serious and medical categories.

** Weighted Average

+ Excluding California, Delaware, Massachusetts, New Jersey, New York, Pennsylvania and Texas.

LONGSHORE AND HARBOR WORKERS' COMPENSATION ACT LAW MEMO

EXHIBIT II-A

Overall Effect Due to the Increase in the Minimum
and Maximum Weekly Benefits, Effective 10-1-90

<u>Type of Injury</u>	(1) <u>Losses*</u>	(2) <u>Effect</u>	(3) <u>Modified Losses</u> <u>(1)x(2)</u>
Fatal	7,412,991	1.011	7,494,534
Permanent Total	11,638,134	1.004	11,684,687
Major Permanent Partial	75,682,026	1.001	75,757,708
(Serious)	(94,733,151)	(1.002)	(94,936,929)
Minor Permanent Partial	3,704,849	1.001	3,708,554
Temporary Total	10,528,749	1.004	10,570,864
(Non-Serious)	(14,233,598)	(1.003)	(14,279,418)
Medical	31,192,672	1.000	31,192,672
Total/Effect	140,159,421	1.002	140,409,019

* Nationwide+ losses under Longshore and Harbor Workers' Act, excluding Non-Appropriated Fund Instrumentality losses, for the two-year policy period ending 1-31-86 on the 10-1-89 law level and developed to an ultimate report by serious, non-serious and medical categories.

+ Excluding California, Delaware, Massachusetts, New Jersey, New York, Pennsylvania and Texas.

LONGSHORE AND HARBOR WORKERS' COMPENSATION ACT LAW MEMO

EXHIBIT III

Calculation of the Effect of the Increase in the Minimum and Maximum Weekly Benefits on Fatal Benefit Costs, Effective 10-1-90

	<u>10-1-89</u>	<u>10-1-90</u>
1. Cost of Dependency (Exhibit III-A)	359,373,006	363,319,437
2. Burial Cost (1,000 cases x \$3,000)	3,000,000	3,000,000
3. Cost of Remarriage	4,581,904 *	4,633,668 **
4. Second Injury Fund (147 cases x \$5,000)	<u>735,000</u>	<u>735,000</u>
5. Total Cost (1) + (2) + (3) + (4)	367,689,910	371,688,105
6. Effect		1.011

* $(356 \times 0.1400 + 427 \times 0.3710) \times 104 \text{ weeks} \times 211.55$ (Exhibit VII).

** $(356 \times 0.1400 + 427 \times 0.3710) \times 104 \text{ weeks} \times 213.94$ (Exhibit VIII).

+ Exhibit III-B.

LONGSHORE AND HARBOR WORKERS' COMPENSATION ACT LAW MEMO

EXHIBIT III-A

Valuation of Fatal Benefits

EFFECTIVE 10-1-89

(1) No. of Cases	(2) Person Receiving Compensation	(3) Average Pension Age-4.9%	(4) Annuity Symbol	(5) Annuity Value*	(6) Avg. Weekly Ben.**	(7) Monetary Cost (1)x(5)x(6)
147	None	xxx	xxx	xxx	xxx	xxx
356	Widow Alone	21	$\bar{a}'21:\overline{\text{Life}}$	1,699.58	211.55	127,998,429
427	Widow with Child(ren)	26	$8/\bar{a}'26:\overline{\text{Life}}$	1,834.22	211.55	165,688,486
		10	$a \overline{416}$	439.11	277.97	52,119,367
16	Orphan	11	$\bar{a}11:\overline{7.0000}$	381.14	211.55	1,290,083
21	Orphans	11	$a \overline{364}$	381.62	277.97	2,227,657
13	Parent	58	$\bar{a}58:\overline{\text{Life}}$	1,346.73	107.12	1,875,402
17	Parents	48	$\bar{a}48:\overline{\text{Life}}$	1,967.38	211.55	7,075,38
1	Brother or Sister	23	$\bar{a}23:\overline{\text{Life}}$	4,127.21	85.83	354,238
<u>2</u>	Other Dependent	21	$\bar{a}21:\overline{\text{Life}}$	4,333.90	85.83	<u>743,957</u>
1,000						359,373,006

EFFECTIVE 10-1-90

147	None	xxx	xxx	xxx	xxx	xxx
356	Widow Alone	21	$\bar{a}'21:\overline{\text{Life}}$	1,699.58	213.94	129,444,500
427	Widow with Child(ren)	26	$8/\bar{a}'26:\overline{\text{Life}}$	1,834.22	213.94	167,560,362
		10	$a \overline{416}$	439.11	280.52	52,597,492
16	Orphan	11	$\bar{a}11:\overline{7.0000}$	381.14	213.94	1,304,657
21	Orphans	11	$a \overline{364}$	381.62	280.52	2,248,093
13	Parent	58	$\bar{a}58:\overline{\text{Life}}$	1,346.73	108.39	1,897,637
17	Parents	48	$\bar{a}48:\overline{\text{Life}}$	1,967.38	213.94	7,155,322
1	Brother or Sister	23	$\bar{a}23:\overline{\text{Life}}$	4,127.21	86.86	358,489
<u>2</u>	Other Dependent	21	$\bar{a}21:\overline{\text{Life}}$	4,333.90	86.86	<u>752,88</u>
1,000						363,319,437

* Includes 4.9% escalation.

** Exhibit VII, VIII.

LONGSHORE AND HARBOR WORKERS' COMPENSATION ACT LAW MEMO

EXHIBIT III-B

Calculation of Remarriage Values

(1)	(2) No. of Cases		(3)	(4)	(5)	(6)
Average Age (x)	Widow Alone	Widow w/child(ren)	R(x)/D(x)	(2)x(4)	(3)x(4)	
17	97	135	0.91276	88.53772	123.22260	
22	124	462	0.75210	93.26040	347.47020	
27	81	522	0.56997	46.16757	297.52434	
32	67	494	0.40427	27.08609	199.70938	
37	124	534	0.27324	33.88176	145.91016	
42	253	572	0.17837	45.12761	102.02764	
47	563	398	0.11315	63.70345	45.03370	
52	779	233	0.06982	54.38978	16.26806	
57	806	84	0.04179	33.68274	3.51036	
62	431	14	0.02415	10.40865	0.33810	
67	151	5	0.01350	2.03850	0.06750	
72	68	0	0.00734	0.49912	-	
77	13	0	0.00394	0.05122	-	
82	6	0	0.00208	0.01248	-	
87	1	0	0.00110	0.00110	-	
Total	3,564	3,453		498.84819	1,281.08204	

Remarriage Values+

Widow Alone: [Sum Col. (5)]/[Sum Col. (2)] = 0.1400

Widow with child(ren): [Sum Col. (6)]/[Sum Col. (3)] = 0.3710

+ Present value of percent of distribution remarrying, including 4.9% escalation.



LONGSHORE AND HARBOR WORKERS' COMPENSATION ACT LAW MEMO

EXHIBIT IV

Calculation of the Effect of the Increase in the Minimum and Maximum
Weekly Benefits on Permanent Total Disability Costs, Effective 10-1-90

	<u>10-1-89</u>	<u>10-1-90</u>
1. Annuity Symbol	$\bar{a} 44:\overline{\text{Life}}/*$	$\bar{a} 44:\overline{\text{Life}}/*$
2. Annuity Value	2,256.28	2,256.28
3. Average Weekly Benefit (Exh. VII, VIII)	264.53	265.58
4. Cost of 1,000 Cases ((2)x(3)x1,000)	596,853,748	599,222,842
5. Effect		1.004

* 4.9% escalation per annum.

LONGSHORE AND HARBOR WORKERS' COMPENSATION ACT LAW MEMO

EXHIBIT V

Determination of the Monetary Cost and Effect
of Amendments on Permanent Partial Benefits

	Major Perm. Partial Effective		Minor Perm. Partial Effective	
	<u>10-1-89</u>	<u>10-1-90</u>	<u>10-1-89</u>	<u>10-1-90</u>
A. PERMANENT PARTIAL SCHEDULE INJURIES				
1. Cost in Units of Wks. Wages (Exh. V-A,B)	70,529	70,529	55,599	55,599
2. Average Weekly Benefit (Exh. VII,VIII)	259.92	260.07	259.92	260.07
3. Cost of Schedule Injuries (1)x(2)	18,331,898	18,342,477	14,451,292	14,459,632
B. PERMANENT PARTIAL NON-SCHEDULE INJURIES				
4. Cost in Units of Wks. Wages	305,014 *	305,014 *	480,178 +	480,178 +
5. Average Weekly Benefit (Exh. VII,VIII)	104.55	104.56	65.36	65.36
6. Cost of Non-Schedule Injuries (4)x(5)	31,889,214	31,892,264	31,384,434	31,384,434
C. PERMANENT PARTIAL (HEALING PERIOD)				
7. Cost in Units of Wks. Wages (Exh. V-A,B)	30,848	30,848	31,717	31,717
8. Average Weekly Benefit (Exh. VII,VIII)	264.53	265.58	264.53	265.58
9. Cost of Healing Period (7)x(8)	8,160,221	8,192,612	8,390,098	8,423,401
D. TOTAL COST AND EFFECT				
10. Total Cost of P.P. Benefits (3)+(6)+(9)	58,381,333	58,427,353	54,225,824	54,267,467
11. Effect		1.001		1.001

Life expectancy of a 37-year old = 2,057.14 weeks.

* $(2,057.14 - 36) \times 0.40 = 15.5472$ years; $\bar{a} 37:\overline{15.5472} \times 497 = 613.71 \times 497 = 305,014$

+ $(2,057.14 - 14) \times 0.25 = 9.8228$ years; $\bar{a} 37:\overline{9.8228} \times 1,120 = 428.73 \times 1,120 = 480,178$

LONGSHORE AND HARBOR WORKERS' COMPENSATION ACT LAW MEMO

EXHIBIT V-A

Valuation of Major Permanent Partial

LAW EFFECTIVE
10-1-89 AND 10-1-90

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Type of Benefit	Case Freq.	Avg. % Loss	Weeks Duration		Com- muted**	Weeks Payable For Sched. (2)x(6)	Avg. H.P. (Wks)	Weeks Payable For H.P. (2)x(8)
			Sched. At 100%	Payable (3)x(4)				
A. SCHEDULE INJURIES								
Arm:								
Dism. at or above elbow	4	100%	312.00	312.00	281.98	1,128	33	132
Dism. below elbow	3	100%	244.00	244.00	225.37	676	18	54
Loss of use	81	53%	312.00	165.36	156.66	12,689	27	2,187
Hand:								
Dismemberment	5	100%	244.00	244.00	225.37	1,127	29	145
Loss of use	139	56%	244.00	136.64	130.66	18,162	20	2,780
Leg:								
Dism. at or above knee	6	100%	288.00	288.00	262.29	1,574	34	204
Dism. below knee	3	100%	205.00	205.00	191.74	575	39	117
Loss of use	145	53%	288.00	152.64	145.21	21,055	34	4,930
Foot:								
Dismemberment	3	100%	205.00	205.00	191.74	575	26	78
Loss of use	69	51%	205.00	104.55	101.03	6,971	25	1,725
Eye:								
Enucleation	3	100%	160.00	160.00	151.84	456	20	60
Loss of use	38	88%	160.00	140.80	134.46	5,109	14	532
Hearing: both ears								
	<u>4</u>	<u>56%</u>	<u>200.00</u>	<u>112.00</u>	<u>107.96</u>	<u>432</u>	<u>3</u>	<u>12</u>
Total Sch. Inj.	503	xx	xx	xx	xx	70,529	xx	12,956
B. OTHER MAJOR INJURIES								
	<u>497</u>	<u>40%</u>	xx	xx	xx	xx	36	<u>17,892</u>
	1,000							30,848

* Average percent of wage loss.

** Commuted if over 52 weeks.

LONGSHORE AND HARBOR WORKERS' COMPENSATION ACT LAW MEMO

EXHIBIT V-B

Valuation of Minor Permanent Partial

LAW EFFECTIVE
10-1-89 AND 10-1-90

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Type of Benefit	Case Freq.	Avg. % Loss	Weeks Duration		Com- muted**	Weeks Payable For Sched. (2)x(6)	Avg. H.P. (Wks)	Weeks Payable For H.P. (2)x(8)
			Sched. At 100%	Payable (3)x(4)				
A. SCHEDULE INJURIES								
Thumb:								
Dism. 1 phalange	23	100%	37.50	37.50	37.50	863	6	138
Dism. 2 or more	5	100%	75.00	75.00	73.17	366	6	30
Loss of use	164	25%	75.00	18.75	18.75	3,075	4	656
Index Finger:								
Dism. 1 phalange	48	100%	23.00	23.00	23.00	1,104	5	240
Dism. 2 or more	18	100%	46.00	46.00	46.00	828	8	144
Loss of use	216	32%	46.00	14.72	14.72	3,180	4	864
Middle Finger:								
Dism. 1 phalange	32	100%	15.00	15.00	15.00	480	3	96
Dism. 2 or more	11	100%	30.00	30.00	30.00	330	7	77
Loss of use	152	29%	30.00	8.70	8.70	1,322	3	456
Ring Finger:								
Dism. 1 phalange	19	100%	12.50	12.50	12.50	238	4	76
Dism. 2 or more	8	100%	25.00	25.00	25.00	200	4	32
Loss of use	98	31%	25.00	7.75	7.75	760	3	294
Little Finger:								
Dism. 1 phalange	15	100%	7.50	7.50	7.50	113	2	30
Dism. 2 or more	8	100%	15.00	15.00	15.00	120	5	40
Loss of use	95	36%	15.00	5.40	5.40	513	3	285
Great Toe:								
Dism. 1 phalange	2	100%	19.00	19.00	19.00	38	6	12
Dism. 2 or more	1	100%	38.00	38.00	38.00	38	12	12
Loss of use	50	26%	38.00	9.88	9.88	494	4	200
Other Toes:								
Dismemberment	4	100%	16.00	16.00	16.00	64	9	36
Loss of use	21	29%	16.00	4.64	4.64	97	2	42
Hearing: one ear	10	37%	52.00	19.24	19.24	192	3	30
MAJOR MEMBERS								
Arm	259	13%	312.00	40.56	40.56	10,505	10	2,590
Hand	308	13%	244.00	31.72	31.72	9,770	8	2,464
Leg	386	13%	288.00	37.44	37.44	14,452	13	5,018
Foot	202	13%	205.00	26.65	26.65	5,383	10	2,020
Eye	32	15%	160.00	24.00	24.00	768	4	128
Hearing (2 ears)	9	17%	200.00	34.00	34.00	306	3	27
Total Schedule Injuries	2,196	xx	xx	xx	xx	55,599	xx	16,037
B. OTHER MINOR INJURIES								
	1,120	25%*	xx	xx	xx	xx	14	15,680
	3,316							31,717

* Average percent of wage loss.
** Commuted if over 52 weeks.



LONGSHORE AND HARBOR WORKERS' COMPENSATION ACT LAW MEMO

EXHIBIT VI

Calculation of the Effect of the Increase in the Minimum and Maximum Weekly Benefits on Temporary Total Disability Costs, Effective 10-1-90

	<u>10-1-89</u>	<u>10-1-90</u>
1. Waiting Period (days)	3	3
2. Retroactive After (days)	14	14
3. Days Disability Based on (1)	2,776,360	2,776,360
4. Total Cases Based on (2)	39,245	39,245
5. Additional Days of Disability Based on (2), ((4) x (1))	117,735	117,735
6. Cost in Days ((3) + (5))	2,894,095	2,894,095
7. Cost in Weeks	413,442	413,442
8. Avg. Wkly. Ben. (Exh. VII,VIII)	264.53	265.58
9. Monetary Cost (7) x (8)	109,367,812	109,801,926
10. Effect		1.004

LONGSHORE AND HARBOR WORKERS' COMPENSATION ACT LAW MEMO

EXHIBIT VI-A

SPECIAL CALL FOR ACCIDENT STATISTICS DISTRIBUTION OF DURATIONS

Temporary Total Accident Distribution According to Duration of Disability

<u>(1)</u> <u>Disability</u> <u>Period (Days)</u>	<u>(2)</u> <u>Total</u> <u>Cases</u>	<u>(3)</u> <u>Summation of</u> <u>Col. 2 Upward</u>	<u>(4)</u> <u>Days Disability</u> <u>Lasting Col. 1 and Over</u>
1	8,973	103,371	3,060,329
2	8,198	94,398	2,956,958
3	6,236	86,200	2,862,560
4	7,077	79,964	2,776,360
5	6,437	72,887	2,696,396
6	5,156	66,450	2,623,509
7	4,854	61,294	2,557,059
8	2,351	56,440	2,495,765
9	2,407	54,089	2,439,325
10	2,865	51,682	2,385,236
11	2,665	48,817	2,333,554
12	2,156	46,152	2,284,737
13	1,891	43,996	2,238,585
14	2,860	42,105	2,194,589
15	1,563	39,245	2,152,484
16	1,621	37,682	2,113,239
17	1,703	36,061	2,075,557
18	1,486	34,358	2,039,496
19	1,096	32,872	2,005,138
20	888	31,776	1,972,266
21	2,009	30,888	1,940,490
22	854	28,879	1,909,602
23	910	28,025	1,880,723
24	961	27,115	1,852,698
25	762	26,154	1,825,583
26	590	25,392	1,799,429
27	467	24,802	1,774,037
28	1,480	24,335	1,749,235
29	532	22,855	1,724,900
30	604	22,323	1,702,045
31	655	21,719	1,679,722
32	603	21,064	1,658,003
33	437	20,461	1,636,939
34	376	20,024	1,616,478
35	894	19,648	1,596,454
36	389	18,754	1,576,806
37	390	18,365	1,558,052
38	442	17,975	1,539,687
39	424	17,533	1,521,712
40	287	17,109	1,504,179
41	274	16,822	1,487,070
42	1,160	16,548	1,470,248

LONGSHORE AND HARBOR WORKERS' COMPENSATION ACT LAW MEMO

EXHIBIT VI-A (Cont.)

SPECIAL CALL FOR ACCIDENT STATISTICS DISTRIBUTION OF DURATIONS

Temporary Total Accident Distribution According to Duration of Disability

<u>(1)</u> <u>Disability</u> <u>Period (Days)</u>	<u>(2)</u> <u>Total</u> <u>Cases</u>	<u>(3)</u> <u>Summation of</u> <u>Col. 2 Upward</u>	<u>(4)</u> <u>Days Disability</u> <u>Lasting Col. 1 and Over</u>
43 - 49	2,692	15,388	1,453,700 - 1,366,629
50 - 56	2,155	12,696	1,353,205 - 1,281,192
57 - 63	1,725	10,541	1,270,007 - 1,210,298
64 - 70	1,258	8,816	1,201,053 - 1,150,461
71 - 77	987	7,558	1,142,491 - 1,099,160
78 - 84	807	6,571	1,092,325 - 1,054,427
85 - 91	626	5,764	1,048,409 - 1,015,082
92 - 98	544	5,138	1,009,770 - 979,894
99 - 105	423	4,594	975,102 - 948,240
106 - 112	342	4,171	943,909 - 919,548
113 - 119	273	3,829	915,620 - 893,144
120 - 126	271	3,556	889,496 - 868,653
127 - 133	231	3,285	865,275 - 846,026
134 - 140	217	3,054	842,900 - 824,849
141 - 147	196	2,837	821,900 - 805,306
148 - 154	167	2,641	802,615 - 787,062
155 - 161	137	2,474	784,524 - 769,952
162 - 168	130	2,337	767,578 - 753,784
169 - 175	116	2,207	751,530 - 738,480
176 - 182	129	2,091	736,343 - 723,948
183 - 189	86	1,962	721,921 - 710,316
190 - 196	92	1,876	708,412 - 697,317
197 - 203	62	1,784	695,503 - 684,914
204 - 210	74	1,722	683,169 - 672,957
211 - 217	73	1,648	671,280 - 661,521
218 - 224	55	1,575	659,919 - 650,588
225 - 231	63	1,520	649,050 - 640,049
232 - 266	220	1,457	638,570 - 592,396
267 - 301	203	1,237	591,139 - 552,653
302 - 336	95	1,034	551,611 - 518,088
337 - 371	104	939	517,143 - 486,802
372 - 406	80	835	485,961 - 458,672
407 - 441	67	755	457,909 - 433,213
442 - 476	64	688	432,519 - 410,069
477 - 511	58	624	409,434 - 389,141
512 - 581	80	566	388,570 - 352,003
582 - 651	65	486	351,514 - 320,191
652 and Over	-	421	319,770 - xxx

LONGSHORE AND HARBOR WORKERS' COMPENSATION ACT LAW MEMO

EXHIBIT VII

Calculation of Average Weekly Benefits, Effective 10-1-89

(1) Wage Interval	(2) Ratio to Avg. (1)/\$392.07*	(3) Percent in Wage Bracket Workers	(4) Wages	(5) Avg. Wage \$392.07 * x(4)/(3)	(6) Average Benefit
Fatal: Widow Alone, Orphan, Parents (Nominal Rate of Comp. - 0.5000)					
0.00 - 166.20	0.00 - 0.40	4.7328	1.2173	100.84	100.84 @
166.20 - 332.39	0.40 - 0.85	38.2381	25.4711	261.17	166.20 #
332.39 - 1,329.56	0.85 - 3.40	56.8286	72.3782	499.35	249.68 &
1,329.56 & over	3.40 & over	0.2005	0.9334	1,825.23	664.78 !
AVERAGE WEEKLY BENEFIT -	[SUM (Col(3) X Col(6))] / 100 -				\$211.55
Fatal: Widow and Child(ren), Orphans (Nominal Rate of Comp. - 0.6667)					
0.00 - 221.60	0.00 - 0.55	11.6032	4.6692	157.77	157.77 @
221.60 - 332.39	0.55 - 0.85	31.3677	22.0192	275.22	221.60 #
332.39 - 997.12	0.85 - 2.55	56.2463	70.7563	493.21	328.82 &
997.12 & over	2.55 & over	0.7828	2.5553	1,279.84	664.78 !
AVERAGE WEEKLY BENEFIT -	[SUM (Col(3) X Col(6))] / 100 -				\$277.97
Fatal: One Parent (Nominal Rate of Comp. - 0.2500)					
0.00 - 83.10	0.00 - 0.20	1.4357	0.1903	51.97	51.97 @
83.10 - 332.39	0.20 - 0.85	41.5352	26.4981	250.13	83.10 #
332.39 - 2,659.12	0.85 - 6.80	57.0168	73.2265	503.53	125.88 &
2,659.12 & over	6.80 & over	0.0123	0.0851	2712.61	664.78 !
AVERAGE WEEKLY BENEFIT -	[SUM (Col(3) X Col(6))] / 100 -				\$107.12
Fatal: Brother, Sister (Nominal Rate of Comp. - 0.2000)					
0.00 - 66.48	0.00 - 0.15	0.8384	0.0845	39.52	39.52 @
66.48 - 332.39	0.15 - 0.85	42.1325	26.6039	247.57	66.48 #
332.39 - 3,323.90	0.85 - 8.50	57.0291	73.3116	504.01	100.80 &
3,323.90 & over	8.50 & over	0.0000	0.0000	0.00	664.78 !
AVERAGE WEEKLY BENEFIT -	[SUM (Col(3) X Col(6))] / 100 -				\$85.83

* Average Injured Workers Wage for the 12 month period ending 12-31-89.
 @ Average Wage Within The Interval.
 # Minimum Weekly Benefit.
 & Average Wage Within Interval x Nominal Rate Of Comp.
 ! Maximum Weekly Benefit.

LONGSHORE AND HARBOR WORKERS' COMPENSATION ACT LAW MEMO

EXHIBIT VII (Cont.)

Calculation of Average Weekly Benefits, Effective 10-1-89

(1) Wage Interval	(2) Ratio to Avg. (1)/\$392.07*	(3) Percent in Wage Bracket Workers	(4) Wages	(5) Avg. Wage \$392.07 * x(4)/(3)	(6) Average Benefit
Total (Nominal Rate of Comp. - 0.6667)					
0.00 - 166.20	0.00 - 0.40	4.7328	1.2173	100.84	100.84 @
166.20 - 249.29	0.40 - 0.65	15.8344	8.9117	220.66	166.20 #
249.29 - 997.12	0.65 - 2.55	78.6500	87.3157	435.27	290.19 &
997.12 & over	2.55 & over	0.7828	2.5553	1,279.84	<u>664.78 !</u>
AVERAGE WEEKLY BENEFIT - [SUM (Col(3) X Col(6))] / 100 -					\$264.53
Perm. Partial Schedule (Nominal Rate of Comp. - 0.6667)					
0.00 - 997.12	0.00 - 2.55	99.2172	97.4447	385.07	256.73 &
997.12 & over	2.55 & over	0.7828	2.5553	1,279.84	<u>664.78 !</u>
AVERAGE WEEKLY BENEFIT - [SUM (Col(3) X Col(6))] / 100 -					\$259.92
Perm. Partial Non-Sched. Major (Nominal Rate of Comp. - 0.2667)					
0.00 - 2,492.61	0.00 - 6.35	99.9763	99.8380	391.53	104.42 &
2,492.61 & over	6.35 & over	0.0237	0.1620	2,679.97	<u>664.78 !</u>
AVERAGE WEEKLY BENEFIT - [SUM (Col(3) X Col(6))] / 100 -					\$104.55
Perm. Partial Non-Sched. Minor (Nominal Rate of Comp. - 0.1667)					
0.00 - 3,987.88	0.00 - 10.15	100.0000	100.0000	392.07	65.36 &
3,987.88 & over	10.15 & over	0.0000	0.0000	0.00	<u>664.78 !</u>
AVERAGE WEEKLY BENEFIT - [SUM (Col(3) X Col(6))] / 100 -					\$65.36

* Average Injured Workers Wage for the 12 month period ending 12-31-89.
 @ Average Wage Within The Interval.
 # Minimum Weekly Benefit.
 & Average Wage Within Interval x Nominal Rate Of Comp.
 ! Maximum Weekly Benefit.

LONGSHORE AND HARBOR WORKERS' COMPENSATION ACT LAW MEMO

EXHIBIT VIII

Calculation of Average Weekly Benefits, Effective 10-1-90

(1) Wage Interval	(2) Ratio to Avg. (1)/\$392.07*	(3) Percent in Wage Bracket Workers	(4) Wages	(5) Avg. Wage \$392.07 * x(4)/(3)	(6) Average Benefit
Fatal: Widow Alone, Orphan, Parents (Nominal Rate of Comp. - 0.5000)					
0.00 - 171.92	0.00 - 0.45	6.1073	1.8188	116.76	116.76 @
171.92 - 343.84	0.45 - 0.90	42.1248	29.3956	273.59	171.92 #
343.84 - 1,375.36	0.90 - 3.50	51.5890	67.9260	516.23	258.12 &
1,375.36 & over	3.50 & over	0.1789	0.8596	1,883.86	<u>687.68 !</u>
AVERAGE WEEKLY BENEFIT - [SUM (Col(3) X Col(6))] / 100 -					\$213.94
Fatal: Widow and Child(ren), Orphans (Nominal Rate of Comp. - 0.6667)					
0.00 - 229.24	0.00 - 0.60	15.3290	6.7892	173.65	173.65 @
229.24 - 343.84	0.60 - 0.90	32.9031	24.4252	291.05	229.24 #
343.84 - 1,031.47	0.90 - 2.65	51.1641	66.6907	511.05	340.72 &
1,031.47 & over	2.65 & over	0.6038	2.0949	1,360.30	<u>687.68 !</u>
AVERAGE WEEKLY BENEFIT - [SUM (Col(3) X Col(6))] / 100 -					\$280.52
Fatal: One Parent (Nominal Rate of Comp. - 0.2500)					
0.00 - 85.96	0.00 - 0.20	1.4357	0.1903	51.97	51.97 @
85.96 - 343.84	0.20 - 0.90	46.7964	31.0241	259.93	85.96 #
343.84 - 2,750.72	0.90 - 7.00	51.7596	68.7285	520.61	130.15 &
2,750.72 & over	7.00 & over	0.0083	0.0571	2,697.25	<u>687.68 !</u>
AVERAGE WEEKLY BENEFIT - [SUM (Col(3) X Col(6))] / 100 -					\$108.39
Fatal: Brother, Sister (Nominal Rate of Comp. - 0.2000)					
0.00 - 68.77	0.00 - 0.20	1.4357	0.1903	51.97	51.97 @
68.77 - 343.84	0.20 - 0.90	46.7964	31.0241	259.93	68.77 #
343.84 - 3,438.40	0.90 - 8.75	51.7679	68.7856	520.96	104.19 &
3,438.40 & over	8.75 & over	0.0000	0.0000	0.00	<u>687.68 !</u>
AVERAGE WEEKLY BENEFIT - [SUM (Col(3) X Col(6))] / 100 -					\$86.86

* Average Injured Workers Wage for the 12 month period ending 12-31-89.
 @ Average Wage Within The Interval.
 # Minimum Weekly Benefit.
 & Average Wage Within Interval x Nominal Rate Of Comp.
 ! Maximum Weekly Benefit.

LONGSHORE AND HARBOR WORKERS' COMPENSATION ACT LAW MEMO

EXHIBIT VIII (Cont.)

Calculation of Average Weekly Benefits, Effective 10-1-90

(1) Wage Interval	(2) Ratio to Avg. (1)/\$392.07*	(3) Percent in Wage Bracket Workers	(4) Wages	(5) Avg. Wage \$392.07 * x(4)/(3)	(6) Average Benefit
Total (Nominal Rate of Comp. - 0.6667)					
0.00 - 171.92	0.00 - 0.45	6.1073	1.8188	116.76	116.76 @
171.92 - 257.87	0.45 - 0.65	14.4599	8.3102	225.33	171.92 #
257.87 - 1,031.47	0.65 - 2.65	78.8290	87.7761	436.57	291.06 &
1,031.47 & over	2.65 & over	0.6038	2.0949	1,360.30	<u>687.68 !</u>
AVERAGE WEEKLY BENEFIT - [SUM (Col(3) X Col(6))] / 100 -					\$265.58
Perm. Partial Schedule (Nominal Rate of Comp. - 0.6667)					
0.00 - 1,031.47	0.00 - 2.65	99.3962	97.9051	386.19	257.47 &
1,031.47 & over	2.65 & over	0.6038	2.0949	1,360.30	<u>687.68 !</u>
AVERAGE WEEKLY BENEFIT - [SUM (Col(3) X Col(6))] / 100 -					\$260.07
Perm. Partial Non-Sched. Major (Nominal Rate of Comp. - 0.2667)					
0.00 - 2,578.48	0.00 - 6.60	99.9848	99.8964	391.72	104.47 &
2,578.48 & over	6.60 & over	0.0152	0.1036	2,672.27	<u>687.68 !</u>
AVERAGE WEEKLY BENEFIT - [SUM (Col(3) X Col(6))] / 100 -					\$104.56
Perm. Partial Non-Sched. Minor (Nominal Rate of Comp. - 0.1667)					
0.00 - 4,125.25	0.00 - 10.50	100.0000	100.0000	392.07	65.36 &
4,125.25 & over	10.50 & over	0.0000	0.0000	0.00	<u>687.68 !</u>
AVERAGE WEEKLY BENEFIT - [SUM (Col(3) X Col(6))] / 100 -					\$65.36

* Average Injured Workers Wage for the 12 month period ending 12-31-89.
 @ Average Wage Within The Interval.
 # Minimum Weekly Benefit.
 & Average Wage Within Interval x Nominal Rate Of Comp.
 ! Maximum Weekly Benefit.

LONGSHORE AND HARBOR WORKERS' COMPENSATION ACT LAW MEMO

EXHIBIT IX

The 1973 Standard Wage Distribution Table

- R - Ratio to Average Wage
 A - Percentage of workers receiving not more than the percentage of the average wage indicated by column R
 B - Percentage of wages received by the % of workers in column A

R	A	B	R	A	B	R	A	B
0.05	0.1068	0.0030	2.40	98.8248	96.4991	4.75	99.9210	99.5369
0.10	0.3511	0.0222	2.45	98.9702	96.8502	4.80	99.9245	99.5542
0.15	0.8384	0.0845	2.50	99.1283	97.2237	4.85	99.9277	99.5700
0.20	1.4357	0.1903	2.55	99.2172	97.4447	4.90	99.9290	99.5762
0.25	2.1432	0.3483	2.60	99.3278	97.7304	4.95	99.9316	99.5881
0.30	2.9058	0.5629	2.65	99.3962	97.9051	5.00	99.9337	99.5984
0.35	3.7375	0.8393	2.70	99.4464	98.0372	5.05	99.9357	99.6093
0.40	4.7328	1.2173	2.75	99.5127	98.2151	5.10	99.9390	99.6258
0.45	6.1073	1.8188	2.80	99.5551	98.3291	5.15	99.9415	99.6393
0.50	8.2201	2.8537	2.85	99.5867	98.4178	5.20	99.9438	99.6516
0.55	11.6032	4.6692	2.90	99.6240	98.5226	5.25	99.9453	99.6594
0.60	15.3290	6.7892	2.95	99.6515	98.6021	5.30	99.9483	99.6752
0.65	20.5672	10.1290	3.00	99.6742	98.6709	5.35	99.9488	99.6778
0.70	25.9600	13.7452	3.05	99.6888	98.7150	5.40	99.9498	99.6836
0.75	32.3089	18.2868	3.10	99.7116	98.7817	5.45	99.9508	99.6892
0.80	37.5110	22.2523	3.15	99.7288	98.8358	5.50	99.9539	99.7064
0.85	42.9709	26.6884	3.20	99.7427	98.8809	5.55	99.9552	99.7130
0.90	48.2321	31.2144	3.25	99.7614	98.9448	5.60	99.9559	99.7174
0.95	53.1109	35.7149	3.30	99.7825	99.0090	5.65	99.9569	99.7228
1.00	58.4036	40.9066	3.35	99.7922	99.0422	5.70	99.9584	99.7318
1.05	62.9643	45.6459	3.40	99.7995	99.0666	5.75	99.9607	99.7447
1.10	67.1858	50.1850	3.45	99.8141	99.1161	5.80	99.9623	99.7537
1.15	70.6767	54.0985	3.50	99.8211	99.1404	5.85	99.9656	99.7730
1.20	74.0989	58.1398	3.55	99.8308	99.1747	5.90	99.9674	99.7840
1.25	77.0678	61.7560	3.60	99.8403	99.2088	5.95	99.9684	99.7903
1.30	79.9516	65.5218	3.65	99.8457	99.2272	6.00	99.9701	99.8007
1.35	82.2534	68.5701	3.70	99.8511	99.2463	6.05	99.9712	99.8069
1.40	84.5435	71.7325	3.75	99.8575	99.2701	6.10	99.9722	99.8131
1.45	86.3620	74.3294	3.80	99.8616	99.2854	6.15	99.9727	99.8161
1.50	87.9326	76.6547	3.85	99.8657	99.3029	6.20	99.9734	99.8210
1.55	89.1240	78.4667	3.90	99.8731	99.3315	6.25	99.9753	99.8315
1.60	90.4193	80.4994	3.95	99.8774	99.3499	6.30	99.9758	99.8349
1.65	91.6370	82.4738	4.00	99.8800	99.3594	6.35	99.9763	99.8380
1.70	92.4497	83.8454	4.05	99.8835	99.3739	6.40	99.9775	99.8468
1.75	93.2448	85.2260	4.10	99.8871	99.3886	6.45	99.9780	99.8504
1.80	93.9290	86.4398	4.15	99.8949	99.4207	6.50	99.9816	99.8762
1.85	94.5674	87.5957	4.20	99.8970	99.4295	6.55	99.9831	99.8855
1.90	95.1329	88.6605	4.25	99.9000	99.4429	6.60	99.9848	99.8964
1.95	95.7436	89.8715	4.30	99.9033	99.4574	6.65	99.9851	99.8978
2.00	96.2339	90.8451	4.35	99.9058	99.4689	6.70	99.9861	99.9047
2.05	96.6383	91.6662	4.40	99.9086	99.4807	6.75	99.9871	99.9118
2.10	97.1239	92.6803	4.45	99.9091	99.4831	6.80	99.9877	99.9149
2.15	97.4920	93.4767	4.50	99.9122	99.4965	6.85	99.9892	99.9259
2.20	97.8424	94.2425	4.55	99.9142	99.5052	6.90	99.9897	99.9290
2.25	98.1208	94.8736	4.60	99.9155	99.5113	6.95	99.9902	99.9321
2.30	98.3723	95.4400	4.65	99.9173	99.5197	7.00	99.9917	99.9429
2.35	98.6285	96.0369	4.70	99.9197	99.5309			

APPENDIX C-V

**CALCULATION OF U.S. LONGSHORE AND HARBOR WORKERS'
COMPENSATION ACT - SPECIAL FUND ASSESSMENT FACTOR**

Calculation of U.S. Longshore and Harbor Workers'
Compensation Act - Special Fund Assessment Factor

1. Estimated Total Expense needed for 1990	91,969,924
2. Compensation Payments reported (on indemnity only) 1989	294,738,047
3. Assessment Rate on Indemnity Losses (1)/(2)	31.2%

Breakdown of losses under Longshore and Harbor Workers Act (10/1/90)

4. Indemnity Losses	109,245,023
5. Medical Losses	31,393,988
6. Total Losses (4)+(5)	140,639,011
7. Assessment Rate on Total Losses [(3)x(4)]/(6)	24.2%



JUL 3 1990

File Number:

**NOTICE TO INSURANCE CARRIERS AND SELF-INSURED EMPLOYERS
(LONGSHORE AND HARBOR WORKERS' COMPENSATION ACT AND
EXTENSIONS**

**SUBJECT: 1990 ASSESSMENT FOR THE SPECIAL FUND, SECTION 44
OF THE LONGSHORE AND HARBOR WORKERS' COMPENSATION
ACT**

On January 5, 1990, pursuant to section 44 of the Longshore and Harbor Workers' Compensation Act, a Notice was sent to insurance carriers and self-insured employers authorized under the Act and its extensions (including the District of Columbia Compensation Act), requesting a report of the amount of all compensation and medical payments made during calendar year 1989. Form LS-513, Report of Payments, was attached to the Notice.

All payments made during calendar year 1989 by insurance carriers and self-insured employers have now been reported. A total of \$294,738,046.95 in compensation payments has been reported under the Longshore Act and three extensions, the Defense Base Act, the Outer Continental Shelf Lands Act, and the Nonappropriated Funds Instrumentalities Act. A total of \$11,765,605.77 has been reported under the District of Columbia Compensation Act for compensation and medical payments in cases that arose prior to July 26, 1982.

This Office has determined that for calendar year 1990 a total of \$91,969,924 is needed for the Special Fund under the Longshore Act and extensions excluding the District of Columbia Compensation Act, and a total of \$11,297,124 is needed for the Special Fund under the District of Columbia Compensation Act. Proceeds from the Special Fund assessment are used for one-half the adjusted payments made under the original provisions of section 10(h)(1), for payments under section 8(f), and for other payments from the Fund listed in section 44 of the Act.

This Notice transmits the total amount of your 1990 assessment.

The attached billing form shows the calculation on which your assessment is based. Under the Longshore Act and extensions, except for the District of Columbia Compensation Act, the assessment is based on (1) the ratio of the amount each carrier or self-insurer paid during the prior calendar year for compensation benefits in relation to the amount all such carriers and self-insurers paid during that period, and

(2), the ratio of the amount of payments made by the Special Fund attributable to each carrier or self-insurer for all cases being paid under the provisions of section 8(f) of the Act during the preceding calendar year, in relation to the total of such payments. The resulting sum of the percentages is divided by two and multiplied by the estimated expenses of the Fund. The amount paid for the advance assessment is credited against the total assessment and the amount now due is shown last.


Under the District of Columbia Compensation Act the ratio of the amount each carrier or self-insurer paid during the prior calendar year for compensation and medical benefits in relation to the amount all such carriers and self-insurers paid during that period is multiplied by the estimated expenses of the Fund.

PLEASE MAKE YOUR CHECK PAYABLE TO THE U.S. DEPARTMENT OF LABOR, OFFICE OF WORKERS' COMPENSATION PROGRAMS, AND MAIL IT TO:

Department of Labor - Longshore
P O Box 371088M
Pittsburgh, PA 15251

Payment should be mailed to reach this address no later than 30 days from the date of this Notice. Please attach the original copy of the billing form to the check. Any payments received after the due date are subject to interest charges.

Please direct any inquiries concerning your assessment to Frank Fiorini or Carl Abildso at 202-523-8721.


JOSEPH F. OLIMPIO
Director, Division of Longshore
and Harbor Workers' Compensation

APPENDIX C-VI

**COMPUTATION OF INSURANCE GUARANTY FUND PROVISION
IN PROPOSED ADVISORY RATES**

ILLINOIS

APPENDIX C-VI

Computation of Insurance Guaranty Fund Provision
in Proposed Advisory Rates

<u>(1)</u> <u>Date of</u> <u>Call</u>	<u>(2)</u> <u>Amount of</u> <u>Call</u>	<u>(3)</u> <u>Premium</u> <u>Base Year</u>	<u>(4)</u> <u>Premium</u> <u>Base</u>	<u>(5)</u> <u>Factor</u> <u>(2)/(4)</u>
7-18-89	10,000,000	1986	5,118,088,740	0.0020
	6,100,000	1988	5,644,658,193	<u>0.0011</u>
				0.0031 (A)
12-29-89	-950,000	1981	3,011,914,996	-0.0003
	-200,000	1984	3,156,321,870	-0.0001
	-3,000,000	1985	4,268,243,757	-0.0007
	-51,812	1986	5,155,693,432	<u>-0.0000</u>
				-0.0011 (B)
1-28-90	1,000,000	1985	4,184,837,245	0.0002
	4,000,000	1986	5,116,010,973	0.0008
	1,000,000	1988	5,337,200,037	<u>0.0002</u>
				0.0012 (C)
3-30-90	5,000,000	1986	5,096,291,595	0.0010
	5,500,000	1988	5,309,760,196	<u>0.0010</u>
				0.0020 (D)
5(A)+5(B)+5(C)+5(D)			0.0052 (.52%)	

**SECTION IIA
NCCI RATEMAKING PROCEDURES
TECHNICAL SUPPLEMENT**

PART II - SUPPORTING APPENDICES

APPENDIX D

STATE ILLINOIS
 LOC. REV'N 62

DATE 08/27/90
 INITIALS EG

EXHIBIT I

RATIO OF EARNED TO MANUAL PREMIUMS

POLICY PERIOD	(1) POLICY YEAR STD. EARNED PREMIUMS	(2) PREMS. AT POLICY YEAR MAN. RATES	(3) (1)/(2) RATIO OF E/M PREMIUM ADJ. FOR OFF-BALANCE
MANUFACTURING			
4/85-3/86	352,364,866	359,484,788	XXX
4/86-3/87	396,516,595	401,906,578	XXX
4/87-3/88	415,048,464	417,813,951	XXX
TOTAL	1,163,929,925	1,179,205,317	0.987
CONTRACTING GROUP			
4/85-3/86	285,571,410	293,112,327	XXX
4/86-3/87	347,334,474	369,247,892	XXX
4/87-3/88	389,362,460	413,590,505	XXX
TOTAL	1,022,268,344	1,075,950,724	0.950
ALL-OTHER GROUP			
4/85-3/86	555,098,616	561,109,356	XXX
4/86-3/87	678,228,067	683,906,224	XXX
4/87-3/88	717,755,767	719,450,199	XXX
TOTAL	1,951,082,450	1,964,465,779	0.993
TOTAL ALL GROUPS			
4/85-3/86	1,193,034,892	1,213,706,471	XXX
4/86-3/87	1,422,079,136	1,455,060,694	XXX
4/87-3/88	1,522,166,691	1,550,854,655	XXX
TOTAL	4,137,280,719	4,219,621,820	0.980

	MFG.	CTG.	A.O.	ALL GROUPS
1. POLICY YEAR LOSS & LOSS ADJ. RATIO BASED ON MANUAL PREMIUMS (COL. (3), SECTION A)	0.571	0.555	0.575	0.568
2. RATIO OF EARNED PREM. TO MAN. PREMS. (COL. (3), SECTION B)	0.987	0.950	0.993	0.980
3. ADJUSTMENT FOR EFFECTS OF REMOVAL OF LOSS RATIO ADJUSTMENT PROGRAM (LRAP)	1.000	0.961	1.000	0.989
4. ADJUSTED RATIO OF EARNED TO MANUAL PREMIUMS ((2)/(3))	0.987	0.989	0.993	0.991
5. RATIO OF MANUAL TO EARNED PREMIUMS (1.000/(4))	1.013	1.011	1.007	1.009
6. POLICY YEAR LOSS & LOSS ADJ. RATIO BASED ON EARNED PREMS. (1)/(4)	0.579	0.561	0.579	0.573

STATE ILLINOIS
REVISION 62

DATE 01/22/91
INITIALS JTG

INDICATED LOSS EXHIBIT
CALCULATION FOR AVERAGE WEEKLY WAGE TREND

Year	X	CPS Average Weekly Wages		
		Manuf.	Contr.	A.O.
1984	84.5	404.34	463.31	308.56
1985	85.5	411.62	486.06	308.36
1986	86.5	424.26	514.13	329.74
1987	87.5	439.25	503.26	343.28
1988	88.5	457.83	534.43	356.33

Manufacturing ----- (a) 4/1/87 87.25 437.56
 Regression Output: (b) 7/1/88 88.50 454.38
 Constant -736.916
 Std Err of Y Est 3.874523
 R Squared 0.975748
 No. of Observations 5
 Degrees of Freedom 3
 Manuf. Trend 1.038
 (b)/(a)

X Coefficient(s) 13.461
 Std Err of Coef. 1.225231

Contracting ----- (a) 4/1/87 87.25 512.20
 Regression Output: (b) 7/1/88 88.50 532.13
 Constant -878.918
 Std Err of Y Est 11.45708
 R Squared 0.865869
 No. of Observations 5
 Degrees of Freedom 3
 Contr. Trend 1.039
 (b)/(a)

X Coefficient(s) 15.944
 Std Err of Coef. 3.623048

All Other ----- (a) 4/1/87 87.25 339.04
 Regression Output: (b) 7/1/88 88.50 355.35
 Constant -799.225
 Std Err of Y Est 5.564601
 R Squared 0.948244
 No. of Observations 5
 Degrees of Freedom 3
 A.O. Trend 1.048
 (b)/(a)

X Coefficient(s) 13.046
 Std Err of Coef. 1.759681

STATE ILLINOIS
LOCAL REV'N #62DATE
INITIALSPage 2
08/27/90
EG

INDICATED LOSSES EXHIBIT

	(A) INDICATED LOSSES	(B1) INDEMNITY	(B2) INDICATED LOSSES I-B MEDICAL	(B3) TOTAL
MANUFACTURING	1,046,632,299	534,470,519	300,164,488	834,635,007
CONTRACTING	1,172,134,571	708,433,195	226,283,369	934,716,564
ALL OTHER	1,876,341,153	968,998,523	527,286,288	1,496,284,811
TOTAL	4,095,108,023	2,211,902,237	1,053,734,145	3,265,636,382

	(C) WAGE TRENDS	(D) WAGE TREND DIFFERENTIAL	(E) ADJUSTMENTS	(F) NORMALIZED ADJUSTMENTS
MANUFACTURING	1.038	1.005	1.002	1.002
CONTRACTING	1.039	1.004	1.001	1.001
ALL OTHER	1.048	0.995	0.998	0.998
TOTAL	1.043 C1		1.000 E1	1.000

(G)
ADJUSTED INDICATED LOSSES

MANUFACTURING	1,048,725,564
CONTRACTING	1,173,306,706
ALL OTHER	1,872,588,471
TOTAL	4,094,620,741

(A) Total losses on 7/15/89 law level * policy year and calendar-accident year adjustment factor for differentials.

(B1) - (B3)
Indicated indemnity, medical, and total losses by industry group from Exhibit I-B.

(C) Calculated using linear regression on the most recent five years of average weekly wages by industry group.

(C1) Total trend- weighted average of wage trends, with expected losses (from Appendix A-VII) used as weights.

(D) (Total wage trend)/(Industry Group wage trend).

(E) Adjustments- [(B1)*1.000 + (B2)*(D)]/(B3)

(E1) Total adjustment- weighted average of adjustments by industry group, with expected losses (from Appendix A-VII) used as weights.

(F) Normalized adjustment - adjustments/total adjustment.

(G) Adjusted indicated losses = indicated losses (A) * normalized adjustment.

ILLINOIS COMB APR 85 MAR 86 MANUFACTRG 3RD UNL/LIM 08/25/90

CLASS CODE	INDY GROUP	TRANS. & INJ	NO. OF RISKS	EARNED PAYROLL	EARNED PREMIUM	
2014	1		114	62,060,595	4,177,323	3,984,276
2014	1	01				
TOTAL			114	62,060,595	4,177,323	3,798,108
CLASS CODE	INDY GROUP	TRANS. & INJ	NO. OF CASES	ACTUAL INCURRED LOSSES INDEMNITY	ACTUAL INCURRED LOSSES MEDICAL	
2014	1	11				
2014	1	12				
2014	1	13	23	892,527	340,648	
2014	1	14	43	266,986	110,073	
2014	1	15	66	87,885	83,216	
2014	1	16	337		61,848	
2014	1	17				
2014	1	18				
TOTAL			469	1,247,398	595,785	TOTAL INCURRED 1,843,183
TRANS. & INJ. CODES		00-STANDARD PAYROLL 01-EX-MEDICAL PAYROLL	11-DEATH 12-PERMANENT TOTAL 13-MAJOR 14-MINOR	15-TEMPORARY 16-NON-COMP. MEDICAL 17-CONTRACT MEDICAL		

ILLINOIS COMB APR 87 MAR 88 MANUFACTRG 1ST UNL/LIM 08/25/90

CLASS CODE	INDY GROUP	TRANS & INJ	NO. OF RISKS	EARNED PAYROLL	EARNED PREMIUM	
2014	1		112	46,896,281	3,084,892	3,419,967
2014	1	01				
TOTAL			112	46,896,281	3,084,892	2,870,052
CLASS CODE	INDY GROUP	TRANS & INJ	NO. OF CASES	ACTUAL INCURRED LOSSES INDEMNITY	ACTUAL INCURRED LOSSES MEDICAL	
2014	1	11				
2014	1	12				
2014	1	13	8	362,768	285,105	LIM
2014	1	14	26	221,814	116,156	
2014	1	15	50	81,002	84,222	
2014	1	16	335		69,809	
2014	1	17				
2014	1	18				
TOTAL			419	665,584	555,292	TOTAL INCURRED 1,220,876
TRANS. & INJ. CODES		00-STANDARD PAYROLL 01-EX-MEDICAL PAYROLL		11-DEATH 12-PERMANENT TOTAL 13-MAJOR 14-MINOR	15-TEMPORARY 16-NON-COMP. MEDICAL 17-CONTRACT MEDICAL	

ILLINOIS COMB APR 87 MAR 88 MANUFACTRG 1ST UNL/UNL 08/25/90

CLASS CODE	INDY GROUP	TRANS & INJ	NO. OF RISKS	EARNED PAYROLL	EARNED PREMIUM	
2014	1		112	46,896,281	3,084,892	3,419,967
2014	1	01				
TOTAL			112	46,896,281	3,084,892	2,870,052
CLASS CODE	INDY GROUP	TRANS & INJ	NO. OF CASES	ACTUAL INCURRED LOSSES INDEMNITY	ACTUAL INCURRED LOSSES MEDICAL	
2014	1	11				
2014	1	12				
2014	1	13	8	380,292	312,881	UNL
2014	1	14	26	221,814	116,156	
2014	1	15	50	81,002	84,222	
2014	1	16	335		69,809	
2014	1	17				
2014	1	18				
TOTAL			419	683,108	583,068	TOTAL INCURRED 1,266,176
TRANS. & INJ. CODES		00-STANDARD PAYROLL 01-EX-MEDICAL PAYROLL		11-DEATH 12-PERMANENT TOTAL 13-MAJOR 14-MINOR	15-TEMPORARY 16-NON-COMP. MEDICAL 17-CONTRACT MEDICAL	

STATE
LOCAL REV'N #

ILLINOIS
62

DATE
INITIAL

08/27/90
EG

FORM J

CREDIBILITY CRITERIA
BASED ON POLICY YEARS:

1ST REPORT 4/87-3/88
2ND REPORT 4/86-3/87
3RD REPORT 4/85-3/86
3YR. F. R. POL. 1985

(1)	(2)	(3)	(4)
LOSSES AT CURRENT MANUAL RATE LEVEL			
TOT NO. OF CASES (FORM I-B)	LOSSES AND LOSS ADJ. EXPENSE (FORM I-B)	AVERAGE COST PER. CASE (3)/(2)	
A. SERIOUS	19,275	1,524,937,070	79,115
B. NON-SERIOUS	203,343	686,965,167	3,378
C. MEDICAL	XXX	1,053,734,145	XXX
D.	222,618	3,265,636,382	XXX

(5)	(6)	(7)	(8)
	BASIS OF CREDIBILITY CRITERIA	FULL CREDIBILITY CRITERIA ON M.R.L. (4)X(6)*	EXPECTED LOSSES ON PRESENT LEVEL
A. SERIOUS	25 CASES	1,977,875	1,878,055,608
B. NON-SERIOUS	300 CASES	1,013,400	843,445,225
C. MEDICAL	80% NON-SER.	810,720	1,350,244,809
D.	XXX	XXX	4,071,745,642

(9)	(10)	(11)
	RATIO: PRESENT TO STATE M.R.L. (8)/(3)	FULL CRED. CRIT. ON ASSIGNMENT LEVEL (7)*(10)D.
A. SERIOUS	XXX	2,466,410
B. NON-SERIOUS	XXX	1,263,710
C. MEDICAL	XXX	1,010,968
D.	1.247	XXX

EX: CALCULATION OF A PARTIAL CREDIBILITY GIVEN AN EXPECTED LOSS AMOUNT:

PARTIAL CRED. = ((EXP. LOSS/FULL CRED.)^(2/3), TRUNCATED TO TWO PLACES)

EX: CALCULATION OF AN EXPECTED LOSS AMOUNT GIVEN A PARTIAL CREDIBILITY:

EXPECTED LOSS = (((PARTIAL CRED.)^(3/2), ROUNDED TO THREE PLACES)
*FULL CREDIBILITY), ROUNDED TO THE NEAREST INTEGER)

STATE ILLINOIS
LOC. REV 'N# 62

EXHIBIT I-B

DATE 08/27/90
INITIALS EG

DETERMINATION OF MODIFIED DATA FOR POLICIES BECOMING EFF. 4/87-3/88
1ST REPORT

NO. CASES	INJ TYP	(1) ACTUAL INCURRED LOSSES	(2) TO 7/15/89 LAW LEVEL	(3) DEV.	(4) LAE X ASSESSMENT.*	(5) COMPOSITE 2X[3X4]	LOSSES & LOSS ADJ. EXPENSE 1 X 5
MANUFACTURING							
16	11	1,492,670	1.018	1.627	1.127	1.867	2,786,815
11	12	1,137,611	1.032	1.627	1.127	1.893	2,153,498
1,276	13	53,761,530	1.011	1.627	1.127	1.854	99,673,877
6,788	14	37,544,499	1.009	0.998	1.127	1.135	42,613,006
15,226	15	31,920,008	1.004	0.998	1.127	1.130	36,069,609
XX	S. MED	28,145,614	1.000	1.057	1.120	1.184	33,324,407
XX	NS. MED	65,238,913	1.000	1.101	1.120	1.233	80,439,580
23,317	TOT	219,240,845	XX	XX	XX	XX	297,060,792

CONTRACTING

30	11	5,946,053	1.018	1.627	1.127	1.867	11,101,281
12	12	2,483,755	1.032	1.627	1.127	1.893	4,701,748
1,883	13	98,138,856	1.011	1.627	1.127	1.854	181,949,439
2,958	14	20,413,042	1.009	0.998	1.127	1.135	23,168,803
7,105	15	25,133,131	1.004	0.998	1.127	1.130	28,400,438
XX	S. MED	40,367,003	1.000	1.057	1.120	1.184	47,794,532
XX	NS. MED	29,647,967	1.000	1.101	1.120	1.233	36,555,943
11,988	TOT	222,129,807	XX	XX	XX	XX	333,672,184

ALL-OTHER

98	11	11,774,200	1.018	1.627	1.127	1.867	21,982,431
13	12	2,443,488	1.032	1.627	1.127	1.893	4,625,523
2,375	13	105,691,076	1.011	1.627	1.127	1.854	195,951,255
9,866	14	54,891,666	1.009	0.998	1.127	1.135	62,302,041
26,741	15	54,676,762	1.004	0.998	1.127	1.130	61,784,741
XX	S. MED	56,448,117	1.000	1.057	1.120	1.184	66,834,571
XX	NS. MED	104,587,936	1.000	1.101	1.120	1.233	128,956,925
39,093	TOT	390,513,245	XX	XX	XX	XX	542,437,487

ALL GROUPS

144	11	19,212,923	XX	XX	XX	XX	35,870,527
36	12	6,064,854	XX	XX	XX	XX	11,480,769
5,534	13	257,591,462	XX	XX	XX	XX	477,574,571
19,612	14	112,849,207	XX	XX	XX	XX	128,083,850
49,072	15	111,729,901	XX	XX	XX	XX	126,254,788
XX	S. MED	124,960,734	XX	XX	XX	XX	147,953,510
XX	NS. MED	199,474,816	XX	XX	XX	XX	245,952,448
74,398	TOT	831,883,897	XX	XX	XX	XX	1,173,170,463

	INDEMNITY	MEDICAL
* A) LOSS ADJ. EXPENSE	1.120	1.120
B) ASSESSMENT	1.00625	1.00000
C) COMBINED (A X B)	1.127	1.120

STATE ILLINOIS DATE 08/27/90
 LOC.REV'N# 62 EXHIBIT I-B INITIALS EG

DETERMINATION OF MODIFIED DATA FOR POLICIES BECOMING EFF. 4/86-3/87
 2ND REPORT

NO.	INJ CASES TYP	(1) ACTUAL INCURRED LOSSES	(2) TO 7/15/89 LAW LEVEL	(3) DEV.	(4) LAE X ASSMENT.*	(5) COMPOSITE 2X[3X4]	LOSSES & LOSS ADJ. EXPENSE 1 X 5
MANUFACTURING							
24	11	3,987,192	1.025	1.308	1.127	1.511	6,024,647
10	12	2,194,826	1.044	1.308	1.127	1.539	3,377,837
1,523	13	66,167,071	1.019	1.308	1.127	1.502	99,382,941
7,665	14	35,580,400	1.017	1.031	1.127	1.182	42,056,033
14,810	15	27,017,522	1.005	1.031	1.127	1.168	31,556,466
XX	S. MED	32,051,723	1.000	0.997	1.120	1.117	35,801,775
XX	NS. MED	54,613,527	1.000	1.039	1.120	1.164	63,570,145
24,032	TOT	221,612,261	XX	XX	XX	XX	281,769,844

CONTRACTING

32	11	5,939,709	1.025	1.308	1.127	1.511	8,974,900
36	12	5,398,385	1.044	1.308	1.127	1.539	8,308,115
2,054	13	120,060,539	1.019	1.308	1.127	1.502	180,330,930
2,704	14	17,036,637	1.017	1.031	1.127	1.182	20,137,305
6,886	15	22,066,009	1.005	1.031	1.127	1.168	25,773,099
XX	S. MED	44,636,599	1.000	0.997	1.120	1.117	49,859,081
XX	NS. MED	24,005,672	1.000	1.039	1.120	1.164	27,942,602
11,712	TOT	239,143,550	XX	XX	XX	XX	321,326,032

ALL-OTHER

89	11	12,126,172	1.025	1.308	1.127	1.511	18,322,646
32	12	4,931,603	1.044	1.308	1.127	1.539	7,589,737
2,709	13	126,982,926	1.019	1.308	1.127	1.502	190,728,355
10,184	14	48,572,621	1.017	1.031	1.127	1.182	57,412,838
25,227	15	44,521,978	1.005	1.031	1.127	1.168	52,001,670
XX	S. MED	69,572,389	1.000	0.997	1.120	1.117	77,712,359
XX	NS. MED	89,352,686	1.000	1.039	1.120	1.164	104,006,527
38,241	TOT	396,060,375	XX	XX	XX	XX	507,774,132

ALL GROUPS

145	11	22,053,073	XX	XX	XX	XX	33,322,193
78	12	12,524,814	XX	XX	XX	XX	19,275,689
6,286	13	313,210,536	XX	XX	XX	XX	470,442,226
20,553	14	101,189,658	XX	XX	XX	XX	119,606,176
46,923	15	93,605,509	XX	XX	XX	XX	109,331,235
XX	S. MED	146,260,711	XX	XX	XX	XX	163,373,215
XX	NS. MED	167,971,885	XX	XX	XX	XX	195,519,274
73,985	TOT	856,816,186	XX	XX	XX	XX	1,110,870,008

	INDEMNITY	MEDICAL
A) LOSS ADJ. EXPENSE	1.120	1.120
B) ASSESSMENT	1.00625	1.00000
C) COMBINED (A X B)	1.127	1.120

STATE ILLINOIS DATE 08/27/90
 LOC.REV'N# 62 EXHIBIT I-B INITIALS EG

DETERMINATION OF MODIFIED DATA FOR POLICIES BECOMING EFF. 4/85-3/86
 3RD REPORT

NO.	INJ CASES TYP	(1) ACTUAL INCURRED LOSSES	(2) TO 7/15/89 LAW LEVEL	(3) DEV.	(4) LAE X ASSMENT.*	(5) COMPOSITE 2X[3X4]	LOSSES & LOSS ADJ. EXPENSE 1 X 5
MANUFACTURING							
27	11	3,632,995	1.038	1.115	1.127	1.305	4,741,058
23	12	2,753,593	1.064	1.115	1.127	1.337	3,681,554
1,718	13	72,359,798	1.021	1.115	1.127	1.283	92,837,621
7,595	14	32,921,206	1.019	1.003	1.127	1.151	37,892,308
15,430	15	26,033,316	1.006	1.003	1.127	1.137	29,599,880
XX	S. MED	30,388,645	1.000	0.965	1.120	1.081	32,850,125
XX	NS. MED	48,100,889	1.000	1.005	1.120	1.126	54,161,601
24,793	TOT	216,190,442	XX	XX	XX	XX	255,764,147
CONTRACTING							
42	11	7,515,219	1.038	1.115	1.127	1.305	9,807,361
39	12	8,575,668	1.064	1.115	1.127	1.337	11,465,668
2,113	13	121,601,617	1.021	1.115	1.127	1.283	156,014,875
2,489	14	14,384,411	1.019	1.003	1.127	1.151	16,556,457
6,684	15	19,121,545	1.006	1.003	1.127	1.137	21,741,197
XX	S. MED	38,807,375	1.000	0.965	1.120	1.081	41,950,772
XX	NS. MED	19,696,885	1.000	1.005	1.120	1.126	22,178,693
11,367	TOT	229,702,720	XX	XX	XX	XX	279,715,023
ALL-OTHER							
78	11	10,152,997	1.038	1.115	1.127	1.305	13,249,661
51	12	8,685,849	1.064	1.115	1.127	1.337	11,612,980
2,958	13	134,915,522	1.021	1.115	1.127	1.283	173,096,615
10,170	14	42,529,401	1.019	1.003	1.127	1.151	48,951,341
24,785	15	42,952,699	1.006	1.003	1.127	1.137	48,837,219
XX	S. MED	58,556,938	1.000	0.965	1.120	1.081	63,300,050
XX	NS. MED	76,209,675	1.000	1.005	1.120	1.126	85,812,094
38,042	TOT	374,003,081	XX	XX	XX	XX	444,859,960
ALL GROUPS							
147	11	21,301,211	XX	XX	XX	XX	27,798,080
113	12	20,015,110	XX	XX	XX	XX	26,760,202
6,789	13	328,876,937	XX	XX	XX	XX	421,949,111
20,254	14	89,835,018	XX	XX	XX	XX	103,400,106
46,899	15	88,107,560	XX	XX	XX	XX	100,178,296
XX	S. MED	127,752,958	XX	XX	XX	XX	138,100,947
XX	NS. MED	144,007,449	XX	XX	XX	XX	162,152,388
74,202	TOT	819,896,243	XX	XX	XX	XX	980,339,130

	INDEMNITY	MEDICAL
* A) LOSS ADJ. EXPENSE	1.120	1.120
B) ASSESSMENT	1.00625	1.00000
C) COMBINED (A X B)	1.127	1.120

STATE ILLINOIS
LOC.REV'N# 62

EXHIBIT I-B

DATE
INITIALS08/27/90
EGDETERMINATION OF MODIFIED DATA FOR POLICIES BECOMING EFF. 1985
3 YEAR F.R.P.

NO.	INJ CASES TYP	(1) ACTUAL INCURRED LOSSES	(2) TO 7/15/89 LAW LEVEL	(3) DEV.	(4) LAE X ASSMENT.*	(5) COMPOSITE 2X[3X4]	LOSSES& LOSS ADJ. EXPENSE 1 X 5
MANUFACTURING							
	0 11	0	1.029	1.350	1.127	1.565	0
	0 12	0	1.053	1.350	1.127	1.602	0
	0 13	0	1.018	1.350	1.127	1.548	0
	0 14	0	1.017	1.011	1.127	1.158	0
	4 15	20,410	1.005	1.011	1.127	1.145	23,369
	XX S. MED	0	1.000	1.006	1.120	1.127	0
	XX NS. MED	14,357	1.000	1.048	1.120	1.174	16,855
	4 TOT	34,767	XX	XX	XX	XX	40,224

CONTRACTING

	0 11	0	1.029	1.350	1.127	1.565	0
	0 12	0	1.053	1.350	1.127	1.602	0
	0 13	0	1.018	1.350	1.127	1.548	0
	0 14	0	1.017	1.011	1.127	1.158	0
	1 15	1,379	1.005	1.011	1.127	1.145	1,579
	XX S. MED	0	1.000	1.006	1.120	1.127	0
	XX NS. MED	1,487	1.000	1.048	1.120	1.174	1,746
	1 TOT	2,866	XX	XX	XX	XX	3,325

ALL-OTHER

	0 11	0	1.029	1.350	1.127	1.565	0
	0 12	0	1.053	1.350	1.127	1.602	0
	3 13	299,549	1.018	1.350	1.127	1.548	463,702
	5 14	32,286	1.017	1.011	1.127	1.158	37,387
	20 15	42,254	1.005	1.011	1.127	1.145	48,381
	XX S. MED	474,461	1.000	1.006	1.120	1.127	534,718
	XX NS. MED	109,918	1.000	1.048	1.120	1.174	129,044
	28 TOT	958,468	XX	XX	XX	XX	1,213,232

ALL GROUPS

	0 11	0	XX	XX	XX	XX	0
	0 12	0	XX	XX	XX	XX	0
	3 13	299,549	XX	XX	XX	XX	463,702
	5 14	32,286	XX	XX	XX	XX	37,387
	25 15	64,043	XX	XX	XX	XX	73,329
	XX S. MED	474,461	XX	XX	XX	XX	534,718
	XX NS. MED	125,762	XX	XX	XX	XX	147,645
	33 TOT	996,101	XX	XX	XX	XX	1,256,781

	INDEMNITY	MEDICAL
A) LOSS ADJ. EXPENSE	1.120	1.120
B) ASSESSMENT	1.00625	1.00000
C) COMBINED (A X B)	1.127	1.120

ILLINOIS EFFECTIVE 01/01/91
 FIRST POLICY PERIOD 04/01/87-03/31/88
 CALCULATION OF DISCOUNT RATIO FACTORS

	(A) Serious	(B) Non-Serious	(C) Medical	(D) Total
1. Total Indemnity Losses (G.T. NC-235 incl. Stev.)	283,921,207	225,530,606	XXX	XXX
2. Total Medical Losses (G.T. NC-235 incl. Stev.)	125,820,827	155,121,648	44,975,086	325,917,561
3. Total Losses (1)+(2)	409,742,034	380,652,254	44,975,086	835,369,374
4. Total Primary Losses (from Loss Study Program)	28,583,787	181,457,979	44,362,820	XXX
5. Estimated Indemnity Primary (4)x((1)/(3))	19,808,564	107,423,124	XXX	XXX
6. Estimated Medical Primary (4)-(5)	8,775,223	74,034,855	44,362,820	127,172,898
7. Primary for D-Ratios A&B = (5), C = Sum of (6)	19,808,564	107,423,124	127,172,898	XXX
8. Total Losses for D-Ratios A&B = (1), C = (2D)	283,921,207	225,530,606	325,917,561	835,369,374
9. First Report Partial D-Ratios (7)/(8)	0.070	0.476	0.390	XXX
10. First Report Loss Distribution (8)/Sum of (8)	0.340	0.270	0.390	1.000
11. WCSP Experience on-Level (Pure Prem. Checksheet)	1,796,020,420	843,979,078	1,330,846,307	XXX
12. Rate Factors Applied by Parts (Rate Factor Cards)	1.006	1.001	1.021	
13. Adjusted Experience (11)x(12)	1,806,796,543	844,823,057	1,358,794,079	4,010,413,679
14. Adjusted Experience Distribution (13)/sum (13)	0.450	0.211	0.339	1.000
15. Final D-Ratio Factors (9)x(10)/(14)	0.053	0.609	0.449	XXX

**RATEMAKING PROCEDURES
EVALUATION OF RATEMAKING METHODOLOGIES**

**NCCI EXAMINATION
VOLUME III - SECTION IIB - PART 1
PREMIUM AND LOSS
DEVELOPMENT FACTORS**

December 6, 1991

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**PREMIUM AND LOSS
DEVELOPMENT FACTORS**

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PREMIUM AND LOSS DEVELOPMENT FACTORS

I. INTRODUCTION

The determination of an overall rate level requirement is generally based on an estimate of the ultimate loss ratio for the period during which the rates will be in effect. This estimate is often derived from the ultimate loss levels of prior periods, which are also estimated.

One of the fundamental concepts underlying most actuarial projections of ultimate losses is that of loss development. In the Casualty Actuarial Society textbook "Foundations of Casualty Actuarial Science", development is defined as:

"... the difference, on successive evaluation dates, between observed values of certain fundamental quantities that may be used in the (loss) estimation process."

One of the basic actuarial projection methods is to aggregate claims by accident year or policy year, and to measure development as the ratio of the aggregate values of these claims at successive valuation dates. By examining these ratios, or development factors as they are called, for successive years at common maturities, patterns of development can be observed. These patterns are then used to project the future development for years that have not yet reached their full maturity.

When experience is analyzed on a policy year basis, development techniques are also commonly used in estimating the total premiums on policies insuring the claims. As a result of premium audits and late payroll reports, adjustments to policy year premium earnings may occur for some time after the relevant policies have expired.

In this chapter, we have two primary objectives:

- 1a. Evaluate the NCCI's premium and loss development techniques.
- 1b. Evaluate the NCCI's procedures for reconciling differences that occur between different development techniques and evaluate the effectiveness and likely accuracy of the criteria they use to choose one technique over another.

**PREMIUM AND LOSS
DEVELOPMENT FACTORS**

PREMIUM AND LOSS DEVELOPMENT FACTORS

II. CONCLUSIONS AND RECOMMENDATIONS

The following is a summary of our conclusions and recommendations. For ease of reference, where recommendations can be found in a specific section of this report, we have identified the section.

General Methodology

- The premium and loss development analysis process cannot be reduced to a single best methodology. No one approach for analyzing development patterns or choosing among several alternative projection methods will be most appropriate in all circumstances.

Informed judgment is required at many junctures of the ratemaking process. This judgment should be based on a review of various loss statistics as well as knowledge of the workers compensation environment for a given state. (Section V.A., Page 24).

- Our tests of predictive accuracy indicate that projections of ultimate losses from first report are subject to significant estimation error. The accuracy of projections based on data at second and third reports is naturally better, although far from perfect. This suggests that consideration should be given to using data from more than one policy and/or accident year rather than one policy year and one accident year, as in the current NCCI methodology. In using older years, there is a tradeoff between the increased accuracy of the estimated ultimate past loss ratios and the decrease in accuracy due to the lengthening of the trend period. We recommend that future NCCI filings develop projections of ultimate, trended loss ratios based on the latest two or three policy years or the latest two or three policy and accident years. Judgment will need to be exercised in selecting standard weights (or a variable weighting system), although tests of predictive accuracy may be helpful in making this judgment. (Section V.E., Pages 37-38).

PREMIUM AND LOSS DEVELOPMENT FACTORS

Loss Development

- Loss development factors have been increasing at early ages of development for many states, as well as on a regional basis. This appears to be occurring without a corresponding decrease in development at later maturities. In general, the upward trend for paid losses appears to continue through the latest development year (calendar year 1989) included in this study, while the trends for paid plus outstanding and for incurred (including IBNR) losses appear to have ceased, at least temporarily, in about calendar year 1988 or 1989. (Section V.A., Pages 22-24).
- Because of the trends in development factors over the period studied in this report, for many of the states, use of a trended development factor method would have produced more accurate results than any average of prior years' development factors. We believe that it is important to investigate the underlying causes of trend to evaluate whether an observed trend is likely to continue. Where a trended development factor method is employed, it is also important to consider how causes of the trend in development factors at a given maturity will affect factors at other maturities. While a trended development factor method may be appropriate in some instances, it will generally be the least accurate method (compared to an average of prior factors) when a reversal of the trend occurs. (Section V.A., Pages 23-24).
- In cases where there is not a trend in loss development factors, an average of three or four years (rather than two) appears to produce a small improvement in accuracy. (This statement applies for all loss types). (Section V.A., Page 24).
- Development factors based on all three types of loss data studied (paid, paid plus outstanding, and incurred losses) tended to underestimate the ultimate losses by approximately equal amounts, on average, for the time period studied in this report. That is, there was no appreciable difference among the estimation biases in the period studied. The observed underestimation resulted from the upward trend noted previously and does not, in our opinion, indicate an inherent flaw in loss development methods. (Section V.D., Page 35).

PREMIUM AND LOSS DEVELOPMENT FACTORS

- Development factors based on paid losses and paid plus outstanding losses have tended to produce more stable estimates, from one evaluation to the next, than have development factors based on incurred losses (including IBNR). As noted in the previous conclusion, this is accomplished without a reduction in average accuracy. We hypothesize that the greater instability of the incurred loss development method may be due to inaccuracies in the allocation procedures used by companies to calculate IBNR by state. We recommend that an average of the ultimate losses resulting from paid and paid plus outstanding projection methods be used as the primary basis for the rate indications. Deviations from the primary methodology (such as using only the paid method, the paid plus outstanding method, or the incurred method) should be made when appropriate, based on diagnostic tests and consideration of the underlying forces influencing the development patterns. The supporting information provided with the NCCI rate filing should provide documentation and explain the rationale for deviations from the primary methodology. (Section V.D., Page 36).
- We consider it likely that development factors based on the sum of paid losses and case reserves will be found to be a more reliable basis for projection than paid plus outstanding losses, for most states. However, the collection of "pure" case reserve data by NCCI began only with the December 31, 1987 data calls. Thus, there is not enough historical data to thoroughly test this judgment. (Section V.D., Pages 36-37).
- We recommend that NCCI expand the diagnostic tests to enhance their ability to analyze loss development patterns. To assist in the evaluation of changes in loss development patterns, several such tests are identified in this report, some of which can be calculated with currently available data. (Section VI.D., Page 50).
- We recommend the collection of additional claim count data (number of claims closed with indemnity payments), for use in diagnostic tests of loss development. There are data quality implications to this recommendation which will be discussed later in this report. (It is likely to be some time before an adequate history of claim count data is available, from all carriers, to utilize claim counts in the diagnostic tests). (Section VI.D., Pages 50-51).

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- The methodology employed by NCCI to estimate "tail" factors makes best use of available incurred loss data. However, we recommend that NCCI also utilize tail factors based on paid losses and paid plus outstanding losses. (Section V.C., Page 28).
- We agree with the NCCI's planned expansion of the data calls to allow development factors to be evaluated beyond eighth report (thereby reducing the magnitude of the tail). Eventually, the data base will include development to fifteenth report. In the interim, we recommend that data be collected from a sample of companies, to possibly allow acceleration of the schedule for expanded loss development. (Section V.C., Page 28).
- The use of multiple state data appears unlikely to contribute significantly toward stabilizing the loss development factor estimation process. (Section V.B., Page 25).

Premium Development

- No one premium development factor estimation method was consistently more successful than the others. However, there is some evidence that a longer term average will perform better than the NCCI's current two year average. We recommend that the NCCI review at least four years of premium development factors, and that a three year average be used as the standard procedure from which deviations can be made where appropriate. (Section V.A., Page 22).
- The adjustment of calendar year earned premium to current rate level does not take into account the contributions to calendar year premium arising from audit adjustments to older policy years. It also does not reflect differences in exposure volume between the two policy years contributing to the accident year. A more theoretically correct calculation would be based on policy year contributions to accident year exposures. In periods of increasing premium volume, the current NCCI approach results in an understatement of calendar year premiums at current rates. The more theoretically correct calculation

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appears likely, for most states, to reduce the indicated rate level by less than one percent. (Section V.F., Pages 38-41).

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III. PREMIUM AND LOSS DEVELOPMENT METHODOLOGIES

A. NCCI Standard Approach

The following is a description of how premium and loss development are used in the ratemaking process employed by NCCI.

1. Source of Data

The data underlying the premium and loss development sections of the rate filing is compiled from the NCCI's Financial Calls for data. The two specific calls relevant to our analysis request premium and loss data, by policy year and accident year, at each year end. The data collected in these calls is:

- Standard Earned Premium¹
- Net Earned Premium
- Paid Losses²
- Outstanding Losses Excluding IBNR²
- IBNR Losses²
- Incurred Losses Including IBNR²
- Incurred Indemnity Claim Count
- Case Outstanding Losses³
- Bulk Outstanding Losses³

"Bulk" reserves as defined by NCCI are "reserves for general case reserve inadequacy, supplemental case reserves, cases that may reopen, or other [non-IBNR] reserves which are not associated with specific claims." "Outstanding losses" include bulk reserves for some companies, while other companies include bulk reserves in IBNR.

The development triangles are then compiled from successive year end evaluations.

-
- 1 Standard Earned Premium is required to be presented at two rate levels: the NCCI Designated Statistical Reporting Level and the Company level.
 - 2 Medical, Indemnity and Total.
 - 3 These items are required of companies that include Bulk reserves in the "Outstanding Excluding IBNR".
-

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Development factors are defined by reporting period, i.e., first to second report, second to third report etc. By definition, first report for accident year 19xx is December 31, 19xx; first report for policy year 19xx is December 31, 19xx+1.

A complication arises from the fact that, as a result of the NCCI's editing process and the timing of some state rate filings, not all companies' data will be included in the compilation of policy year and accident year aggregates. NCCI uses a "matching company" process for deriving development factors. In this process, development factors for, say, first to second report, are derived only from companies that provide useable data for each of these reports. The same is true for second to third report, and so on. On average, less than 5% of premiums and losses are omitted due to the matching process.

2. Premium and Loss Development Factors

Policy year standard earned premium at a first report is developed to a fifth report. Premium development factors are selected separately for first report to second report, second report to third report, third report to fourth report and fourth report to fifth report. The development factors are based on historical policy year premium development in the state. The standard methodology uses the arithmetic average of the two most recent years' development factors. The fifth report is considered final, that is, no premium development is assumed to take place beyond the fifth report.

Policy year indemnity and medical losses are separately developed to ultimate. Loss development factors are selected for each successive development interval, i.e., first to second through seventh to eighth. As with premium development, the standard methodology uses the arithmetic average of the two most recent years.

Accident year losses are developed in a similar manner. Premium development is not utilized in the accident year loss ratio indication.

Using the development process described above, loss projections based on the following methodologies are reviewed for each state. (Methodology refers to the type of data being used. In general, the calculation of development factors is similar for the various methodologies.)

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Incurred Losses including IBNR
Incurred Losses excluding IBNR (i.e paid plus outstanding including reported
bulk reserves)
Paid plus Case Outstanding Losses
Paid Losses
Paid Losses to fourth report; Incurred including IBNR from fourth report to
ultimate

In each of the above methodologies, development beyond eighth report is based on incurred including IBNR, using the tail factor calculation described below.

3. Tail Factor Calculation

A "tail" factor is a loss development factor that reflects the expected development beyond the period for which individual loss development factors are available.

For data calls conducted through December 31, 1986, the policy year and accident year aggregate data included loss experience for individual years only to the eighth report. All years at a valuation date beyond eighth report were aggregated. As a consequence, the loss development factors by development year were available only through eighth report.

Experience shows that development beyond eighth report can be significant, and the tail factor is intended to estimate this development.

The derivation of the tail factor is a two step process:

- a. Calculate a factor to convert losses projected to an eighth report to an incurred (including IBNR) basis at eighth report. The general methodology uses a two year average of the following ratio:

$$\frac{\text{Incurred (including IBNR) at eighth report}}{\text{Reported at eighth report}}$$

Reported at eighth report reflects the loss type being developed, (e.g. paid).

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- b. Calculate the eighth to ultimate tail (incurred including IBNR) as follows:

Calendar Year (Incurred) Loss Development
for all maturities beyond eighth report
Average of most recent three years'
incurred losses at eighth report

The denominator (three year average) reflects a fairly recent modification to the NCCI's tail factor calculation. It is a reflection of the fact that the previous approach, which used only the most recent year's incurred losses at eighth report, understates the tail factor when the loss base is growing over time (as has been the case for most states.)

Beginning with the December 31, 1987 report, the aggregate calls for data have been modified to allow the collection of individual years' development beyond eighth report. Ultimately, the expanded calls will provide loss development to fifteenth report.

As NCCI compiles more data from its expanded policy year and accident year calls, the actual development factors will be extended to reflect the available data, and the development interval projected by the tail will be adjusted accordingly.

The current NCCI methodology requires two values for each development factor and tail factor. Several alternative tail methodologies are possible. For example, the December 31, 1990 reports will include one development factor for (policy year) eleventh to twelfth report, and would allow one calculation of a tail factor for eleventh report to ultimate. The current methodology would be to use development to tenth report, with a tail factor reflecting development from tenth report to ultimate, since two values of the latter are available. An alternative would be to use development to eleventh report, along with the single eleventh to ultimate tail factor.

The NCCI staff analyzed several alternative methodologies in early 1989. This analysis tested each of the methodologies' accuracy in predicting the "true" tail, for each of 38 states and in total. The test was designed to evaluate the predictive accuracy of the

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various methodologies, under several alternative scenarios of loss development factors that replicate the most recent eighth to ultimate factor. In addition to the most recent eighth to ultimate factor for each state, the test incorporated average annual (loss) growth rates exhibited by each state. Based on the results of this analysis, NCCI established the following schedule:

<u>Filing Year</u>	<u>Tail Methodology</u>
1991	10th to Ultimate (no growth adjustment)
1992	11th to Ultimate (no growth adjustment)
1993	12th to Ultimate (no growth adjustment)
1994	13th to Ultimate (no growth adjustment)
1995	14th to Ultimate (no growth adjustment)
1996	15th to Ultimate (no growth adjustment)
1997	15th to Ultimate (two year average denominator)
1998	15th to Ultimate (three year average denominator)

The planned methodology has subsequently been modified to reflect a growth adjustment in the factors for the 1991-1996 filing years. We understand that the NCCI staff monitors the actual tail development, each year, relative to the test results.

4. Selection Among Various Methodologies

As discussed above, ultimate loss projections are prepared using a number of loss measures, including:

- Incurred Losses including IBNR
- Incurred Losses excluding IBNR
- Paid plus Case Outstanding losses
- Paid Losses
- Paid Losses to fourth report; Incurred including IBNR from fourth report to ultimate

Currently, rate level analyses utilizing all five of the data types are prepared for internal review by NCCI, along with the results of the NCCI's "Early Warning System"

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which was developed to assist in choosing among the various methodologies. The two main tests included in the Early Warning System are:

- Change in the product of the first to fifth incurred (including IBNR) loss development factors (based on two year averages). A change of more than five percentage points is considered evidence of a possible change in reserve adequacy, leading to consideration of methodologies other than incurred losses.
- Change in ratio of paid to incurred (including IBNR) losses at first report. If the ratios for successive years differ by more than three percentage points, this is taken as evidence of changing reserving patterns or payment patterns.

In addition to the early warning tests, NCCI may evaluate other diagnostic tests and may also take into consideration information received from company managements, particularly claim departments, as to changes in the claim process which may be affecting development patterns.

B. Independent Bureau Methodologies

We have reviewed the filings of the following independent rating bureaus (selected as a sample):

<u>State</u>	<u>Effective Dates</u>
California	1/1/90; 1/1/91
Massachusetts	1/1/90; 1/1/91
Minnesota (pure premium filing)	1/1/90; 1/1/91
New York	7/1/89; 7/1/90

The following is a summary of the premium and loss development methodologies used by these bureaus:

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1. Premium and Loss Data

California ultimate loss ratio projections are based on accident year loss data (together with calendar year earned premium data) only. Indemnity and medical losses are developed separately using incurred losses excluding IBNR. (As with NCCI data, these losses may include companies' estimates of bulk reserves for case reserve development.)

Massachusetts ultimate loss ratio projections are based on averages of policy year and accident year data. While several alternatives are provided in the filing, the indicated change in rate level is based on paid plus case loss development for medical and indemnity losses combined. This represents a change from previous filings, for which the indications were based on incurred losses including IBNR.

Minnesota ultimate loss ratio projections are based on averages of policy year and accident year data. While several alternatives are provided in the filing, the ultimate loss projection is based on incurred losses excluding IBNR (with medical and indemnity evaluated separately).

New York ultimate loss ratio projections are based on averages of policy year and calendar year data. The indicated change in rate level in the most recent filing (effective 7/1/90) is based on development of paid plus case for medical and indemnity losses combined. This represents a change from previous filings, in which the indications were based on incurred losses including IBNR.

2. Premium and Loss Development Factors

California "standard" loss development factor selection is the average of the three most recent years. Where the three years show evidence of a trend in the factors, a trending method (double exponential smoothing) is used to project the next factor, which is given consideration in the final selection. Loss development data is compiled and projected separately for the state fund and for the private carriers. Premium development is not considered because calendar year earned premiums are used.

Massachusetts premium and loss development factors are based on the most recent two year average. In the most recent filing (effective 1/1/91) loss development data is

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compiled (and projected) separately for the ten largest carriers (individually), and for the rest of the industry.

Minnesota premium and loss development factors are chosen from among several diagnostic averages, including the following: average of all (five) factors; average of the two most recent factors; and average of (three) factors excluding the highest and lowest.

New York premium and loss development factors are based on the most recent two year averages.

3. Tail Factor

California accident year loss development is available to 234 months (19.5 years). The tail factor (234 months to ultimate) is based on the ratio of incurred including IBNR to incurred excluding IBNR.

Massachusetts policy year and accident year loss development is available to tenth report. The tail (tenth report to ultimate) is based on the ratio of incurred including IBNR to incurred excluding IBNR.

Minnesota pure premiums reflect development only to eighth report. Beyond that, carriers are required to apply their own development tail. The Minnesota filing provides several alternative tail factor calculations for carriers to consider. Each of these alternatives is a variation of the approach used by NCCI and discussed above.

New York policy year development is available to seventh report. Beyond that, the tail factor is derived using the NCCI methodology described above, but without the adjustment for growth in the denominator.

4. General Observations

In general, these four independent bureaus tend to be moving away from the use of incurred loss including IBNR.

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Three of the four bureaus rely solely on the last two or three development factors. The fourth bureau (Minnesota) evaluates the factors over a longer time period.

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IV. DATA UNDERLYING OUR ANALYSIS

The following states were chosen for our analysis, to represent a mixture of states of various size, geography and workers compensation laws:

- Connecticut
- Florida
- Illinois
- Louisiana
- Maine
- Michigan
- Nebraska
- North Carolina
- Oregon
- Utah
- Wisconsin

The following policy year data was obtained from NCCI:

- Standard Earned Premiums (at NCCI Designated Reporting Level)
- Paid Medical Losses
- Paid Indemnity Losses
- Outstanding (excluding IBNR) Medical Losses
- Outstanding (excluding IBNR) Indemnity Losses
- Bulk Medical Losses
- Bulk Indemnity Losses
- Incurred (including IBNR) Medical Losses
- Incurred (including IBNR) Indemnity Losses
- Reported Indemnity Claim Counts

Matching company data was provided for each development period for policy years 1973 through 1987.

In addition to the eleven states identified above, similar data was obtained for each of the three NCCI regions (North, South, West). We also received the premium and loss

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development sections from each of the most recent three rate filings for the states above.

We obtained a copy of the "Early Warning System" exhibits prepared by NCCI with each rate review.

We received copies of internal NCCI correspondence relative to modifications to the tail factor procedure to reflect the additional development data as it becomes available.

We chose to perform our analysis using policy year data only. For the issues we are studying, conclusions based on policy year data are equally applicable to accident year data.

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V. OBJECTIVE 1a -- EVALUATION OF THE NCCI'S PREMIUM AND LOSS DEVELOPMENT TECHNIQUES

A. Number of Years Entering the Development Triangle

The purpose of this section of our analysis was to evaluate alternatives to the two year arithmetic average which is the norm for the development factors used by NCCI in its projections of ultimate losses and premiums. We evaluated the following alternatives:

- Three Year Average
- Four Year Average
- Two Year Weighted Average
- Three Year Weighted Average
- Four Year Weighted Average

The weights utilized in the weighted averages were exponential weights based on a weighting factor of 0.9, as follows:

Most recent factor	1.000
Next most recent factor	0.900
Next most recent factor (if used)	0.810
Next most recent factor (if used)	0.729

We designed a test which compares, for each of the alternative averages, the projected factor to the actual factor. This was done for each of five successive development years - December 31, 1984 through December 31, 1989. For example, as a test of the first to second development factor, the factors from policy years 1981-1983 were used to project the factor for 1984, the factors for 1982-1984 were used to project the factor for 1985, and so on.

For each alternative, and for each development interval, we calculated the square of the difference between the projected development factor based on the development technique and the actual development factor.

The best performing alternative at each development interval was then defined as the one for which the sum of the squared differences was the lowest.

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(Note: This test evaluates the ability to predict the next calendar year's loss development, rather than the latest policy year's loss development. For purposes of comparing the accuracy of the alternative weighting methods, we consider it preferable to test against the next calendar year's loss development, because this allows use of the latest available development factors. However, later in this study, our comparison of predictive accuracy of alternative data types (paid vs. paid plus outstanding vs. incurred) will test the ability to predict a policy year's loss development).

Exhibits 1 through 7 summarize the results. (More detailed summaries for each state are provided in the technical appendix.) Two summaries are provided for each exhibit. The top half of each exhibit identifies the method producing the lowest average deviation, summed across all development intervals, i.e., the average deviation for the first report to second report factors plus the average deviation for the second report to third report factors, and so on. The bottom half of each exhibit identifies the method that produces the lowest average deviation for the greatest number of development intervals.

For premium development, no single averaging method was consistently more successful than the others. There is some evidence that longer term averages will perform better than the standard two year average utilized by NCCI. Based on the tests, we recommend that NCCI compile at least four years of premium development factors, and that a three year average be used as the standard procedure from which deviations can be made where appropriate.

For losses, the frequent success of the two year exponential average can be explained by the fact that, for many states, the development factors at a given age exhibit a trend. In particular, loss development factors have generally been increasing over the time period studied. The two year exponential average is weighted more heavily toward recent experience than the other alternatives we evaluated.

The increase in loss development factors at the early maturities appears to be occurring without a corresponding decrease at the later maturities. In general, the upward trend for paid losses appears to continue through the latest development year included in the study, while the trends for paid plus outstanding and for incurred

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(including IBNR) losses appear to have ceased, at least temporarily, in about calendar year 1988 or 1989.

We chose not to include trended development factors in our tests (that is, development factors resulting from the assumption of a continuation of a "down the column" trend). While an appropriately chosen trending method would have performed better than the other averages in predicting the development factors in many instances, a trending method will generally be the least accurate in a situation where a reversal of the trend occurs. For example, the following is a summary of the paid indemnity loss development factors for Louisiana, from first report to second report:

<u>Policy Year</u>	<u>Development Factor</u>
1979	1.622
1980	1.704
1981	1.748
1982	1.691
1983	1.767
1984	1.758
1985	1.797
1986	1.850
1987	1.736

Clearly, an upward trend exists in the factors through policy year 1986.

With the benefit of hindsight, we can see that a development factor approach which assumed a continuation of the trend in the development factors would have more accurately predicted the factors for policy years 1985 and 1986 than would any average of the prior years development factors.

Conversely, again with hindsight, we can observe that a development factor approach which assumed a continuation of the trend would have overstated the factor for policy year 1987.

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The point of the above is to illustrate that no one approach for analyzing development factors is most appropriate in all circumstances.

As noted above, for most states the upward trend in paid development factors appears to continue through the latest development year included in the study (Calendar Year 1989). We believe that it is unlikely that a reversal of the trends will occur in all states at any point in time. However, we believe that it is equally unlikely that the trends will continue indefinitely in all states. An investigation into the causes of the trend, and the likelihood that it will continue, can assist in the development factor selection process for a given state.

The tests for each state suggests that, for those states and development intervals for which there is no apparent trend in development factors (trends appear to be more prevalent at the early development intervals), no one average consistently outperforms the others. However, there is some evidence that the longer term averages (three and four year) perform better when there is no apparent trend.

We conclude, from the above tests, that in the absence of a trend in development factors, an average of three or four years (rather than two) may produce a small improvement in accuracy. However, where a trend is present, we do not believe that it is appropriate to assume that the trend will continue, without an investigation of the underlying cause of the trend. If the results of the investigation give a reason to expect a continuation of the trend, then a trended development method may be appropriate. It will be important, however, to also consider how the trend in development factors at a given maturity will affect factors at other maturities.

Where a trend has existed in the past development factors, and where it is not clear whether the trend is more likely to continue or to reverse in the future, the most appropriate development factor may be the most recent factor, rather than an average of several recent factors.

In conclusion, no one approach for analyzing development patterns will be most appropriate in all circumstances. Informed judgment, based on knowledge of workers compensation environment for a given state, is required in the development analysis.

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B. Use of Multiple State Data

The development factors selected by NCCI for a given state are based solely on the loss development data from that state. We have designed a test to evaluate whether the use of multiple state data would improve the development factor selections for the smaller states.

The premise underlying the concept of using multiple state data is that the factors for a given state exhibit too much variability to allow full reliance upon them as a basis for estimating future development. This would be more likely to occur for small (low volume) states than for the larger states. Thus, if the premise is correct, we would expect that the smaller states would exhibit more variability in the development factors than would the larger states.

To test for this, we have calculated the variances of the loss development factors for each of the eleven states, as well as for the regional data. If the above premise is true, we would expect the variances to decrease as the size of the state increases. A comparison of the variances for each of the six loss types (paid medical, paid indemnity, paid plus outstanding medical, paid plus outstanding indemnity, incurred medical, incurred indemnity) is attached as Exhibits 8 through 13. On the exhibits, states are arranged in increasing order based on policy year 1987 earned premium. At the early maturities, there does not appear to be any clear relationship between size (premium volume) and variance of development factors. At the later maturities, the regional variances are lower than the state variances. However, there are a number of anomalies in the variances of the state data (i.e., large states with relatively high variances and small states with relatively low variances) which indicate that elements other than volume have significant impact on development stability. In addition, there are a number of instances where the average loss development factors for one state are consistently higher than the corresponding regional average, while those for another state in the region are consistently lower than the regional average. Thus, grouping states to increase the volume of data would not appear to improve the development factor estimation process.

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C. Selection of Tail Factor

As discussed above, the NCCI tail factor is based on the following ratio:

$$\frac{\text{Calendar Year Incurred Loss Development} \\ \text{for all maturities beyond eighth report}}{\text{Average of most recent three years'} \\ \text{incurred losses at eighth report}}$$

Our first observation is that the adjustment which was made to the tail calculation, whereby the denominator was adjusted for growth, was a valid measure to counteract the bias in the previous procedure. The prior approach was to use the ratio of:

$$\frac{\text{Calendar Year Incurred Loss Development} \\ \text{for all maturities beyond eighth report}}{\text{Most recent year at eighth report}}$$

Exhibit 14 attached provides a hypothetical example which demonstrates that, in a period of growth, the prior approach will understate the true tail. From the example, the following are the key values:

"True" Tail	1.163
Unadjusted Tail	1.147
Adjusted Tail	1.161

A second observation is that, despite the improvement in the process, there still exists a fair amount of volatility in the eighth to ultimate factors from one year to the next. A two year average of tail factors, calculated from successive calendar years, is used to reduce variability from one rate filing to the next. This is illustrated below with tail factors from Connecticut rate filings.

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<u>Filing Effective</u>	<u>Indemnity Eighth to Ultimate</u>		
	<u>Tail Factor #1</u>	<u>Tail Factor #2</u>	<u>Average</u>
10/01/87	1.132	1.187	1.160
01/01/89	1.158	1.127	1.143
01/01/90	1.125	1.160	1.143

As the data becomes available for development beyond eighth report, the tail will be one year shorter, with each evaluation, up to the point when development is available to fifteenth report. Thus, the magnitude of the tail will diminish as this data becomes available. To illustrate, as discussed earlier, the California data provides accident year development factors to 234 months. Based on the California filing effective January 1, 1991, the following is a comparison of the (incurred excluding IBNR) tail factors from 102 months (which is approximately equivalent to a policy year at eighth report), 186 months (which is approximately equivalent to a policy year at fifteenth report) and 234 months (which is approximately equivalent to a policy year at nineteenth report):

<u>Accident Year Maturity</u>	<u>California Tail Factors</u>	
	<u>Medical</u>	<u>Indemnity</u>
102	1.1233	1.0445
186	1.0692	1.0296
234	1.0350	1.0174

The NCCI plan for integrating the additional loss development data, with corresponding adjustments to the tail, as this data becomes available, was discussed in Section III-A 3. The plan requires that two data points (loss development factor or tail factor) be available before a specific methodology is used. We believe that this constraint is appropriate. While other methods exist for deriving a tail, such as curve fitting or modeling methods, we do not believe that these generally provide more accurate estimates of the tail than the NCCI's current procedure. Curve fitting, for example, requires an assumption regarding the underlying "shape" of the development curve. Families of plausible curves, with equally good measures of fit to the loss development data to eighth report, can produce significantly different tail factors.

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We agree with the NCCI's plan, which will result in data for one additional loss development interval, each year (with the tail factor therefore reflecting one less development interval), until December 31, 1996 when the tail will reflect development from fifteenth report to ultimate. We recommend that, in the interim, NCCI collect loss development data on a sampling basis, from carriers having development data by policy year (and accident year) for maturities beyond those required in the calls. Analysis of this data may allow acceleration of the schedule for expanded loss development.

We also recommend that NCCI utilize tail factors based on paid losses and paid plus outstanding losses. For reasons to be discussed in more detail in a later section, we believe the incurred including IBNR is a less reliable predictor of ultimate incurred losses than paid losses or paid plus outstanding losses.

In conclusion, we believe that the approach used by NCCI makes best use of available data in deriving the tail. We agree with the plan to extend the development history to fifteenth report, as the data becomes available. We recommend that tail calculations, based on paid losses and on paid plus outstanding losses, be used as alternatives to the tail based on incurred losses. We also recommend that additional tail data be collected, on a sampling basis, to possibly allow acceleration of the tail modification schedule.

D. Performance Tests of Loss Development Methods

As discussed earlier, several methodologies (i.e., loss types) are considered by NCCI in projecting ultimate loss ratios. In a later section, we will discuss the NCCI's procedure for choosing the methodology to be used in the rate filing. We will also discuss other diagnostic tests which may assist in this selection process.

First, however, we will evaluate the historical performance of the three main methodologies:

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Paid Losses

Incurred Losses excluding IBNR (referred to herein as Paid plus Outstanding Losses)

Incurred Losses including IBNR (referred to herein as Incurred Losses)

A fourth methodology, Paid plus Case Outstanding Losses, is also considered by NCCI. However, case reserves have only been reported separately (from bulk reserves) since December 31, 1986. This is not a sufficient history to incorporate this method in our evaluation.

The purpose of the tests, which will be described below, is to compare the three methods with respect to:

- variability in the estimates of ultimate incurred losses;
- accuracy in the estimates of ultimate incurred losses from the early policy year maturities.

The premise underlying the use of both of these measures in evaluating the methods is that, while predictive accuracy is the most important feature of the methodology, if two (or three) methods are approximately equal in their predictive ability, then the methods exhibiting the least variability will be preferred because of the greater potential to detect and adjust for any bias.

1. Tests of Variability

Our first test of performance compares the variability in the estimates produced by each of the three data types as a policy year matures. The estimates are based on the NCCI's current projection methodology (that is, using a two year average development factor) and are developed to eighth report.

This test measures the variability in two ways. The first is the percentage variation in the projected value at eighth report based on data at successive development points.

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That is, if the available projections are from:

Fourth Report	P4
Fifth Report	P5
Sixth Report	P6
Seventh Report	P7
Eighth Report	P8

The first measure of variability is:

$$\frac{\left| \frac{P5}{P4} - 1 \right| + \left| \frac{P6}{P5} - 1 \right| + \left| \frac{P7}{P6} - 1 \right| + \left| \frac{P8}{P7} - 1 \right|}{4}$$

Exhibits 15 and 16 summarize the average variations in the projections for each state and policy year.

The second measure of variability is the percentage variation between the estimates from each valuation relative to the most recent available estimate:

$$\frac{\left| \frac{P4}{P8} - 1 \right| + \left| \frac{P5}{P8} - 1 \right| + \left| \frac{P6}{P8} - 1 \right| + \left| \frac{P7}{P8} - 1 \right|}{4}$$

Exhibits 17 and 18 summarize the average variations measured in this way.

On the exhibits (15 through 18) we have identified the method with the least variability (as defined above) for each state and policy year. For each test, we have seventy-seven measures of variability (eleven states and seven policy years). The following is a summary of the number of times each method produced the least variability:

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<u>Exhibit Number</u>	<u>Loss Type</u>	<u>Deviation From</u>	<u>Projection Based on Paid Plus</u>		
			<u>Paid Losses</u>	<u>Outstanding Losses</u>	<u>Incurred Losses</u>
15	Indemnity	Prior Projection	46	23	8
16	Medical	Prior Projection	75	1	1
17	Indemnity	Latest Projection	47	22	8
18	Medical	Latest Projection	62	6	9

The results clearly indicate that for a majority of states tested the paid loss development projection exhibits less variability, to eighth report, than the incurred and the paid plus outstanding development projections.

The tests above measure variability within each of the projection methods only. They do not reflect variability resulting from the conversion to an incurred basis. That is, if all else were equal, we would expect more variability in development from paid losses at eighth report than we would in incurred losses at eighth report. We have reflected this component of the variability by converting the projections from each of the first two methods (paid; paid plus outstanding) to an incurred basis. This conversion uses the most recent two year average of:

$$\frac{\text{Paid Losses}}{\text{Incurred Losses}}$$

or

$$\frac{\text{Paid Plus Outstanding Losses}}{\text{Incurred Losses}}$$

This is the approach used by NCCI in converting to an incurred basis, before applying the tail factor.

Exhibits 19-22 display the results of these projections. The interpretation of these exhibits is the same as that for Exhibits 15-18. The following table is a summary.

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<u>Exhibit Number</u>	<u>Loss Type</u>	<u>Deviation From</u>	<u>Projection Based on</u>		
			<u>Paid Losses</u>	<u>Paid Plus Outstanding Losses</u>	<u>Incurred Losses</u>
19	Indemnity	Prior Projection	37	31	9
20	Medical	Prior Projection	41	25	11
21	Indemnity	Latest Projection	29	26	22
22	Medical	Latest Projection	31	28	18

These tests indicate that, even after making an adjustment to an incurred basis, the paid development method exhibits the least variability in the projection of incurred at eighth report in more states than either of the other two methods. Paid plus outstanding is the next least variable.

These results are opposite to those one might expect. That is, if the IBNR (and bulk reserve) estimates were to reflect companies' actuarial estimates of these values for each state, one would expect the least variability in the incurred projection, followed by the paid plus outstanding, and the most variability in the paid projection. In fact, however, the opposite is the case.

It is our understanding that the IBNR and bulk reserves which are reported on many companies' responses to the calls for aggregate data by state do not reflect detailed actuarial analyses of the required values for the individual states. Rather, the values often result from an allocation method applied to the results of a countrywide analysis. The estimates of total IBNR are also subject to variations in adequacy from year to year. Consequently, a change in the value of incurred losses from one valuation to the next may not be a reflection of changing IBNR (or bulk) requirements for that state, but rather a reflection either of changes in the company's countrywide estimate of IBNR for workers compensation or of changes in the allocation formulae.

This would appear to explain the results of the above tests, and suggests that the incurred method is influenced by imprecise estimates of IBNR, thereby producing more variability in the estimates from one evaluation to the next.

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Another observation can be made from the above tests. After converting to an incurred basis, the paid plus outstanding method produces the least variability almost as often as the paid method. Paid plus outstanding is affected by variability in the bulk reserve in the same way as the incurred projection is affected by variability in the IBNR reserve. However, not all companies calculate a bulk reserve, (some include it with IBNR). The impact of bulk reserves on the paid plus outstanding method should be less than the impact of bulk and IBNR reserves on the incurred methods.

The above tests suggest that the paid and paid plus outstanding methods are the most stable. If paid plus case data were available for the development history reflected in the tests, we would expect it to demonstrate variability less than or equal to the variability of the paid plus outstanding method. (While not shown on the exhibits, the paid plus case development factors, in the three years for which they are available, exhibit about the same degree of variability as the paid plus outstanding factor for these same years.)

2. Tests of Predictive Ability

The focus of the previous test was the variability across all development intervals. Given that the NCCI's current methodology is based on a projection of the most recent (policy and accident) year at first report, we need to also focus on the relative predictive ability of the three methods using data as of first report.

To accomplish this, Exhibits 23 through 28 display the projections, converted to incurred at eighth report, from each of the first three reports for policy years 1981 through 1984. The exhibits also display the projection from the most recent report for each of the four policy years. We received data through December 31, 1989. Thus the most recent reports are:

Policy Year 1981	Eighth Report
Policy Year 1982	Seventh Report
Policy Year 1983	Sixth Report
Policy Year 1984	Fifth Report

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On the bottom of each exhibit, we have shown the following values:

- Average deviation
- Average absolute deviation
- Average of the variances of state deviations

Positive values on the exhibits indicate projections that are lower than the latest estimate. The following is a summary:

	<u>Average Percentage Deviation From</u>		
	<u>1st Report</u>	<u>2nd Report</u>	<u>3rd Report</u>
<u>Indemnity</u>			
Paid	10.61%	8.23%	5.63%
Paid Plus Outstanding	10.52	7.27	3.87
Incurred	11.68	8.19	4.31

<u>Medical</u>			
Paid	4.24	2.50	1.62
Paid Plus Outstanding	3.79	1.30	0.20
Incurred	3.56	1.44	(0.15)

	<u>Average Percentage Absolute Deviation From</u>		
	<u>1st Report</u>	<u>2nd Report</u>	<u>3rd Report</u>
<u>Indemnity</u>			
Paid	11.74%	9.70%	7.34%
Paid Plus Outstanding	11.46	8.50	5.55
Incurred	12.35	8.76	5.22

<u>Medical</u>			
Paid	6.39	4.94	4.43
Paid Plus Outstanding	5.63	6.01	4.18
Incurred	8.24	6.34	4.12

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From the above and the Exhibits 23 through 28, we observe:

- a. There is no appreciable difference in the predictive accuracy from first report among the three methods.
- b. The predictive accuracy for all methods improved at second and third reports. The improvements in accuracy from first to second and third reports suggest the possibility of using the later reports in projecting loss ratios in rate filings. This will be discussed in a later section.
- c. The results vary considerably from state to state.

As a final note, none of the methods described above was as successful in predicting ultimate losses from the early maturities as we would have liked. Each demonstrated a tendency for the projections to understate the ultimate losses for policy years 1981 through 1984. We do not consider the observed understatement to indicate a chronic fault of the projection methods. As noted in the loss development factor section of this chapter, loss development factors have exhibited an upward trend over this time period. Had a continuation of the trend been anticipated at the time, and had development factors been chosen in accordance with this expectation, it is possible that each of the methods would have demonstrated more accurate results. The trends in the development factors are less pronounced for the incurred losses than for paid and paid plus outstanding. However, as we discussed earlier, estimates based on incurred losses will be subject to variability due to the adequacy of the carriers' estimates of IBNR. With the benefit of hindsight, the insurance industry's reserves for workers compensation during this period of time have proven to have been inadequate. This is a contributing cause to the understatement of the ultimate losses from the projections based on incurred losses.

Had the tests been performed for a different time period, it is possible that the results would differ. Nevertheless, the exhibits above indicate no appreciable difference in the accuracy of the three methods for the four policy years studied.

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3. Conclusions

The tests above have suggested that all three methods have demonstrated a tendency to understate the ultimate losses, based on projections from early maturities for the years studied. This bias is not appreciably different for any of the three methods.

The tests above have also suggested that, in most of the states studied, the paid and paid plus outstanding methods exhibit less variability in the projections than does the incurred method.

While the evidence is not conclusive, we believe that the tests support a "primary" methodology which gives precedence to the paid and paid plus outstanding methods. The incurred method is subject to external factors which increase the variability of the projections. These include changes in the adequacy of companies' estimates of IBNR, inaccuracies in the allocation of IBNR to individual states, and similarly, inaccuracies in the allocation of IBNR to policy years.

These "external" influences and the observed variability in the incurred method lead us to believe that the paid and paid plus outstanding (and eventually paid plus case) methods are more susceptible to identification and correction of any projection biases than is the incurred method. These corrections, which may be either by adjustments to the data or elimination of the method, can follow from the evaluation of diagnostic tests and statistics discussed in a later section, and from an evaluation of the underlying causes of patterns in the development factors.

We recommend that an average of the ultimate losses resulting from the paid loss development and paid plus outstanding loss development projections be used as the primary basis for the rate indications. Deviations from this primary approach (such as using solely the paid method, the paid plus outstanding method, or the incurred method) should be made when appropriate, based on diagnostic tests and consideration of the underlying forces influencing the development patterns. The supporting information provided with the NCCI rate filing should explain the rationale for deviations from the primary methodology and include documentation.

As noted previously, NCCI has not been collecting "true" case outstanding losses for a long enough time to draw any conclusions about the paid plus case projection

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method. We believe that case reserves should be less subject to distortions (due to allocation) than are bulk and IBNR reserves. Some very simple tests of the development factors suggest that the paid plus case development has similar variability to the paid plus outstanding. We consider it likely that further testing by NCCI, as additional data becomes available, will show that paid plus case losses should replace paid plus outstanding losses.

Finally, we emphasize the need for additional diagnostics to allow evaluation of the reliability of various methodologies for a specific situation. This will be discussed in a later section.

E. Number of Years Used in the Projection

The current ratemaking methodology uses the most recent policy year and accident year, at first report, in projecting ultimate loss ratios, for the rate level indication.

The tests described earlier demonstrated the tendency for the projection from first report to understate the ultimate losses for policy years 1981 through 1984. This was due, in part, to the trend in development factors discussed earlier. That is, if development factors are increasing, with no corresponding reduction in the tail, the use of past factors will understate the future development. (As discussed earlier, we do not consider the observed understatement to indicate a chronic fault of the projection methods).

The tests indicated that the tendency to understate the ultimate losses existed in projections from second and third reports as well but that the magnitude of the differences was reduced. This suggests to us that the ratemaking methodology should be revised to incorporate two or more policy years in the estimation of the loss ratio for the year for which the rates will be in effect.

The incorporation of additional years would require increased reliance on the trending procedure. That is, the objective of using more mature data is to improve the accuracy and reduce the variability of the projected ultimate losses for prior policy years. However, this will require the trending process to cover a longer time span,

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thereby potentially increasing the variability resulting from this step of the ratemaking process. Thus, there is a trade-off which only additional testing can evaluate.

While our tests focused on policy year data, it is reasonable to expect similar results with accident year data. In fact, we would expect more variability in the accident year projections from first report, because accident year losses at first report are less mature than policy year losses at first report. Thus, the analysis of the number of years used in the loss ratio projections should encompass the accident year indications as well.

We recommend that future NCCI filings develop projections of ultimate, trended loss ratios based on the latest two or three policy years or the latest two or three policy and accident years. Judgment will need to be exercised in selecting standard weights (or a variable weighting system), although tests of predictive accuracy may be helpful in making this judgment.

F. Impact of Premium Development on Calendar Year Premiums

Standard Earned Premium for workers compensation is a function of, among other things, the insured's payroll during the coverage period. Payrolls are initially estimated at policy inception, with the final payroll (and premium) determined by audit after policy expiration. As a result, policy year earned premium will change after the policy year expires. The policy year premium development factors reflect this phenomenon. For most states, policy year premium development factors from the expiration of a policy year (First Report) are in the range of 1.03 to 1.06, however, factors in excess of this are not uncommon.

The accident year rate indication derived by NCCI is based on calendar year earned premiums. Calendar year premiums are adjusted to current rate levels using methodology described in another part of the M&R study. The current methodology has two shortcomings in the use of calendar year premiums as a basis for measuring the accident year exposure. First, the calendar year premiums include audit premiums from policy years prior to the previous policy year. The adjustments do not reflect the rate levels underlying these premiums, nor the growth in volume of

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business (in most states) between the exposure periods related to the audits and the accident year of interest.

We can illustrate this with the adjustment calculation from the Florida rate filing effective 1/1/90. The following calculation, adjusting the calendar year 1988 premium, is reproduced from that filing:

Rate Change Date	(1) Premium Level <u>Change</u>	(2) Cumulative Index	(3) Weight	(4) Product <u>(2)x(3)</u>	(5) Adj. Factor Pres. Index/ <u>Sum Col. (4)</u>
1/1/87	Base	1.000	.390	.390	1.351
1/1/88	1.137	1.137	.610	<u>.694</u>	
1/1/89	1.288	1.464		1.084	

Column (3) represents the percentage of the calendar year premium that is assumed to be contributed from policies written at the rate level that took effect on the date in the left hand column. Thus, the calculation assumes 39% of the calendar year 1988 earned premium is from policy year 1987, and 61% is from policy year 1988.

As discussed above, a portion of calendar year 1988 premium is from audit adjustments for policy year 1986. Florida premium development data indicates that about 5% of policy year premium is booked as earned after the policy year expires. This premium would be at 1986 rate levels, which were lower than the 1987-1989 levels. This premium is not adjusted to the appropriate rate level in the current calculation.

In addition, the actual audit adjustments from policy year 1986 are, in effect, used as estimates of the audit adjustments relating to exposure during 1988, with no reflection in changes in volume of exposure.

The second shortcoming exists in the fact that the weights applied to the respective policy years do not reflect differences between the underlying exposure volumes of the two policy years. The different weights above (.390; .610) are a reflection of policy year contributions solely due to the distribution of premiums written by month

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within the policy year. They do not reflect any difference which may have existed between the level of exposures written in the two policy years.

An alternative approach, which resolves both of the shortcomings, follows:

1. Develop Policy Year 1987 premium to ultimate;
2. Determine the component of Policy Year 1987 premium that relates to accident year 1988 exposure. This could be done by using the distribution of premium writings, by month, which is used in the current methodology;
3. Adjust this premium component to the current rate level;
4. Do the same for Policy Year 1988; and
5. Add the two components.

In the above approach, audit premiums are reflected by the development to ultimate. Growth is reflected in the separate projections of the two policy years.

The approach described above would provide a more theoretically correct matching of losses and exposures. We have constructed a hypothetical example to measure the impact of the recommended approach. The example considered several assumptions regarding annual rate changes, annual payroll growth rates and policy year premium earning patterns. The following is a summary of the results:

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<u>Annual Rate Increase</u>	<u>Annual Payroll Growth</u>	<u>Premium Earning Pattern (1)</u>	<u>Ratio of Theoretical Value to NCCI Value (2)</u>
5.0%	5.0%	60/40/0/0	0.999
5.0	5.0	55/40/5/0	1.009
5.0	5.0	50/40/7/3	1.021
5.0	10.0	60/40/0/0	0.999
5.0	10.0	55/40/5/0	1.012
5.0	10.0	50/40/7/3	1.029
10.0	5.0	60/40/0/0	0.999
10.0	5.0	55/40/5/0	1.012
10.0	5.0	50/40/7/3	1.029
15.0	0.0	60/40/0/0	1.000
15.0	0.0	55/40/5/0	1.013
15.0	0.0	50/40/7/3	1.030
15.0	15.0	60/40/0/0	0.995
15.0	15.0	55/40/5/0	1.020
15.0	15.0	50/40/7/3	1.050

(1) Percent of Premium Booked as Earned by Calendar Year, i.e. 60/40 = 60% in first calendar year; 40% in second calendar year. The "true" earning of the underlying policy year exposure is assumed to be 60/40, in all of the examples.

(2) Value greater than one indicates that theoretical value exceeds NCCI value. This implies an overstatement of the accident year loss ratio. Since the calendar-accident year loss ratio receives 50% weight in the rate level indication, the impact on the rate level will be one half of the impact on the calendar-accident year loss ratio.

Clearly, the impact depends on a number of factors. For most states, the theoretically correct calculation appears likely to reduce the indicated rate level by less than 1 percent.

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VI. OBJECTIVE 1b -- EVALUATION OF NCCI'S PROCEDURES FOR RECONCILING DIFFERENCES BETWEEN DEVELOPMENT TECHNIQUES

A. Impact of Changes in Claim Processing and Reserving

The main assumptions underlying each of the development techniques are:

The paid loss development techniques assume that loss payment patterns are relatively consistent through the underlying history.

The paid plus outstanding loss development techniques assume that case (plus bulk if applicable) reserving practices are relatively consistent through the underlying history.

The incurred loss development techniques assume that total (case plus bulk plus IBNR) reserving practices are relatively consistent through the underlying history.

When considering the above assumptions it is important to recognize that many of the types of changes that may materially affect each of the techniques for an individual carrier are less likely to affect the industry as a whole. For example, an individual company may implement a new data processing system which records claims activity (payments and reserves) more quickly. While this type of change will affect that company's paid and paid plus case development patterns, it is not likely to significantly impact the aggregate industry development patterns. Thus, in considering events that may cause violation of the underlying assumptions, one should focus primarily on external factors, which affect the industry as a whole, rather than on changes in individual companies' claim processes. Additionally, changes in the market share of insurers within a state can have an impact on development patterns reflecting different claim practices.

Further, in considering how the various methods will be affected by these factors, we need to consider whether the changes are gradual or sudden. For example, the industry has seen, in some states, a long term tendency towards more litigation of

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workers compensation claims. This tendency may have manifested itself in a lengthening of the payment pattern over time, such that any diagnostics based on year over year changes in (for example) paid to incurred ratios may not discern any changes. This type of change has less of a distorting effect on loss development projections than sudden changes, for example a significant change in the benefit structure or in the benefit delivery system. Nevertheless, it can introduce a bias in the loss development projections.

The point of the above discussion is that while tests of the various development methods can be meaningful in evaluating the resulting loss projections, the analysis of these tests represents only half of the process in deciding among the available methods. Equally important is an understanding of the forces impacting the development history. This should include an understanding of the impact of benefit changes as well as changes taking place in the claim environment which can be learned about through communication with companies.

B. Tests Performed by NCCI

As discussed earlier, NCCI has designed an "Early Warning System" which is intended to assist NCCI in selecting among the loss development methodologies. The test focuses primarily on two key values.

- Two year average Incurred loss development factor from first report to fifth report.
- Paid to incurred ratio at first report.

If either of these values changes by more than a specified amount (+/- .05 for the development factors, and +/- .03 for the paid/incurred ratio), it is taken as an indication of possible changes in reserve adequacy.

The two tests have a practical advantage in that they are readily produced from information which is currently available to NCCI. However, there are other diagnostic tests which could be produced from currently available data, as well as tests which require additional data. We will discuss these in a later section.

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NCCI, in its reviews of the experience, incorporates other tests of development and reserve adequacy. The early warning system serves as the starting point for their analysis of the experience. However, there is no systematic NCCI approach beyond the early warning system.

We understand that the two specific early warning tests were established with the premise that the "standard methodology" would be based on incurred losses. The tests were designed to identify situations where the incurred methodology might be influenced by changes in adequacy of IBNR, and other methodologies might be more reliable.

Our conclusion in a previous section was that the incurred method should be replaced as the primary methodology by the average of the ultimate losses from the paid plus outstanding method and the ultimate losses from the paid method. The two early warning tests could be replaced with corresponding tests utilizing these loss measures, i.e.

- Paid loss development factor from first report to fifth report.
- Paid plus outstanding loss development factor from first report to fifth report.
- Paid to paid plus outstanding ratio at first report.

Other tests, to be discussed later, will supplement these tests in providing diagnostic tools to assess the validity of the various methodologies. The value of additional tests can be illustrated with an example.

C. Illustrative Example

We will illustrate the value of additional diagnostics using the current NCCI tests.

The illustration is based on medical losses for the state of Wisconsin. The case that will be isolated is the projection of policy year 1984 losses from first report. From Exhibits 26 through 28, a history of projections from first report, restated to a common (incurred) level, is:

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<u>Method</u>	<u>Policy Year: 1981</u>	<u>Policy Year: 1982</u>	<u>Policy Year: 1983</u>	<u>Policy Year: 1984</u>
Paid	72,747,106	74,856,485	84,006,593	96,117,248
Paid Plus Outstanding	67,394,747	71,524,618	81,918,983	101,942,981
Incurred	68,855,845	71,287,196	81,897,172	103,475,484

For the 1984 policy year, the relative magnitude of the paid projection has reversed relative to prior years. This reversal requires a judgment of whether the paid projection has decreased relative to final ultimate losses, or the paid + outstanding and the incurred projections have increased relative to final ultimate losses.

One early warning test used by NCCI is an analysis of paid to incurred ratios. From these ratios, shown on Exhibit 29, we see that NCCI's early warning test for these ratios is positive for 1984, having changed at least 3.0 percentage points from the preceding year's ratio:

<u>Policy Year</u>	<u>Paid/Incurred Ratio at First Report</u>	<u>Change in Ratio at First Report</u>
1981	67.4%	xxx
1982	65.7%	-1.7%
1983	64.2%	-1.5%
1984	61.2%	-3.0%

Further, the other early warning test, which is based on incurred development factors out to fifth report, indicates an increasing tendency for the incurred loss development factors in recent years:

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<u>Projected Policy Year</u>	<u>Two-Year Average Development Factor First to Fifth</u>	<u>Change in Development Factor First to Fifth</u>
1981	0.969	xxx
1982	0.932	-3.7%
1983	0.928	-0.4%
1984	0.967	3.9%

Although this test does not exceed the NCCI's warning value of a 5.0 percentage point change, the increase in the development factor to be applied to 1984, taken with the change in 1984's paid/incurred ratio signals that the incurred projection may be expected to be overstated.

As it turns out, the paid projection for 1984 actually was on the low side:

<u>Method</u>	<u>Projections for 1984 at 1st Report (From 1985 Evaluation)</u>	<u>Projections for 1984 at 5th Report (From 1989 Evaluation)</u>
Paid	96,117,248	103,189,583
Paid Plus Outstanding	101,942,981	101,918,112
Incurred	103,475,484	102,669,065

Additional diagnostic tests may have suggested this in 1985.

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D. Diagnostics

1. Diagnostic Tests

Each of the development techniques has, inherent in its use, underlying assumptions regarding the claim process.

The paid loss development technique assumes that loss payment patterns are relatively consistent through the underlying history.

The paid plus outstanding loss development technique assumes that case (plus bulk if applicable) reserving practices are relatively consistent through the underlying history.

The incurred loss development technique assumes that total (case plus bulk plus IBNR) reserving practices are relatively consistent through the underlying history.

In the following paragraphs, we will discuss several diagnostics which can test these assumptions. We will then identify those diagnostics which we believe will be most useful for evaluating the various methodologies.

Each of the diagnostic tests is derived by calculating either a ratio or an average value, for each element of a loss triangle. In all cases, (e.g., paid losses/paid plus case losses) the values are derived by dividing each value in the numerator triangle by the corresponding value in the denominator triangle. In some cases, (e.g., closed claim counts/ultimate claim counts), the values in the denominator will be the same for all evaluations of a given policy or accident year.

In each of the tests, we would be looking for two things:

First, and most important, would be a significant difference in the current statistic (i.e., the value along the last diagonal) from that of the prior years. This would suggest a recent event giving rise to a change in the statistic being evaluated. An example of this would be the implementation of a significant

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change in workers compensation benefits in a state, and a corresponding industrywide change in payment patterns or reserve requirements.

The second phenomenon we would be looking for would be a trend in the statistics over time. This would suggest a longer term change in the payment patterns or reserve levels.

Exhibits 30-32 summarize a variety of tests which could be constructed to evaluate each of the three methodologies:

- Paid Losses (Exhibit 30)
- Paid plus Outstanding Losses (Exhibit 31)
- Incurred Losses (Exhibit 32)

Paid plus case losses could easily be substituted for paid plus outstanding losses.

For each method, we have identified whether the data is currently available, and what the diagnostic would be testing.

It should be noted that some tests are common to more than one of the methods. For example, we identified the ratio of paid losses to paid plus outstanding losses as a test for both paid loss development and paid plus outstanding loss development. This is because a change in the ratio could be evidence of either a change in payment patterns or a change in case reserve adequacy. Further analysis of other tests is required before drawing conclusions.

As an example, one might find that the paid/paid plus outstanding ratio for the most recent policy year (at first report) is notably lower than for prior years. One might also find that the paid losses/earned premiums are reasonably stable relative to prior years, but that outstanding reserves/earned premiums are noticeably higher than average. This would suggest a change in case reserve adequacy. Alternatively, one might note that a change in the benefit levels enacted last year resulted in a more liberal benefit structure. The statistics might suggest that the industry is reacting to this change by increasing case reserves. If, in this example, the benefit changes were estimated to extend the payment of benefits beyond the historical levels, the conclusion might be

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that the paid development method will understate the ultimate value for the most recent year.

The point of the above discussion is that the reserve and loss estimation process cannot be reduced to a single mechanical methodology and a series of tests. Informed judgment is required to interpret the tests, and the various techniques, and to convert them to a reasonable estimate of ultimate losses.

2. Recommended Diagnostics

We do not believe that it is practical to develop all of the diagnostics referred to in the previous section. However, we do recommend that additional diagnostics be calculated by NCCI.

Our recommendations are based on our previous conclusions that the incurred method should be replaced by the paid and paid plus outstanding methods as the primary ratemaking methodology. Thus, the recommended diagnostic tests are those which will assist in evaluating these two. The tests would be derived for both medical and indemnity losses. In the tests, "claims" refer to the number of claims.

a. Tests with available data

Paid Losses/Paid plus Outstanding Losses
Paid Losses/Earned Premiums at Current Rate Level
Outstanding Losses/Earned Premiums at Current Rate Level
Paid Losses/Incurred Claims⁴

b. Tests with data not currently available

We recommend the expansion of the annual calls to collect the number of claims closed with indemnity payments. It will be necessary to clearly and carefully define the closed claim count description in the financial calls, to

4 Incurred indemnity claims can be used in both the indemnity and medical diagnostics.

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ensure that this item is consistently reported by companies. These would allow the following diagnostic tests to be produced.

Paid Losses/Closed Claims
Closed Claims/Incurred Claims
Outstanding Reserves/Open Claims

3. Additional Discussion of Diagnostics

A common feature exhibited by almost all of the loss development data, both state and regional, is the existence of an upward trend in the development factors, particularly at the early ages of development (first to second, second to third, etc.). That is, factors are increasing as we look down the column. As discussed above, this trend is the chief reason for the frequent success of the two year exponential average as the "best predictor" of development factors. However, in most cases, the average development factors have understated the actual subsequent factors. Analysis is required to determine the possible causes of the trend.

A trend in paid loss development factors could signal either a lengthening or a shortening of payment patterns. The following example illustrates this.

Consider the following development history:

HYPOTHETICAL PAID LOSS DEVELOPMENT HISTORY

<u>Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>
1975	1000	1500	1750
1976	1000	1500	1750
1977	1000	1500	1750
1978	1000	1500	1750

PREMIUM AND LOSS DEVELOPMENT FACTORS

Development Factors are:

First to <u>Second</u>	Second to <u>Third</u>
1.500	1.167

Now, assume that events occur to "shift" payment of losses from first to second report, and the shift is 10% per year.

SCENARIO #1: LENGTHENING DEVELOPMENT PATTERNS

<u>Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>
1978	1000	1500	1750
1979	900	1500	1750
1980	810	1500	1750
1981	729	1500	1750
1982	656	1500	1750

Development factors are:

<u>Year</u>	First to <u>Second</u>	Second to <u>Third</u>
1978	1.500	1.167
1979	1.667	1.167
1980	1.852	1.167
1981	2.058	1.167
1982	2.287	1.167

The upward trend in development factors from first to second report is due to lengthening of payment patterns.

PREMIUM AND LOSS DEVELOPMENT FACTORS

Alternatively, assume that the shift is from third report to second report, again at 10% per year.

SCENARIO #2: SHORTENING DEVELOPMENT PATTERNS

<u>Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>
1978	1000	1500	1750
1979	1000	1525	1750
1980	1000	1548	1750
1981	1000	1568	1750
1982	1000	1586	1750

Development factors are:

<u>Year</u>	<u>First to Second</u>	<u>Second to Third</u>
1978	1.500	1.167
1979	1.525	1.148
1980	1.548	1.130
1981	1.568	1.116
1982	1.586	1.103

The upward trend in development factors from first to second report in this case is due to a shortening of the payment pattern, and is offset by a downward trend in subsequent factors (which might not be as obvious if it occurred at later maturities).

In reality, such readily detectable causes of trend in development factors are unlikely to exist in isolation. Thus, we must rely on other diagnostics, coupled with knowledge of external forces which may be affecting the loss payment patterns, to appropriately interpret the loss development patterns.

PREMIUM AND LOSS DEVELOPMENT FACTORS

Following an illustration presented in Section V I-C, we commented that additional diagnostics can be useful in evaluating the results of the various projections.

In the illustration, we focused on the estimate of ultimate medical losses for policy years 1981-1984. The projections from first report for policy year 1984 were:

Paid	96,117,248
Paid Plus Outstanding	101,942,981
Incurred	103,475,484

One of the diagnostic items suggested is the ratio of losses to earned premiums at current rate levels. This ratio is presented below:

<u>Policy Year</u>	Ratio to Earned Premiums ⁵		
	<u>Paid Losses</u> ⁶	<u>Outstanding Losses</u> ⁶	<u>IBNR Losses</u> ⁶
1981	.153	.055	.019
1982	.164	.064	.021
1983	.180	.076	.025
1984	.181	.086	.028

The paid losses do not demonstrate the growth patterns (trends) which are evident in previous years, and which are also evident in the outstanding and IBNR losses. This suggests that something has occurred to slow down the upward trend in loss payments. If this has occurred, one might expect the paid loss development projection to understate the ultimate value. As the earlier illustration demonstrated, this was the case.

Adding diagnostics to the ratemaking process will not necessarily simplify the process. No one set of diagnostics will always provide clear answers in a time of changing payment patterns or reserve adequacy. However, the diagnostics discussed and

5 Earned Premium at first report, adjusted to common rate level.

6 Losses are at first report.

PREMIUM AND LOSS DEVELOPMENT FACTORS

illustrated above can help one to get a better understanding of the forces affecting the losses and, correspondingly, the rate indications.

E. Alternate Techniques

As discussed above, loss development methods are fundamental to many loss projections. They are not, however, the only methods used in this area. The following discussion will focus on two types of alternate estimation techniques utilized in practice today. These are frequency/severity and stochastic modelling estimates.

1. Frequency/Severity Estimates

As discussed in the diagnostics section above, an understanding of loss development "anomalies" can sometimes be obtained by reviewing claim count related statistics. The frequency/severity methods take this a step further by developing separate estimates of the two components of losses, namely frequency (number of claims per exposure) and severity (average cost per claim).

The advantage of these methods is that changes in the underlying trends affecting either of these two components are more readily discerned and adjusted for than in the loss development approaches.

These approaches can be particularly relevant to workers compensation losses, where benefit changes can have sudden and significant impact upon one or both of the components. Where such benefit changes may have been estimated to have an impact on the severity of claims the historical loss data can be adjusted accordingly.

Just as there are a variety of loss development methods, there also exist a number of frequency/severity methods. Frequency and severity projections can be made from closed claims, reported claims or open claims. As with the loss development methods, no one method is appropriate at all times.

NCCI currently collects only incurred indemnity claim counts and, until recently, the definition was not clear. Consequently, a consistent history of incurred claim counts is not yet available. In addition, we have concerns about the consistency of claim count

PREMIUM AND LOSS DEVELOPMENT FACTORS

data which would be reported by carriers. That is, different definitions of claim counts among companies give rise to potential changes in the frequency and severity measures which are solely due to changes in the underlying mix of companies represented by the data rather than to trends in the frequencies and severities themselves.

As a result, while the use of frequency/severity estimates can be valuable in evaluating ultimate workers compensation losses, the data does not presently exist in a format which can be immediately integrated into the ratemaking process for NCCI.

2. Stochastic Modelling

Stochastic modelling is an emerging area of loss estimation methods. Generally, stochastic models are those projection techniques that specifically incorporate a probabilistic or statistical structure.

Stochastic modelling starts with a general equation defining the claim process, and incorporates specific features thought to represent the situation applicable to the loss data being analyzed.

Stochastic modelling techniques generally fall into three broad categories:

- regression models
- adaptive models
- collective risk theory

a. Regression models use regression techniques to provide forecasts as well as estimates of the statistical error in those forecasts and uncertainty regarding the fitted parameters. A fairly simple example of this type of approach would be to model the incremental payments for accident year i in development period j $\{P(i,j)\}$ by:

$$\frac{P(i,j)}{\text{Exp}(i)} = A(i) \times D(j) \times E(i,j)$$

PREMIUM AND LOSS DEVELOPMENT FACTORS

Here, $\text{Exp}(i)$ are exposures, $A(i)$ parameters reflect the accident year influence on payments (i.e., measure of expected pure premiums for accident year i), $D(j)$ parameters reflect the development year influence, and $E(i,j)$ is an error term.

If we view $\text{Exp}(i) \times A(i)$ as the ultimate losses in accident year i , and $D(j)$ as the expected percentage of ultimate losses paid in development interval j , the above formula is conceptually similar to a paid loss development projection.

A transformation, by taking logarithms produces a linear formula:

$$\ln \left\{ \frac{P(i,j)}{\text{Exp}(i)} \right\} = \ln(A(i)) + \ln(D(j)) + \ln(E(i,j))$$

which can be analyzed by using regression techniques.

Another example of a regression model is

$$\frac{P(i,j)}{\text{Exp}(i)} = A \times D(j) \times E(i,j)$$

In this case, the pure premium parameters ($A(i)$) become a single parameter (A) meaning that losses per exposure are expected to be the same for all years.

The formulas above are very general. In practice, they can be adapted to specific situations, either through modification of the parameters or through additional transformations of the data. For example, for workers compensation, the relationship between successive ultimate accident year losses will be affected not only by the relationship between exposures but also by relative benefit levels for each of the two years. This can be reflected in the data by adjusting all losses to a common benefit level. If there are trends in the rate of losses per exposure, the losses can be trended to a common level. Alternatively, the exposures can be adjusted or a trend parameter can be introduced directly into the model.

PREMIUM AND LOSS DEVELOPMENT FACTORS

In addition, the formula can be adapted to situations where, for example, claim closing patterns are changing, by defining the development period, in terms of percent of ultimate claims closed (rather than the more conventional definition which relates to the chronological maturity of the accident year.)

The use of regression techniques generally assumes that the error terms ($E(i,j)$) have a normal distribution with a mean of 0 (in our example above, this means that the multiplicative error then has a lognormal distribution). This may not be a valid assumption. Sometimes, further transformation of the data will create a situation with normally distributed error terms. If not, other techniques can be used to evaluate the parameters of the formula.

b. Adaptive models differ from regression models in that, rather than having a fixed set of parameters applicable to all development years, adaptive methods allow the parameters to change between years as a reflection of the data for those years. For example, consider the two regression models above:

$$\frac{P(i,j)}{\text{Exp}(i)} = A(i) \times D(j) \times E(i,j), \text{ and} \quad (1)$$

$$\frac{P(i,j)}{\text{Exp}(i)} = A \times D(j) \times E(i,j) \quad (2)$$

In model (1), pure premiums for each year i are fitted independently, whereas in model (2) pure premiums are set equal for all years.

If the relationship between $A(i)$ and $A(i+1)$ is merely trend, then a transformation or a trend parameter, as discussed above, will allow model (2) to be used. If however, other elements come into play which cannot be easily filtered out of the general data, adaptive models allow the $A(i)$ parameters to be related but to change over time, giving some weight to the actual data for each year. For example, one might define the following relationship:

$$A(i+1) = w(i) \times A(i) + (1-w(i)) \times A^*(i+1)$$

PREMIUM AND LOSS DEVELOPMENT FACTORS

where $A^*(i+1)$ is the observed value of a parameter for year $i+1$, and $w(i)$ is a weight between 0 and 1. Various approaches are available to determine the optimal weights.

c. Collective Risk Theory models decompose the claim process into frequency and severity components. However, unlike the frequency/severity methods discussed earlier, risk theoretic models assume probability distributions for the number of claims, length of time between occurrence of an event and settlement of the claim, and severity of claims settled in specific time intervals. Statistical methods are used to determine the parameters of the distributions, which then define a loss development process.

One of the main advantages of stochastic models is in their derivation of measures of variability about the estimates. However, the models are also valuable in that they involve a decomposition of the loss process into its constituent parts. The workers compensation claim process is a result of many forces working in tandem. By isolating each component, stochastic models can better react to underlying changes.

In conclusion, we believe that stochastic modelling techniques can be adapted for use in the NCCI's process of projecting ultimate losses for past policy years and accident years. We anticipate that a large amount of research and testing will be needed in order to create reliable models, but our judgment is that this work has potential for improving the estimates of ultimate losses.

**PREMIUM AND LOSS
DEVELOPMENT FACTORS**

**PREMIUM AND LOSS
DEVELOPMENT FACTORS**

EXHIBITS

**PREMIUM AND LOSS
DEVELOPMENT FACTORS**

NATIONAL COUNCIL ON COMPENSATION INSURANCE

PREMIUM

INDICATION OF METHOD PRODUCING MINIMUM TOTAL AVERAGE SQUARED DEVIATION (1)

STATE OR REGION	1987						
	EARNED PREMIUM 2ND REPT	TWO-YEAR STR AVG	THREE-YEAR STR AVG	FOUR-YEAR STR AVG	TWO-YEAR EXPO AVG	THREE-YEAR EXPO AVG	FOUR-YEAR EXPO AVG
UTAH	123,044,832				1		
NEBRASKA	127,816,027						1
MAINE	213,544,578				1		
NORTH CAROLINA	415,953,120						1
LOUISIANA	436,455,028					1	
OREGON	581,245,692				1		
WISCONSIN	609,230,991						1
CONNECTICUT	726,148,241				1		
MICHIGAN	859,722,833			1			
FLORIDA	1,171,136,775						1
ILLINOIS	1,512,127,208			1			
TOTAL		0	0	2	4	1	4
DISTRIBUTION		0.0%	0.0%	18.2%	36.4%	9.1%	36.4%

INDICATION OF METHOD PRODUCING MINIMUM AVERAGE SQUARED DEVIATION AGE BY AGE (1) (2)

STATE OR REGION	1987						
	EARNED PREMIUM 2ND REPT	TWO-YEAR STR AVG	THREE-YEAR STR AVG	FOUR-YEAR STR AVG	TWO-YEAR EXPO AVG	THREE-YEAR EXPO AVG	FOUR-YEAR EXPO AVG
UTAH	123,044,832				1		
NEBRASKA	127,816,027				1		
MAINE	213,544,578				1		
NORTH CAROLINA	415,953,120			1			
LOUISIANA	436,455,028		1				
OREGON	581,245,692	1					
WISCONSIN	609,230,991			1			
CONNECTICUT	726,148,241				1		
MICHIGAN	859,722,833			1			
FLORIDA	1,171,136,775			1			
ILLINOIS	1,512,127,208			1			
TOTAL		1	1	5	4	0	0
DISTRIBUTION		9.1%	9.1%	45.5%	36.4%	0.0%	0.0%

NOTES: (1) MINIMUM IS INDICATED BY "1" FOR EACH STATE.

(2) THIS TEST COUNTS THE NUMBER OF AGES FOR WHICH A PARTICULAR METHOD HAS THE MINIMUM AVERAGE SQUARED DEVIATION; TIES ARE POSSIBLE.

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 INDEMNITY
 PAID LOSSES

INDICATION OF METHOD PRODUCING MINIMUM TOTAL AVERAGE SQUARED DEVIATION (1)

STATE OR REGION	1987						
	EARNED PREMIUM 2ND REPT	TWO-YEAR STR AVG	THREE-YEAR STR AVG	FOUR-YEAR STR AVG	TWO-YEAR EXPO AVG	THREE-YEAR EXPO AVG	FOUR-YEAR EXPO AVG
UTAH	123,044,832					1	
NEBRASKA	127,816,027				1		
MAINE	213,544,578				1		
NORTH CAROLINA	415,953,120			1			
LOUISIANA	436,455,028				1		
OREGON	581,245,692				1		
WISCONSIN	609,230,991				1		
CONNECTICUT	726,148,241				1		
MICHIGAN	859,722,833						1
FLORIDA	1,171,136,775				1		
ILLINOIS	1,512,127,208				1		
TOTAL		0	0	1	8	1	1
DISTRIBUTION		0.0%	0.0%	9.1%	72.7%	9.1%	9.1%

INDICATION OF METHOD PRODUCING MINIMUM AVERAGE SQUARED DEVIATION AGE BY AGE (1) (2)

STATE OR REGION	1987						
	EARNED PREMIUM 2ND REPT	TWO-YEAR STR AVG	THREE-YEAR STR AVG	FOUR-YEAR STR AVG	TWO-YEAR EXPO AVG	THREE-YEAR EXPO AVG	FOUR-YEAR EXPO AVG
UTAH	123,044,832		1				
NEBRASKA	127,816,027			1			
MAINE	213,544,578				1		
NORTH CAROLINA	415,953,120				1		
LOUISIANA	436,455,028				1		
OREGON	581,245,692				1		
WISCONSIN	609,230,991				1		
CONNECTICUT	726,148,241		1	1	1		
MICHIGAN	859,722,833				1		
FLORIDA	1,171,136,775				1		
ILLINOIS	1,512,127,208				1		
TOTAL		0	2	2	9	0	0
DISTRIBUTION		0.0%	15.4%	15.4%	69.2%	0.0%	0.0%

NOTES: (1) MINIMUM IS INDICATED BY "1" FOR EACH STATE.

(2) THIS TEST COUNTS THE NUMBER OF AGES FOR WHICH A PARTICULAR METHOD HAS THE MINIMUM AVERAGE SQUARED DEVIATION; TIES ARE POSSIBLE.

NATIONAL COUNCIL ON COMPENSATION INSURANCE
INDEMNITY
PAID PLUS OUTSTANDING

INDICATION OF METHOD PRODUCING MINIMUM TOTAL AVERAGE SQUARED DEVIATION (1)

STATE OR REGION	1987						
	EARNED PREMIUM 2ND REPT	TWO-YEAR STR AVG	THREE-YEAR STR AVG	FOUR-YEAR STR AVG	TWO-YEAR EXPO AVG	THREE-YEAR EXPO AVG	FOUR-YEAR EXPO AVG
UTAH	123,044,832		1				
NEBRASKA	127,816,027					1	
MAINE	213,544,578						1
NORTH CAROLINA	415,953,120				1		
LOUISIANA	436,455,028				1		
OREGON	581,245,692			1			
WISCONSIN	609,230,991				1		
CONNECTICUT	726,148,241			1			
MICHIGAN	859,722,833				1		
FLORIDA	1,171,136,775				1		
ILLINOIS	1,512,127,208				1		
TOTAL		0	1	2	6	1	1
DISTRIBUTION		0.0%	9.1%	18.2%	54.5%	9.1%	9.1%

INDICATION OF METHOD PRODUCING MINIMUM AVERAGE SQUARED DEVIATION AGE BY AGE (1) (2)

STATE OR REGION	1987						
	EARNED PREMIUM 2ND REPT	TWO-YEAR STR AVG	THREE-YEAR STR AVG	FOUR-YEAR STR AVG	TWO-YEAR EXPO AVG	THREE-YEAR EXPO AVG	FOUR-YEAR EXPO AVG
UTAH	123,044,832		1				
NEBRASKA	127,816,027				1		1
MAINE	213,544,578				1		
NORTH CAROLINA	415,953,120					1	
LOUISIANA	436,455,028					1	
OREGON	581,245,692			1		1	
WISCONSIN	609,230,991				1		
CONNECTICUT	726,148,241			1			
MICHIGAN	859,722,833				1		
FLORIDA	1,171,136,775				1		
ILLINOIS	1,512,127,208				1		
TOTAL		0	1	4	6	1	1
DISTRIBUTION		0.0%	7.7%	30.8%	46.2%	7.7%	7.7%

NOTES: (1) MINIMUM IS INDICATED BY "1" FOR EACH STATE.

(2) THIS TEST COUNTS THE NUMBER OF AGES FOR WHICH A PARTICULAR METHOD HAS THE MINIMUM AVERAGE SQUARED DEVIATION; TIES ARE POSSIBLE.

NATIONAL COUNCIL ON COMPENSATION INSURANCE

INDEMNITY

INCURRED

INDICATION OF METHOD PRODUCING MINIMUM TOTAL AVERAGE SQUARED DEVIATION (1)

STATE OR REGION	1987						
	EARNED PREMIUM 2ND REPT	TWO-YEAR STR AVG	THREE-YEAR STR AVG	FOUR-YEAR STR AVG	TWO-YEAR EXPO AVG	THREE-YEAR EXPO AVG	FOUR-YEAR EXPO AVG
UTAH	123,044,832		1				
NEBRASKA	127,816,027						1
MAINE	213,544,578						1
NORTH CAROLINA	415,953,120				1		
LOUISIANA	436,455,028				1		
OREGON	581,245,692			1			
WISCONSIN	609,230,991				1		
CONNECTICUT	726,148,241						1
MICHIGAN	859,722,833				1		
FLORIDA	1,171,136,775				1		
ILLINOIS	1,512,127,208				1		
TOTAL		0	1	1	6	0	3
DISTRIBUTION		0.0%	9.1%	9.1%	54.5%	0.0%	27.3%

INDICATION OF METHOD PRODUCING MINIMUM AVERAGE SQUARED DEVIATION AGE BY AGE (1) (2)

STATE OR REGION	1987						
	EARNED PREMIUM 2ND REPT	TWO-YEAR STR AVG	THREE-YEAR STR AVG	FOUR-YEAR STR AVG	TWO-YEAR EXPO AVG	THREE-YEAR EXPO AVG	FOUR-YEAR EXPO AVG
UTAH	123,044,832		1				
NEBRASKA	127,816,027				1		
MAINE	213,544,578				1		
NORTH CAROLINA	415,953,120					1	
LOUISIANA	436,455,028					1	
OREGON	581,245,692				1		
WISCONSIN	609,230,991					1	
CONNECTICUT	726,148,241				1	1	
MICHIGAN	859,722,833					1	
FLORIDA	1,171,136,775					1	
ILLINOIS	1,512,127,208					1	
TOTAL		0	1	4	7	0	0
DISTRIBUTION		0.0%	8.3%	33.3%	58.3%	0.0%	0.0%

NOTES: (1) MINIMUM IS INDICATED BY "1" FOR EACH STATE.

(2) THIS TEST COUNTS THE NUMBER OF AGES FOR WHICH A PARTICULAR METHOD HAS THE MINIMUM AVERAGE SQUARED DEVIATION; TIES ARE POSSIBLE.

NATIONAL COUNCIL ON COMPENSATION INSURANCE

MEDICAL

PAID LOSSES

INDICATION OF METHOD PRODUCING MINIMUM TOTAL AVERAGE SQUARED DEVIATION (1)

STATE OR REGION	1987						
	EARNED PREMIUM 2ND REPT	TWO-YEAR STR AVG	THREE-YEAR STR AVG	FOUR-YEAR STR AVG	TWO-YEAR EXPO AVG	THREE-YEAR EXPO AVG	FOUR-YEAR EXPO AVG
UTAH	123,044,832			1			
NEBRASKA	127,816,027				1		
MAINE	213,544,578				1		
NORTH CAROLINA	415,953,120				1		
LOUISIANA	436,455,028				1		
OREGON	581,245,692				1		
WISCONSIN	609,230,991				1		
CONNECTICUT	726,148,241				1		
MICHIGAN	859,722,833				1		
FLORIDA	1,171,136,775				1		
ILLINOIS	1,512,127,208				1		
TOTAL		0	0	1	10	0	0
DISTRIBUTION		0.0%	0.0%	9.1%	90.9%	0.0%	0.0%

INDICATION OF METHOD PRODUCING MINIMUM AVERAGE SQUARED DEVIATION AGE BY AGE (1) (2)

STATE OR REGION	1987						
	EARNED PREMIUM 2ND REPT	TWO-YEAR STR AVG	THREE-YEAR STR AVG	FOUR-YEAR STR AVG	TWO-YEAR EXPO AVG	THREE-YEAR EXPO AVG	FOUR-YEAR EXPO AVG
UTAH	123,044,832				1		
NEBRASKA	127,816,027			1			
MAINE	213,544,578				1		
NORTH CAROLINA	415,953,120			1			
LOUISIANA	436,455,028				1		
OREGON	581,245,692			1			1
WISCONSIN	609,230,991	1		1	1		
CONNECTICUT	726,148,241	1	1		1		
MICHIGAN	859,722,833				1		1
FLORIDA	1,171,136,775				1		
ILLINOIS	1,512,127,208				1		
TOTAL		2	1	4	8	0	2
DISTRIBUTION		11.8%	5.9%	23.5%	47.1%	0.0%	11.8%

NOTES: (1) MINIMUM IS INDICATED BY "1" FOR EACH STATE.

(2) THIS TEST COUNTS THE NUMBER OF AGES FOR WHICH A PARTICULAR METHOD HAS THE MINIMUM AVERAGE SQUARED DEVIATION; TIES ARE POSSIBLE.

NATIONAL COUNCIL ON COMPENSATION INSURANCE

MEDICAL

PAID PLUS OUTSTANDING

INDICATION OF METHOD PRODUCING MINIMUM TOTAL AVERAGE SQUARED DEVIATION (1)

STATE OR REGION	1987						
	EARNED PREMIUM @2ND REPT	TWO-YEAR STR AVG	THREE-YEAR STR AVG	FOUR-YEAR STR AVG	TWO-YEAR EXPO AVG	THREE-YEAR EXPO AVG	FOUR-YEAR EXPO AVG
UTAH	123,044,832			1			
NEBRASKA	127,816,027			1			
MAINE	213,544,578					1	
NORTH CAROLINA	415,953,120				1		
LOUISIANA	436,455,028					1	
OREGON	581,245,692			1			
WISCONSIN	609,230,991						1
CONNECTICUT	726,148,241		1				
MICHIGAN	859,722,833			1			
FLORIDA	1,171,136,775					1	
ILLINOIS	1,512,127,208					1	
TOTAL		0	1	4	1	4	1
DISTRIBUTION		0.0%	9.1%	36.4%	9.1%	36.4%	9.1%

INDICATION OF METHOD PRODUCING MINIMUM AVERAGE SQUARED DEVIATION AGE BY AGE (1) (2)

STATE OR REGION	1987						
	EARNED PREMIUM @2ND REPT	TWO-YEAR STR AVG	THREE-YEAR STR AVG	FOUR-YEAR STR AVG	TWO-YEAR EXPO AVG	THREE-YEAR EXPO AVG	FOUR-YEAR EXPO AVG
UTAH	123,044,832			1			
NEBRASKA	127,816,027		1				
MAINE	213,544,578			1	1		
NORTH CAROLINA	415,953,120				1		1
LOUISIANA	436,455,028		1	1	1		
OREGON	581,245,692			1	1		
WISCONSIN	609,230,991			1			
CONNECTICUT	726,148,241		1	1			
MICHIGAN	859,722,833			1			
FLORIDA	1,171,136,775				1		
ILLINOIS	1,512,127,208			1			
TOTAL		0	3	8	5	0	1
DISTRIBUTION		0.0%	17.6%	47.1%	29.4%	0.0%	5.9%

NOTES: (1) MINIMUM IS INDICATED BY "1" FOR EACH STATE.

(2) THIS TEST COUNTS THE NUMBER OF AGES FOR WHICH A PARTICULAR METHOD HAS THE MINIMUM AVERAGE SQUARED DEVIATION; TIES ARE POSSIBLE.

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 MEDICAL
 INCURRED

INDICATION OF METHOD PRODUCING MINIMUM TOTAL AVERAGE SQUARED DEVIATION (1)

STATE OR REGION	1987						
	EARNED PREMIUM 2ND REPT	TWO-YEAR STR AVG	THREE-YEAR STR AVG	FOUR-YEAR STR AVG	TWO-YEAR EXPO AVG	THREE-YEAR EXPO AVG	FOUR-YEAR EXPO AVG
UTAH	123,044,832			1			
NEBRASKA	127,816,027			1			
MAINE	213,544,578					1	
NORTH CAROLINA	415,953,120				1		
LOUISIANA	436,455,028				1		
OREGON	581,245,692					1	
WISCONSIN	609,230,991						1
CONNECTICUT	726,148,241					1	
MICHIGAN	859,722,833					1	
FLORIDA	1,171,136,775					1	
ILLINOIS	1,512,127,208					1	
TOTAL		0	0	2	2	6	1
DISTRIBUTION		0.0%	0.0%	18.2%	18.2%	54.5%	9.1%

INDICATION OF METHOD PRODUCING MINIMUM AVERAGE SQUARED DEVIATION AGE BY AGE (1) (2)

STATE OR REGION	1987						
	EARNED PREMIUM 2ND REPT	TWO-YEAR STR AVG	THREE-YEAR STR AVG	FOUR-YEAR STR AVG	TWO-YEAR EXPO AVG	THREE-YEAR EXPO AVG	FOUR-YEAR EXPO AVG
UTAH	123,044,832			1			
NEBRASKA	127,816,027	1	1	1			
MAINE	213,544,578		1	1	1		
NORTH CAROLINA	415,953,120				1		
LOUISIANA	436,455,028				1		1
OREGON	581,245,692						1
WISCONSIN	609,230,991				1		
CONNECTICUT	726,148,241				1		
MICHIGAN	859,722,833		1		1		
FLORIDA	1,171,136,775				1		
ILLINOIS	1,512,127,208				1		
TOTAL		1	4	5	5	0	2
DISTRIBUTION		5.9%	23.5%	29.4%	29.4%	0.0%	11.8%

NOTES: (1) MINIMUM IS INDICATED BY "1" FOR EACH STATE.

(2) THIS TEST COUNTS THE NUMBER OF AGES FOR WHICH A PARTICULAR METHOD HAS THE MINIMUM AVERAGE SQUARED DEVIATION; TIES ARE POSSIBLE.

NATIONAL COUNCIL ON COMPENSATION INSURANCE
SUMMARY OF VARIANCE OF DEVELOPMENT FACTORS

INDEMNITY

PAID LOSSES

STATE OR REGION	1987 EARNED PREMIUM 2ND REPORT	VARIANCE OF DEVELOPMENT FACTORS (IN MILLIONTHS)							
		1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	
UTAH	123,044,832	2465	452	125	129	40	77	55	
NEBRASKA	127,816,027	5513	714	308	209	38	120	60	
MAINE	213,544,578	8860	6211	2519	1849	546	293	278	
NORTH CAROLINA	415,953,120	1299	333	90	20	15	13	9	
LOUISIANA	436,455,028	4261	3162	1496	434	134	59	34	
OREGON	581,245,692	8103	979	242	124	20	35	16	
WISCONSIN	609,230,991	2779	599	163	43	15	82	18	
CONNECTICUT	726,148,241	1161	252	122	53	41	25	21	
MICHIGAN	859,722,833	1985	476	194	191	35	37	45	
FLORIDA	1,171,136,775	31031	5400	2288	1118	901	432	274	
ILLINOIS	1,512,127,208	4477	2276	901	288	103	88	501	
WESTERN	2,462,594,483	4194	847	123	27	10	11	7	
NORTHERN	6,173,015,621	1141	672	241	133	56	38	20	
SOUTHERN	7,064,274,158	5030	651	114	51	24	20	9	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
SUMMARY OF VARIANCE OF DEVELOPMENT FACTORS

INDEMNITY

PAID PLUS OUTSTANDING

STATE OR REGION	1987										
	EARNED PREMIUM 32ND REPORT	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH			
UTAH	123,044,832	2693	2030	1224	175	1705	163	179			
NEBRASKA	127,816,027	2846	571	628	193	202	250	245			
MAINE	213,544,578	6237	3570	407	1003	319	549	725			
NORTH CAROLINA	415,953,120	1988	845	122	23	33	39	41			
LOUISIANA	436,455,028	4607	3047	695	297	74	126	22			
OREGON	581,245,692	4798	6860	3084	980	542	453	190			
WISCONSIN	609,230,991	844	507	349	248	230	173	72			
CONNECTICUT	726,148,241	392	29	56	148	210	298	215			
MICHIGAN	859,722,833	1700	318	150	339	123	30	47			
FLORIDA	1,171,136,775	2802	2117	1945	715	636	206	131			
ILLINOIS	1,512,127,208	952	942	256	61	18	33	630			
WESTERN	2,462,594,483	890	576	209	21	9	19	11			
NORTHERN	6,173,015,621	333	400	195	74	34	25	27			
SOUTHERN	7,064,274,158	1604	592	123	55	21	28	8			

NATIONAL COUNCIL ON COMPENSATION INSURANCE
SUMMARY OF VARIANCE OF DEVELOPMENT FACTORS

INDEMNITY

INCURRED

STATE OR REGION	1987 EARNED PREMIUM 2ND REPORT	VARIANCE OF DEVELOPMENT FACTORS (IN MILLIONTHS)							
		1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	
UTAH	123,044,832	753	1286	873	250	1617	139	198	
NEBRASKA	127,816,027	1250	632	630	190	214	270	254	
MAINE	213,544,578	3108	2575	435	806	352	586	682	
NORTH CAROLINA	415,953,120	1667	1077	276	163	160	27	52	
LOUISIANA	436,455,028	3566	3042	567	418	138	124	54	
OREGON	581,245,692	1001	2340	842	534	218	212	98	
WISCONSIN	609,230,991	611	608	393	179	224	194	77	
CONNECTICUT	726,148,241	1384	335	169	149	324	305	247	
MICHIGAN	859,722,833	2598	454	146	522	178	39	87	
FLORIDA	1,171,136,775	4828	2922	1979	891	613	208	193	
ILLINOIS	1,512,127,208	567	992	227	82	25	38	649	
WESTERN	2,462,594,483	957	720	270	57	26	30	34	
NORTHERN	6,173,015,621	455	610	216	172	80	38	42	
SOUTHERN	7,064,274,158	1680	833	147	169	48	28	22	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
SUMMARY OF VARIANCE OF DEVELOPMENT FACTORS

MEDICAL

PAID LOSSES

STATE OR REGION	1987 EARNED PREMIUM @2ND REPORT	VARIANCE OF DEVELOPMENT FACTORS (IN MILLIONTHS)							
		1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	
UTAH	123,044,832	642	314	53	69	13	49	92	
NEBRASKA	127,816,027	1425	166	46	59	36	177	123	
MAINE	213,544,578	1741	606	227	117	94	124	34	
NORTH CAROLINA	415,953,120	1008	117	29	29	7	3	8	
LOUISIANA	436,455,028	1899	230	138	52	11	54	50	
OREGON	581,245,692	3581	622	145	39	119	84	12	
WISCONSIN	609,230,991	1105	23	28	28	3	8	13	
CONNECTICUT	726,148,241	2223	168	93	111	11	8	10	
MICHIGAN	859,722,833	219	69	74	50	10	32	8	
FLORIDA	1,171,136,775	2441	487	68	61	57	75	57	
ILLINOIS	1,512,127,208	1893	161	25	67	7	4	14	
WESTERN	2,462,594,483	1148	119	25	2	2	5	2	
NORTHERN	6,173,015,621	882	55	11	4	2	1	3	
SOUTHERN	7,064,274,158	2096	229	31	15	6	5	2	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
SUMMARY OF VARIANCE OF DEVELOPMENT FACTORS

MEDICAL

PAID PLUS OUTSTANDING

STATE OR REGION	1987 EARNED PREMIUM 2ND REPORT	VARIANCE OF DEVELOPMENT FACTORS (IN MILLIONTHS)							
		1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	
UTAH	123,044,832	3903	2403	133	116	812	2892	1160	
NEBRASKA	127,816,027	418	812	274	300	177	978	79	
MAINE	213,544,578	2061	812	523	672	414	191	265	
NORTH CAROLINA	415,953,120	1344	271	255	128	75	58	513	
LOUISIANA	436,455,028	1419	768	136	303	42	215	175	
OREGON	581,245,692	2672	1434	717	286	527	311	419	
WISCONSIN	609,230,991	162	145	234	256	442	181	69	
CONNECTICUT	726,148,241	581	811	63	60	32	103	245	
MICHIGAN	859,722,833	390	128	34	32	47	100	94	
FLORIDA	1,171,136,775	401	344	321	112	221	228	129	
ILLINOIS	1,512,127,208	752	40	176	80	13	82	17	
WESTERN	2,462,594,483	225	55	32	22	22	27	37	
NORTHERN	6,173,015,621	168	36	32	18	2	13	11	
SOUTHERN	7,064,274,158	468	100	45	11	24	13	6	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
SUMMARY OF VARIANCE OF DEVELOPMENT FACTORS

MEDICAL
INCURRED

STATE OR REGION	1987 EARNED PREMIUM 2ND REPORT	VARIANCE OF DEVELOPMENT FACTORS (IN MILLIONTHS)							
		1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	
UTAH	123,044,832	1694	2207	369	313	348	2540	1298	
NEBRASKA	127,816,027	322	719	245	236	188	947	73	
MAINE	213,544,578	1684	470	474	538	480	211	252	
NORTH CAROLINA	415,953,120	1686	425	384	114	83	73	485	
LOUISIANA	436,455,028	1539	879	116	405	57	211	146	
OREGON	581,245,692	1225	438	746	616	676	701	545	
WISCONSIN	609,230,991	96	101	239	239	430	182	59	
CONNECTICUT	726,148,241	834	1034	142	269	182	111	251	
MICHIGAN	859,722,833	674	132	82	118	46	142	98	
FLORIDA	1,171,136,775	779	455	391	180	276	264	171	
ILLINOIS	1,512,127,208	602	64	204	66	21	96	30	
WESTERN	2,462,594,483	247	138	58	10	15	32	37	
NORTHERN	6,173,015,621	155	79	42	48	31	17	15	
SOUTHERN	7,064,274,158	609	194	45	34	30	15	7	

The following is a hypothetical example which illustrates the NCCI's current tail methodology.

Assumptions:	Growth -- 10% per year	
	Development -- 8th - 9th	1.058
	9th - 10th	1.044
	10th - 11th	1.032
	11th - 12th	1.020
	Beyond 12th	1.000

Thus, the tail (8th - Ult) is: 1.163

Consider the following triangle:

	8th	9th	10th	11th	12th	13th
1975	860	910	950	980	1000	1000
1976	946	1001	1045	1078	1100	
1977	1041	1101	1150	1186		
1978	1145	1211	1265			
1979	1260	1332				
1980	1386					

A year later, the data triangle is:

	8th	9th	10th	11th	12th	13th	14th
1975	860	910	950	980	1000	1000	1000
1976	946	1001	1045	1078	1100	1100	
1977	1041	1101	1150	1186	1210		
1978	1145	1211	1265	1305			
1979	1260	1332	1391				
1980	1386	1467					

Differencing the two diagonals to get Calendar Year Development (which is the numerator of the tail) produces a total of 204.

The NCCI old procedure would relate this to the most recent policy year at 8th report, i.e., 1386. Thus, the old tail would be $(1+204/1386) = 1.147$

The current NCCI procedure relates it to the average of the most recent three years at 8th report, i.e., 1264. Thus, the current tail would be $(1+204/1264) = 1.161$.

Thus, the current approach comes much closer to the true tail.

NATIONAL COUNCIL ON COMPENSATION INSURANCE

INDEMNITY COMPARISON OF PROJECTIONS - AVERAGE DEVIATION FROM PRIOR PROJECTION

	UTAH A	NEBRKA A	MAINE A	NO DRLMA A	LOUIS'NA A	OREGON A	WISCONS A	CONN'CT A	MICHIGAN A	FLORIDA A	ILLINOIS A	TOT
1978 PAID	0.68% 1	0.92% 1	2.27% 1	0.42% 0	0.90% 0	0.62% 1	1.10% 1	0.59% 1	0.95% 0	0.93% 1	1.34% 0	7
1978 PAID+Q/S	1.30% 0	2.27% 0	2.72% 0	0.28% 1	0.94% 0	1.51% 0	3.08% 0	4.01% 0	0.47% 1	1.58% 0	1.34% 0	2
1978 INCURRED	1.39% 0	1.94% 0	2.51% 0	0.45% 0	0.81% 1	2.31% 0	3.57% 0	3.05% 0	0.81% 0	1.04% 0	1.21% 1	2
1979 PAID	1.23% 1	0.91% 1	1.56% 1	0.55% 0	1.16% 0	0.94% 1	1.20% 1	0.93% 1	1.24% 0	3.97% 0	1.19% 0	6
1979 PAID+Q/S	2.12% 0	2.31% 0	3.18% 0	0.53% 1	1.01% 1	3.31% 0	3.00% 0	3.33% 0	0.57% 1	3.35% 0	0.92% 1	4
1979 INCURRED	2.55% 0	3.12% 0	3.15% 0	0.96% 0	1.13% 0	3.62% 0	3.50% 0	2.79% 0	1.18% 0	3.23% 1	1.43% 0	1
1980 PAID	1.00% 1	1.05% 1	2.45% 1	0.59% 0	0.56% 1	1.04% 1	1.48% 1	0.68% 1	1.36% 0	4.99% 0	1.38% 0	7
1980 PAID+Q/S	1.41% 0	2.65% 0	4.44% 0	0.57% 1	1.15% 0	6.62% 0	3.65% 0	4.24% 0	1.15% 1	4.96% 1	0.75% 1	4
1980 INCURRED	1.67% 0	3.54% 0	4.22% 0	1.26% 0	0.58% 0	3.37% 0	4.14% 0	3.76% 0	1.87% 0	5.07% 0	1.09% 0	0
1981 PAID	2.07% 1	1.15% 1	4.63% 1	1.22% 0	1.25% 1	1.43% 1	0.90% 1	0.84% 1	1.80% 0	5.87% 0	1.89% 0	7
1981 PAID+Q/S	3.44% 0	1.77% 0	6.22% 0	1.06% 1	1.77% 0	7.94% 0	4.10% 0	3.21% 0	1.18% 1	5.58% 1	1.16% 1	4
1981 INCURRED	4.02% 0	2.51% 0	5.85% 0	1.18% 0	2.03% 0	3.01% 0	4.63% 0	2.15% 0	1.59% 0	6.85% 0	1.61% 0	0
1982 PAID	3.08% 1	1.29% 1	6.53% 0	1.00% 1	2.07% 0	1.79% 1	1.88% 1	1.67% 1	2.45% 0	5.71% 0	2.45% 0	6
1982 PAID+Q/S	3.40% 0	2.43% 0	6.05% 1	1.70% 0	1.85% 1	8.81% 0	4.58% 0	2.45% 0	1.53% 1	2.86% 1	1.42% 1	5
1982 INCURRED	5.46% 0	3.44% 0	6.25% 0	2.96% 0	1.91% 0	3.96% 0	4.45% 0	2.83% 0	2.80% 0	5.22% 0	1.84% 0	0
1983 PAID	3.13% 1	1.78% 1	8.74% 0	1.63% 1	5.03% 1	3.79% 0	2.55% 1	2.19% 1	2.29% 0	6.68% 0	4.08% 0	6
1983 PAID+Q/S	4.91% 0	3.12% 0	5.36% 0	2.24% 0	5.59% 0	8.17% 0	5.63% 0	2.69% 0	2.02% 1	3.90% 1	1.60% 1	3
1983 INCURRED	4.63% 0	5.04% 0	4.26% 1	3.87% 0	6.20% 0	1.13% 1	5.53% 0	4.10% 0	3.34% 0	4.40% 0	2.51% 0	2
1984 PAID	2.08% 1	2.67% 1	8.65% 0	0.82% 1	6.53% 1	4.69% 0	1.65% 1	1.10% 1	2.00% 1	7.72% 0	3.95% 0	7
1984 PAID+Q/S	5.85% 0	4.67% 0	4.42% 0	2.66% 0	7.44% 0	10.03% 0	4.29% 0	2.00% 0	4.45% 0	5.40% 1	3.45% 0	1
1984 INCURRED	4.28% 0	4.23% 0	3.35% 1	4.44% 0	7.36% 0	2.17% 1	3.30% 0	4.48% 0	4.99% 0	5.47% 0	2.80% 1	3
TOTAL PAID	7	7	4	3	4	5	7	7	1	1	0	46
TOTAL PAID+Q/S	0	0	1	4	2	0	0	0	6	5	5	23
TOTAL INCURRED	0	0	2	0	1	2	0	0	0	1	2	8
DIST PAID	100.00%	100.00%	57.14%	42.86%	57.14%	71.43%	100.00%	100.00%	14.29%	14.29%	0.00%	59.74%
DIST PAID+Q/S	0.00%	0.00%	14.29%	57.14%	28.57%	0.00%	0.00%	0.00%	85.71%	71.43%	71.43%	29.87%
DIST INCURRED	0.00%	0.00%	28.57%	0.00%	14.29%	28.57%	0.00%	0.00%	0.00%	14.29%	28.57%	10.39%

NOTES: A. "1" IN THIS COLUMN INDICATES THE PROJECTION METHOD WITH THE LOWEST AVERAGE DEVIATION.

WEIGHTS N-4 0.0000
 ASSIGNED TO N-3 0.0000
 PRECEDING N-2 0.5000
 YEARS: N-1 0.5000

01:16 PM
 03/27/91

LOSSES HAVE BEEN RESTATED TO THE LATEST DIAGONAL.

NATIONAL COUNCIL ON COMPENSATION INSURANCE

MEDICAL COMPARISON OF PROJECTIONS - AVERAGE DEVIATION FROM PRIOR PROJECTION

	UTAH A	NEBRKA A	MAINE A	NO ORLVA A	LOUIS'NA A	OREGON A	WISONSN A	CONN'CT A	MICHIGAN A	FLORIDA A	ILLINOIS A	TOT
1978 PAID	0.68% 1	1.25% 1	0.87% 1	0.33% 1	0.92% 1	0.45% 1	0.27% 1	0.43% 1	0.38% 1	0.38% 1	0.28% 1	11
1978 PAID+O/S	3.54% 0	2.29% 0	3.35% 0	1.29% 0	1.87% 0	2.30% 0	1.84% 0	1.11% 0	1.06% 0	0.91% 0	1.24% 0	0
1978 INCURRED	3.77% 0	2.15% 0	2.77% 0	1.53% 0	2.22% 0	3.60% 0	1.96% 0	2.13% 0	0.89% 0	1.41% 0	1.59% 0	0
1979 PAID	0.59% 1	0.99% 1	1.29% 1	0.25% 1	0.89% 1	0.39% 1	0.32% 1	0.43% 1	0.52% 1	1.26% 1	0.32% 1	11
1979 PAID+O/S	7.78% 0	1.30% 0	3.72% 0	1.73% 0	1.38% 0	2.60% 0	1.81% 0	1.44% 0	0.83% 0	1.63% 0	0.77% 0	0
1979 INCURRED	7.13% 0	1.53% 0	2.93% 0	2.26% 0	1.95% 0	4.79% 0	2.09% 0	2.49% 0	1.13% 0	1.65% 0	1.30% 0	0
1980 PAID	1.00% 1	1.15% 1	1.23% 1	0.49% 1	0.59% 1	0.73% 1	0.29% 1	0.38% 1	0.83% 1	1.05% 1	0.20% 1	11
1980 PAID+O/S	7.57% 0	2.86% 0	4.72% 0	1.72% 0	1.62% 0	3.78% 0	2.66% 0	1.63% 0	1.08% 0	2.07% 0	1.22% 0	0
1980 INCURRED	7.73% 0	2.41% 0	3.87% 0	2.07% 0	2.04% 0	6.29% 0	2.97% 0	2.17% 0	1.47% 0	2.19% 0	1.76% 0	0
1981 PAID	1.28% 1	1.29% 1	2.41% 1	0.19% 1	1.63% 1	1.22% 1	0.50% 1	0.42% 1	0.94% 1	0.96% 1	0.30% 1	11
1981 PAID+O/S	8.51% 0	1.74% 0	5.76% 0	1.05% 0	2.49% 0	5.59% 0	2.65% 0	0.77% 0	1.22% 0	2.12% 0	1.19% 0	0
1981 INCURRED	6.10% 0	1.30% 0	4.61% 0	1.66% 0	2.35% 0	6.43% 0	2.87% 0	2.54% 0	1.59% 0	2.71% 0	1.87% 0	0
1982 PAID	1.98% 1	1.23% 1	2.21% 1	0.59% 1	1.10% 1	2.15% 1	0.43% 1	0.53% 1	0.77% 1	0.95% 1	0.48% 1	11
1982 PAID+O/S	11.81% 0	2.14% 0	4.18% 0	1.85% 0	3.36% 0	6.90% 0	2.40% 0	1.62% 0	1.90% 0	2.03% 0	1.01% 0	0
1982 INCURRED	8.40% 0	2.20% 0	3.35% 0	2.09% 0	3.47% 0	6.46% 0	2.35% 0	4.46% 0	2.60% 0	3.45% 0	1.73% 0	0
1983 PAID	1.15% 1	0.71% 1	1.84% 1	1.14% 1	0.77% 1	4.37% 1	0.69% 1	0.83% 1	1.17% 1	1.18% 1	0.94% 1	11
1983 PAID+O/S	14.61% 0	1.95% 0	4.94% 0	3.04% 0	2.25% 0	7.95% 0	3.23% 0	1.81% 0	1.55% 0	2.55% 0	1.51% 0	0
1983 INCURRED	11.84% 0	1.61% 0	3.54% 0	2.90% 0	2.43% 0	6.50% 0	3.16% 0	3.87% 0	1.59% 0	2.54% 0	1.83% 0	0
1984 PAID	1.45% 1	2.69% 1	2.19% 0	0.65% 1	1.05% 1	6.16% 1	1.37% 1	1.27% 1	0.83% 1	2.74% 1	1.12% 0	9
1984 PAID+O/S	20.07% 0	4.24% 0	3.34% 0	2.46% 0	3.01% 0	9.48% 0	2.76% 0	1.85% 0	1.63% 0	3.04% 0	0.93% 1	1
1984 INCURRED	13.85% 0	3.40% 0	2.04% 1	2.76% 0	2.27% 0	7.81% 0	2.26% 0	4.35% 0	2.12% 0	3.31% 0	1.08% 0	1
TOTAL PAID	7	7	6	7	7	7	7	7	7	7	6	75
TOTAL PAID+O/S	0	0	0	0	0	0	0	0	0	0	1	1
TOTAL INCURRED	0	0	1	0	0	0	0	0	0	0	0	1
DIST PAID	100.00%	100.00%	85.71%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	85.71%	97.40%
DIST PAID+O/S	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	14.29%	1.30%
DIST INCURRED	0.00%	0.00%	14.29%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.30%

NOTES: A. "1" IN THIS COLUMN INDICATES THE PROJECTION METHOD WITH THE LOWEST AVERAGE DEVIATION.

WEIGHTS N-4 0.0000
 ASSIGNED TO N-3 0.0000
 PRECEDING N-2 0.5000
 YEARS: N-1 0.5000

LOSSES HAVE BEEN RESTATED TO THE LATEST DIAGONAL.

01:25 PM
 03/27/91

NATIONAL COUNCIL ON COMPENSATION INSURANCE

INDEMNITY COMPARISON OF PROJECTIONS - AVERAGE DEVIATION FROM LAST PROJECTION

	UTAH A	NEBRKA A	MAINE A	NO ORLNA A	LOUIS'NA A	OREGON A	WISCONS A	CONN'CT A	MICHIGAN A	FLORIDA A	ILLINOIS A	TOT
1978 PAID	0.57% 1	0.90% 1	1.83% 1	0.24% 0	1.40% 0	0.63% 1	1.26% 1	0.76% 1	1.07% 0	2.62% 0	1.27% 1	7
1978 PAID+Q/S	1.22% 0	1.61% 0	4.00% 0	0.18% 1	0.94% 1	1.62% 0	2.30% 0	3.61% 0	0.81% 1	2.98% 0	1.38% 0	3
1978 INCURRED	1.06% 0	1.27% 0	3.80% 0	0.60% 0	1.70% 0	1.76% 0	2.27% 0	4.64% 0	2.16% 0	1.27% 1	1.48% 0	1
1979 PAID	1.52% 1	1.14% 1	3.35% 1	1.11% 0	1.55% 0	1.83% 1	1.50% 1	1.16% 1	1.48% 0	9.12% 0	1.30% 0	6
1979 PAID+Q/S	1.58% 0	2.55% 0	4.37% 0	0.57% 1	1.15% 1	6.55% 0	2.40% 0	3.06% 0	1.31% 1	5.98% 1	0.98% 1	5
1979 INCURRED	1.72% 0	2.68% 0	4.08% 0	1.18% 0	1.39% 0	3.10% 0	2.34% 0	2.23% 0	1.61% 0	7.01% 0	1.32% 0	0
1980 PAID	1.26% 1	2.80% 1	5.53% 0	0.69% 1	0.83% 1	1.79% 1	1.52% 1	0.96% 1	1.60% 1	12.66% 0	2.73% 0	8
1980 PAID+Q/S	1.67% 0	2.96% 0	5.65% 0	0.85% 0	1.42% 0	11.24% 0	2.58% 0	4.06% 0	1.61% 0	10.43% 1	0.74% 1	2
1980 INCURRED	2.00% 0	3.08% 0	5.43% 1	0.78% 0	1.10% 0	6.37% 0	2.99% 0	3.42% 0	1.97% 0	11.78% 0	1.00% 0	1
1981 PAID	4.56% 1	1.18% 1	12.08% 1	1.56% 1	2.54% 1	1.84% 1	1.55% 1	0.93% 1	3.20% 0	12.89% 0	4.26% 0	8
1981 PAID+Q/S	8.67% 0	2.51% 0	13.66% 0	3.24% 0	2.73% 0	13.29% 0	4.31% 0	2.27% 0	2.96% 1	9.67% 1	3.01% 1	3
1981 INCURRED	9.80% 0	2.45% 0	13.48% 0	2.83% 0	3.58% 0	6.12% 0	4.12% 0	1.35% 0	3.24% 0	12.02% 0	3.25% 0	0
1982 PAID	3.39% 0	1.58% 1	15.73% 0	3.23% 1	3.87% 0	4.14% 1	4.55% 1	1.50% 1	5.17% 1	11.50% 0	6.75% 0	6
1982 PAID+Q/S	3.06% 1	2.84% 0	9.23% 1	4.23% 0	3.06% 1	11.39% 0	6.25% 0	1.98% 0	6.18% 0	4.69% 1	1.90% 1	5
1982 INCURRED	5.04% 0	4.71% 0	9.92% 0	7.73% 0	5.58% 0	4.76% 0	6.38% 0	5.31% 0	8.49% 0	8.01% 0	3.41% 0	0
1983 PAID	4.75% 1	3.34% 1	13.52% 0	2.52% 1	11.65% 0	3.57% 0	3.77% 1	2.35% 1	5.28% 1	10.47% 0	8.12% 0	6
1983 PAID+Q/S	7.82% 0	5.65% 0	4.42% 0	3.70% 0	10.52% 1	9.59% 0	5.43% 0	3.08% 0	6.34% 0	8.30% 1	3.49% 1	3
1983 INCURRED	7.32% 0	6.41% 0	3.70% 1	5.73% 0	11.04% 0	2.72% 1	5.24% 0	2.82% 0	7.83% 0	8.88% 0	4.29% 0	2
1984 PAID	2.28% 1	5.85% 1	9.03% 0	2.24% 1	12.76% 0	3.25% 1	2.94% 1	2.32% 0	5.31% 1	10.38% 0	8.35% 0	6
1984 PAID+Q/S	6.10% 0	8.03% 0	4.89% 0	3.30% 0	11.40% 0	12.15% 0	6.46% 0	1.17% 1	10.25% 0	8.37% 0	5.84% 0	1
1984 INCURRED	5.29% 0	8.29% 0	3.99% 1	5.92% 0	11.28% 1	5.04% 0	5.66% 0	4.52% 0	10.85% 0	7.91% 1	5.17% 1	4
TOTAL PAID	6	7	3	5	2	6	7	6	4	0	1	47
TOTAL PAID+Q/S	1	0	1	2	4	0	0	1	3	5	5	22
TOTAL INCURRED	0	0	3	0	1	1	0	0	0	2	1	8
DIST PAID	85.71%	100.00%	42.86%	71.43%	28.57%	85.71%	100.00%	85.71%	57.14%	0.00%	14.29%	61.04%
DIST PAID+Q/S	14.29%	0.00%	14.29%	28.57%	57.14%	0.00%	0.00%	14.29%	42.86%	71.43%	71.43%	28.57%
DIST INCURRED	0.00%	0.00%	42.86%	0.00%	14.29%	14.29%	0.00%	0.00%	0.00%	28.57%	14.29%	10.39%

NOTES: A. "1" IN THIS COLUMN INDICATES THE PROJECTION METHOD WITH THE LOWEST AVERAGE DEVIATION.

WEIGHTS N-4 0.0000
 ASSIGNED TO N-3 0.0000
 PRECEDING N-2 0.5000
 YEARS: N-1 0.5000

LOSSES HAVE BEEN RESTATED TO THE LATEST DIAGONAL.

01:16 PM
 03/27/91

NATIONAL COUNCIL ON COMPENSATION INSURANCE

MEDICAL COMPARISON OF PROJECTIONS - AVERAGE DEVIATION FROM LAST PROJECTION

	UTAH A	NEBRKA A	MAINE A	NO ORLNA A	LOUIS/NA A	OREGON A	WISCONS A	CONN/CT A	MICHIGAN A	FLORIDA A	ILLINOIS A	TOT
1978 PAID	0.93% 1	1.22% 1	0.86% 1	0.70% 1	1.00% 1	1.03% 1	0.30% 1	0.30% 1	0.51% 1	0.65% 1	0.47% 1	11
1978 PAID+O/S	7.67% 0	1.48% 0	4.40% 0	1.55% 0	3.39% 0	5.79% 0	1.86% 0	0.98% 0	1.93% 0	0.74% 0	0.83% 0	0
1978 INCURRED	7.21% 0	1.30% 0	3.89% 0	1.91% 0	2.76% 0	4.98% 0	1.99% 0	2.10% 0	2.64% 0	0.92% 0	1.10% 0	0
1979 PAID	1.14% 1	2.25% 0	2.64% 1	0.14% 1	0.94% 1	0.91% 1	0.66% 1	0.30% 1	1.47% 1	3.67% 0	0.35% 1	9
1979 PAID+O/S	10.03% 0	1.88% 1	4.97% 0	1.81% 0	1.96% 0	8.20% 0	2.45% 0	1.08% 0	1.60% 0	3.57% 1	0.56% 0	2
1979 INCURRED	9.77% 0	2.29% 0	4.19% 0	2.47% 0	1.80% 0	10.18% 0	2.32% 0	2.19% 0	2.28% 0	3.92% 0	1.03% 0	0
1980 PAID	1.05% 1	1.31% 1	3.09% 1	1.15% 1	0.71% 1	1.82% 1	0.35% 1	0.90% 1	2.41% 1	3.34% 1	0.38% 1	11
1980 PAID+O/S	4.89% 0	3.26% 0	4.66% 0	1.82% 0	1.80% 0	7.17% 0	4.07% 0	0.98% 0	3.07% 0	6.68% 0	0.92% 0	0
1980 INCURRED	6.98% 0	2.99% 0	3.54% 0	1.96% 0	1.52% 0	10.17% 0	3.76% 0	2.40% 0	3.51% 0	7.20% 0	1.30% 0	0
1981 PAID	1.32% 1	2.29% 0	6.32% 0	0.96% 1	2.04% 1	1.14% 1	0.55% 1	0.57% 1	1.53% 0	3.14% 1	0.58% 1	8
1981 PAID+O/S	5.95% 0	2.17% 0	6.22% 0	2.30% 0	3.97% 0	7.11% 0	3.63% 0	1.31% 0	1.10% 1	5.80% 0	1.21% 0	1
1981 INCURRED	6.35% 0	1.64% 1	5.24% 1	2.99% 0	3.82% 0	9.98% 0	3.14% 0	2.64% 0	1.75% 0	7.38% 0	1.70% 0	2
1982 PAID	2.29% 1	1.68% 0	5.54% 0	0.85% 1	0.97% 1	2.20% 1	0.62% 1	0.69% 1	1.48% 1	2.94% 1	0.45% 1	9
1982 PAID+O/S	10.25% 0	2.01% 0	3.78% 0	2.32% 0	3.35% 0	8.26% 0	3.24% 0	2.76% 0	1.60% 0	5.86% 0	0.75% 0	0
1982 INCURRED	8.83% 0	1.61% 1	2.42% 1	3.63% 0	3.47% 0	9.09% 0	3.36% 0	7.21% 0	1.58% 0	8.35% 0	1.67% 0	7
1983 PAID	2.12% 1	0.46% 1	2.82% 1	0.96% 1	2.26% 1	4.92% 1	1.06% 1	0.95% 1	2.32% 0	3.18% 1	2.47% 0	9
1983 PAID+O/S	10.91% 0	2.12% 0	7.17% 0	3.66% 0	3.94% 0	10.36% 0	3.28% 0	2.07% 0	1.70% 0	6.10% 0	1.54% 1	1
1983 INCURRED	10.44% 0	1.63% 0	5.76% 0	3.67% 0	5.05% 0	8.79% 0	3.10% 0	4.02% 0	1.59% 1	7.39% 0	2.00% 0	1
1984 PAID	2.71% 1	4.49% 0	3.71% 0	1.48% 1	2.94% 0	5.37% 1	2.48% 1	3.09% 0	0.92% 0	5.39% 1	2.07% 0	5
1984 PAID+O/S	13.31% 0	4.40% 0	4.24% 0	1.61% 0	2.55% 0	17.28% 0	2.70% 0	2.07% 1	0.89% 1	5.99% 0	1.59% 0	2
1984 INCURRED	8.47% 0	4.31% 1	2.36% 1	3.02% 0	2.34% 1	7.91% 0	2.52% 0	3.77% 0	2.36% 0	6.84% 0	1.16% 1	4
TOTAL PAID	7	3	4	7	6	7	7	6	4	6	5	62
TOTAL PAID+O/S	0	1	0	0	0	0	0	1	2	1	1	6
TOTAL INCURRED	0	3	3	0	1	0	0	0	1	0	1	9
DIST PAID	100.00%	42.86%	57.14%	100.00%	85.71%	100.00%	100.00%	85.71%	57.14%	85.71%	71.43%	80.52%
DIST PAID+O/S	0.00%	14.29%	0.00%	0.00%	0.00%	0.00%	0.00%	14.29%	28.57%	14.29%	14.29%	7.79%
DIST INCURRED	0.00%	42.86%	42.86%	0.00%	14.29%	0.00%	0.00%	0.00%	14.29%	0.00%	14.29%	11.69%

NOTES: A. "1" IN THIS COLUMN INDICATES THE PROJECTION METHOD WITH THE LOWEST AVERAGE DEVIATION.

WEIGHTS N-4 0.0000
ASSIGNED TO N-3 0.0000
PRECEDING N-2 0.5000
YEARS: N-1 0.5000

LOSSES HAVE BEEN RESTATED TO THE LATEST DIAGONAL.

01:25 PM
03/27/91

NATIONAL COUNCIL ON COMPENSATION INSURANCE

INDEMNITY COMPARISON OF PROJECTIONS RESTATED TO INCURRED LEVEL - AVERAGE DEVIATION FROM PRIOR PROJECTION

	UTAH A	NEBRKA A	MAINE A	NO ORLA A	LOUIS'NA A	OREGON A	WISOMN A	CONN'CT A	MICHIGAN A	FLORIDA A	ILLINOIS A	TOT
1978 PAID	0.74% 1	1.71% 1	3.33% 0	1.27% 0	1.64% 0	1.93% 0	2.52% 1	1.74% 1	1.09% 0	0.82% 1	0.38% 1	6
1978 PAID+Q/S	1.47% 0	2.25% 0	2.79% 0	0.29% 1	1.10% 0	1.61% 1	3.19% 0	4.26% 0	0.62% 1	1.31% 0	1.20% 0	3
1978 INCURRED	1.39% 0	1.94% 0	2.51% 1	0.45% 0	0.81% 1	2.31% 0	3.57% 0	3.05% 0	0.81% 0	1.04% 0	1.21% 0	2
1979 PAID	1.53% 1	1.63% 1	2.80% 1	0.99% 0	1.34% 0	1.54% 1	2.29% 1	1.78% 1	1.41% 0	4.76% 0	0.49% 1	7
1979 PAID+Q/S	1.93% 0	2.39% 0	3.22% 0	0.45% 1	0.93% 1	3.46% 0	3.10% 0	3.52% 0	0.69% 1	3.04% 1	0.87% 0	4
1979 INCURRED	2.55% 0	3.12% 0	3.15% 0	0.96% 0	1.13% 0	3.62% 0	3.50% 0	2.79% 0	1.18% 0	3.23% 0	1.43% 0	0
1980 PAID	1.72% 0	1.51% 1	2.72% 1	0.88% 0	1.16% 0	1.71% 1	2.09% 1	2.44% 1	1.61% 0	6.66% 0	0.97% 0	5
1980 PAID+Q/S	1.48% 1	2.69% 0	4.54% 0	0.57% 1	1.04% 0	6.29% 0	3.67% 0	4.54% 0	1.40% 1	4.99% 1	0.74% 1	5
1980 INCURRED	1.67% 0	3.54% 0	4.22% 0	1.26% 0	0.58% 1	3.37% 0	4.14% 0	3.76% 0	1.87% 0	5.07% 0	1.09% 0	1
1981 PAID	3.51% 0	1.17% 1	4.49% 1	1.32% 0	1.50% 1	2.11% 1	1.61% 1	2.14% 1	1.95% 0	7.47% 0	1.60% 0	6
1981 PAID+Q/S	3.24% 1	1.83% 0	6.31% 0	0.99% 1	1.91% 0	7.67% 0	4.13% 0	3.48% 0	1.27% 1	5.53% 1	1.14% 1	5
1981 INCURRED	4.02% 0	2.51% 0	5.85% 0	1.18% 0	2.03% 0	3.01% 0	4.63% 0	2.15% 0	1.59% 0	6.85% 0	1.61% 0	0
1982 PAID	4.64% 0	2.48% 0	6.24% 0	1.47% 1	2.04% 0	1.20% 1	1.74% 1	3.17% 0	2.38% 0	7.49% 0	2.56% 0	3
1982 PAID+Q/S	3.30% 1	2.41% 1	6.18% 1	1.63% 0	1.86% 1	8.49% 0	4.49% 0	2.70% 1	1.51% 1	2.28% 1	1.42% 1	8
1982 INCURRED	5.46% 0	3.44% 0	6.25% 0	2.96% 0	1.91% 0	3.96% 0	4.45% 0	2.83% 0	2.80% 0	5.22% 0	1.84% 0	0
1983 PAID	4.71% 0	1.81% 1	8.10% 0	2.12% 1	4.62% 1	2.83% 0	2.57% 1	3.66% 0	2.66% 0	8.44% 0	4.07% 0	4
1983 PAID+Q/S	4.69% 0	3.17% 0	5.49% 0	2.17% 0	5.50% 0	8.05% 0	5.51% 0	3.01% 1	2.04% 1	3.66% 1	1.56% 1	4
1983 INCURRED	4.63% 1	5.04% 0	4.26% 1	3.87% 0	6.20% 0	1.13% 1	5.53% 0	4.10% 0	3.34% 0	4.40% 0	2.51% 0	3
1984 PAID	3.43% 1	1.51% 1	9.15% 0	1.04% 1	5.75% 1	3.84% 0	1.87% 1	2.55% 0	2.51% 1	10.55% 0	4.01% 0	6
1984 PAID+Q/S	5.68% 0	4.56% 0	4.60% 0	2.60% 0	7.38% 0	10.19% 0	4.15% 0	2.40% 1	4.41% 0	5.46% 1	3.41% 0	2
1984 INCURRED	4.28% 0	4.23% 0	3.35% 1	4.44% 0	7.36% 0	2.17% 1	3.30% 0	4.48% 0	4.99% 0	5.47% 0	2.80% 1	3
TOTAL PAID	3	6	3	3	3	4	7	4	1	1	2	37
TOTAL PAID+Q/S	3	1	1	4	2	1	0	3	6	6	4	31
TOTAL INCURRED	1	0	3	0	2	2	0	0	0	0	1	9
DIST PAID	42.86%	85.71%	42.86%	42.86%	42.86%	57.14%	100.00%	57.14%	14.29%	14.29%	28.57%	48.05%
DIST PAID+Q/S	42.86%	14.29%	14.29%	57.14%	28.57%	14.29%	0.00%	42.86%	85.71%	85.71%	57.14%	40.26%
DIST INCURRED	14.29%	0.00%	42.86%	0.00%	28.57%	28.57%	0.00%	0.00%	0.00%	0.00%	14.29%	11.69%

NOTES: A. *1* IN THIS COLUMN INDICATES THE PROJECTION METHOD WITH THE LOWEST AVERAGE DEVIATION.

LOSSES HAVE BEEN RESTATED TO THE LATEST DIAGONAL.

PROJECTIONS HAVE BEEN RESTATED TO THE INCURRED LEVEL.

WEIGHTS N-4. 0.0000
 ASSIGNED TO N-3 0.0000
 PRECEDING N-2 0.5000
 YEARS: N-1 0.5000

01:59 PM
 03/27/91

NATIONAL COUNCIL ON COMPENSATION INSURANCE

MEDICAL COMPARISON OF PROJECTIONS RESTATED TO INCURRED LEVEL - AVERAGE DEVIATION FROM PRIOR PROJECTION

	UTAH A	NEBRKA A	MAINE A	NO ORLNA A	LOUIS'NA A	OREGON A	WISCONSIN A	CONN'CT A	MICHIGAN A	FLORIDA A	ILLINOIS A	TOT
1978 PAID	4.76% 0	2.27% 0	1.81% 1	1.73% 0	2.35% 0	2.03% 0	1.14% 1	2.75% 0	0.92% 0	1.10% 0	0.57% 1	3
1978 PAID+O/S	3.56% 1	2.44% 0	3.40% 0	1.22% 1	1.84% 1	1.12% 1	1.85% 0	0.98% 1	1.08% 0	1.02% 1	1.27% 0	6
1978 INCURRED	3.77% 0	2.15% 1	2.77% 0	1.53% 0	2.22% 0	3.60% 0	1.96% 0	2.13% 0	0.89% 1	1.41% 0	1.59% 0	2
1979 PAID	5.11% 1	2.97% 0	2.84% 1	1.92% 0	2.02% 0	2.23% 0	1.11% 1	2.22% 0	1.04% 0	1.92% 0	0.48% 1	4
1979 PAID+O/S	7.73% 0	1.42% 1	3.66% 0	1.75% 1	1.46% 1	1.66% 1	1.83% 0	1.31% 1	0.86% 1	1.57% 1	0.77% 0	7
1979 INCURRED	7.13% 0	1.53% 0	2.93% 0	2.26% 0	1.95% 0	4.79% 0	2.09% 0	2.49% 0	1.13% 0	1.65% 0	1.30% 0	0
1980 PAID	4.89% 1	3.10% 0	2.76% 1	1.55% 1	2.05% 0	2.56% 1	0.85% 1	2.33% 0	1.22% 0	2.49% 0	0.44% 1	6
1980 PAID+O/S	7.85% 0	2.89% 0	4.91% 0	1.69% 0	1.68% 1	2.98% 0	2.67% 0	1.61% 1	1.20% 1	2.10% 1	1.28% 0	4
1980 INCURRED	7.73% 0	2.41% 1	3.87% 0	2.07% 0	2.04% 0	6.29% 0	2.97% 0	2.17% 0	1.47% 0	2.19% 0	1.76% 0	1
1981 PAID	4.61% 1	3.22% 0	3.66% 1	1.43% 0	3.01% 0	2.09% 1	1.23% 1	2.14% 0	1.40% 0	2.75% 0	0.49% 1	5
1981 PAID+O/S	8.67% 0	1.77% 0	5.79% 0	1.07% 1	2.53% 0	4.88% 0	2.64% 0	0.70% 1	1.30% 1	2.21% 1	1.21% 0	4
1981 INCURRED	6.10% 0	1.30% 1	4.61% 0	1.66% 0	2.35% 1	6.43% 0	2.87% 0	2.54% 0	1.59% 0	2.71% 0	1.87% 0	2
1982 PAID	4.33% 1	3.22% 0	3.12% 1	1.05% 1	2.28% 1	2.82% 1	0.57% 1	1.53% 1	1.31% 1	2.57% 0	0.73% 1	9
1982 PAID+O/S	12.04% 0	2.24% 0	4.16% 0	1.80% 0	3.32% 0	6.03% 0	2.37% 0	1.67% 0	2.00% 0	2.16% 1	1.04% 0	1
1982 INCURRED	8.40% 0	2.20% 1	3.35% 0	2.09% 0	3.47% 0	6.46% 0	2.35% 0	4.46% 0	2.60% 0	3.45% 0	1.73% 0	1
1983 PAID	3.07% 1	3.18% 0	2.96% 1	1.50% 1	0.91% 1	4.93% 1	0.78% 1	1.35% 1	1.85% 0	3.40% 0	0.88% 1	8
1983 PAID+O/S	14.90% 0	2.03% 0	4.74% 0	3.05% 0	2.22% 0	6.83% 0	3.20% 0	1.73% 0	1.62% 0	2.67% 0	1.50% 0	0
1983 INCURRED	11.84% 0	1.61% 1	3.54% 0	2.90% 0	2.43% 0	6.50% 0	3.16% 0	3.87% 0	1.59% 1	2.54% 1	1.83% 0	3
1984 PAID	3.58% 1	3.71% 0	3.80% 0	1.32% 1	0.43% 1	6.24% 1	1.80% 1	2.24% 0	1.46% 1	5.29% 0	1.12% 0	6
1984 PAID+O/S	20.49% 0	4.20% 0	3.38% 0	2.36% 0	3.02% 0	8.59% 0	2.73% 0	1.59% 1	1.76% 0	3.21% 1	1.00% 1	3
1984 INCURRED	13.85% 0	3.40% 1	2.04% 1	2.76% 0	2.27% 0	7.81% 0	2.26% 0	4.35% 0	2.12% 0	3.31% 0	1.08% 0	2
TOTAL PAID	6	0	6	4	3	5	7	2	2	0	6	41
TOTAL PAID+O/S	1	1	0	3	3	2	0	5	3	6	1	25
TOTAL INCURRED	0	6	1	0	1	0	0	0	2	1	0	11
DIST PAID	85.71%	0.00%	85.71%	57.14%	42.86%	71.43%	100.00%	28.57%	28.57%	0.00%	85.71%	53.25%
DIST PAID+O/S	14.29%	14.29%	0.00%	42.86%	42.86%	28.57%	0.00%	71.43%	42.86%	85.71%	14.29%	32.47%
DIST INCURRED	0.00%	85.71%	14.29%	0.00%	14.29%	0.00%	0.00%	0.00%	28.57%	14.29%	0.00%	14.29%

NOTES: A. *1* IN THIS COLUMN INDICATES THE PROJECTION METHOD WITH THE LOWEST AVERAGE DEVIATION. LOSSES HAVE BEEN RESTATED TO THE LATEST DIAGONAL. PROJECTIONS HAVE BEEN RESTATED TO THE INCURRED LEVEL.

WEIGHTS N-4 0.0000
 ASSIGNED TO N-3 0.0000
 PRECEDING N-2 0.5000
 YEARS: N-1 0.5000

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 03/27/91

NATIONAL COUNCIL ON COMPENSATION INSURANCE

INDEMNITY COMPARISON OF PROJECTIONS RESTATED TO INCURRED LEVEL - AVERAGE DEVIATION FROM LAST PROJECTION

	UTAH A	NEBRKA A	MAINE A	MO CR/LMA A	LOUIS'NA A	OREGON A	WISCONSIN A	CONN'CT A	MICHIGAN A	FLORIDA A	ILLINOIS A	TOT
1978 PAID	1.07% 0	1.54% 0	3.80% 1	1.57% 0	1.70% 1	5.57% 0	3.40% 0	1.43% 1	1.06% 1	1.89% 0	0.41% 1	5
1978 PAID+Q/S	1.09% 0	1.40% 0	4.00% 0	0.44% 1	1.70% 0	3.70% 0	2.10% 1	4.05% 0	1.51% 0	1.61% 0	1.33% 0	2
1978 INCURRED	1.06% 1	1.27% 1	3.80% 0	0.60% 0	1.70% 0	1.76% 1	2.27% 0	4.64% 0	2.16% 0	1.27% 1	1.48% 0	4
1979 PAID	3.26% 0	4.32% 0	3.06% 1	1.43% 0	1.15% 0	4.38% 0	3.22% 0	1.73% 1	1.93% 0	12.41% 0	1.22% 0	2
1979 PAID+Q/S	1.52% 1	2.83% 0	4.38% 0	0.36% 1	0.82% 1	7.09% 0	2.22% 1	3.38% 0	1.97% 0	4.84% 1	0.79% 1	6
1979 INCURRED	1.72% 0	2.68% 1	4.08% 0	1.18% 0	1.39% 0	3.10% 1	2.34% 0	2.23% 0	1.61% 1	7.01% 0	1.32% 0	3
1980 PAID	4.47% 0	6.29% 0	4.73% 1	1.05% 0	1.79% 0	4.23% 1	2.96% 0	3.66% 0	2.19% 0	19.93% 0	3.23% 0	2
1980 PAID+Q/S	1.43% 1	3.15% 0	5.74% 0	0.70% 1	1.68% 0	11.02% 0	2.61% 1	4.34% 0	1.88% 1	11.09% 1	0.70% 1	6
1980 INCURRED	2.00% 0	3.08% 1	5.43% 0	0.78% 0	1.10% 1	6.37% 0	2.99% 0	3.42% 1	1.97% 0	11.78% 0	1.00% 0	3
1981 PAID	11.98% 0	4.90% 0	12.88% 1	1.23% 1	1.51% 1	4.67% 1	1.96% 1	2.81% 0	3.31% 0	19.87% 0	5.01% 0	5
1981 PAID+Q/S	8.26% 1	2.70% 0	13.86% 0	3.04% 0	2.45% 0	12.91% 0	4.18% 0	2.51% 0	3.05% 1	10.23% 1	3.05% 1	4
1981 INCURRED	9.80% 0	2.45% 1	13.48% 0	2.83% 0	3.58% 0	6.12% 0	4.12% 0	1.35% 1	3.24% 0	12.02% 0	3.25% 0	2
1982 PAID	8.81% 0	5.32% 0	16.97% 0	3.66% 1	2.73% 1	1.15% 1	4.57% 1	3.12% 0	5.32% 1	18.32% 0	7.07% 0	5
1982 PAID+Q/S	2.65% 1	2.64% 1	9.46% 1	4.08% 0	2.86% 0	10.90% 0	6.14% 0	2.21% 1	6.30% 0	4.84% 1	1.83% 1	6
1982 INCURRED	5.04% 0	4.71% 0	9.92% 0	7.73% 0	5.58% 0	4.76% 0	6.38% 0	5.31% 0	8.49% 0	8.01% 0	3.41% 0	0
1983 PAID	11.43% 0	1.04% 1	14.63% 0	2.77% 1	10.16% 1	3.35% 0	4.22% 1	4.02% 0	5.43% 1	16.67% 0	8.40% 0	5
1983 PAID+Q/S	7.56% 0	5.52% 0	4.60% 0	3.63% 0	10.43% 0	9.31% 0	5.32% 0	3.16% 0	6.49% 0	9.26% 0	3.61% 1	1
1983 INCURRED	7.32% 1	6.41% 0	3.70% 1	5.73% 0	11.04% 0	2.72% 1	5.24% 0	2.82% 1	7.83% 0	8.88% 1	4.29% 0	5
1984 PAID	7.45% 0	2.75% 1	10.45% 0	2.53% 1	11.36% 0	3.03% 1	3.46% 1	4.28% 0	5.53% 1	16.45% 0	8.69% 0	5
1984 PAID+Q/S	5.97% 0	8.02% 0	5.10% 0	3.34% 0	11.42% 0	11.76% 0	6.37% 0	1.26% 1	10.47% 0	9.43% 0	6.03% 0	1
1984 INCURRED	5.29% 1	8.29% 0	3.99% 1	5.92% 0	11.28% 1	5.04% 0	5.66% 0	4.52% 0	10.85% 0	7.91% 1	5.17% 1	5
TOTAL PAID	0	2	4	4	4	4	4	2	4	0	1	29
TOTAL PAID+Q/S	4	1	1	3	1	0	3	2	2	4	5	26
TOTAL INCURRED	3	4	2	0	2	3	0	3	1	3	1	22
DIST PAID	0.00%	28.57%	57.14%	57.14%	57.14%	57.14%	57.14%	28.57%	57.14%	0.00%	14.29%	37.66%
DIST PAID+Q/S	57.14%	14.29%	14.29%	42.86%	14.29%	0.00%	42.86%	28.57%	28.57%	57.14%	71.43%	33.77%
DIST INCURRED	42.86%	57.14%	28.57%	0.00%	28.57%	42.86%	0.00%	42.86%	14.29%	42.86%	14.29%	28.57%

NOTES: A. "1" IN THIS COLUMN INDICATES THE PROJECTION METHOD WITH THE LOWEST AVERAGE DEVIATION. LOSSES HAVE BEEN RESTATED TO THE LATEST DIAGONAL. PROJECTIONS HAVE BEEN RESTATED TO THE INCURRED LEVEL.

WEIGHTS N-4 0.0000
 ASSIGNED TO N-3 0.0000
 PRECEDING N-2 0.5000
 YEARS: N-1 0.5000

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 03/27/91

NATIONAL COUNCIL ON COMPENSATION INSURANCE

MEDICAL COMPARISON OF PROJECTIONS RESTATED TO INCURRED LEVEL - AVERAGE DEVIATION FROM LAST PROJECTION

	UTAH A	NEBRKA A	MAINE A	MO ORLA A	LOUIS'NA A	OREGON A	WISONSN A	CONN'CT A	MICHIGAN A	FLORIDA A	ILLINOIS A	TOT
1978 PAID	3.57% 1	1.91% 0	2.07% 1	1.44% 1	4.67% 0	3.44% 0	1.01% 1	2.62% 0	2.55% 0	0.88% 0	0.86% 0	4
1978 PAID+Q/S	7.36% 0	1.54% 0	4.42% 0	1.52% 0	2.91% 0	1.12% 1	1.86% 0	0.90% 1	2.18% 1	0.78% 1	0.82% 1	5
1978 INCURRED	7.21% 0	1.30% 1	3.89% 0	1.91% 0	2.76% 1	4.98% 0	1.99% 0	2.10% 0	2.64% 0	0.92% 0	1.10% 0	2
1979 PAID	7.21% 1	6.01% 0	8.15% 0	1.75% 1	3.89% 0	2.61% 1	1.06% 1	2.22% 0	3.35% 0	6.04% 0	0.58% 1	5
1979 PAID+Q/S	9.73% 0	2.11% 1	4.80% 0	1.77% 0	1.84% 0	4.26% 0	2.38% 0	1.08% 1	1.83% 1	3.47% 1	0.76% 0	4
1979 INCURRED	9.77% 0	2.29% 0	4.19% 1	2.47% 0	1.80% 1	10.18% 0	2.32% 0	2.19% 0	2.28% 0	3.92% 0	1.03% 0	2
1980 PAID	5.03% 0	2.79% 1	7.83% 0	1.08% 1	2.92% 0	4.28% 0	0.61% 1	2.22% 0	3.90% 0	10.24% 0	0.38% 1	4
1980 PAID+Q/S	4.82% 1	3.28% 0	4.64% 0	1.68% 0	1.77% 0	4.05% 1	4.06% 0	0.93% 1	3.09% 1	6.89% 1	0.94% 0	5
1980 INCURRED	6.98% 0	2.99% 0	3.54% 1	1.96% 0	1.52% 1	10.17% 0	3.76% 0	2.40% 0	3.51% 0	7.20% 0	1.30% 0	2
1981 PAID	4.06% 1	4.12% 0	9.35% 0	2.43% 0	4.20% 0	5.26% 0	1.03% 1	2.59% 0	2.58% 0	10.70% 0	1.32% 1	3
1981 PAID+Q/S	7.01% 0	2.21% 0	6.23% 0	2.39% 1	3.90% 0	5.03% 1	3.61% 0	0.94% 1	1.20% 1	6.50% 1	1.34% 0	5
1981 INCURRED	6.35% 0	1.64% 1	5.24% 1	2.99% 0	3.82% 1	9.98% 0	3.14% 0	2.64% 0	1.75% 0	7.38% 0	1.70% 0	3
1982 PAID	4.14% 1	1.83% 0	7.86% 0	0.79% 1	2.44% 1	7.93% 0	1.06% 1	2.88% 1	2.47% 0	10.37% 0	1.07% 0	5
1982 PAID+Q/S	7.23% 0	2.14% 0	3.57% 0	2.23% 0	3.34% 0	6.61% 1	3.22% 0	3.20% 0	1.65% 0	6.57% 1	0.75% 1	3
1982 INCURRED	8.83% 0	1.61% 1	2.42% 1	3.63% 0	3.47% 0	9.09% 0	3.36% 0	7.21% 0	1.58% 1	8.35% 0	1.67% 0	7
1983 PAID	4.68% 1	2.29% 0	5.44% 1	1.34% 1	0.92% 1	8.27% 1	1.61% 1	2.78% 0	2.61% 0	10.36% 0	2.10% 0	6
1983 PAID+Q/S	11.37% 0	2.17% 0	6.47% 0	3.64% 0	3.81% 0	9.28% 0	3.24% 0	1.69% 1	1.79% 0	6.80% 1	1.51% 1	3
1983 INCURRED	10.44% 0	1.63% 1	5.76% 0	3.67% 0	5.05% 0	8.79% 0	3.10% 0	4.02% 0	1.59% 1	7.39% 0	2.00% 0	2
1984 PAID	4.28% 1	6.09% 0	5.36% 0	0.95% 1	0.96% 1	7.69% 1	3.08% 0	5.34% 0	1.46% 0	11.74% 0	1.82% 0	4
1984 PAID+Q/S	11.74% 0	4.39% 0	3.96% 0	1.54% 0	2.55% 0	16.90% 0	2.67% 0	1.74% 1	1.01% 1	6.69% 1	1.55% 0	3
1984 INCURRED	8.47% 0	4.31% 1	2.36% 1	3.02% 0	2.34% 0	7.91% 0	2.52% 1	3.77% 0	2.36% 0	6.84% 0	1.16% 1	4
TOTAL PAID	6	1	2	6	3	3	6	1	0	0	3	31
TOTAL PAID+Q/S	1	1	0	1	0	4	0	6	5	7	3	28
TOTAL INCURRED	0	5	5	0	4	0	1	0	2	0	1	18
DIST PAID	85.71%	14.29%	28.57%	85.71%	42.86%	42.86%	85.71%	14.29%	0.00%	0.00%	42.86%	40.26%
DIST PAID+Q/S	14.29%	14.29%	0.00%	14.29%	0.00%	57.14%	0.00%	85.71%	71.43%	100.00%	42.86%	36.36%
DIST INCURRED	0.00%	71.43%	71.43%	0.00%	57.14%	0.00%	14.29%	0.00%	28.57%	0.00%	14.29%	23.38%

NOTES: A. "1" IN THIS COLUMN INDICATES THE PROJECTION METHOD WITH THE LOWEST AVERAGE DEVIATION. LOSSES HAVE BEEN RESTATED TO THE LATEST DIAGONAL. PROJECTIONS HAVE BEEN RESTATED TO THE INCURRED LEVEL.

WEIGHTS N-4 0.0000
 ASSIGNED TO N-3 0.0000
 PRECEDING N-2 0.5000
 YEARS: N-1 0.5000

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 03/27/91

NATIONAL COUNCIL ON COMPENSATION INSURANCE
PAID INDEMNITY
COMPARISON OF PROJECTIONS RESTATED TO INCURRED LEVEL (1)

	POLICY YEAR	FROM 1st REPORT	DEVIATION(2)	FROM 2nd REPORT	DEVIATION(2)	FROM 3rd REPORT	DEVIATION(2)	FROM LAST REPORT
UTAH	1981	21,857,500	14.87%	22,397,476	12.77%	21,497,768	16.27%	25,676,553
	1982	24,084,056	3.53%	21,291,111	14.72%	22,122,583	11.39%	24,965,914
	1983	24,038,488	20.45%	26,030,632	13.86%	26,628,104	11.88%	30,219,371
	1984	32,470,927	12.60%	33,704,669	9.28%	35,133,289	5.44%	37,154,087
VARIANCE FOR UTAH			0.004		0.000		0.001	
NEBRASKA	1981	30,582,413	-5.72%	30,855,837	-6.67%	30,852,986	-6.66%	28,926,890
	1982	30,292,083	-3.92%	30,950,164	-6.18%	32,019,368	-9.85%	29,148,791
	1983	32,325,710	-0.14%	33,302,137	-3.16%	32,240,820	0.12%	32,281,065
	1984	37,643,561	4.55%	38,214,515	3.10%	38,374,937	2.69%	39,436,786
VARIANCE FOR NEBRASKA			0.002		0.002		0.003	
MAINE	1981	122,034,320	15.68%	113,787,138	21.37%	116,440,935	19.54%	144,720,949
	1982	112,980,000	30.11%	117,999,103	27.01%	122,652,852	24.13%	161,659,108
	1983	133,175,591	31.44%	142,843,308	26.46%	171,516,284	11.70%	194,249,397
	1984	153,637,171	25.54%	181,308,942	12.13%	203,002,008	1.62%	206,346,960
VARIANCE FOR MAINE			0.004		0.004		0.007	
NORTH CAROLINA	1981	72,016,601	-4.14%	69,019,025	0.20%	68,743,566	0.60%	69,155,860
	1982	66,742,056	7.03%	67,733,843	5.65%	69,970,994	2.53%	71,789,934
	1983	79,351,225	7.80%	84,267,408	2.08%	85,447,116	0.71%	86,060,788
	1984	102,328,919	2.57%	102,385,616	2.52%	101,603,865	3.26%	105,032,851
VARIANCE FOR NORTH CAROLINA			0.002		0.000		0.000	
LOUISIANA	1981	211,716,383	5.53%	220,449,532	1.64%	222,336,897	0.79%	224,116,223
	1982	214,404,726	4.52%	211,772,769	5.70%	221,044,153	1.57%	224,565,438
	1983	171,672,158	20.03%	181,217,270	15.58%	189,883,543	11.55%	214,674,212
	1984	191,378,385	19.85%	198,913,857	16.70%	220,970,645	7.46%	238,784,468
VARIANCE FOR LOUISIANA			0.006		0.004		0.002	
OREGON	1981	143,296,271	-4.18%	151,093,056	-9.84%	147,194,513	-7.01%	137,552,656
	1982	137,998,679	-2.41%	135,255,994	-0.38%	137,001,964	-1.67%	134,750,203
	1983	167,842,027	3.17%	178,494,768	-2.97%	180,294,129	-4.01%	173,339,160
	1984	211,118,087	1.15%	220,157,437	-3.08%	229,331,097	-7.38%	213,578,538
VARIANCE FOR OREGON			0.001		0.001		0.001	
WISCONSIN	1981	108,563,026	-3.93%	104,038,532	0.40%	100,608,711	3.68%	104,454,245
	1982	102,700,141	8.33%	101,885,452	9.05%	106,506,930	4.93%	112,027,751
	1983	109,994,235	11.74%	118,758,095	4.71%	122,157,627	1.98%	124,630,495
	1984	137,843,776	7.11%	143,962,372	2.98%	144,662,329	2.51%	148,388,416
VARIANCE FOR WISCONSIN			0.003		0.001		0.000	
CONNECTICUT	1981	133,316,079	2.48%	131,263,218	3.99%	134,648,677	1.51%	136,711,428
	1982	135,521,942	5.80%	141,364,898	1.74%	145,496,478	-1.13%	143,863,732
	1983	159,555,974	6.35%	167,082,131	1.93%	158,731,718	6.83%	170,367,130
	1984	195,934,197	4.55%	191,125,605	6.90%	194,061,435	5.47%	205,282,583
VARIANCE FOR CONNECTICUT			0.000		0.000		0.001	
MICHIGAN	1981	272,243,929	-0.43%	257,932,292	4.85%	256,098,547	5.52%	271,070,627
	1982	242,539,171	6.64%	233,895,150	9.97%	246,680,277	5.05%	259,802,141
	1983	280,756,241	8.41%	293,687,017	4.20%	288,372,196	5.93%	306,551,501
	1984	353,954,726	5.26%	349,417,640	6.47%	346,069,990	7.37%	373,598,246
VARIANCE FOR MICHIGAN			0.001		0.001		0.000	
FLORIDA	1981	167,869,995	39.36%	192,915,158	30.32%	208,677,897	24.62%	276,852,087
	1982	194,253,498	34.97%	218,009,983	27.02%	235,113,103	21.29%	298,723,044
	1983	244,142,609	33.04%	273,970,473	24.86%	300,901,418	17.47%	364,611,099
	1984	321,472,439	32.67%	374,051,549	21.66%	432,153,139	9.49%	477,463,361
VARIANCE FOR FLORIDA			0.001		0.001		0.003	
ILLINOIS	1981	335,590,568	7.95%	330,913,241	9.23%	339,084,200	6.99%	364,573,945
	1982	299,829,960	14.03%	308,098,274	11.66%	324,125,939	7.06%	348,761,392
	1983	328,909,218	17.93%	359,166,986	10.38%	370,678,785	7.51%	400,783,937
	1984	390,895,891	14.52%	405,157,457	11.40%	425,712,371	6.91%	457,301,523
VARIANCE FOR ILLINOIS			0.001		0.000		0.000	
AVERAGE DEVIATION			10.61%		8.23%		5.63%	
AVERAGE ABSOLUTE DEVIATION			11.74%		9.70%		7.34%	
AVERAGE OF WITHIN-STATE VARIANCES			0.002		0.001		0.002	

NOTES: (1) PROJECTIONS ARE TO EIGHTH REPORT.

(2) DEVIATIONS ARE RATIOED TO THE LAST REPORT. (POSITIVE VALUES INDICATE THAT THE PROJECTION UNDERESTIMATES THE EIGHTH OR LATEST REPORT.)

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03/28/91

NATIONAL COUNCIL ON COMPENSATION INSURANCE
PAID + O/S INDEMNITY
COMPARISON OF PROJECTIONS RESTATED TO INCURRED LEVEL (1)

	POLICY YEAR	FROM 1st REPORT	DEVIATION(2)	FROM 2nd REPORT	DEVIATION(2)	FROM 3rd REPORT	DEVIATION(2)	FROM LAST REPORT
UTAH	1981	23,943,755	9.44%	22,541,238	14.74%	23,245,718	12.08%	26,439,703
	1982	22,412,017	5.77%	23,473,662	1.30%	23,549,675	0.98%	23,783,606
	1983	26,130,379	9.10%	26,176,798	8.94%	26,477,609	7.89%	28,746,908
	1984	31,844,683	7.28%	32,978,634	3.98%	36,945,479	-7.57%	34,346,080
VARIANCE FOR UTAH			0.000		0.003		0.006	
NEBRASKA	1981	29,886,226	-5.20%	29,337,478	-3.27%	28,927,412	-1.82%	28,409,098
	1982	27,598,765	1.37%	26,359,701	5.79%	27,174,199	2.88%	27,981,112
	1983	29,382,815	9.84%	30,278,094	7.09%	29,692,677	8.89%	32,588,484
	1984	32,810,153	16.22%	35,201,684	10.12%	37,779,444	3.53%	39,163,865
VARIANCE FOR NEBRASKA			0.007		0.002		0.001	
MAINE	1981	101,465,794	30.46%	109,002,590	25.30%	130,022,193	10.89%	145,918,072
	1982	122,591,082	24.31%	144,464,965	10.80%	154,014,085	4.90%	161,956,651
	1983	155,840,020	12.20%	181,472,145	-2.24%	169,718,136	4.38%	177,482,229
	1984	208,757,746	-3.67%	186,560,789	7.35%	190,425,595	5.43%	201,362,060
VARIANCE FOR MAINE			0.017		0.010		0.001	
NORTH CAROLINA	1981	65,398,208	6.63%	66,495,395	5.07%	67,685,520	3.37%	70,043,532
	1982	66,203,060	9.20%	68,374,078	6.22%	70,238,164	3.67%	72,910,891
	1983	79,610,144	9.15%	83,715,961	4.47%	85,711,912	2.19%	87,631,761
	1984	100,163,939	7.94%	104,942,333	3.55%	107,839,678	0.88%	108,801,676
VARIANCE FOR NORTH CAROLINA			0.000		0.000		0.000	
LOUISIANA	1981	209,995,961	7.60%	223,660,806	1.59%	224,852,051	1.07%	227,277,527
	1982	220,083,461	1.69%	211,834,163	5.37%	210,665,912	5.90%	223,866,506
	1983	171,451,271	21.17%	180,918,025	16.81%	197,759,000	9.07%	217,482,258
	1984	190,031,929	23.61%	208,047,640	16.37%	236,038,947	5.11%	248,761,320
VARIANCE FOR LOUISIANA			0.008		0.004		0.001	
OREGON	1981	86,815,575	37.13%	105,969,390	23.26%	123,859,511	10.30%	138,084,884
	1982	99,947,552	26.90%	123,174,373	9.91%	113,900,117	16.69%	136,725,083
	1983	157,742,193	11.90%	145,651,630	18.65%	167,157,153	6.64%	179,045,780
	1984	170,921,010	22.50%	191,651,943	13.10%	234,795,294	-6.46%	220,539,801
VARIANCE FOR OREGON			0.008		0.003		0.007	
WISCONSIN	1981	100,783,454	3.95%	92,237,270	12.09%	96,878,373	7.67%	104,923,447
	1982	96,886,470	14.51%	103,050,915	9.07%	115,752,761	-2.13%	113,333,859
	1983	107,032,182	12.31%	123,962,473	-1.56%	130,387,136	-6.83%	122,055,743
	1984	153,401,630	-5.02%	162,660,019	-11.36%	155,523,433	-6.47%	146,073,014
VARIANCE FOR WISCONSIN			0.006		0.009		0.003	
CONNECTICUT	1981	126,919,632	3.88%	132,653,164	-0.46%	138,694,767	-5.04%	132,046,201
	1982	136,344,662	-0.62%	140,466,116	-3.66%	136,537,282	-0.76%	135,508,215
	1983	170,460,875	-6.15%	167,797,618	-4.49%	158,239,039	1.46%	160,583,122
	1984	191,436,194	0.06%	187,071,684	2.34%	191,280,211	0.14%	191,555,623
VARIANCE FOR CONNECTICUT			0.001		0.001		0.001	
MICHIGAN	1981	268,902,267	2.12%	263,670,840	4.03%	267,345,032	2.69%	274,733,881
	1982	243,457,612	8.04%	242,986,030	8.21%	244,466,132	7.65%	264,729,905
	1983	272,198,136	9.30%	277,033,741	7.69%	276,656,146	7.82%	300,122,843
	1984	310,354,178	15.78%	320,566,239	13.01%	330,833,261	10.22%	368,488,711
VARIANCE FOR MICHIGAN			0.002		0.001		0.001	
FLORIDA	1981	193,510,535	30.06%	237,969,561	13.99%	246,368,424	10.96%	276,691,868
	1982	262,640,305	10.16%	273,145,060	6.56%	274,155,000	6.22%	292,336,865
	1983	299,056,560	16.31%	302,012,261	15.48%	327,224,363	8.42%	357,319,301
	1984	376,398,777	19.00%	411,302,433	11.49%	443,728,342	4.51%	464,687,556
VARIANCE FOR FLORIDA			0.005		0.001		0.001	
ILLINOIS	1981	351,705,465	4.06%	347,199,306	5.29%	349,914,865	4.55%	366,600,925
	1982	341,676,049	2.71%	337,407,993	3.92%	341,442,890	2.77%	351,183,036
	1983	372,892,950	7.39%	376,244,927	6.56%	393,388,037	2.30%	402,660,489
	1984	406,219,305	12.49%	430,148,902	7.33%	450,264,579	3.00%	464,183,130
VARIANCE FOR ILLINOIS			0.001		0.000		0.000	
AVERAGE DEVIATION			10.52%		7.27%		3.87%	
AVERAGE ABSOLUTE DEVIATION			11.46%		8.50%		5.55%	
AVERAGE OF WITHIN-STATE VARIANCES			0.005		0.003		0.002	

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NATIONAL COUNCIL ON COMPENSATION INSURANCE
 INCURRED INDEMNITY
 COMPARISON OF PROJECTIONS RESTATED TO INCURRED LEVEL (1)

	POLICY YEAR	FROM 1st REPORT	DEVIATION(2)	FROM 2nd REPORT	DEVIATION(2)	FROM 3rd REPORT	DEVIATION(2)	FROM LAST REPORT
UTAH	1981	22,706,955	14.09%	21,346,831	19.23%	23,083,897	12.66%	26,429,666
	1982	20,235,201	15.88%	23,088,462	4.02%	23,671,588	1.60%	24,055,923
	1983	25,561,057	11.20%	26,478,923	8.01%	26,330,626	8.52%	28,783,892
	1984	32,667,549	5.21%	32,751,791	4.97%	36,464,421	-5.81%	34,463,527
VARIANCE FOR UTAH			0.002		0.004		0.005	
NEBRASKA	1981	30,367,544	-6.89%	28,430,148	-0.07%	28,601,466	-0.67%	28,409,943
	1982	27,109,573	5.63%	26,334,485	8.33%	27,655,665	3.73%	28,727,725
	1983	29,353,828	10.64%	30,821,381	6.17%	29,475,414	10.27%	32,848,585
	1984	33,946,504	15.15%	35,136,824	12.18%	37,985,033	5.06%	40,009,182
VARIANCE FOR NEBRASKA			0.007		0.002		0.002	
MAINE	1981	103,803,808	28.86%	109,631,574	24.86%	130,477,651	10.57%	145,904,792
	1982	120,137,635	26.38%	145,369,940	10.92%	152,775,451	6.38%	163,183,825
	1983	160,254,891	10.40%	179,814,445	-0.53%	171,314,087	4.22%	178,863,646
	1984	207,277,504	-1.80%	191,907,530	5.75%	194,026,578	4.71%	203,609,930
VARIANCE FOR MAINE			0.016		0.009		0.001	
NORTH CAROLINA	1981	67,390,104	3.76%	66,293,049	5.33%	67,257,695	3.95%	70,026,420
	1982	65,253,099	14.89%	67,546,898	11.90%	70,294,175	8.31%	76,668,644
	1983	76,302,694	13.81%	82,593,613	6.71%	85,738,367	3.16%	88,531,677
	1984	97,748,297	12.65%	104,199,599	6.88%	109,421,080	2.22%	111,901,212
VARIANCE FOR NORTH CAROLINA			0.002		0.001		0.001	
LOUISIANA	1981	204,928,655	9.86%	216,593,527	4.73%	222,394,940	2.18%	227,346,618
	1982	207,351,421	9.07%	208,490,068	8.57%	208,178,232	8.70%	228,024,396
	1983	169,388,674	22.47%	180,151,262	17.55%	198,825,478	9.00%	218,494,023
	1984	192,162,813	23.41%	210,734,935	16.00%	238,328,280	5.01%	250,886,533
VARIANCE FOR LOUISIANA			0.005		0.003		0.001	
OREGON	1981	116,117,686	15.47%	114,920,800	16.35%	131,548,806	4.24%	137,375,072
	1982	111,996,583	16.85%	131,788,317	2.15%	132,272,067	1.79%	134,688,482
	1983	163,653,732	5.43%	164,901,751	4.71%	169,847,995	1.85%	173,044,376
	1984	191,168,002	8.15%	191,505,141	7.99%	202,083,149	2.91%	208,134,288
VARIANCE FOR OREGON			0.002		0.003		0.000	
WISCONSIN	1981	102,329,800	2.38%	91,261,793	12.93%	96,501,562	7.94%	104,819,978
	1982	95,310,059	17.15%	101,937,620	11.39%	116,883,237	-1.60%	115,038,221
	1983	106,792,391	13.31%	125,694,066	-2.04%	130,766,593	-6.15%	123,185,941
	1984	156,098,364	-5.51%	162,412,681	-9.78%	155,008,412	-4.77%	147,945,066
VARIANCE FOR WISCONSIN			0.008		0.009		0.003	
CONNECTICUT	1981	132,482,077	-0.48%	130,349,106	1.14%	133,106,980	-0.95%	131,851,969
	1982	132,999,520	6.53%	132,452,600	6.91%	134,651,939	5.36%	142,283,762
	1983	154,984,579	4.44%	161,603,520	0.35%	158,926,102	2.01%	162,178,457
	1984	182,205,058	8.11%	188,126,461	5.13%	198,097,602	0.10%	198,294,281
VARIANCE FOR CONNECTICUT			0.001		0.001		0.001	
MICHIGAN	1981	270,793,366	1.28%	260,167,553	5.15%	263,841,818	3.81%	274,299,393
	1982	230,595,754	14.28%	237,018,291	11.89%	244,227,679	9.21%	269,010,469
	1983	256,003,906	14.99%	272,627,337	9.47%	277,890,072	7.73%	301,158,187
	1984	307,325,523	17.59%	325,840,461	12.63%	333,307,218	10.63%	372,933,449
VARIANCE FOR MICHIGAN			0.004		0.001		0.001	
FLORIDA	1981	178,945,614	35.46%	219,655,304	20.78%	242,117,970	12.68%	277,265,880
	1982	231,152,600	22.39%	266,610,925	10.49%	278,593,017	6.46%	297,841,962
	1983	291,890,832	19.21%	309,031,180	14.46%	331,966,505	8.11%	361,283,671
	1984	387,348,755	18.43%	421,640,292	11.21%	466,807,091	1.70%	474,881,618
VARIANCE FOR FLORIDA			0.005		0.002		0.002	
ILLINOIS	1981	349,820,177	4.53%	340,021,733	7.20%	348,419,681	4.91%	366,408,984
	1982	327,406,870	8.25%	334,482,399	6.27%	347,184,768	2.71%	356,843,406
	1983	362,424,865	10.69%	382,625,833	5.71%	395,959,802	2.43%	405,816,559
	1984	420,949,062	10.44%	439,333,568	6.53%	456,046,109	2.97%	470,018,651
VARIANCE FOR ILLINOIS			0.001		0.000		0.000	
AVERAGE DEVIATION			11.68%		8.19%		4.31%	
AVERAGE ABSOLUTE DEVIATION			12.35%		8.76%		5.22%	
AVERAGE OF WITHIN-STATE VARIANCES			0.005		0.003		0.001	

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NATIONAL COUNCIL ON COMPENSATION INSURANCE
PAID MEDICAL
COMPARISON OF PROJECTIONS RESTATED TO INCURRED LEVEL (1)

	POLICY YEAR	FROM 1st REPORT	DEVIATION(2)	FROM 2nd REPORT	DEVIATION(2)	FROM 3rd REPORT	DEVIATION(2)	FROM LAST REPORT
UTAH	1981	22,985,883	11.02%	25,832,177	0.00%	24,644,801	4.60%	25,832,818
	1982	29,109,590	-5.39%	26,281,038	4.85%	25,168,083	8.88%	27,620,149
	1983	29,852,050	7.79%	29,240,425	9.68%	31,355,633	3.15%	32,374,256
	1984	33,884,398	12.07%	36,856,896	4.36%	38,614,229	-0.20%	38,537,445
VARIANCE FOR UTAH			0.005		0.001		0.001	
NEBRASKA	1981	21,989,512	6.67%	22,639,160	3.91%	22,372,812	5.04%	23,561,180
	1982	23,964,739	0.61%	23,740,284	1.55%	24,702,384	-2.44%	24,112,863
	1983	24,994,177	4.05%	26,096,034	-0.18%	25,695,649	1.36%	26,050,285
	1984	28,302,297	10.05%	29,628,958	5.83%	29,053,995	7.66%	31,463,607
VARIANCE FOR NEBRASKA			0.001		0.001		0.001	
MAINE	1981	21,430,525	20.70%	22,802,611	15.62%	24,137,817	10.68%	27,023,503
	1982	24,640,844	16.68%	25,853,154	12.58%	26,535,278	10.27%	29,572,051
	1983	31,825,398	11.83%	33,241,538	7.90%	34,022,062	5.74%	36,094,111
	1984	37,057,181	12.80%	39,374,509	7.35%	42,181,181	0.74%	42,497,027
VARIANCE FOR MAINE			0.001		0.001		0.002	
NORTH CAROLINA	1981	50,980,784	-2.38%	52,630,016	-5.69%	50,974,200	-2.37%	49,794,612
	1982	57,075,469	-1.23%	56,199,879	0.32%	56,907,974	-0.93%	56,383,121
	1983	68,027,794	1.22%	70,397,129	-2.22%	70,901,539	-2.95%	68,867,918
	1984	83,329,337	0.52%	84,280,435	-0.62%	82,299,121	1.75%	83,763,230
VARIANCE FOR NORTH CAROLINA			0.000		0.001		0.000	
LOUISIANA	1981	91,363,399	11.04%	96,464,511	6.08%	102,581,227	0.12%	102,705,619
	1982	106,219,244	6.53%	113,097,733	0.48%	117,507,683	-3.40%	113,641,098
	1983	122,269,794	3.98%	127,047,718	0.22%	127,257,926	0.06%	127,331,479
	1984	141,328,109	1.71%	142,468,048	0.92%	142,744,824	0.73%	143,790,512
VARIANCE FOR LOUISIANA			0.001		0.001		0.000	
OREGON	1981	98,593,142	-1.72%	101,844,877	-5.08%	102,008,588	-5.25%	96,923,733
	1982	105,036,506	-6.13%	104,464,461	-5.55%	109,203,782	-10.34%	98,971,821
	1983	124,733,279	-0.79%	133,622,461	-7.97%	139,237,145	-12.51%	123,757,967
	1984	161,659,498	-1.36%	175,577,460	-10.09%	181,942,214	-14.08%	159,484,500
VARIANCE FOR OREGON			0.000		0.000		0.001	
WISCONSIN	1981	72,747,106	-2.57%	71,485,641	-0.79%	70,380,198	0.77%	70,923,493
	1982	74,856,485	1.47%	74,964,212	1.33%	74,552,056	1.87%	75,971,096
	1983	84,006,593	3.67%	85,002,015	2.53%	86,155,656	1.21%	87,209,069
	1984	96,117,248	6.85%	100,435,778	2.67%	101,546,595	1.59%	103,189,583
VARIANCE FOR WISCONSIN			0.001		0.000		0.000	
CONNECTICUT	1981	52,696,385	-1.91%	49,666,806	3.95%	51,067,331	1.24%	51,708,544
	1982	55,291,190	4.97%	57,154,448	1.76%	56,947,593	2.12%	58,181,067
	1983	69,332,814	3.09%	69,680,377	2.61%	68,434,481	4.35%	71,546,169
	1984	79,914,356	6.13%	78,897,778	7.32%	80,947,561	4.92%	85,133,281
VARIANCE FOR CONNECTICUT			0.001		0.000		0.000	
MICHIGAN	1981	115,678,275	-5.21%	113,654,081	-3.37%	114,072,455	-3.75%	109,948,714
	1982	115,481,282	-4.20%	115,600,866	-4.31%	112,581,893	-1.58%	110,827,185
	1983	143,064,811	-6.53%	139,796,216	-4.09%	134,452,644	-0.11%	134,299,245
	1984	165,375,269	-1.72%	161,901,494	0.41%	159,225,484	2.06%	162,572,839
VARIANCE FOR MICHIGAN			0.000		0.000		0.000	
FLORIDA	1981	183,703,972	14.63%	188,430,575	12.43%	185,483,016	13.80%	215,179,101
	1982	211,390,577	13.79%	211,113,874	13.90%	213,739,812	12.83%	245,204,692
	1983	242,368,676	15.33%	246,666,206	13.83%	252,988,330	11.62%	286,245,075
	1984	270,647,067	18.61%	284,627,560	14.40%	298,423,484	10.25%	332,514,275
VARIANCE FOR FLORIDA			0.000		0.000		0.000	
ILLINOIS	1981	145,833,980	-2.53%	146,241,229	-2.82%	143,874,327	-1.15%	142,234,473
	1982	151,543,014	-3.67%	147,588,578	-0.97%	147,285,881	-0.76%	146,172,025
	1983	175,701,114	3.03%	176,054,851	2.83%	177,381,928	2.10%	181,184,223
	1984	190,700,616	3.15%	192,919,363	2.02%	193,990,775	1.48%	196,902,034
VARIANCE FOR ILLINOIS			0.001		0.001		0.000	
AVERAGE DEVIATION			4.24%		2.50%		1.62%	
AVERAGE ABSOLUTE DEVIATION			6.39%		4.94%		4.43%	
AVERAGE OF WITHIN-STATE VARIANCES			0.001		0.001		0.001	

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NATIONAL COUNCIL ON COMPENSATION INSURANCE
PAID + O/S MEDICAL
COMPARISON OF PROJECTIONS RESTATED TO INCURRED LEVEL (1)

	POLICY YEAR	FROM 1st REPORT	DEVIATION(2)	FROM 2nd REPORT	DEVIATION(2)	FROM 3rd REPORT	DEVIATION(2)	FROM LAST REPORT
UTAH	1981	24,150,498	6.49%	24,792,024	4.00%	23,273,507	9.88%	25,826,365
	1982	28,148,814	2.91%	25,312,300	12.69%	29,163,148	-0.59%	28,991,321
	1983	26,595,536	20.73%	29,973,302	10.66%	38,060,360	-13.44%	33,551,519
	1984	35,342,676	7.15%	48,537,315	-27.52%	37,539,109	1.38%	38,062,684
VARIANCE FOR UTAH			0.005		0.026		0.007	
NEBRASKA	1981	22,036,637	3.03%	23,244,732	-2.28%	23,374,431	-2.85%	22,725,796
	1982	22,784,577	-0.40%	24,176,422	-6.53%	23,319,426	-2.75%	22,694,382
	1983	26,517,466	-4.84%	25,797,113	-1.99%	25,449,556	-0.62%	25,293,704
	1984	28,176,801	8.13%	29,005,467	5.42%	31,057,123	-1.27%	30,668,632
VARIANCE FOR NEBRASKA			0.002		0.002		0.000	
MAINE	1981	20,998,463	23.02%	24,165,792	11.41%	27,396,124	-0.43%	27,279,532
	1982	28,183,243	4.04%	30,926,583	-5.30%	31,768,579	-8.17%	29,368,616
	1983	35,861,792	-5.90%	39,234,069	-15.86%	36,331,376	-7.28%	33,864,747
	1984	44,598,131	-9.05%	42,436,596	-3.77%	40,688,212	0.51%	40,895,745
VARIANCE FOR MAINE			0.016		0.009		0.002	
NORTH CAROLINA	1981	50,458,906	-3.02%	49,969,364	-2.02%	49,664,493	-1.40%	48,980,675
	1982	52,439,984	5.48%	54,051,669	2.57%	55,491,306	-0.02%	55,478,099
	1983	66,085,072	0.72%	70,598,005	-6.06%	69,377,326	-4.23%	66,561,738
	1984	82,047,416	1.17%	82,365,395	0.78%	86,433,918	-4.12%	83,014,998
VARIANCE FOR NORTH CAROLINA			0.001		0.001		0.000	
LOUISIANA	1981	93,633,936	8.90%	96,867,802	5.76%	106,189,732	-3.31%	102,783,836
	1982	102,557,720	9.27%	114,321,064	-1.13%	116,004,365	-2.62%	113,041,926
	1983	124,594,055	6.44%	127,177,314	4.50%	124,857,291	6.24%	133,163,935
	1984	147,090,496	-1.52%	143,798,634	0.75%	151,559,715	-4.61%	144,882,276
VARIANCE FOR LOUISIANA			0.002		0.001		0.002	
OREGON	1981	98,819,896	-0.27%	103,378,501	-4.90%	105,466,000	-7.02%	98,550,135
	1982	106,196,276	-1.28%	111,657,505	-6.48%	95,505,142	8.92%	104,857,644
	1983	135,476,015	-0.63%	114,757,414	14.76%	113,411,934	15.76%	134,621,614
	1984	137,912,323	22.47%	132,932,997	25.26%	152,664,055	14.17%	177,871,980
VARIANCE FOR OREGON			0.010		0.018		0.008	
WISCONSIN	1981	67,394,747	4.79%	66,739,529	5.72%	66,308,363	6.32%	70,785,046
	1982	71,524,618	5.15%	70,990,254	5.86%	74,379,496	1.37%	75,409,756
	1983	81,918,983	5.42%	86,331,240	0.32%	91,151,192	-5.24%	86,611,006
	1984	101,942,981	-0.02%	107,630,689	-5.61%	107,060,397	-5.05%	101,918,112
VARIANCE FOR WISCONSIN			0.001		0.002		0.002	
CONNECTICUT	1981	52,604,770	-3.17%	51,677,454	-1.36%	51,556,090	-1.12%	50,985,988
	1982	55,678,321	8.03%	55,700,925	8.00%	60,018,780	0.86%	60,541,243
	1983	70,511,466	1.84%	73,607,879	-2.47%	72,642,043	-1.13%	71,830,723
	1984	83,535,185	0.97%	86,625,449	-2.70%	86,088,051	-2.06%	84,351,052
VARIANCE FOR CONNECTICUT			0.002		0.002		0.000	
MICHIGAN	1981	112,997,391	-0.63%	112,626,048	-0.30%	115,495,593	-2.85%	112,294,396
	1982	114,957,506	-0.97%	119,462,422	-4.93%	115,464,240	-1.42%	113,848,380
	1983	138,705,982	-4.13%	133,521,523	-0.24%	130,456,109	2.06%	133,202,072
	1984	164,391,727	-0.14%	160,572,176	2.19%	163,406,618	0.46%	164,163,399
VARIANCE FOR MICHIGAN			0.000		0.001		0.000	
FLORIDA	1981	183,420,257	13.89%	195,558,796	8.19%	198,548,592	6.78%	212,996,052
	1982	224,936,603	11.96%	233,728,100	8.51%	234,405,560	8.25%	255,481,456
	1983	264,719,489	8.97%	259,763,416	10.67%	265,954,324	8.54%	290,793,416
	1984	298,220,112	11.77%	303,341,046	10.25%	326,527,315	3.39%	337,994,891
VARIANCE FOR FLORIDA			0.000		0.000		0.000	
ILLINOIS	1981	147,548,091	-4.43%	141,624,280	-0.23%	141,985,947	-0.49%	141,293,616
	1982	143,361,216	1.43%	145,702,843	-0.18%	148,643,538	-2.20%	145,439,711
	1983	176,007,090	2.01%	182,888,126	-1.82%	182,018,888	-1.34%	179,615,161
	1984	197,317,002	1.17%	194,552,596	2.55%	196,425,683	1.61%	199,646,943
VARIANCE FOR ILLINOIS			0.001		0.000		0.000	
AVERAGE DEVIATION			3.79%		1.30%		0.20%	
AVERAGE ABSOLUTE DEVIATION			5.63%		6.01%		4.18%	
AVERAGE OF WITHIN-STATE VARIANCES			0.004		0.006		0.002	

NOTES: (1) PROJECTIONS ARE TO EIGHTH REPORT.

(2) DEVIATIONS ARE RATIOED TO THE LAST REPORT. (POSITIVE VALUES INDICATE THAT THE PROJECTION UNDERESTIMATES THE EIGHTH OR LATEST REPORT.)

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NATIONAL COUNCIL ON COMPENSATION INSURANCE
 INCURRED MEDICAL
 COMPARISON OF PROJECTIONS RESTATED TO INCURRED LEVEL (1)

	POLICY YEAR	FROM 1st REPORT	DEVIATION(2)	FROM 2nd REPORT	DEVIATION(2)	FROM 3rd REPORT	DEVIATION(2)	FROM LAST REPORT
UTAH	1981	23,704,028	8.75%	24,075,576	7.32%	23,208,377	10.65%	25,975,757
	1982	26,240,913	12.09%	24,988,741	16.29%	29,140,616	2.38%	29,850,004
	1983	26,205,811	22.53%	30,047,965	11.17%	38,125,247	-12.71%	33,825,338
	1984	35,659,147	11.09%	48,689,001	-21.39%	40,449,839	-0.85%	40,108,263
VARIANCE FOR UTAH			0.003		0.021		0.007	
NEBRASKA	1981	22,361,057	1.65%	22,996,807	-1.14%	23,239,959	-2.21%	22,736,716
	1982	22,574,611	1.93%	23,950,998	-4.05%	23,369,931	-1.53%	23,017,738
	1983	26,326,747	-3.64%	25,841,088	-1.73%	25,402,298	-0.00%	25,401,149
	1984	28,401,470	8.38%	28,954,404	6.60%	31,027,790	-0.09%	30,999,259
VARIANCE FOR NEBRASKA			0.002		0.002		0.000	
MAINE	1981	22,284,384	18.42%	24,664,610	9.71%	27,172,732	0.53%	27,317,196
	1982	28,451,542	5.19%	30,435,251	-1.42%	31,282,075	-4.24%	30,009,408
	1983	35,714,168	-4.03%	38,248,162	-11.41%	37,105,292	-8.08%	34,329,895
	1984	43,335,906	-3.37%	43,629,666	-4.07%	42,020,873	-0.23%	41,923,605
VARIANCE FOR MAINE			0.008		0.006		0.001	
NORTH CAROLINA	1981	52,183,850	-6.59%	50,295,000	-2.73%	49,498,356	-1.10%	48,957,552
	1982	52,113,685	8.95%	53,401,697	6.70%	55,317,168	3.36%	57,239,188
	1983	63,970,147	4.73%	69,462,167	-3.45%	69,327,798	-3.25%	67,143,021
	1984	79,990,793	5.72%	82,070,783	3.27%	86,974,298	-2.51%	84,842,223
VARIANCE FOR NORTH CAROLINA			0.003		0.002		0.001	
LOUISIANA	1981	93,865,842	8.86%	96,150,978	6.65%	105,719,596	-2.64%	102,996,315
	1982	99,473,446	13.40%	112,448,128	2.11%	114,572,621	0.26%	114,867,367
	1983	120,966,350	9.46%	125,272,312	6.23%	125,066,143	6.39%	133,598,564
	1984	144,452,494	1.16%	143,833,729	1.59%	151,333,717	-3.55%	146,152,248
VARIANCE FOR LOUISIANA			0.002		0.001		0.002	
OREGON	1981	121,311,089	-23.92%	107,382,772	-9.69%	114,682,309	-17.15%	97,894,129
	1982	111,470,511	-9.81%	122,032,006	-20.21%	117,332,397	-15.58%	101,515,737
	1983	148,380,894	-18.00%	143,160,773	-13.85%	127,216,384	-1.17%	125,750,474
	1984	174,738,264	-8.55%	150,583,830	6.45%	142,869,771	11.24%	160,969,922
VARIANCE FOR OREGON			0.004		0.010		0.013	
WISCONSIN	1981	68,855,845	2.68%	66,727,774	5.68%	66,453,092	6.07%	70,749,377
	1982	71,287,196	6.39%	70,706,244	7.15%	74,959,336	1.57%	76,153,259
	1983	81,897,172	5.72%	87,007,845	-0.17%	91,186,699	-4.98%	86,862,843
	1984	103,475,484	-0.79%	107,835,699	-5.03%	106,881,599	-4.10%	102,669,065
VARIANCE FOR WISCONSIN			0.001		0.002		0.002	
CONNECTICUT	1981	57,151,748	-11.80%	52,097,535	-1.91%	49,794,117	2.59%	51,120,258
	1982	56,401,243	11.58%	52,925,483	17.03%	58,958,664	7.57%	63,788,675
	1983	64,662,001	10.90%	70,546,207	2.79%	72,754,877	-0.25%	72,571,443
	1984	79,100,452	9.14%	86,660,316	0.46%	88,566,787	-1.73%	87,060,856
VARIANCE FOR CONNECTICUT			0.009		0.005		0.001	
MICHIGAN	1981	117,048,891	-4.44%	113,285,689	-1.08%	115,454,457	-3.02%	112,073,710
	1982	114,589,778	0.76%	118,424,936	-2.56%	114,509,042	0.83%	115,467,568
	1983	136,039,705	-1.97%	131,001,336	1.81%	129,439,614	2.98%	133,416,404
	1984	160,026,117	3.24%	159,321,500	3.66%	164,744,138	0.38%	165,377,686
VARIANCE FOR MICHIGAN			0.001		0.001		0.000	
FLORIDA	1981	177,923,928	16.88%	190,001,225	11.24%	199,066,858	7.00%	214,059,126
	1982	212,813,679	18.15%	233,401,120	10.24%	235,754,529	9.33%	260,017,265
	1983	264,740,392	10.66%	263,168,792	11.19%	269,048,154	9.20%	296,312,724
	1984	306,285,956	12.04%	309,158,699	11.21%	337,193,589	3.16%	348,204,690
VARIANCE FOR FLORIDA			0.001		0.000		0.001	
ILLINOIS	1981	149,424,425	-5.91%	140,297,996	0.56%	141,535,914	-0.32%	141,090,542
	1982	140,429,598	4.73%	144,693,890	1.84%	149,431,844	-1.38%	147,404,967
	1983	172,856,652	3.90%	183,211,881	-1.85%	182,226,274	-1.31%	179,876,306
	1984	199,874,735	0.47%	196,082,173	2.36%	197,411,249	1.70%	200,825,050
VARIANCE FOR ILLINOIS			0.002		0.000		0.000	
AVERAGE DEVIATION			3.56%		1.44%		-0.15%	
AVERAGE ABSOLUTE DEVIATION			8.24%		6.34%		4.12%	
AVERAGE OF WITHIN-STATE VARIANCES			0.003		0.004		0.003	

NOTES: (1) PROJECTIONS ARE TO EIGHTH REPORT.

(2) DEVIATIONS ARE RATIOED TO THE LAST REPORT. (POSITIVE VALUES INDICATE THAT THE PROJECTION UNDERESTIMATES THE EIGHTH OR LATEST REPORT.)

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NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PAID/INCURRED
 WISCONSIN
 1ST REPORT
 MEDICAL

	PAID LOSS -----	INCURRED LOSS -----	RATIO PD/INC -----	CHANGE IN RATIO -----
1981	49,887,690	74,014,506	67.4%	
1982	54,638,119	83,126,091	65.7%	-1.7%
1983	61,395,469	95,644,133	64.2%	-1.5%
1984	68,537,617	111,954,113	61.2%	-3.0%

DIAGNOSTIC TESTS OF PAID LOSS DEVELOPMENT

<u>DIAGNOSTIC</u>	<u>AVAILABILITY</u>	<u>DIAGNOSTIC LOOKS FOR:</u>
<u>Paid Losses</u> <u>Paid Plus Case Losses</u>	1 1	Unusual value on current diagonal suggest change in payment pattern
<u>Paid Losses</u> <u>Incurred Losses</u>	1 1	Unusual value on current diagonal suggest change in payment pattern
<u>Paid Losses</u> <u>Estimated Ultimate Losses</u>	1 2	Unusual value on current diagonal suggest change in payment pattern
<u>Paid Losses</u> <u>Earned Premiums at Current Rate Levels</u>	1 2	Unusual value on current diagonal suggest change in payment pattern
<u>Paid Losses</u> <u>Closed Claims</u>	1 5	Departure from "down the column" trend
<u>Closed Claims</u> <u>Incurred Claims</u>	5 3	Unusual value on current diagonal suggest change in claim closure pattern
<u>Closed Claims</u> <u>Estimated Ultimate Claims</u>	5 4	Unusual value on current diagonal suggest change in claim closure pattern
<u>Closed Claims</u> <u>Earned Premiums at Current Rate Levels</u>	5 2	Unusual value on current diagonal suggest change in claim closure pattern

Availability Key:

- 1: Data currently available
- 2: Data currently available - calculation required
- 3: Data currently available - indemnity only
- 4: Data currently available indemnity only - calculation required
- 5: Data not currently available

DIAGNOSTIC TESTS OF PAID PLUS OUTSTANDING DEVELOPMENT

<u>DIAGNOSTIC</u>	<u>AVAILABILITY</u>	<u>DIAGNOSTIC LOOKS FOR:</u>
<u>Paid Losses</u>	1	Unusual value on current diagonal suggest change in reserve adequacy
<u>Paid Plus Outstanding Losses</u>	1	
<u>Outstanding Reserves</u>	1	Unusual value on current diagonal suggest change in reserve adequacy
<u>IBNR Reserves</u>	1	
<u>Outstanding Reserves</u>	1	Unusual value on current diagonal suggest change in reserve adequacy
<u>Estimated Total Reserves</u>	2	
<u>Outstanding Reserves</u>	1	Unusual value on current diagonal suggest change in reserve adequacy
<u>Earned Premiums at Current Rate Levels</u>	2	
<u>Outstanding Reserves</u>	1	Unusual value on current diagonal suggest change in reserve adequacy
<u>Open Claims</u>	5	Departure from "down the column" trend

Availability Key:

- 1: Data currently available
- 2: Data currently available - calculation required
- 3: Data currently available -- Indemnity only
- 4: Data currently available Indemnity only - calculation required
- 5: Data not currently available

DIAGNOSTIC TESTS OF INCURRED LOSS DEVELOPMENT

<u>DIAGNOSTIC</u>	<u>AVAILABILITY</u>	<u>DIAGNOSTIC LOOKS FOR:</u>
$\frac{\text{Paid Losses}}{\text{Incurred Losses}}$	1 1	Unusual value on current diagonal suggest change in reserve adequacy
$\frac{\text{Bulk + IBNR Reserves}}{\text{Estimated Total Reserves Needed}}$	1 2	Unusual value on current diagonal suggest change in reserve adequacy
$\frac{\text{Bulk + IBNR Reserves}}{\text{Earned Premiums at Current Rate Levels}}$	1 2	Unusual value on current diagonal suggest change in reserve adequacy
$\frac{\text{Bulk + IBNR Reserves}}{\text{Incurred Claim Counts}}$	1 3	Departure from "down the column" trend
$\frac{\text{Bulk + IBNR Reserves}}{\text{Open Claims}}$	1 5	Departure from "down the column" trend

Availability Key:

- 1: Data currently available
- 2: Data currently available - calculation required
- 3: Data currently available -- Indemnity only
- 4: Data currently available Indemnity only - calculation required
- 5: Data not currently available

(As part of an NAIC examination of NCCI, Milliman & Robertson, Inc. has completed a study of the premium and loss development ratemaking procedures of NCCI. This document represents the Technical Appendix and includes supporting data and calculations underlying the study.)

**RATEMAKING PROCEDURES
EVALUATION OF RATEMAKING METHODOLOGIES**

**NCCI EXAMINATION
VOLUME III - SECTION IIB - PART 1
PREMIUM AND LOSS DEVELOPMENT
FACTORS: TECHNICAL APPENDIX**

December 6, 1991

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**PREMIUM AND LOSS
DEVELOPMENT FACTORS:
TECHNICAL APPENDIX**

I. INTRODUCTION

Accompanying this appendix is a series of exhibits prepared in the course of our analysis of the National Council on Compensation Insurance's (NCCI) development factor selection and experience projection methodologies. The discussion that follows will provide an overview of these exhibits, and will illustrate the calculations involved in the tests that the exhibits present. Finally, we will discuss the manner in which the tests tie in to the summary exhibits included in the main body of the report.

**PREMIUM AND LOSS
DEVELOPMENT FACTORS:
TECHNICAL APPENDIX**

**PREMIUM AND LOSS
DEVELOPMENT FACTORS:
TECHNICAL APPENDIX**

II. SCOPE OF THE TESTS

The exhibits that support our tests and analysis were prepared for eleven states distributed among the three regions:

<u>Northern Region</u>	<u>Southern Region</u>	<u>Western Region</u>
Maine	North Carolina	Utah
Wisconsin	Louisiana	Nebraska
Connecticut	Florida	Oregon
Michigan		
Illinois		

For each state, we received nine reports (diagonals) of policy year premium and loss data. The reports, or evaluation dates, spanned the period 1981 to 1989. The corresponding range of policy years is 1973 (for which the 1981 evaluation date constitutes the eighth report) to 1987 (for which the 1989 evaluation date constitutes the second report.)

The same exhibits were prepared for each state. These exhibits¹, in order of presentation, are:

- Premium - Development by Diagonal, Showing Variance
- Premium - Tests of Minimum Average Squared Deviations
- Indemnity - Paid - Development by Diagonal, Showing Variance
- Indemnity - Paid - Tests of Minimum Average Squared Deviations
- Indemnity - Paid + Outstanding - Development by Diagonal, Showing Variance
- Indemnity - Paid + Outstanding - Tests of Minimum Average Squared Deviations
- Indemnity - Incurred - Development by Diagonal, Showing Variance
- Indemnity - Incurred - Tests of Minimum Average Squared Deviations
- Medical - Paid - Development by Diagonal, Showing Variance
- Medical - Paid - Tests of Minimum Average Squared Deviations

¹ Note: These exhibits follow Exhibits E-1 through E-16. The E-xx exhibits are provided, along with a narrative discussion, to provide the reader with more of the details underlying the calculations on the referenced state exhibits.

**PREMIUM AND LOSS
DEVELOPMENT FACTORS:
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- Medical - Paid + Outstanding - Development by Diagonal, Showing Variance
- Medical - Paid + Outstanding - Tests of Minimum Average Squared Deviations
- Medical - Incurred - Development by Diagonal, Showing Variance
- Medical - Incurred - Tests of Minimum Average Squared Deviations
- Indemnity - Comparison of Projections
- Indemnity - Comparison of Projections Restated to Incurred Level
- Medical - Comparison of Projections
- Medical - Comparison of Projections Restated to Incurred Level

(As a technical note, NCCI has recently begun analyzing paid plus case projections, as case reserves have been separately identified in their data base beginning with the December 31, 1986 evaluation. Prior to this date, the financial calls did not allow a decomposition of outstanding losses into their case and bulk components. Since total outstanding losses have also been included in the subsequent reports, a complete history of them was available. For this reason, our tests are based on paid plus outstanding (as well as paid and incurred) rather than on paid plus case; this serves as an approximate indication of the predictive ability that can be expected to emerge from the paid plus case projections as future reports become available.) The following is a brief overview of the exhibits for each state.

NCCI projects:

Premium

Indemnity Paid Losses	Medical Paid Losses
Indemnity Paid + Outstanding Losses	Medical Paid + Outstanding Losses
Indemnity Incurred Losses	Medical Incurred Losses

For each of seven different development projections that NCCI performs in each rate review, we have prepared two initial tests.

For each of these data types, we have tabulated the sample variance resulting for each report-to-report development period. This is the variance of the column of development factors for each period, based on the nine diagonals of data for each state. Also shown on the exhibit for each state are the variances for the corresponding

PREMIUM AND LOSS DEVELOPMENT FACTORS: TECHNICAL APPENDIX

region. For each data type, this is the state exhibit referred to above as "Development by Diagonal, Showing Variance."

Also for each data type, we have tabulated the total of the average squared deviations for each report-to-report development period. Deviation is defined as the difference between a predicted development factor, based on the preceding diagonals, and the actual value of the factor. The squares of these deviations have been averaged across common years for each report-to report development period, for each of these six different development factor averaging methods:

- Two-Year Straight Average
- Three-Year Straight Average
- Four-Year Straight Average
- Two-Year Exponentially Weighted Average
- Three-Year Exponentially Weighted Average
- Four-Year Exponentially Weighted Average

The down-the-column averages are then summed across the development periods to provide a total measure of the historical predictive ability of each of the six averaging methods. The lower the total, the closer a particular method comes to predicting the factor, and thus the better the method's past predictive ability. For each data type, this is the state exhibit referred to above as "Tests of Minimum Average Squared Deviations". The final four exhibits for each state analyze projection results. The same two exhibits appear for both indemnity and medical. These exhibits compare projection results based each of three types of data:

- Paid Losses
- Paid + Outstanding Losses
- Incurred (including IBNR) Losses

The projections are to eighth report, and the development factors used to project to eighth report are based on the NCCI's current selection procedure of two-year straight averages.

PREMIUM AND LOSS DEVELOPMENT FACTORS: TECHNICAL APPENDIX

Once the projections have been calculated, they are compared by policy year for each data type to indicate the variability of the projection methods over time. The variability in the projections results from the use of prior development patterns to project the actual emergence of losses; two measures of this variability we have used are report-to-report fluctuations and deviations relative to the latest available projection for each policy year. These measures of variability are presented in the exhibits referred to as "Comparisons of Projections" for both indemnity and medical.

The projections are only done to eighth report, corresponding to the latest generally available evaluation of each policy year, thus the projections are intrinsically on different levels. In order to make them comparable, the paid projections and the paid plus outstanding projections are adjusted to the incurred level. After adjustment, a second element of variability has been incorporated for the affected loss statistic types: the projections reflect not only the difference between predicted and actual loss emergence noted above, but now also reflect the difference between predicted and actual factors at the incurred level of the eighth report. Therefore, report-to-report fluctuations in the projections and deviations to the last available projection by policy year are again compiled. These tests are presented in the exhibits referred to as "Comparisons of Projections - Restated to Incurred Level" for both indemnity and medical.

So far, a general overview of the exhibits presented for each state has been given. The next sections of this memorandum will cover the details behind the exhibits, and how the exhibits relate to the summary exhibits that appear in the main body of the report. These sections will refer to a series of illustrative exhibits, attached as Exhibit E-1 to Exhibit E-24.

**PREMIUM AND LOSS
DEVELOPMENT FACTORS:
TECHNICAL APPENDIX**

III. FACTOR SELECTION TESTS

Our first test for factors was intended to investigate the variability of development factors as a function of the underlying volume of data. The intent was to evaluate the appropriateness of including regional, or other broader-based, data with state data in selecting development factors. A clear relationship between increasing size and decreasing variance would indicate that the stability of state factor selections might be improved by giving weight to broader-based factors.

The test will be illustrated with Nebraska indemnity paid losses. The process began by compiling state and regional development triangles for policy year data. For Nebraska indemnity paid losses, these triangles appear as Exhibits E-1 to E-4. (Nebraska is in the Western region.)

The state and regional development factors for each report-to-report development period are then carried forward from Exhibits E-2 and E-4, respectively, to Exhibit E-5, which is the "Development by Diagonal, Showing Variance" exhibit discussed above. For each report-to-report period, the sample variance has been calculated for both the state and regional experience.

For Nebraska and the Western region, we see that the following sample variances (in millionths) for each report-to-report period were found:

	First to <u>Second</u>	Second to <u>Third</u>	Third to <u>Fourth</u>	Fourth to <u>Fifth</u>	Fifth to <u>Sixth</u>	Sixth to <u>Seventh</u>	Seventh to <u>Eighth</u>
Nebraska	5513	714	308	209	38	120	60
West	4194	847	123	27	10	11	7

These are then carried to the summary exhibit for variance in development factors used in our report, which is reproduced here as Exhibit E-6. On Exhibit E-6, the states and regions are arranged in increasing order of size (as measured by 1987 standard earned premium at second report), to allow the nature of variance as a function of size to be discerned. Our conclusions on the value of broadening the experience

**PREMIUM AND LOSS
DEVELOPMENT FACTORS:
TECHNICAL APPENDIX**

base in the selection of development factors were drawn from this exhibit and corresponding exhibits for the other data types.

Note that this test is performed for seven data types that NCCI projects in each rate review. Thus, for each state (and its corresponding region), the above test is performed for:

Premium

Indemnity Paid Losses	Medical Paid Losses
Indemnity Paid + Outstanding Losses	Medical Paid + Outstanding Losses
Indemnity Incurred Losses	Medical Incurred Losses

The second test of development factors considers different alternatives in the selection process, by using more than two years, and also by using non-uniform weights by year. The test measure is the average squared deviation for each averaging alternative; the deviations are between the predicted development factor for year N (as predicted from years N-1, N-2, and N-3 and N-4, as needed), and the factor that ultimately resulted for year N. The average squared deviations are subsequently compiled for each report-to-report period, and then summed across periods to give an aggregate measure of the performance of each weighting alternative.

An illustration will again be used to make the design of the test and its use in our report clearer. Continuing with the example of Nebraska indemnity paid losses, the development factors from Exhibit E-2 are posted in the top part of Exhibit E-7. From the factors, tables of the squared deviations for each averaging alternative are created immediately below. (Exhibit E-7 shows the 2-, 3-, and 4-year straight average alternatives; Exhibit E-8 shows the exponentially weighted average alternatives.)

As an example of the calculation of the squared deviations, we consider first to second report development culminating with the 1981, 1982, and 1983 evaluation dates. For these periods, the first-to-second report development factors can be calculated for the 1979, 1980, and 1981 policy years, respectively. Further, under a two year straight average, the policy year 1979 and 1980 factors are used to predict

PREMIUM AND LOSS DEVELOPMENT FACTORS: TECHNICAL APPENDIX

the policy year 1981 first-to-second report development factor. In this example, the policy year 1981 paid development factor is thus estimated as:

$$(1/2) \times (1.462 + 1.498) = 1.480.$$

The policy year 1981 first-to-second development factor was actually 1.521. Thus, the squared deviation between the predicted factor and the actual factor is:

$$(1.480 - 1.521)^2 = (-.041)^2 = .001681.$$

This number can be found as the first entry in the table for "Squared Errors for Predictions from Two-Year Straight Averages" in Exhibit E-7. Subsequent entries down the column are calculated in a similar fashion, and averages are computed for each report-to-report period.

As the number of years averaged into the predicted factor increases, the predictions can be made for fewer years. For example, where four years are built into the prediction, development culminating with the 1985 report becomes the first period for which predictions can be performed. The average squared deviations were computed across common development periods beginning with the 1985 report to remove any potential distortions. Thus, the averages shown across the 1985-1989 development periods for each averaging method are used for comparisons across the methods.

Similar average squared deviations are calculated for the exponentially weighted averaging methods. The only difference is that the prediction of the paid loss development factor (PLDF) at N is of the form:

$$\hat{PLDF}_N = \frac{.9^1 \times PLDF_{N-2} + .9^0 \times PLDF_{N-1}}{.9^1 + .9^0}$$

This form assumes the two year period is being used for predictions; the extension of this formula to three or four years is analogous. The results of applying this family of

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formulas are seen in Exhibit E-8, with the average squared deviations across the 1985-1989 development periods again being the pertinent statistic.

Exhibit E-9 summarizes the results from the six averaging methods in Exhibits E-7 and E-8. (A version of this summary exhibit has been prepared for each loss type for each state.) The average squared deviations by report-to-report period are posted and totaled across periods. The method producing the lowest total average squared deviations across periods is then designated in Exhibit E-9, and tabulated in the summary exhibit (shown here as Exhibit E-10) which was presented in the report.

Exhibit E-9 includes two sets of variance comparisons. In the second set, the factor averaging method that produces the minimum average squared deviation for each report-to-report period is identified. The method that has the minimum average squared deviation for the most report-to-report periods is identified on Exhibit E-9, and then tabulated on Exhibit E-10.

The two tables in Exhibit E-10 are different ways of evaluating the methods of averaging and weighting prior development factors that would have worked best in the past.

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IV. PROJECTION METHOD TESTS

Our tests for the loss projections from the three different loss statistic types (paid, paid plus outstanding, incurred) are designed to identify stability and predictive accuracy in the projection results.

Our projection tests begin with a restatement of experience reported to NCCI. The restatement is performed by starting with the last available report for each policy year and successively dividing out the prior report-to-report development factors derived from the NCCI data for that policy year. The restatement removes the impact of differences in reporting carriers; that is, it eliminates the problem of "matching" companies, by restating each policy year's losses to the level of the companies included in the last available report for the year. The restated Nebraska indemnity paid loss triangle is presented here as Exhibit E-11.

As an illustration of the restatement process, the paid loss data in Exhibit E-1 is related to the restated paid loss data in Exhibit E-11 as follows. First, the paid losses at seventh and eighth report in Exhibit E-11 come directly from the matching seventh and eighth report columns of Exhibit E-1. Then, for example, Exhibit E-1 shows the policy year 1974 development (for matching companies) from sixth to seventh report as:

$$\frac{\text{Paid losses at seventh report}}{\text{Paid losses at sixth report}} = \frac{8,997,989}{8,725,874} = 1.031.$$

This development factor is divided out of the policy year 1974 restated paid losses at seventh report to calculate the corresponding policy year 1974 restated paid losses at sixth report:

$$8,999,016 \div 1.031 = 8,728,435$$

This procedure is continued until all reports have been restated for the composition of companies included in the eighth (or latest available) report of the policy year.

PREMIUM AND LOSS DEVELOPMENT FACTORS: TECHNICAL APPENDIX

The projections that were performed utilized predicted development factors based on NCCI's current two-year straight average selection procedure. Exhibit E-12 gives the triangle of predicted report-to-report development factors, as found by taking two-year averages of the factors in Exhibit E-2.

Projections were made to eighth report for two reasons. First, eighth report marks the terminal point in the data that was historically available for individual policy years. Second, for the paid and paid plus outstanding methods, the development tail beyond eighth report is based on the incurred loss development tail. Hence, it is to eighth report for which the last projection incorporating the unique aspects of each data type's own development history can be performed.

To make projections to eighth report, development factors were accumulated from each earlier report to eighth report. Exhibit E-13, which is an example of this for Nebraska indemnity paid losses, is essentially the multiplication of Exhibit E-12 along the diagonals. Projections are then shown in Exhibit E-14. The triangle of projections in Exhibit E-14 is simply the product of corresponding entries in Exhibits E-11 (restated paid losses) and E-13 (cumulative development factors to eighth report).

To illustrate the projection process, we first consider the computation of cumulative development factors. For example, the predicted development factor to be applied to policy year 1977 paid losses at fifth report to bring them up to eighth report is found as:

Policy year 1975	7th to 8th		1.0335 [unrounded]
Policy year 1976	6th to 7th	x	<u>1.040</u>
Cumulative	6th to 8th		1.07484
Policy year 1977	5th to 6th	x	<u>1.034</u>
Cumulative	5th to 8th		1.11138456

This cumulative factor is as shown in Exhibit E-13, where it is the factor shown to three decimal places as 1.111. The factor is then multiplied by the 1977 restated paid losses at fifth report:

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$$13,164,899 \times 1.11138456 = 14,631,265.$$

This result appears on Exhibit E-14 as the policy year 1977 projection of paid losses at eighth report from fifth report.

Exhibit E-14 provides a means for comparing the stability of projections across reports, within data type and policy year. The tests are intended to measure variability of the projections to eighth report. The values shown do not represent estimates converted to a common (incurred) basis. That is, variability reflected in the conversion to incurred at eighth report is not reflected in this test.

To convert the projections to an equivalent level, adjustment factors are derived for each evaluation year. The adjustment factors are ratios of either paid or paid plus outstanding to incurred, and are applied by evaluation year in order to match the manner in which they emerge.

The example of Nebraska indemnity paid losses is continued in Exhibit E-15, where a paid to incurred ratio for each evaluation year is calculated. The ratio that is then applied to restate the paid projections to an incurred level for each evaluation year is the average of the preceding evaluation year's ratio with the current evaluation year's ratio. For example, Exhibit E-15 shows that the eighth report for evaluation year 1981 (the age of policy year 1973) has a paid to incurred ratio of .8016 and the eighth report for evaluation 1982 (the age of policy year 1974) has a paid to incurred ratio of .8097. Hence, the average of these two ratio values, .8057, is used to modify all projections from the evaluation year 1982 diagonal: the policy year 1981 from first report, the policy year 1980 projection from second report, etc., out to the policy year 1974 projection from eighth report.

The restated paid projections based on the adjustment ratios in Exhibit E-15 are shown in Exhibit E-16. As an example of the derivation of the values in Exhibit E-16, we recall that the paid projection of policy year 1977 from fifth to eighth report was 14,631,265. This is a projection from the 1982 evaluation year, so the paid to incurred ratio of the preceding paragraph is relevant. Dividing the unadjusted paid

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projection by the unrounded average paid to incurred ratio for the 1982 evaluation date, the restated projection at the incurred level is then:

$$14,631,265 + .8056521 = 18,160,773$$

The value can be confirmed on Exhibit E-16.

Projections are now available to compare not only from report to report, but between projection methods. Exhibits E-17 and E-18 perform these comparisons. Versions of these exhibits accompany this appendix for each state for each of indemnity and medical losses.

Exhibits E-17 and E-18 focus on policy years 1978 to 1984, because earlier and later policy years do not have enough report dates available to produce meaningful comparisons. Exhibit E-17 covers unadjusted projections (at the level of each data type), and Exhibit E-18 covers projections adjusted to the level of incurred losses at eighth report.

The unadjusted Nebraska indemnity paid loss projections have been posted from Exhibit E-14 to Exhibit E-17, by policy year and by report date. Once the projections have been posted on Exhibit E-17, two sets of ratios are developed. First, within each data type (paid, paid plus outstanding, or incurred) and within each policy year, the deviation of each projection from the last available projection is ratioed to the last available projection. As an example of this, consider the 1984 policy year, for which the last available projection is from fifth report data:

**PREMIUM AND LOSS
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<u>Report</u>	<u>Paid Projection from Report</u>	<u>Absolute Deviation to Fifth Report</u>	<u>Deviation Ratioed to Fifth Report</u>
First	30,520,025	3,384,627	9.98%
Second	31,182,956	2,721,696	8.03%
Third	32,308,387	1,596,265	4.71%
Fourth	33,671,319	233,333	0.69%
Fifth	33,904,652	xxx	xxx

In the last two columns of Exhibit E-17, the deviations are averaged, and compared across the three different data types. The deviation ratios are a measure of stability, so the lower the average, the more stable the method.

There is a second set of ratios on Exhibit E-17. These ratios are also computed within each data type (paid, paid plus outstanding, or incurred) and within each policy year. They are the ratios of the absolute deviations of adjacent projections (i.e., projections from successive reports), to the earlier report's projection. Again looking at the 1984 policy year:

<u>Report</u>	<u>Paid Projection from Report</u>	<u>Absolute Deviation from prior Report</u>	<u>Deviation Ratioed to prior Report</u>
First	30,520,025	xxx	xxx
Second	31,182,956	662,931	2.17%
Third	32,308,387	1,125,431	3.61%
Fourth	33,671,319	1,362,932	1.22%
Fifth	33,904,652	233,333	0.69%

PREMIUM AND LOSS DEVELOPMENT FACTORS: TECHNICAL APPENDIX

In the last two columns of Exhibit E-17, these deviations are also averaged and then compared across the three different data types. The deviation ratios are a measure of stability, so the lower the average, the more stable the method. The difference between this test and the test to latest projection is that this test generates higher ratios if there are oscillations in the projections than if there are not.

The adjusted Nebraska indemnity paid loss projections are posted from Exhibit E-16 to Exhibit E-18. Once the projections have been posted, the same ratio tests performed on Exhibit E-17 are also utilized on Exhibit E-18. Since the projections in Exhibit E-18 have all been adjusted to the incurred level, they reflect not only the variability inherent in report-to-report development, but also the variability between the three different loss data types.

Exhibits E-19 through E-22 are reproductions of summary exhibits included in the main body of our report. These summary exhibits key off of exhibits similar to E-17 and E-18, by picking up the last two columns for each state. Exhibit E-19 comes from the sections of Exhibit E-17 pertaining to the deviations from the last available projections, and Exhibit E-20 comes from the sections of Exhibit E-17 pertaining to the deviations from the prior projections. Exhibit E-21 and E-22 correspond similarly to the average deviations shown on Exhibit E-18. These exhibits provide a global test, across all states in our study, of the stability of the three different projection types. Our conclusions about the relative stability of the paid, paid plus outstanding, and incurred projections are based in large part upon these exhibits.

Two final global tests were performed for each combination of coverage (indemnity or medical) and data type. These tests focus on policy years 1981 to 1984; examples are presented for Nebraska indemnity paid projections as Exhibit E-23 (for unadjusted projections) and as Exhibit E-24 (for projections restated to the incurred level). In each of these exhibits, projections for each of the first three reports within each policy year are ratioed to the latest available projection (i.e. eighth report for policy year 1981, down to fifth report for policy year 1984). The deviations for each report are then averaged across states and policy years. These tests not only provide additional insight into the stability and predictive ability of projections from a particular data type, but also indicate how quickly the projections converge to a reasonable estimate.

NATIONAL COUNCIL ON COMPENSATION INSURANCE

PAID LOSS DEVELOPMENT

NEBRASKA INDEMNITY	1ST REPT	2ND REPT	2ND REPT	3RD REPT	3RD REPT	4TH REPT	4TH REPT	5TH REPT	5TH REPT	6TH REPT	6TH REPT	7TH REPT	7TH REPT	8TH REPT
1973 PAID														
1974 PAID														
1975 PAID								9,036,868	9,368,722	8,725,874	8,997,989	8,541,055	8,835,171	
1976 PAID								10,861,585	11,262,510	9,337,412	9,798,449	10,446,056	10,745,654	
1977 PAID				11,407,994	12,503,136	10,581,434	10,920,976	13,204,310	11,749,888	11,112,362	12,440,875	12,671,212		
1978 PAID				15,766,351	17,138,948	17,491,116	18,443,889	18,084,924	14,391,605	14,753,491	15,182,322	14,169,828	14,644,228	
1979 PAID				17,948,689	19,654,847	20,017,669	21,402,419	20,902,771	19,555,809	18,922,453	19,482,307	19,263,752	19,720,221	
1980 PAID				20,253,589	22,454,744	22,087,986	23,170,384	23,050,437	24,008,585	21,550,461	22,216,138	22,134,306	22,438,064	
1981 PAID				20,541,575	22,385,423	22,339,426	23,388,971	23,257,408	24,296,784	23,859,664	24,076,149	22,942,470	23,342,177	
1982 PAID				20,677,676	22,452,025	22,363,862	23,686,090	23,986,335	24,296,784	24,571,733	25,306,761	24,416,954	24,869,069	
1983 PAID				21,589,898	24,186,031	24,421,141	26,370,119	25,368,534	24,803,090	24,201,770	24,616,761			
1984 PAID				26,517,193	30,199,666	29,253,052	31,228,847							
1985 PAID				29,277,273	32,414,755									
1986 PAID														
1987 PAID														

NATIONAL COUNCIL ON COMPENSATION INSURANCE
PAID LOSS DEVELOPMENT FACTORS

NEBRASKA	INDEMNITY	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1973 PAID								1.034
1974 PAID							1.031	1.033
1975 PAID					1.032	1.031	1.049	1.029
1976 PAID					1.063	1.037	1.031	1.019
1977 PAID			1.096		1.054	1.046	1.029	1.033
1978 PAID		1.233	1.087		1.069	1.036	1.030	1.024
1979 PAID	1.462	1.183	1.095		1.049	1.038	1.031	1.014
1980 PAID	1.498	1.201	1.109		1.047	1.040	1.009	1.017
1981 PAID	1.521	1.205	1.090		1.059	1.045	1.030	1.019
1982 PAID	1.545	1.228	1.086		1.081	1.034	1.017	
1983 PAID	1.541	1.204	1.120		1.068	1.050		
1984 PAID	1.602	1.257	1.139					
1985 PAID	1.617	1.247	1.107					
1986 PAID	1.649	1.256						
1987 PAID	1.688							

NATIONAL COUNCIL ON COMPENSATION INSURANCE
PAID LOSS DEVELOPMENT

WESTERN INDEMNITY	1ST REPT	2ND REPT	2ND REPT	3RD REPT	3RD REPT	4TH REPT	4TH REPT	5TH REPT	5TH REPT	6TH REPT	6TH REPT	7TH REPT	7TH REPT	8TH REPT
1973 PAID														
1974 PAID														
1975 PAID										186,750,887	192,862,180	202,365,090	207,341,363	
1976 PAID										219,976,312	229,319,269	240,523,116	247,250,457	254,054,377
1977 PAID						226,292,180	239,347,695	249,854,399	260,120,661	268,381,318	277,166,676	270,789,708	277,982,287	
1978 PAID					251,888,182	276,739,666	301,636,988	312,723,603	325,664,108	318,158,660	329,010,319	341,976,456	350,143,333	
1979 PAID			237,304,360	285,853,748	303,457,368	333,932,244	345,808,984	368,535,606	359,003,999	374,516,952	370,734,744	385,078,896	374,753,773	382,643,902
1980 PAID	173,113,847	264,394,447	276,010,961	334,489,891	347,133,236	385,387,947	375,744,787	401,285,307	397,733,157	414,831,054	399,309,009	411,861,094	429,989,896	441,190,279
1981 PAID	193,226,786	304,126,726	314,947,374	384,149,439	372,531,996	413,224,190	406,945,997	433,226,718	419,541,459	438,211,419	459,743,629	473,897,377	450,318,141	459,093,148
1982 PAID	207,662,499	337,060,436	324,408,472	407,807,488	406,345,254	457,376,054	439,643,110	471,479,790	489,032,927	513,026,852	488,821,909	503,681,427		
1983 PAID	240,103,969	404,218,475	404,250,253	514,473,807	494,546,288	556,672,443	580,384,910	623,000,994	591,386,071	613,970,634				
1984 PAID	292,216,732	489,459,918	476,101,011	605,465,540	620,608,640	697,719,388	663,119,281	706,507,904						
1985 PAID	303,049,658	511,293,856	526,160,972	665,391,451	635,572,089	710,154,464								
1986 PAID	311,817,461	530,235,548	513,304,728	651,601,219										
1987 PAID	335,739,365	569,586,507												

NATIONAL COUNCIL ON COMPENSATION INSURANCE
PAID LOSS DEVELOPMENT FACTORS

WESTERN	INDEMNITY	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1973 PAID								1.023
1974 PAID							1.033	1.025
1975 PAID						1.042	1.028	1.022
1976 PAID					1.058	1.041	1.033	1.027
1977 PAID				1.099	1.060	1.041	1.034	1.024
1978 PAID				1.100	1.066	1.043	1.039	1.021
1979 PAID			1.205	1.110	1.068	1.043	1.031	1.026
1980 PAID	1.527		1.212	1.109	1.065	1.045	1.031	1.019
1981 PAID	1.574		1.220	1.126	1.072	1.049	1.030	
1982 PAID	1.623		1.257	1.126	1.073	1.038		
1983 PAID	1.684		1.273	1.124	1.065			
1984 PAID	1.675		1.272	1.117				
1985 PAID	1.687		1.265					
1986 PAID	1.700		1.269					
1987 PAID	1.697							

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: NEBRASKA
 LOSS TYPE: INDEMNITY

PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.462	1.233	1.096	1.032	1.031	1.031	1.034
1982	1.498	1.183	1.087	1.063	1.037	1.049	1.033
1983	1.521	1.201	1.095	1.054	1.046	1.031	1.029
1984	1.545	1.205	1.109	1.069	1.036	1.029	1.019
1985	1.541	1.228	1.090	1.049	1.038	1.030	1.033
1986	1.602	1.204	1.086	1.047	1.040	1.031	1.024
1987	1.617	1.257	1.120	1.059	1.045	1.009	1.014
1988	1.649	1.247	1.139	1.081	1.034	1.030	1.017
1989	1.688	1.256	1.107	1.068	1.050	1.017	1.019
POINTS	9	9	9	9	9	9	9
AVERAGE	1.569	1.224	1.103	1.058	1.040	1.029	1.025
SAMPLE VARIANCE	0.005513	0.000714	0.000308	0.000209	0.000038	0.000120	0.000060
SAMPLE COEFF OF VARIANCE	0.047	0.022	0.016	0.014	0.006	0.011	0.008

REGION: WESTERN
 LOSS TYPE: INDEMNITY

PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	1.527	1.205	1.099	1.058	1.042	1.033	1.023
1983	1.574	1.212	1.100	1.060	1.041	1.028	1.025
1984	1.623	1.220	1.110	1.066	1.041	1.033	1.022
1985	1.684	1.257	1.109	1.068	1.043	1.034	1.027
1986	1.675	1.273	1.126	1.065	1.043	1.039	1.024
1987	1.687	1.272	1.126	1.072	1.045	1.031	1.021
1988	1.700	1.265	1.124	1.073	1.049	1.031	1.026
1989	1.697	1.269	1.117	1.065	1.038	1.030	1.019
POINTS	8	8	8	8	8	8	8
AVERAGE	1.646	1.247	1.114	1.066	1.043	1.032	1.023
SAMPLE VARIANCE	0.004194	0.000847	0.000123	0.000027	0.000010	0.000011	0.000007
SAMPLE COEFF OF VARIANCE	0.039	0.023	0.010	0.005	0.003	0.003	0.003

NATIONAL COUNCIL ON COMPENSATION INSURANCE
SUMMARY OF VARIANCE OF DEVELOPMENT FACTORS

INDERMITY

PAID LOSSES

STATE OR REGION	1987 EARNED PREMIUM Q2ND REPORT	VARIANCE OF DEVELOPMENT FACTORS (IN MILLIONTHS)							
		1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	
UTAH	123,044,832	452	125	129	40	77	55		
NEBRASKA	127,816,027	714	308	209	38	120	60		
MAINE	213,544,578	8660	6211	2519	1849	546	293	278	
NORTH CAROLINA	415,953,120	1299	333	90	20	15	13	9	
LOUISIANA	436,455,028	4261	3162	1496	434	134	59	34	
OREGON	581,245,692	8103	979	242	124	20	35	16	
WISCONSIN	609,230,991	2779	599	163	43	15	82	18	
CONNECTICUT	726,148,241	1161	252	122	53	41	25	21	
MICHIGAN	859,722,833	1985	476	194	191	35	37	45	
FLORIDA	1,171,136,775	31031	5400	2288	1118	901	432	274	
ILLINOIS	1,512,127,208	4477	2276	901	288	103	88	501	
WESTERN	2,462,594,483	4194	847	123	27	10	11	7	
NORTHERN	6,173,015,621	1141	672	241	133	56	38	20	
SOUTHERN	7,064,274,158	5030	651	114	51	24	20	9	

NEBRASKA
INDEMNITY

NATIONAL COUNCIL ON COMPENSATION INSURANCE
PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.462	1.233	1.096	1.032	1.031	1.031	1.034
1982	1.498	1.183	1.087	1.063	1.037	1.049	1.033
1983	1.521	1.201	1.095	1.054	1.046	1.031	1.029
1984	1.545	1.205	1.109	1.069	1.036	1.029	1.019
1985	1.541	1.228	1.090	1.049	1.038	1.030	1.033
1986	1.602	1.204	1.086	1.047	1.040	1.031	1.024
1987	1.617	1.257	1.120	1.059	1.045	1.009	1.014
1988	1.649	1.247	1.139	1.081	1.034	1.030	1.017
1989	1.688	1.256	1.107	1.068	1.050	1.017	1.019

SQUARED ERRORS FOR PREDICTIONS FROM TWO-YEAR STRAIGHT AVERAGES								TOTAL	AVERAGE
1983	0.001681	0.000049	0.000012	0.000042	0.000144	0.000081	0.000020	0.002030	0.000290
1984	0.001260	0.000169	0.000324	0.000110	0.000030	0.000121	0.000144	0.002159	0.000308
1985	0.000064	0.000625	0.000144	0.000156	0.000009	0.000000	0.000081	0.001079	0.000154
1986	0.003481	0.000156	0.000182	0.000144	0.000009	0.000002	0.000004	0.003979	0.000568
1987	0.002070	0.001681	0.001024	0.000121	0.000036	0.000462	0.000210	0.005605	0.000801
1988	0.001560	0.000272	0.001296	0.000784	0.000072	0.000100	0.000004	0.004089	0.000584
1989	0.003025	0.000016	0.000506	0.000004	0.000110	0.000006	0.000012	0.003680	0.000526
TOTAL	0.013142	0.002968	0.003489	0.001362	0.000411	0.000773	0.000476		
AVERAGE	0.001877	0.000424	0.000498	0.000195	0.000059	0.000110	0.000068		
AVG, 85-89	0.002040	0.000550	0.000630	0.000242	0.000047	0.000114	0.000062		
AVG, 86-89	0.002534	0.000531	0.000752	0.000263	0.000057	0.000143	0.000058		

SQUARED ERRORS FOR PREDICTIONS FROM THREE-YEAR STRAIGHT AVERAGES								TOTAL	AVERAGE
1984	0.002635	0.000000	0.000267	0.000374	0.000004	0.000064	0.000169	0.003513	0.000502
1985	0.000387	0.001003	0.000049	0.000169	0.000003	0.000040	0.000036	0.001686	0.000241
1986	0.004400	0.000054	0.000144	0.000107	0.000000	0.000001	0.000009	0.004715	0.000674
1987	0.002952	0.001995	0.000625	0.000016	0.000049	0.000441	0.000128	0.006207	0.000887
1988	0.003885	0.000300	0.001627	0.000860	0.000049	0.000044	0.000044	0.006811	0.000973
1989	0.004268	0.000400	0.000064	0.000032	0.000107	0.000040	0.000000	0.004912	0.000702
TOTAL	0.018528	0.003753	0.002776	0.001558	0.000212	0.000631	0.000387		
AVERAGE	0.003088	0.000625	0.000463	0.000260	0.000035	0.000105	0.000065		
AVG, 85-89	0.003179	0.000750	0.000502	0.000237	0.000042	0.000113	0.000044		
AVG, 86-89	0.003877	0.000687	0.000615	0.000254	0.000051	0.000132	0.000046		

SQUARED ERRORS FOR PREDICTIONS FROM FOUR-YEAR STRAIGHT AVERAGES								TOTAL	AVERAGE
1985	0.001190	0.000506	0.000046	0.000030	0.000000	0.000025	0.000018	0.001816	0.000259
1986	0.005738	0.000000	0.000086	0.000138	0.000001	0.000014	0.000020	0.005997	0.000857
1987	0.004193	0.002256	0.000625	0.000018	0.000025	0.000452	0.000150	0.007718	0.001103
1988	0.005293	0.000552	0.001425	0.000625	0.000033	0.000028	0.000030	0.007986	0.001141
1989	0.007353	0.000484	0.000003	0.000081	0.000116	0.000064	0.000009	0.008110	0.001159
TOTAL	0.023767	0.003799	0.002184	0.000892	0.000174	0.000582	0.000228		
AVERAGE	0.004753	0.000760	0.000437	0.000178	0.000035	0.000116	0.000046		
AVG, 86-89	0.005644	0.000823	0.000535	0.000216	0.000044	0.000139	0.000052		

COMPARISON OF AVERAGE SQUARED ERRORS FOR 1985-1989 PREDICTIONS

	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1. TWO-YEAR STR AVG	0.002040	0.000550	0.000630	0.000242	0.000047	0.000114	0.000062
2. THREE-YEAR STR AVG	0.003179	0.000750	0.000502	0.000237	0.000042	0.000113	0.000044
3. FOUR-YEAR STR AVG	0.004753	0.000760	0.000437	0.000178	0.000035	0.000116	0.000046

COMPARISON OF AVERAGE SQUARED ERRORS FOR 1986-1989 PREDICTIONS

	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1. TWO-YEAR STR AVG	0.002534	0.000531	0.000752	0.000263	0.000057	0.000143	0.000058
2. THREE-YEAR STR AVG	0.003877	0.000687	0.000615	0.000254	0.000051	0.000132	0.000046
3. FOUR-YEAR STR AVG	0.005644	0.000823	0.000535	0.000216	0.000044	0.000139	0.000052

NATIONAL COUNCIL ON COMPENSATION INSURANCE
PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE

NEBRASKA
INDEMNITY

EVAL DATE	WEIGHT	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	0.430467	1.462	1.233	1.096	1.032	1.031	1.031	1.034
1982	0.478297	1.498	1.183	1.087	1.063	1.037	1.049	1.033
1983	0.531441	1.521	1.201	1.095	1.054	1.046	1.031	1.029
1984	0.590490	1.545	1.205	1.109	1.069	1.036	1.029	1.019
1985	0.656100	1.541	1.228	1.090	1.049	1.038	1.030	1.033
1986	0.729000	1.602	1.204	1.086	1.047	1.040	1.031	1.024
1987	0.810000	1.617	1.257	1.120	1.059	1.045	1.009	1.014
1988	0.900000	1.649	1.247	1.139	1.081	1.034	1.030	1.017
1989	1.000000	1.688	1.256	1.107	1.068	1.050	1.017	1.019

SQUARED ERRORS FOR PREDICTIONS FROM TWO-YEAR EXPONENTIAL AVERAGES

	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	AVERAGE
1983	0.001604	0.000032	0.000014	0.000032	0.000140	0.000090	0.000020	0.001933	0.000276
1984	0.001218	0.000157	0.000316	0.000115	0.000033	0.000111	0.000141	0.002091	0.000299
1985	0.000054	0.000620	0.000153	0.000166	0.000007	0.000000	0.000086	0.001087	0.000155
1986	0.003493	0.000172	0.000169	0.000132	0.000009	0.000002	0.000006	0.003982	0.000569
1987	0.001927	0.001733	0.001031	0.000122	0.000035	0.000463	0.000203	0.00515	0.000788
1988	0.001529	0.000228	0.001232	0.000766	0.000075	0.000112	0.000003	0.003946	0.000564
1989	0.002933	0.000018	0.000529	0.000007	0.000116	0.000009	0.000012	0.003624	0.000518
TOTAL	0.012759	0.002960	0.003445	0.001341	0.000416	0.000787	0.000471		
AVERAGE	0.001823	0.000423	0.000492	0.000192	0.000059	0.000112	0.000067		
AVG, 85-89	0.001987	0.000554	0.000623	0.000239	0.000048	0.000117	0.000062		
AVG, 86-89	0.002471	0.000538	0.000740	0.000257	0.000059	0.000147	0.000056		

SQUARED ERRORS FOR PREDICTIONS FROM THREE-YEAR EXPONENTIAL AVERAGES

	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	AVERAGE
1984	0.002428	0.000000	0.000268	0.000345	0.000006	0.000064	0.000164	0.003276	0.000468
1985	0.000325	0.000955	0.000060	0.000175	0.000003	0.000032	0.000042	0.001592	0.000227
1986	0.004310	0.000069	0.000139	0.000103	0.000000	0.000001	0.000010	0.004632	0.000662
1987	0.002735	0.002001	0.000665	0.000023	0.000047	0.000444	0.000132	0.006047	0.000864
1988	0.003564	0.000265	0.001541	0.000840	0.000053	0.000055	0.000036	0.006353	0.000908
1989	0.004055	0.000343	0.000097	0.000020	0.000111	0.000040	0.000001	0.004667	0.000667
TOTAL	0.017415	0.003633	0.002771	0.001505	0.000220	0.000536	0.000385		
AVERAGE	0.002903	0.000605	0.000462	0.000251	0.000037	0.000106	0.000064		
AVG, 85-89	0.002998	0.000727	0.000501	0.000232	0.000043	0.000114	0.000044		
AVG, 86-89	0.003666	0.000669	0.000611	0.000246	0.000053	0.000135	0.000045		

SQUARED ERRORS FOR PREDICTIONS FROM FOUR-YEAR EXPONENTIAL AVERAGES

	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	AVERAGE
1985	0.000958	0.000543	0.000055	0.000046	0.000000	0.000022	0.000024	0.001647	0.000235
1986	0.005443	0.000004	0.000091	0.000129	0.000001	0.000009	0.000019	0.005697	0.000814
1987	0.003790	0.002220	0.000657	0.000023	0.000027	0.000452	0.000150	0.007319	0.001046
1988	0.004773	0.000472	0.001391	0.000644	0.000038	0.000037	0.000027	0.007381	0.001054
1989	0.006616	0.000422	0.000017	0.000057	0.000118	0.000060	0.000005	0.007295	0.001042
TOTAL	0.021580	0.003661	0.002210	0.000900	0.000183	0.000580	0.000225		
AVERAGE	0.004316	0.000732	0.000442	0.000180	0.000037	0.000116	0.000045		
AVG, 86-89	0.005156	0.000780	0.000539	0.000213	0.000046	0.000139	0.000050		

COMPARISON OF AVERAGE SQUARED ERRORS FOR 1985-1989 PREDICTIONS

	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1. TWO-YEAR EXPO WTD AVG	0.001987	0.000554	0.000623	0.000239	0.000048	0.000117	0.000062
2. THREE-YEAR EXPO WTD AVG	0.002998	0.000727	0.000501	0.000232	0.000043	0.000114	0.000044
3. FOUR-YEAR EXPO WTD AVG	0.004316	0.000732	0.000442	0.000180	0.000037	0.000116	0.000045

COMPARISON OF AVERAGE SQUARED ERRORS FOR 1986-1989 PREDICTIONS

	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1. TWO-YEAR EXPO WTD AVG	0.002471	0.000538	0.000740	0.000257	0.000059	0.000147	0.000056
2. THREE-YEAR EXPO WTD AVG	0.003666	0.000669	0.000611	0.000246	0.000053	0.000135	0.000045
3. FOUR-YEAR EXPO WTD AVG	0.005156	0.000780	0.000539	0.000213	0.000046	0.000139	0.000050

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: NEBRASKA PAID - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: INDEMNITY (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.002040	0.000550	0.000630	0.000242	0.000047	0.000114	0.000062	0.003686	
THREE-YEAR STRAIGHT AVERAGE	0.003179	0.000750	0.000502	0.000237	0.000042	0.000113	0.000044	0.004866	
FOUR-YEAR STRAIGHT AVERAGE	0.004753	0.000760	0.000437	0.000178	0.000035	0.000116	0.000046	0.006325	
TWO-YEAR EXPONENTIAL AVG	0.001987	0.000554	0.000623	0.000239	0.000048	0.000117	0.000062	0.003631	*
THREE-YEAR EXPONENTIAL AVG	0.002998	0.000727	0.000501	0.000232	0.000043	0.000114	0.000044	0.004658	
FOUR-YEAR EXPONENTIAL AVG	0.004316	0.000732	0.000442	0.000180	0.000037	0.000116	0.000045	0.005868	

STATE: NEBRASKA PAID - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: INDEMNITY (*1* INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	1	0	0	0	0	0	1	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	0	0	1	1	2	*
FOUR-YEAR STRAIGHT AVERAGE	0	0	1	1	1	0	0	3	
TWO-YEAR EXPONENTIAL AVG	1	0	0	0	0	0	0	1	
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
INDEMNITY
PAID LOSSES

INDICATION OF METHOD PRODUCING MINIMUM TOTAL AVERAGE SQUARED DEVIATION (1)

STATE OR REGION	1987						
	EARNED PREMIUM 2ND REPT	TWO-YEAR STR AVG	THREE-YEAR STR AVG	FOUR-YEAR STR AVG	TWO-YEAR EXPO AVG	THREE-YEAR EXPO AVG	FOUR-YEAR EXPO AVG
UTAH	123,044,832					1	
NEBRASKA	127,816,027				1		
MAINE	213,544,578				1		
NORTH CAROLINA	415,953,120			1			
LOUISIANA	436,455,028				1		
OREGON	581,245,692				1		
WISCONSIN	609,230,991				1		
CONNECTICUT	726,148,241				1		
MICHIGAN	859,722,833						1
FLORIDA	1,171,136,775				1		
ILLINOIS	1,512,127,208				1		
TOTAL		0	0	1	8	1	1
DISTRIBUTION		0.0%	0.0%	9.1%	72.7%	9.1%	9.1%

INDICATION OF METHOD PRODUCING MINIMUM AVERAGE SQUARED DEVIATION AGE BY AGE (1) (2)

STATE OR REGION	1987						
	EARNED PREMIUM 2ND REPT	TWO-YEAR STR AVG	THREE-YEAR STR AVG	FOUR-YEAR STR AVG	TWO-YEAR EXPO AVG	THREE-YEAR EXPO AVG	FOUR-YEAR EXPO AVG
UTAH	123,044,832		1				
NEBRASKA	127,816,027			1			
MAINE	213,544,578				1		
NORTH CAROLINA	415,953,120				1		
LOUISIANA	436,455,028				1		
OREGON	581,245,692				1		
WISCONSIN	609,230,991				1		
CONNECTICUT	726,148,241		1	1	1		
MICHIGAN	859,722,833				1		
FLORIDA	1,171,136,775				1		
ILLINOIS	1,512,127,208				1		
TOTAL		0	2	2	9	0	0
DISTRIBUTION		0.0%	15.4%	15.4%	69.2%	0.0%	0.0%

NOTES: (1) MINIMUM IS INDICATED BY "1" FOR EACH STATE.

(2) THIS TEST COUNTS THE NUMBER OF AGES FOR WHICH A PARTICULAR METHOD HAS THE MINIMUM AVERAGE SQUARED DEVIATION; TIES ARE POSSIBLE.

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 NEBRASKA INDEMNITY
 RESTATED PAID TRIANGLE

	1ST REPT	2ND REPT	3RD REPT	4TH REPT	5TH REPT	6TH REPT	7TH REPT	8TH REPT
1973 PAID							8,541,055	8,835,171
1974 PAID						8,728,435	8,999,016	9,291,700
1975 PAID					9,658,689	9,958,109	10,446,056	10,745,654
1976 PAID				11,275,448	11,636,262	12,066,804	12,440,875	12,671,212
1977 PAID			11,299,877	12,384,665	13,164,899	13,770,484	14,169,828	14,644,228
1978 PAID		12,779,406	15,757,008	17,127,867	18,052,772	18,702,672	19,263,752	19,720,221
1979 PAID	10,216,119	14,935,966	17,669,248	19,347,827	20,682,827	21,468,774	22,134,306	22,438,064
1980 PAID	10,446,091	15,648,245	18,793,542	20,842,038	21,863,298	22,737,830	22,942,470	23,342,177
1981 PAID	10,845,474	16,495,966	19,877,639	21,666,626	22,684,957	23,705,781	24,416,954	24,869,069
1982 PAID	10,728,436	16,575,434	20,354,633	22,105,132	23,409,334	24,205,252	24,616,741	
1983 PAID	11,292,962	17,402,455	20,952,556	23,466,862	25,367,678	26,636,062		
1984 PAID	12,748,620	20,423,290	25,672,075	29,240,493	31,228,847			
1985 PAID	14,521,740	23,481,653	29,281,621	32,414,755				
1986 PAID	16,555,243	27,299,596	34,288,293					
1987 PAID	18,033,513	30,440,570						

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 NEBRASKA INDEMNITY
 WEIGHTED PAID DF TRIANGLE

	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1973 PAID							
1974 PAID							1.034
1975 PAID					1.034	1.040	1.031
1976 PAID				1.048	1.042	1.040	1.024
1977 PAID			1.092	1.059	1.041	1.030	1.026
1978 PAID		1.208	1.091	1.062	1.037	1.030	1.029
1979 PAID			1.102	1.059	1.039	1.031	1.019
1980 PAID			1.100	1.048	1.043	1.020	1.016
1981 PAID	1.480		1.088	1.053	1.040	1.020	1.018
1982 PAID	1.510		1.103	1.070	1.042		
1983 PAID	1.533		1.130	1.075			
1984 PAID	1.543		1.123				
1985 PAID	1.572						
1986 PAID	1.610	1.252					
1987 PAID	1.633	1.252					

NOTES: TRIANGLE GIVES PREDICTED DF'S BASED ON 2 YEARS ENTERING THE TRIANGLE.

THE PREDICTED FACTOR FOR YEAR N ARISES FROM THE PRECEDING

YEARS USING THE FOLLOWING WEIGHTS:

Year N-4 Wt:	0.0000
Year N-3 Wt:	0.0000
Year N-2 Wt:	0.5000
Year N-1 Wt:	0.5000

WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 NEBRASKA INDEMNITY
 CUMULATIVE PAID LOSS DEVELOPMENT TRIANGLE

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH
1973 PAID							
1974 PAID							1.034
1975 PAID					1.111	1.075	1.031
1976 PAID				1.164	1.117	1.072	1.024
1977 PAID			1.271	1.182	1.098	1.055	1.026
1978 PAID		1.535	1.290	1.165	1.095	1.056	1.029
1979 PAID		2.272	1.284	1.160	1.101	1.060	1.019
1980 PAID		2.320	1.275	1.154	1.084	1.039	1.016
1981 PAID		2.369	1.552	1.141	1.076	1.035	1.018
1982 PAID		2.394	1.527	1.152	1.086	1.042	
1983 PAID		2.399	1.549	1.167			
1984 PAID		2.492	1.628				
1985 PAID		2.659	1.640				

NOTES: TRIANGLE GIVES PREDICTED DF'S BASED ON 2 YEARS ENTERING THE TRIANGLE.

THE PREDICTED FACTOR FOR YEAR N ARISES FROM THE PRECEDING YEARS USING THE FOLLOWING WEIGHTS:

Year N-4 Wt:	0.0000
Year N-3 Wt:	0.0000
Year N-2 Wt:	0.5000
Year N-1 Wt:	0.5000

WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 NEBRASKA
 INDEMNITY
 PAID LOSS PROJECTIONS TO EIGHTH REPORT

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	ACTUAL 8TH
1973 PAID								8,835,171
1974 PAID								9,291,700
1975 PAID							10,795,999	10,745,654
1976 PAID					12,969,884			12,671,212
1977 PAID					14,631,265	14,765,264	14,509,904	14,644,228
1978 PAID				19,939,840	20,160,216	19,726,082	19,764,610	19,720,221
1979 PAID			22,452,267	22,870,430	22,708,989	22,676,758	22,765,134	22,438,064
1980 PAID		24,020,093	24,236,814	24,291,151	23,947,939	24,099,126	23,378,377	23,342,177
1981 PAID	24,638,786	25,358,344	25,530,205	25,132,733	24,980,769	24,639,314	24,795,417	24,869,069
1982 PAID	24,895,032	25,610,617	25,960,135	25,510,691	25,365,270	25,059,752	25,059,842	
1983 PAID	26,748,853	27,000,157	26,308,435	26,775,267	27,300,611	27,752,726		
1984 PAID	30,520,025	31,182,956	32,308,387	33,671,319	33,904,652			
1985 PAID	34,843,729	36,363,409	38,085,248	37,813,990				
1986 PAID	41,263,159	44,455,164	44,919,549					
1987 PAID	47,954,848	49,908,343						

NOTES: PROJECTIONS USE PREDICTED DF'S BASED ON 2 YEARS ENTERING THE TRIANGLE.

THE PREDICTED FACTOR FOR YEAR N ARISES FROM THE PRECEDING

YEARS USING THE FOLLOWING WEIGHTS:

Year N-4 Wt:	0.0000
Year N-3 Wt:	0.0000
Year N-2 Wt:	0.5000
Year N-1 Wt:	0.5000

WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.
 LOSSES HAVE BEEN RESTATED TO THE LATEST DIAGONAL.

NATIONAL COUNCIL ON COMPENSATION INSURANCE
PAID TO INCURRED RATIOS AT EIGHTH REPORT

POLICY YEAR AT YEAR 8TH REPORT	EVALUATION YEAR AT	PAID LOSSES		INCURRED LOSSES		PREDICTED	
		8TH REPORT	8TH REPORT	8TH REPORT	8TH REPORT	PAID TO INCURRED	PAID TO INCURRED
1973	1981	8,835,171	11,021,286	0.8016	0.8057	0.8016	0.8057
1974	1982	9,291,700	11,476,078	0.8097	0.8218	0.8097	0.8218
1975	1983	10,745,654	12,884,357	0.8340	0.8275	0.8340	0.8275
1976	1984	12,671,212	15,434,804	0.8210	0.8108	0.8210	0.8108
1977	1985	14,644,228	18,292,106	0.8006	0.8160	0.8006	0.8160
1978	1986	19,720,221	23,718,751	0.8314	0.8419	0.8314	0.8419
1979	1987	22,438,064	26,323,136	0.8524	0.8482	0.8524	0.8482
1980	1988	23,342,177	27,654,052	0.8441	0.8597	0.8441	0.8597
1981	1989	24,869,069	28,409,943	0.8754		0.8754	

NOTES: ADJUSTMENTS TO INCURRED ARE DONE BY EVALUATION YEAR. ALL EVALUATION YEAR N PROJECTIONS (FOR POLICY YEARS N-1 AT FIRST REPORT TO POLICY YEAR N-8 AT EIGHTH REPORT) USE THE SAME RATIO TO ADJUST TO THE INCURRED LEVEL.

THE RATIO USED TO ADJUST THE EVALUATION YEAR N PAID LOSS PROJECTIONS UP TO THE LEVEL OF THE INCURRED PROJECTIONS IS BASED ON THE STRAIGHT AVERAGE OF PAID TO INCURRED RATIOS AT EIGHTH REPORT FOR THE TWO MOST RECENT EVALUATIONS YEARS. THIS INCLUDES THE CURRENT EVALUATION YEAR ITSELF, SO THE AVERAGE THUS CONSISTS OF THE PAID TO INCURRED RATIOS FOR EVALUATION YEARS N-1 AND N.

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 NEBRASKA
 INDEMNITY
 PAID LOSS PROJECTIONS TO EIGHTH REPORT, RESTATED TO INCURRED LEVEL

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	RESTATED 8TH
1973 PAID								11,533,142
1974 PAID							13,400,323	13,075,229
1975 PAID					16,098,615	17,966,259	15,607,237	15,313,028
1976 PAID				24,749,938	23,838,765	23,838,765	17,535,068	18,062,268
1977 PAID			27,868,439	27,828,562	27,443,577	27,969,633	24,377,774	24,167,005
1978 PAID		29,814,473	29,491,168	29,355,603	29,537,514	29,533,326	27,898,527	26,651,262
1979 PAID	30,582,413	30,855,837	30,852,986	30,998,846	30,613,774	29,265,841	27,768,138	27,518,259
1980 PAID	30,292,083	30,950,164	32,019,368	31,263,190	30,128,110	29,543,120	29,231,494	28,926,890
1981 PAID	32,325,710	33,302,137	32,240,820	31,802,863	32,184,885	32,281,065		
1982 PAID	37,643,561	38,214,515	38,374,937	39,695,358	39,436,786			
1983 PAID	42,700,768	43,191,371	44,898,970	43,984,000				
1984 PAID	49,011,147	52,408,510	52,248,954					
1985 PAID	56,534,312	58,051,758						

PROJECTIONS USE PREDICTED DF'S BASED ON 2 YEARS ENTERING THE TRIANGLE.
 THE PREDICTED FACTOR FOR YEAR N ARISES FROM THE PRECEDING

YEARS USING THE FOLLOWING WEIGHTS:

Year N-4 Wt:	0.0000
Year N-3 Wt:	0.0000
Year N-2 Wt:	0.5000
Year N-1 Wt:	0.5000

WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.

LOSSES HAVE BEEN RESTATED TO THE LATEST DIAGONAL AND THE LEVEL OF THE INCURRED PROJECTION.

NATIONAL COUNCIL ON COMPENSATION INSURANCE
NEBRASKA INDENITY COMPARISON OF PROJECTIONS

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	ACTUAL 8TH	AVERAGE	*=LOW AVG
1978 PAID				19,939,840	20,160,216	19,726,082	19,764,610	19,720,221		
1978 PAID + Q/S				23,261,454	23,533,196	23,995,111	23,177,545	23,742,520		
1978 INCURRED				23,528,165	23,515,339	24,061,107	23,251,065	23,718,751		
1978 PAID (1)				1.11%	2.23%	0.03%	0.23%		0.90%	*
1978 PAID + Q/S (1)				2.11%	0.88%	1.06%	2.38%		1.61%	
1978 INCURRED (1)				0.80%	0.86%	1.44%	1.97%		1.27%	
1978 PAID (2)					1.11%	2.15%	0.20%	0.22%	0.92%	*
1978 PAID + Q/S (2)					1.26%	1.96%	3.41%	2.44%	2.27%	
1978 INCURRED (2)					0.05%	2.32%	3.37%	2.01%	1.94%	
1979 PAID			22,452,267	22,870,430	22,708,989	22,676,758	22,765,134	22,438,064		
1979 PAID + Q/S			26,909,196	26,822,633	26,974,212	25,834,862	25,238,260	26,277,859		
1979 INCURRED			27,397,854	26,614,210	27,047,668	25,966,602	25,236,811	26,323,136		
1979 PAID (1)			0.06%	1.93%	1.21%	1.06%	1.46%		1.14%	*
1979 PAID + Q/S (1)			2.40%	2.07%	2.65%	1.69%	3.96%		2.55%	
1979 INCURRED (1)			4.08%	1.11%	2.75%	1.35%	4.13%		2.68%	
1979 PAID (2)				1.86%	0.71%	0.14%	0.39%	1.44%	0.91%	*
1979 PAID + Q/S (2)				0.32%	0.57%	4.22%	2.31%	4.12%	2.31%	
1979 INCURRED (2)				2.86%	1.63%	4.00%	2.81%	4.30%	3.12%	
1980 PAID		24,020,093	24,236,814	24,291,151	23,947,939	24,099,126	23,378,377	23,342,177		
1980 PAID + Q/S		29,199,035	28,467,982	28,889,709	27,494,109	27,133,648	28,156,201	27,595,378		
1980 INCURRED		29,820,353	28,109,967	29,020,977	27,731,536	27,055,605	28,092,884	27,654,052		
1980 PAID (1)		2.90%	3.83%	4.07%	2.60%	3.24%	0.16%		2.80%	*
1980 PAID + Q/S (1)		5.81%	3.16%	4.69%	0.37%	1.67%	2.03%		2.96%	
1980 INCURRED (1)		7.83%	1.65%	4.94%	0.28%	2.16%	1.59%		3.08%	
1980 PAID (2)			0.90%	0.22%	1.41%	0.63%	2.99%	0.15%	1.05%	*
1980 PAID + Q/S (2)			2.50%	1.48%	4.83%	1.31%	3.77%	1.99%	2.65%	
1980 INCURRED (2)			5.74%	3.26%	4.44%	2.44%	3.83%	1.56%	3.54%	
1981 PAID	24,638,786	25,358,344	25,530,205	25,132,733	24,980,769	24,639,314	24,795,417	24,869,069		
1981 PAID + Q/S	29,716,529	29,118,412	28,698,314	27,646,762	27,466,779	27,640,502	28,545,559	28,347,979		
1981 INCURRED	30,367,544	28,430,148	28,601,466	27,896,804	27,207,545	27,615,641	28,593,311	28,409,943		
1981 PAID (1)	0.95%	1.97%	2.66%	1.06%	0.45%	0.92%	0.30%		1.18%	*
1981 PAID + Q/S (1)	4.83%	2.72%	1.24%	2.47%	3.11%	2.50%	0.70%		2.51%	
1981 INCURRED (1)	6.87%	0.07%	0.67%	1.81%	4.23%	2.80%	0.65%		2.45%	
1981 PAID (2)		2.92%	0.68%	1.56%	0.60%	1.37%	0.63%	0.30%	1.15%	*
1981 PAID + Q/S (2)		2.01%	1.44%	3.66%	0.65%	0.63%	3.27%	0.69%	1.77%	
1981 INCURRED (2)		6.38%	0.60%	2.46%	2.47%	1.50%	3.54%	0.64%	2.51%	
1982 PAID	24,895,032	25,610,617	25,960,135	25,510,691	25,365,270	25,059,752	25,059,842			
1982 PAID + Q/S	27,392,681	26,150,938	27,010,467	27,061,065	27,701,250	28,395,946	27,920,913			
1982 INCURRED	27,109,573	26,334,485	27,655,665	27,035,137	28,016,897	29,350,957	28,727,725			
1982 PAID (1)	0.66%	2.20%	3.59%	1.80%	1.22%	0.00%			1.58%	*
1982 PAID + Q/S (1)	1.89%	6.34%	3.26%	3.08%	0.79%	1.70%			2.84%	
1982 INCURRED (1)	5.63%	8.33%	3.73%	5.89%	2.47%	2.17%			4.71%	
1982 PAID (2)		2.87%	1.36%	1.73%	0.57%	1.20%	0.00%		1.29%	*
1982 PAID + Q/S (2)		4.53%	3.29%	0.19%	2.37%	2.51%	1.67%		2.63%	
1982 INCURRED (2)		2.86%	5.02%	2.24%	3.63%	4.76%	2.12%		3.44%	
1983 PAID	26,748,853	27,000,157	26,308,435	26,775,267	27,300,611	27,752,726				
1983 PAID + Q/S	29,150,110	30,095,659	29,651,909	32,196,701	32,726,003	32,518,373				
1983 INCURRED	29,353,828	30,821,381	29,475,414	31,970,752	33,607,728	32,848,585				
1983 PAID (1)	3.62%	2.71%	5.20%	3.52%	1.63%				3.34%	*
1983 PAID + Q/S (1)	10.36%	7.45%	8.81%	0.99%	0.64%				5.65%	
1983 INCURRED (1)	10.64%	6.17%	10.27%	2.67%	2.31%				6.41%	
1983 PAID (2)		0.94%	2.56%	1.77%	1.96%	1.66%			1.78%	*
1983 PAID + Q/S (2)		3.24%	1.47%	8.58%	1.64%	0.63%			3.12%	
1983 INCURRED (2)		5.00%	4.37%	8.47%	5.12%	2.26%			5.04%	
1984 PAID	30,520,025	31,182,956	32,308,387	33,671,319	33,904,652					
1984 PAID + Q/S	32,612,462	35,153,352	37,765,883	38,233,500	39,079,608					
1984 INCURRED	33,946,504	35,136,824	37,985,033	39,706,405	40,009,182					
1984 PAID (1)	9.98%	8.03%	4.71%	0.69%					5.85%	*
1984 PAID + Q/S (1)	16.55%	10.05%	3.36%	2.17%					8.03%	
1984 INCURRED (1)	15.15%	12.18%	5.06%	0.78%					8.29%	
1984 PAID (2)		2.17%	3.61%	4.22%	0.69%				2.67%	*
1984 PAID + Q/S (2)		7.79%	7.43%	1.24%	2.21%				4.67%	
1984 INCURRED (2)		3.51%	8.11%	4.53%	0.76%				4.23%	

NOTES: (1) ABSOLUTE DEVIATION FROM LAST PROJECTION (OR REPORT), RATIOED TO SAME.
(2) ABSOLUTE CHANGE RELATIVE TO PRIOR PROJECTION OR REPORT.
WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.
LOSSES HAVE BEEN RESTATED TO THE LATEST DIAGONAL.

N-4 0.0000
N-3 0.0000
N-2 0.5000
N-1 0.5000

WEIGHTS ASSIGNED TO
PRECEDING YEARS:

08:35 AM
03/14/91

NATIONAL COUNCIL ON COMPENSATION INSURANCE
NEBRASKA INDEMNITY COMPARISON OF PROJECTIONS RESTATED TO INCURRED LEVEL

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	RESTATED 8TH	AVERAGE	*=LOW AVG
1978 PAID				24,749,938	24,530,795	23,838,765	24,377,774	24,167,005		
1978 PAID + Q/S				23,374,174	23,710,243	24,186,664	23,318,043	23,775,163		
1978 INCURRED				23,528,165	23,515,339	24,061,107	23,251,065	23,718,751		
1978 PAID (1)				2.41%	1.51%	1.36%	0.87%		1.54%	
1978 PAID + Q/S (1)				1.69%	0.27%	1.73%	1.92%		1.40%	
1978 INCURRED (1)				0.80%	0.86%	1.44%	1.97%		1.27%	*
1978 PAID (2)					0.89%	2.82%	2.26%	0.86%	1.71%	*
1978 PAID + Q/S (2)					1.44%	2.01%	3.59%	1.96%	2.25%	
1978 INCURRED (2)					0.05%	2.32%	3.37%	2.01%	1.94%	
1979 PAID			27,868,439	27,828,562	27,443,577	27,969,633	27,898,527	26,651,262		
1979 PAID + Q/S			27,062,861	27,024,428	27,189,547	25,991,468	25,272,960	26,287,295		
1979 INCURRED			27,397,854	26,614,210	27,047,668	25,966,602	25,236,811	26,323,136		
1979 PAID (1)			4.57%	4.42%	2.97%	4.95%	4.68%		4.32%	
1979 PAID + Q/S (1)			2.95%	2.80%	3.43%	1.13%	3.86%		2.85%	
1979 INCURRED (1)			4.08%	1.11%	2.75%	1.35%	4.13%		2.68%	*
1979 PAID (2)				0.14%	1.38%	1.92%	0.25%	4.47%	1.63%	*
1979 PAID + Q/S (2)				0.14%	0.61%	4.41%	2.76%	4.01%	2.39%	
1979 INCURRED (2)				2.86%	1.63%	4.00%	2.81%	4.30%	3.12%	
1980 PAID		29,814,473	29,491,168	29,355,603	29,537,514	29,533,326	27,768,138	27,518,259		
1980 PAID + Q/S		29,365,776	28,682,156	29,120,335	27,660,774	27,170,954	28,166,311	27,648,487		
1980 INCURRED		29,820,353	28,109,967	29,020,997	27,731,536	27,055,605	28,092,884	27,654,052		
1980 PAID (1)		8.34%	7.17%	6.68%	7.34%	7.32%	0.91%		6.29%	
1980 PAID + Q/S (1)		6.21%	3.74%	5.32%	0.04%	1.73%	1.87%		3.15%	
1980 INCURRED (1)		7.85%	1.65%	4.94%	0.28%	2.16%	1.59%		3.08%	*
1980 PAID (2)			1.08%	0.46%	0.62%	0.01%	5.98%	0.90%	1.51%	*
1980 PAID + Q/S (2)			2.33%	1.53%	5.01%	1.77%	3.66%	1.84%	2.69%	
1980 INCURRED (2)			5.74%	3.24%	4.44%	2.44%	3.85%	1.56%	3.54%	
1981 PAID	30,582,413	30,855,837	30,852,986	30,998,846	30,613,774	29,265,841	29,231,494	28,926,890		
1981 PAID + Q/S	29,886,226	29,337,478	28,927,412	27,814,352	27,504,543	27,650,427	28,600,497	28,409,098		
1981 INCURRED	30,367,544	28,430,148	28,601,466	27,896,804	27,207,545	27,615,641	28,593,311	28,409,943		
1981 PAID (1)	5.72%	6.67%	6.66%	7.16%	5.85%	1.17%	1.05%		4.90%	
1981 PAID + Q/S (1)	5.20%	3.27%	1.82%	2.09%	3.18%	2.67%	0.67%		2.70%	
1981 INCURRED (1)	6.89%	0.07%	0.67%	1.81%	4.23%	2.80%	0.65%		2.45%	*
1981 PAID (2)		0.89%	0.01%	0.47%	1.24%	4.40%	0.12%	1.04%	1.17%	*
1981 PAID + Q/S (2)		1.84%	1.40%	3.85%	1.11%	0.53%	3.44%	0.67%	1.83%	
1981 INCURRED (2)		6.38%	0.60%	2.46%	2.47%	1.50%	3.54%	0.64%	2.51%	
1982 PAID	30,292,083	30,950,164	32,019,368	31,263,190	30,128,110	29,543,120	29,148,791			
1982 PAID + Q/S	27,598,765	26,359,701	27,174,199	27,098,271	27,711,197	28,450,596	27,981,112			
1982 INCURRED	27,109,573	26,334,485	27,655,665	27,035,137	28,016,897	29,350,957	28,727,725			
1982 PAID (1)	3.92%	6.18%	9.85%	7.25%	3.36%	1.35%			5.32%	
1982 PAID + Q/S (1)	1.37%	5.79%	2.88%	3.16%	0.96%	1.68%			2.64%	*
1982 INCURRED (1)	5.63%	8.33%	3.73%	5.89%	2.47%	2.17%			4.71%	
1982 PAID (2)		2.17%	3.45%	2.36%	3.63%	1.94%	1.33%		2.48%	
1982 PAID + Q/S (2)		4.49%	3.07%	2.28%	2.26%	2.67%	1.65%		2.41%	*
1982 INCURRED (2)		2.86%	5.02%	2.24%	3.63%	4.76%	2.12%		3.44%	
1983 PAID	32,325,710	33,302,137	32,240,820	31,802,863	32,184,885	32,281,065				
1983 PAID + Q/S	29,382,815	30,278,094	29,692,677	32,208,262	32,788,987	32,588,484				
1983 INCURRED	29,353,828	30,821,381	29,475,414	31,970,752	33,607,728	32,848,585				
1983 PAID (1)	0.14%	3.16%	0.12%	1.48%	0.30%				1.04%	*
1983 PAID + Q/S (1)	9.84%	7.09%	8.89%	1.17%	0.62%				5.52%	
1983 INCURRED (1)	10.64%	6.17%	10.27%	2.67%	2.31%				6.41%	
1983 PAID (2)		3.02%	3.19%	1.36%	1.20%	0.30%			1.81%	*
1983 PAID + Q/S (2)		3.05%	1.95%	8.47%	1.80%	0.61%			3.17%	
1983 INCURRED (2)		5.00%	4.37%	8.47%	5.12%	2.26%			5.04%	
1984 PAID	37,643,561	38,214,515	38,374,937	39,695,358	39,436,786					
1984 PAID + Q/S	32,810,153	35,201,684	37,779,444	38,307,084	39,163,865					
1984 INCURRED	33,946,504	35,136,824	37,985,033	39,706,405	40,009,182					
1984 PAID (1)	4.55%	3.10%	2.69%	0.66%					2.75%	*
1984 PAID + Q/S (1)	16.22%	10.12%	3.53%	2.19%					8.02%	
1984 INCURRED (1)	15.15%	12.18%	5.06%	0.76%					8.29%	
1984 PAID (2)		1.52%	0.42%	3.44%	0.65%				1.51%	*
1984 PAID + Q/S (2)		7.29%	7.32%	1.40%	2.24%				4.56%	
1984 INCURRED (2)		3.51%	8.11%	4.53%	0.76%				4.23%	

NOTES: (1) ABSOLUTE DEVIATION FROM LAST PROJECTION (OR REPORT), RATIOTED TO SAME.
 (2) ABSOLUTE CHANGE RELATIVE TO PRIOR PROJECTION OR REPORT.
 WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.
 LOSSES RESTATED TO INCURRED LEVEL OF 8TH REPORT, AND TO LAST DIAGONAL.

WEIGHTS ASSIGNED TO PRECEDING YEARS:
 N-4 0.0000
 N-3 0.0000
 N-2 0.5000
 N-1 0.5000

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03/14/91

NATIONAL COUNCIL ON COMPENSATION INSURANCE

INDEMNITY COMPARISON OF PROJECTIONS - AVERAGE DEVIATION FROM LAST PROJECTION

	UTAH A	NEBRKA A	MAINE A	NO ORLMA A	LOUIS'NA A	OREGON A	WISCONS A	CONN'CT A	MICHIGAN A	FLORIDA A	ILLINOIS A	TOT
1978 PAID	0.57% 1	0.90% 1	1.83% 1	0.24% 0	1.40% 0	0.63% 1	1.26% 1	0.76% 1	1.07% 0	2.62% 0	1.27% 1	7
1978 PAID+Q/S	1.22% 0	1.61% 0	4.00% 0	0.18% 1	0.94% 1	1.62% 0	2.30% 0	3.61% 0	0.81% 1	2.98% 0	1.38% 0	3
1978 INCURRED	1.06% 0	1.27% 0	3.80% 0	0.60% 0	1.70% 0	1.76% 0	2.27% 0	4.64% 0	2.16% 0	1.27% 1	1.48% 0	1
1979 PAID	1.52% 1	1.14% 1	3.35% 1	1.11% 0	1.55% 0	1.83% 1	1.50% 1	1.16% 1	1.48% 0	9.12% 0	1.30% 0	6
1979 PAID+Q/S	1.58% 0	2.55% 0	4.37% 0	0.57% 1	1.15% 1	6.55% 0	2.40% 0	3.06% 0	1.31% 1	5.98% 1	0.98% 1	5
1979 INCURRED	1.72% 0	2.68% 0	4.08% 0	1.18% 0	1.39% 0	3.10% 0	2.34% 0	2.23% 0	1.61% 0	7.01% 0	1.32% 0	0
1980 PAID	1.26% 1	2.80% 1	5.53% 0	0.69% 1	0.83% 1	1.79% 1	1.52% 1	0.96% 1	1.60% 1	12.66% 0	2.73% 0	8
1980 PAID+Q/S	1.67% 0	2.96% 0	5.65% 0	0.85% 0	1.42% 0	11.24% 0	2.58% 0	4.06% 0	1.61% 0	10.43% 1	0.74% 1	2
1980 INCURRED	2.00% 0	3.08% 0	5.43% 1	0.78% 0	1.10% 0	6.37% 0	2.99% 0	3.42% 0	1.97% 0	11.78% 0	1.00% 0	1
1981 PAID	4.56% 1	1.18% 1	12.08% 1	1.56% 1	2.54% 1	1.84% 1	1.55% 1	0.93% 1	3.20% 0	12.89% 0	4.26% 0	8
1981 PAID+Q/S	8.67% 0	2.51% 0	13.66% 0	3.24% 0	2.73% 0	13.29% 0	4.31% 0	2.27% 0	2.96% 1	9.67% 1	3.01% 1	3
1981 INCURRED	9.80% 0	2.45% 0	13.48% 0	2.83% 0	3.58% 0	6.12% 0	4.12% 0	1.35% 0	3.24% 0	12.02% 0	3.25% 0	0
1982 PAID	3.39% 0	1.58% 1	15.73% 0	3.23% 1	3.87% 0	4.14% 1	4.55% 1	1.50% 1	5.17% 1	11.50% 0	6.75% 0	6
1982 PAID+Q/S	3.06% 1	2.84% 0	9.23% 1	4.23% 0	3.06% 1	11.39% 0	6.25% 0	1.98% 0	6.18% 0	4.69% 1	1.90% 1	5
1982 INCURRED	5.04% 0	4.71% 0	9.92% 0	7.73% 0	5.58% 0	4.76% 0	6.38% 0	5.31% 0	8.49% 0	8.01% 0	3.41% 0	0
1983 PAID	4.75% 1	3.34% 1	13.52% 0	2.52% 1	11.65% 0	3.57% 0	3.77% 1	2.35% 1	5.28% 1	10.47% 0	8.12% 0	6
1983 PAID+Q/S	7.82% 0	5.65% 0	4.42% 0	3.70% 0	10.52% 1	9.59% 0	5.43% 0	3.08% 0	6.34% 0	8.30% 1	3.49% 1	3
1983 INCURRED	7.32% 0	6.41% 0	3.70% 1	5.73% 0	11.04% 0	2.72% 1	5.24% 0	2.82% 0	7.83% 0	8.88% 0	4.29% 0	2
1984 PAID	2.28% 1	5.85% 1	9.03% 0	2.24% 1	12.76% 0	3.25% 1	2.94% 1	2.32% 0	5.31% 1	10.38% 0	8.35% 0	6
1984 PAID+Q/S	6.10% 0	8.03% 0	4.89% 0	3.30% 0	11.40% 0	12.15% 0	6.46% 0	1.17% 1	10.25% 0	8.37% 0	5.84% 0	1
1984 INCURRED	5.29% 0	8.29% 0	3.99% 1	5.92% 0	11.28% 1	5.04% 0	5.66% 0	4.52% 0	10.85% 0	7.91% 1	5.17% 1	4
TOTAL PAID	6	7	3	5	2	6	7	6	4	0	1	47
TOTAL PAID+Q/S	1	0	1	2	4	0	0	1	3	5	5	22
TOTAL INCURRED	0	0	3	0	1	1	0	0	0	2	1	8
DIST PAID	85.71%	100.00%	42.86%	71.43%	28.57%	85.71%	100.00%	85.71%	57.14%	0.00%	14.29%	61.04%
DIST PAID+Q/S	14.29%	0.00%	14.29%	28.57%	57.14%	0.00%	0.00%	14.29%	42.86%	71.43%	71.43%	28.57%
DIST INCURRED	0.00%	0.00%	42.86%	0.00%	14.29%	14.29%	0.00%	0.00%	0.00%	28.57%	14.29%	10.39%

NOTES: A. "1" IN THIS COLUMN INDICATES THE PROJECTION METHOD WITH THE LOWEST AVERAGE DEVIATION.

WEIGHTS N-4 0.0000
 ASSIGNED TO N-3 0.0000
 PRECEDING N-2 0.5000
 YEARS: N-1 0.5000

01:16 PM
 03/27/91

LOSSES HAVE BEEN RESTATED TO THE LATEST DIAGONAL.

NATIONAL COUNCIL ON COMPENSATION INSURANCE

INDEMNITY COMPARISON OF PROJECTIONS - AVERAGE DEVIATION FROM PRIOR PROJECTION

	UTAH A	NEBRKA A	MAINE A	NO ORLNA A	LOUIS'NA A	OREGON A	WISCONSIN A	CONN'CT A	MICHIGAN A	FLORIDA A	ILLINOIS A	TOT
1978 PAID	0.68% 1	0.92% 1	2.27% 1	0.42% 0	0.90% 0	0.62% 1	1.10% 1	0.59% 1	0.95% 0	0.95% 1	1.34% 0	7
1978 PAID+Q/S	1.30% 0	2.27% 0	2.72% 0	0.28% 1	0.94% 0	1.51% 0	3.08% 0	4.01% 0	0.47% 1	1.58% 0	1.34% 0	2
1978 INCURRED	1.39% 0	1.94% 0	2.51% 0	0.45% 0	0.81% 1	2.31% 0	3.57% 0	3.05% 0	0.81% 0	1.04% 0	1.21% 1	2
1979 PAID	1.23% 1	0.91% 1	1.56% 1	0.55% 0	1.16% 0	0.94% 1	1.20% 1	0.93% 1	1.24% 0	3.97% 0	1.19% 0	6
1979 PAID+Q/S	2.12% 0	2.31% 0	3.18% 0	0.53% 1	1.01% 1	3.31% 0	3.00% 0	3.33% 0	0.57% 1	3.35% 0	0.92% 1	4
1979 INCURRED	2.55% 0	3.12% 0	3.15% 0	0.96% 0	1.13% 0	3.62% 0	3.50% 0	2.79% 0	1.18% 0	3.23% 1	1.43% 0	1
1980 PAID	1.00% 1	1.05% 1	2.45% 1	0.59% 0	0.56% 1	1.04% 1	1.48% 1	0.68% 1	1.35% 0	4.99% 0	1.38% 0	7
1980 PAID+Q/S	1.41% 0	2.65% 0	4.44% 0	0.57% 1	1.15% 0	6.62% 0	3.65% 0	4.24% 0	1.15% 1	4.96% 1	0.75% 1	4
1980 INCURRED	1.67% 0	3.54% 0	4.22% 0	1.26% 0	0.58% 0	3.37% 0	4.14% 0	3.76% 0	1.87% 0	5.07% 0	1.09% 0	0
1981 PAID	2.07% 1	1.15% 1	4.63% 1	1.22% 0	1.25% 1	1.43% 1	0.90% 1	0.84% 1	1.80% 0	5.87% 0	1.89% 0	7
1981 PAID+Q/S	3.44% 0	1.77% 0	6.22% 0	1.06% 1	1.77% 0	7.94% 0	4.10% 0	3.21% 0	1.18% 1	5.58% 1	1.16% 1	4
1981 INCURRED	4.02% 0	2.51% 0	5.85% 0	1.18% 0	2.03% 0	3.01% 0	4.63% 0	2.15% 0	1.59% 0	6.85% 0	1.61% 0	0
1982 PAID	3.08% 1	1.29% 1	6.53% 0	1.00% 1	2.07% 0	1.79% 1	1.88% 1	1.67% 1	2.45% 0	5.71% 0	2.45% 0	6
1982 PAID+Q/S	3.40% 0	2.43% 0	6.05% 1	1.70% 0	1.85% 1	8.81% 0	4.58% 0	2.45% 0	1.53% 1	2.86% 1	1.42% 1	5
1982 INCURRED	5.46% 0	3.44% 0	6.25% 0	2.96% 0	1.91% 0	3.96% 0	4.45% 0	2.83% 0	2.80% 0	5.22% 0	1.84% 0	0
1983 PAID	3.13% 1	1.78% 1	8.74% 0	1.63% 1	5.03% 1	3.79% 0	2.55% 1	2.19% 1	2.29% 0	6.68% 0	4.08% 0	6
1983 PAID+Q/S	4.91% 0	3.12% 0	5.36% 0	2.24% 0	5.59% 0	8.17% 0	5.63% 0	2.69% 0	2.02% 1	3.90% 1	1.60% 1	3
1983 INCURRED	4.63% 0	5.04% 0	4.26% 1	3.87% 0	6.20% 0	1.13% 1	5.53% 0	4.10% 0	3.34% 0	4.40% 0	2.51% 0	2
1984 PAID	2.08% 1	2.67% 1	8.65% 0	0.82% 1	6.53% 1	4.69% 0	1.65% 1	1.10% 1	2.00% 1	7.72% 0	3.95% 0	7
1984 PAID+Q/S	5.85% 0	4.67% 0	4.42% 0	2.66% 0	7.44% 0	10.03% 0	4.29% 0	2.00% 0	4.45% 0	5.40% 1	3.45% 0	1
1984 INCURRED	4.28% 0	4.23% 0	3.35% 1	4.44% 0	7.36% 0	2.17% 1	3.30% 0	4.48% 0	4.99% 0	5.47% 0	2.80% 1	3
TOTAL PAID	7	7	4	3	4	5	7	7	1	1	0	46
TOTAL PAID+Q/S	0	0	1	4	2	0	0	0	6	5	5	23
TOTAL INCURRED	0	0	2	0	1	2	0	0	0	1	2	8
DIST PAID	100.00%	100.00%	57.14%	42.86%	57.14%	71.43%	100.00%	100.00%	14.29%	14.29%	0.00%	59.74%
DIST PAID+Q/S	0.00%	0.00%	14.29%	57.14%	28.57%	0.00%	0.00%	0.00%	85.71%	71.43%	71.43%	29.87%
DIST INCURRED	0.00%	0.00%	28.57%	0.00%	14.29%	28.57%	0.00%	0.00%	0.00%	14.29%	28.57%	10.39%

NOTES: A. *1* IN THIS COLUMN INDICATES THE PROJECTION METHOD WITH THE LOWEST AVERAGE DEVIATION.

WEIGHTS N-4 0.0000
 ASSIGNED TO N-3 0.0000
 PRECEDING N-2 0.5000
 YEARS: N-1 0.5000

01:16 PM
 03/27/91

LOSSES HAVE BEEN RESTATED TO THE LATEST DIAGONAL.

NATIONAL COUNCIL ON COMPENSATION INSURANCE

INDEMNITY COMPARISON OF PROJECTIONS RESTATED TO INCURRED LEVEL - AVERAGE DEVIATION FROM LAST PROJECTION

	UTAH A	NEBRKA A	MAINE A	NO ORLA A	LOUIS'NA A	OREGON A	WISCONS A	CONN'CT A	MICHIGAN A	FLORIDA A	ILLINOIS A	TOT
1978 PAID	1.07% 0	1.54% 0	3.80% 1	1.57% 0	1.70% 1	5.57% 0	3.40% 0	1.43% 1	1.06% 1	1.89% 0	0.41% 1	5
1978 PAID+Q/S	1.09% 0	1.40% 0	4.00% 0	0.44% 1	1.70% 0	3.70% 0	2.10% 1	4.05% 0	1.51% 0	1.61% 0	1.33% 0	2
1978 INCURRED	1.06% 1	1.27% 1	3.80% 0	0.60% 0	1.70% 0	1.76% 1	2.27% 0	4.64% 0	2.16% 0	1.27% 1	1.48% 0	4
1979 PAID	3.26% 0	4.32% 0	3.06% 1	1.43% 0	1.15% 0	4.38% 0	3.22% 0	1.73% 1	1.93% 0	12.41% 0	1.22% 0	2
1979 PAID+Q/S	1.52% 1	2.83% 0	4.38% 0	0.36% 1	0.82% 1	7.09% 0	2.22% 1	3.38% 0	1.97% 0	4.84% 1	0.79% 1	6
1979 INCURRED	1.72% 0	2.68% 1	4.08% 0	1.18% 0	1.39% 0	3.10% 1	2.34% 0	2.23% 0	1.61% 1	7.01% 0	1.32% 0	3
1980 PAID	4.47% 0	6.29% 0	4.73% 1	1.05% 0	1.79% 0	4.23% 1	2.96% 0	3.66% 0	2.19% 0	19.93% 0	3.23% 0	2
1980 PAID+Q/S	1.43% 1	3.15% 0	5.74% 0	0.70% 1	1.68% 0	11.02% 0	2.61% 1	4.34% 0	1.88% 1	11.09% 1	0.70% 1	6
1980 INCURRED	2.00% 0	3.08% 1	5.43% 0	0.78% 0	1.10% 1	6.37% 0	2.99% 0	3.42% 1	1.97% 0	11.78% 0	1.00% 0	3
1981 PAID	11.98% 0	4.90% 0	12.88% 1	1.23% 1	1.51% 1	4.67% 1	1.96% 1	2.81% 0	3.31% 0	19.87% 0	5.01% 0	5
1981 PAID+Q/S	8.26% 1	2.70% 0	13.86% 0	3.04% 0	2.45% 0	12.91% 0	4.18% 0	2.51% 0	3.05% 1	10.23% 1	3.05% 1	4
1981 INCURRED	9.80% 0	2.45% 1	13.48% 0	2.83% 0	3.58% 0	6.12% 0	4.12% 0	1.35% 1	3.24% 0	12.02% 0	3.25% 0	2
1982 PAID	8.81% 0	5.32% 0	16.97% 0	3.66% 1	2.73% 1	1.15% 1	4.57% 1	3.12% 0	5.32% 1	18.32% 0	7.07% 0	5
1982 PAID+Q/S	2.65% 1	2.64% 1	9.46% 1	4.08% 0	2.86% 0	10.90% 0	6.14% 0	2.21% 1	6.30% 0	4.84% 1	1.83% 1	6
1982 INCURRED	5.04% 0	4.71% 0	9.92% 0	7.73% 0	5.58% 0	4.76% 0	6.38% 0	5.31% 0	8.49% 0	8.01% 0	3.41% 0	0
1983 PAID	11.43% 0	1.04% 1	14.63% 0	2.77% 1	10.16% 1	3.35% 0	4.22% 1	4.02% 0	5.43% 1	16.67% 0	8.40% 0	5
1983 PAID+Q/S	7.56% 0	5.52% 0	4.60% 0	3.63% 0	10.43% 0	9.31% 0	5.32% 0	3.16% 0	6.49% 0	9.26% 0	3.61% 1	1
1983 INCURRED	7.32% 1	6.41% 0	3.70% 1	5.73% 0	11.04% 0	2.72% 1	5.24% 0	2.82% 1	7.83% 0	8.88% 1	4.29% 0	5
1984 PAID	7.45% 0	2.75% 1	10.45% 0	2.53% 1	11.36% 0	3.03% 1	3.46% 1	4.28% 0	5.53% 1	16.45% 0	8.69% 0	5
1984 PAID+Q/S	5.97% 0	8.02% 0	5.10% 0	3.34% 0	11.42% 0	11.76% 0	6.37% 0	1.26% 1	10.47% 0	9.43% 0	6.03% 0	1
1984 INCURRED	5.29% 1	8.29% 0	3.99% 1	5.92% 0	11.28% 1	5.04% 0	5.66% 0	4.52% 0	10.85% 0	7.91% 1	5.17% 1	5
TOTAL PAID	0	2	4	4	4	4	4	2	4	0	1	29
TOTAL PAID+Q/S	4	1	1	3	1	0	3	2	2	4	5	26
TOTAL INCURRED	3	4	2	0	2	3	0	3	1	3	1	22
DIST PAID	0.00%	28.57%	57.14%	57.14%	57.14%	57.14%	57.14%	28.57%	57.14%	0.00%	14.29%	37.66%
DIST PAID+Q/S	57.14%	14.29%	14.29%	42.86%	14.29%	0.00%	42.86%	28.57%	28.57%	57.14%	71.43%	33.77%
DIST INCURRED	42.86%	57.14%	28.57%	0.00%	28.57%	42.86%	0.00%	42.86%	14.29%	42.86%	14.29%	28.57%

NOTES: A. "1" IN THIS COLUMN INDICATES THE PROJECTION METHOD WITH THE LOWEST AVERAGE DEVIATION. LOSSES HAVE BEEN RESTATED TO THE LATEST DIAGONAL. PROJECTIONS HAVE BEEN RESTATED TO THE INCURRED LEVEL.

WEIGHTS N-4 0.0000
 ASSIGNED TO N-3 0.0000
 PRECEDING N-2 0.5000
 YEARS: N-1 0.5000

01:59 PM
 03/27/91

NATIONAL COUNCIL ON COMPENSATION INSURANCE

INDEMNITY COMPARISON OF PROJECTIONS RESTATED TO INCURRED LEVEL - AVERAGE DEVIATION FROM PRIOR PROJECTION

	UTAH A	NEBRKA A	MAINE A	NO ORLNA A	LOUIS'NA A	OREGON A	WISCONS A	CONN'CT A	MICHIGAN A	FLORIDA A	ILLINOIS A	TOT
1978 PAID	0.74% 1	1.71% 1	3.33% 0	1.27% 0	1.64% 0	1.95% 0	2.52% 1	1.74% 1	1.09% 0	0.82% 1	0.38% 1	6
1978 PAID+Q/S	1.47% 0	2.25% 0	2.79% 0	0.29% 1	1.10% 0	1.61% 1	3.19% 0	4.26% 0	0.62% 1	1.31% 0	1.20% 0	3
1978 INCURRED	1.39% 0	1.94% 0	2.51% 1	0.45% 0	0.81% 1	2.31% 0	3.57% 0	3.05% 0	0.81% 0	1.04% 0	1.21% 0	2
1979 PAID	1.53% 1	1.63% 1	2.80% 1	0.99% 0	1.34% 0	1.54% 1	2.29% 1	1.78% 1	1.41% 0	4.76% 0	0.49% 1	7
1979 PAID+Q/S	1.93% 0	2.39% 0	3.22% 0	0.45% 1	0.93% 1	3.46% 0	3.10% 0	3.52% 0	0.69% 1	3.04% 1	0.87% 0	4
1979 INCURRED	2.55% 0	3.12% 0	3.15% 0	0.96% 0	1.13% 0	3.62% 0	3.50% 0	2.79% 0	1.18% 0	3.23% 0	1.43% 0	0
1980 PAID	1.72% 0	1.51% 1	2.72% 1	0.88% 0	1.16% 0	1.71% 1	2.09% 1	2.44% 1	1.61% 0	6.66% 0	0.97% 0	5
1980 PAID+Q/S	1.48% 1	2.69% 0	4.54% 0	0.57% 1	1.04% 0	6.29% 0	3.67% 0	4.54% 0	1.40% 1	4.99% 1	0.74% 1	5
1980 INCURRED	1.67% 0	3.54% 0	4.22% 0	1.26% 0	0.58% 1	3.37% 0	4.14% 0	3.76% 0	1.87% 0	5.07% 0	1.09% 0	1
1981 PAID	3.51% 0	1.17% 1	4.49% 1	1.32% 0	1.50% 1	2.11% 1	1.61% 1	2.14% 1	1.95% 0	7.47% 0	1.60% 0	6
1981 PAID+Q/S	3.24% 1	1.83% 0	6.31% 0	0.99% 1	1.91% 0	7.67% 0	4.13% 0	3.48% 0	1.27% 1	5.53% 1	1.14% 1	5
1981 INCURRED	4.02% 0	2.51% 0	5.85% 0	1.18% 0	2.03% 0	3.01% 0	4.63% 0	2.15% 0	1.59% 0	6.85% 0	1.61% 0	0
1982 PAID	4.64% 0	2.48% 0	6.24% 0	1.47% 1	2.04% 0	1.20% 1	1.74% 1	3.17% 0	2.38% 0	7.49% 0	2.56% 0	3
1982 PAID+Q/S	3.30% 1	2.41% 1	6.18% 1	1.63% 0	1.86% 1	8.49% 0	4.49% 0	2.70% 1	1.51% 1	2.28% 1	1.42% 1	8
1982 INCURRED	5.46% 0	3.44% 0	6.25% 0	2.96% 0	1.91% 0	3.96% 0	4.45% 0	2.83% 0	2.80% 0	5.22% 0	1.84% 0	0
1983 PAID	4.71% 0	1.81% 1	8.10% 0	2.12% 1	4.62% 1	2.83% 0	2.57% 1	3.66% 0	2.66% 0	8.44% 0	4.07% 0	4
1983 PAID+Q/S	4.69% 0	3.17% 0	5.49% 0	2.17% 0	5.50% 0	8.05% 0	5.51% 0	3.01% 1	2.04% 1	3.66% 1	1.56% 1	4
1983 INCURRED	4.63% 1	5.04% 0	4.26% 1	3.87% 0	6.20% 0	1.13% 1	5.53% 0	4.10% 0	3.34% 0	4.40% 0	2.51% 0	3
1984 PAID	3.43% 1	1.51% 1	9.15% 0	1.04% 1	5.75% 1	3.84% 0	1.87% 1	2.55% 0	2.51% 1	10.55% 0	4.01% 0	6
1984 PAID+Q/S	5.68% 0	4.56% 0	4.60% 0	2.60% 0	7.38% 0	10.19% 0	4.15% 0	2.40% 1	4.41% 0	5.46% 1	3.41% 0	2
1984 INCURRED	4.28% 0	4.23% 0	3.35% 1	4.44% 0	7.36% 0	2.17% 1	3.30% 0	4.48% 0	4.99% 0	5.47% 0	2.80% 1	3
TOTAL PAID	3	6	3	3	3	4	7	4	1	1	2	37
TOTAL PAID+Q/S	3	1	1	4	2	1	0	3	6	6	4	31
TOTAL INCURRED	1	0	3	0	2	2	0	0	0	0	1	9
DIST PAID	42.86%	85.71%	42.86%	42.86%	42.86%	57.14%	100.00%	57.14%	14.29%	14.29%	28.57%	48.05%
DIST PAID+Q/S	42.86%	14.29%	14.29%	57.14%	28.57%	14.29%	0.00%	42.86%	85.71%	85.71%	57.14%	40.26%
DIST INCURRED	14.29%	0.00%	42.86%	0.00%	28.57%	28.57%	0.00%	0.00%	0.00%	0.00%	14.29%	11.69%

NOTES: A. "1" IN THIS COLUMN INDICATES THE PROJECTION METHOD WITH THE LOWEST AVERAGE DEVIATION. LOSSES HAVE BEEN RESTATED TO THE LATEST DIAGONAL. PROJECTIONS HAVE BEEN RESTATED TO THE INCURRED LEVEL.

WEIGHTS
ASSIGNED TO
PRECEDING
YEARS:

N-4 0.0000
N-3 0.0000
N-2 0.5000
N-1 0.5000

01:59 PM
03/27/91

NATIONAL COUNCIL ON COMPENSATION INSURANCE
PAID INDEMNITY
COMPARISON OF PROJECTIONS (1)

	POLICY YEAR	FROM 1st REPORT	DEVIATION(2)	FROM 2nd REPORT	DEVIATION(2)	FROM 3rd REPORT	DEVIATION(2)	FROM LAST REPORT
UTAH	1981	21,233,599	5.88%	21,613,987	4.19%	20,724,654	8.14%	22,560,380
	1982	23,241,569	-5.95%	20,525,429	6.43%	21,155,598	3.56%	21,935,986
	1983	23,174,003	12.72%	24,892,825	6.25%	25,506,494	3.94%	26,551,870
	1984	31,051,613	4.88%	32,284,985	1.10%	33,138,392	-1.51%	32,644,971
VARIANCE FOR UTAH			0.004		0.000		0.001	
NEBRASKA	1981	24,638,786	0.93%	25,358,344	-1.97%	25,530,205	-2.66%	24,869,069
	1982	24,895,032	0.66%	25,610,617	-2.20%	25,960,135	-3.59%	25,059,842
	1983	26,748,853	3.62%	27,000,157	2.71%	26,308,435	5.20%	27,752,726
	1984	30,520,025	9.98%	31,182,956	8.03%	32,308,387	4.71%	33,904,652
VARIANCE FOR NEBRASKA			0.001		0.002		0.002	
MAINE	1981	93,716,053	17.86%	88,175,387	22.71%	91,671,377	19.65%	114,086,276
	1982	87,549,924	31.30%	92,898,088	27.10%	101,225,471	20.57%	127,438,950
	1983	104,846,202	31.53%	117,888,666	23.01%	138,714,862	9.41%	153,130,494
	1984	126,796,848	22.05%	146,634,735	9.86%	162,450,260	0.13%	162,667,233
VARIANCE FOR MAINE			0.004		0.004		0.007	
NORTH CAROLINA	1981	69,134,979	-7.31%	65,177,565	-1.16%	64,118,685	0.48%	64,428,312
	1982	63,027,328	5.76%	63,176,894	5.54%	64,752,260	3.18%	66,882,319
	1983	74,012,690	7.69%	77,982,387	2.74%	79,359,674	1.02%	80,177,606
	1984	94,696,793	3.23%	95,091,438	2.82%	95,624,969	2.28%	97,852,724
VARIANCE FOR NORTH CAROLINA			0.003		0.001		0.000	
LOUISIANA	1981	187,654,146	5.41%	194,686,704	1.87%	192,876,163	2.78%	198,391,708
	1982	189,348,325	4.75%	183,711,834	7.58%	189,919,431	4.46%	198,789,361
	1983	148,924,752	21.63%	155,700,481	18.07%	165,554,689	12.88%	190,033,470
	1984	164,430,832	22.21%	173,427,993	17.95%	192,021,202	9.16%	211,376,302
VARIANCE FOR LOUISIANA			0.007		0.005		0.002	
OREGON	1981	107,524,378	7.69%	114,489,165	1.71%	114,864,629	1.39%	116,486,292
	1982	104,567,039	8.37%	105,548,293	7.51%	109,448,955	4.09%	114,113,039
	1983	130,977,112	10.77%	142,596,977	2.86%	147,639,204	-0.58%	146,792,048
	1984	168,659,290	6.75%	180,282,458	0.32%	190,378,496	-5.26%	180,868,714
VARIANCE FOR OREGON			0.000		0.001		0.001	
WISCONSIN	1981	94,666,724	0.93%	92,935,039	2.74%	92,168,564	3.55%	95,557,729
	1982	91,739,487	10.49%	93,338,198	8.93%	98,278,562	4.11%	102,486,188
	1983	100,766,729	11.62%	109,583,243	3.89%	112,183,320	1.61%	114,015,539
	1984	127,194,429	6.30%	132,207,684	2.61%	132,972,580	2.05%	135,749,964
VARIANCE FOR WISCONSIN			0.002		0.001		0.000	
CONNECTICUT	1981	110,611,504	-0.22%	108,412,495	1.77%	108,858,829	1.37%	110,365,626
	1982	111,929,846	3.62%	114,288,663	1.59%	117,818,126	-1.45%	116,139,602
	1983	128,995,523	6.21%	135,297,458	1.63%	132,586,388	3.60%	137,535,502
	1984	158,660,884	4.26%	159,644,550	3.67%	164,027,332	1.02%	165,722,362
VARIANCE FOR CONNECTICUT			0.001		0.000		0.000	
MICHIGAN	1981	226,092,231	-0.56%	214,316,986	4.67%	212,069,168	5.67%	224,827,079
	1982	201,526,779	6.48%	193,683,059	10.12%	203,359,851	5.63%	215,480,951
	1983	232,487,623	8.56%	242,111,566	4.78%	239,323,481	5.87%	254,255,060
	1984	291,795,441	5.83%	289,985,814	6.42%	289,104,743	6.70%	309,863,903
VARIANCE FOR MICHIGAN			0.001		0.000		0.000	
FLORIDA	1981	150,591,753	32.53%	172,102,332	22.89%	186,155,687	16.59%	223,185,064
	1982	173,296,284	28.04%	194,480,578	19.24%	210,621,572	12.54%	240,816,395
	1983	217,792,760	25.90%	245,431,203	16.50%	271,126,426	7.76%	293,932,230
	1984	287,984,931	25.18%	337,038,158	12.44%	373,087,648	3.07%	384,908,389
VARIANCE FOR FLORIDA			0.001		0.001		0.003	
ILLINOIS	1981	320,546,548	4.71%	307,383,305	8.62%	312,781,676	7.02%	336,393,699
	1982	278,510,234	13.45%	284,199,307	11.69%	299,748,191	6.85%	321,803,399
	1983	303,395,960	17.96%	332,153,775	10.18%	343,336,900	7.16%	369,804,790
	1984	361,496,326	14.33%	375,272,368	11.06%	394,816,993	6.43%	421,953,771
VARIANCE FOR ILLINOIS			0.002		0.000		0.000	
AVERAGE DEVIATION			10.41%		7.74%		4.79%	
AVERAGE ABSOLUTE DEVIATION			11.05%		7.98%		5.47%	
AVERAGE OF WITHIN-STATE VARIANCES			0.002		0.001		0.001	

NOTES: (1) PROJECTIONS ARE TO EIGHTH REPORT.

(2) DEVIATIONS ARE RATIOED TO THE LAST REPORT. (POSITIVE VALUES INDICATE THAT THE PROJECTION UNDERESTIMATES THE EIGHTH OR LATEST REPORT.)

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03/28/91

NATIONAL COUNCIL ON COMPENSATION INSURANCE
PAID INDEMNITY
COMPARISON OF PROJECTIONS RESTATED TO INCURRED LEVEL (1)

	POLICY YEAR	FROM 1st REPORT	DEVIATION(2)	FROM 2nd REPORT	DEVIATION(2)	FROM 3rd REPORT	DEVIATION(2)	FROM LAST REPORT
UTAH	1981	21,857,500	14.87%	22,397,476	12.77%	21,497,768	16.27%	25,676,553
	1982	24,084,056	3.53%	21,291,111	14.72%	22,122,583	11.39%	24,965,914
	1983	24,038,488	20.45%	26,030,632	13.86%	26,628,104	11.88%	30,219,371
	1984	32,470,927	12.60%	33,704,669	9.28%	35,133,289	5.44%	37,154,087
VARIANCE FOR UTAH			0.004		0.000		0.001	
NEBRASKA	1981	30,582,413	-5.72%	30,855,837	-6.67%	30,852,986	-6.66%	28,926,890
	1982	30,292,083	-3.92%	30,950,164	-6.18%	32,019,368	-9.85%	29,148,791
	1983	32,325,710	-0.14%	33,302,137	-3.16%	32,240,820	0.12%	32,281,065
	1984	37,643,561	4.55%	38,214,515	3.10%	38,374,937	2.69%	39,436,786
VARIANCE FOR NEBRASKA			0.002		0.002		0.003	
MAINE	1981	122,034,320	15.68%	113,787,138	21.37%	116,440,935	19.54%	144,720,949
	1982	112,980,000	30.11%	117,999,103	27.01%	122,652,852	24.13%	161,659,108
	1983	133,175,591	31.44%	142,843,308	26.46%	171,516,284	11.70%	194,249,397
	1984	153,637,171	25.54%	181,308,942	12.13%	203,002,008	1.62%	206,346,960
VARIANCE FOR MAINE			0.004		0.004		0.007	
NORTH CAROLINA	1981	72,016,601	-4.14%	69,019,025	0.20%	68,743,566	0.60%	69,155,860
	1982	66,742,056	7.03%	67,733,843	5.65%	69,970,994	2.53%	71,789,934
	1983	79,351,225	7.80%	84,267,408	2.08%	85,447,116	0.71%	86,060,788
	1984	102,328,919	2.57%	102,385,616	2.52%	101,603,865	3.26%	105,032,851
VARIANCE FOR NORTH CAROLINA			0.002		0.000		0.000	
LOUISIANA	1981	211,716,383	5.53%	220,449,532	1.64%	222,336,897	0.79%	224,116,223
	1982	214,404,726	4.52%	211,772,769	5.70%	221,044,153	1.57%	224,565,438
	1983	171,672,158	20.03%	181,217,270	15.58%	189,883,543	11.55%	214,674,212
	1984	191,378,385	19.85%	198,913,857	16.70%	220,970,645	7.46%	238,784,468
VARIANCE FOR LOUISIANA			0.006		0.004		0.002	
OREGON	1981	143,296,271	-4.18%	151,093,056	-9.84%	147,194,513	-7.01%	137,552,656
	1982	137,998,679	-2.41%	135,255,994	-0.38%	137,001,964	-1.67%	134,750,203
	1983	167,842,027	3.17%	178,494,768	-2.97%	180,294,129	-4.01%	173,339,160
	1984	211,118,087	1.15%	220,157,437	-3.08%	229,331,097	-7.38%	213,578,538
VARIANCE FOR OREGON			0.001		0.001		0.001	
WISCONSIN	1981	108,563,026	-3.93%	104,038,532	0.40%	100,608,711	3.68%	104,454,245
	1982	102,700,141	8.33%	101,885,452	9.05%	106,506,930	4.93%	112,027,751
	1983	109,994,235	11.74%	118,758,095	4.71%	122,157,627	1.98%	124,630,495
	1984	137,843,776	7.11%	143,962,372	2.98%	144,662,329	2.51%	148,388,416
VARIANCE FOR WISCONSIN			0.003		0.001		0.000	
CONNECTICUT	1981	133,316,079	2.48%	131,263,218	3.99%	134,648,677	1.51%	136,711,428
	1982	135,521,942	5.80%	141,364,898	1.74%	145,496,478	-1.13%	143,863,732
	1983	159,555,974	6.35%	167,082,131	1.93%	158,731,718	6.83%	170,367,130
	1984	195,934,197	4.55%	191,125,605	6.90%	194,061,435	5.47%	205,282,583
VARIANCE FOR CONNECTICUT			0.000		0.000		0.001	
MICHIGAN	1981	272,243,929	-0.43%	257,932,292	4.85%	256,098,547	5.52%	271,070,627
	1982	242,539,171	6.64%	233,895,150	9.97%	246,680,277	5.05%	259,802,141
	1983	280,756,241	8.41%	293,687,017	4.20%	288,372,196	5.93%	306,551,501
	1984	353,954,726	5.26%	349,417,640	6.47%	346,069,990	7.37%	373,598,246
VARIANCE FOR MICHIGAN			0.001		0.001		0.000	
FLORIDA	1981	167,869,995	39.36%	192,915,158	30.32%	208,677,897	24.62%	276,852,087
	1982	194,253,498	34.97%	218,009,983	27.02%	235,113,103	21.29%	298,723,044
	1983	244,142,609	33.04%	273,970,473	24.86%	300,901,418	17.47%	364,611,099
	1984	321,472,439	32.67%	374,051,549	21.66%	432,153,139	9.49%	477,463,361
VARIANCE FOR FLORIDA			0.001		0.001		0.003	
ILLINOIS	1981	335,590,568	7.95%	330,913,241	9.23%	339,084,200	6.99%	364,573,945
	1982	299,829,960	14.03%	308,098,274	11.66%	324,125,939	7.06%	348,761,392
	1983	328,909,218	17.93%	359,166,986	10.38%	370,678,785	7.51%	400,783,937
	1984	390,895,891	14.52%	405,157,457	11.40%	425,712,371	6.91%	457,301,523
VARIANCE FOR ILLINOIS			0.001		0.000		0.000	
AVERAGE DEVIATION			10.61%		8.23%		5.63%	
AVERAGE ABSOLUTE DEVIATION			11.74%		9.70%		7.34%	
AVERAGE OF WITHIN-STATE VARIANCES			0.002		0.001		0.002	

NOTES: (1) PROJECTIONS ARE TO EIGHTH REPORT.

(2) DEVIATIONS ARE RATIOED TO THE LAST REPORT. (POSITIVE VALUES INDICATE THAT THE PROJECTION UNDERESTIMATES THE EIGHTH OR LATEST REPORT.)

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03/28/91

**PREMIUM AND LOSS
DEVELOPMENT FACTORS:
TECHNICAL APPENDIX**

STATE EXHIBITS

1. Connecticut
2. Florida
3. Illinois
4. Louisiana
5. Maine
6. Michigan
7. Nebraska
8. North Carolina
9. Oregon
10. Utah
11. Wisconsin

CONNECTICUT

NATIONAL COUNCIL ON COMPENSATION INSURANCE
ANALYSIS OF FACTOR SELECTION METHODS AND PROJECTION METHODS
STATE: CONNECTICUT

ORDER OF PRESENTATION FOR TESTS AND ANALYSIS

Premium: Development by Diagonal, Showing Variance

Premium: Tests of Minimum Average Squared Deviations

Indemnity: Paid - Development by Diagonal, Showing Variance

Indemnity: Paid - Tests of Minimum Average Squared Deviations

Indemnity: Paid+O/S - Development by Diagonal, Showing Variance

Indemnity: Paid+O/S - Tests of Minimum Average Squared Deviations

Indemnity: Incurred - Development by Diagonal, Showing Variance

Indemnity: Incurred - Tests of Minimum Average Squared Deviations

Medical: Paid - Development by Diagonal, Showing Variance

Medical: Paid - Tests of Minimum Average Squared Deviations

Medical: Paid+O/S - Development by Diagonal, Showing Variance

Medical: Paid+O/S - Tests of Minimum Average Squared Deviations

Medical: Incurred - Development by Diagonal, Showing Variance

Medical: Incurred - Tests of Minimum Average Squared Deviations

Indemnity: Comparison of Projections - Deviations by Loss Statistic Type

Indemnity: Comparison of Restated Projections - Deviations by Loss Statistic Type

Medical: Comparison of Projections - Deviations by Loss Statistic Type

Medical: Comparison of Restated Projections - Deviations by Loss Statistic Type

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: CONNECTICUT

PREMIUM - DEVELOPMENT DIAGONALS BY EVALUATION DATE

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH
1981	1.044	1.000	1.002	1.000
1982	1.053	1.000	1.000	1.000
1983	1.026	1.004	1.002	1.001
1984	1.076	1.004	1.001	1.000
1985	1.092	1.000	1.002	0.999
1986	1.081	1.008	1.002	1.000
1987	1.069	0.999	1.000	1.003
1988	1.039	1.005	0.998	1.006
1989	1.052	1.021	1.000	0.999
POINTS	9	9	9	9
AVERAGE	1.059	1.005	1.001	1.001
SAMPLE VARIANCE	0.000470	0.000047	0.000002	0.000005
SAMPLE COEFF OF VARIANCE	0.020	0.007	0.001	0.002

REGION: NORTHERN

PREMIUM - DEVELOPMENT DIAGONALS BY EVALUATION DATE

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH
1981				
1982	1.034	1.001	1.002	1.000
1983	1.027	1.004	1.000	1.001
1984	1.036	1.002	1.002	0.999
1985	1.049	1.000	1.000	0.999
1986	1.047	1.002	1.002	1.001
1987	1.039	0.999	0.999	1.004
1988	1.035	1.001	1.002	1.002
1989	1.043	1.003	1.000	1.000
POINTS	8	8	8	8
AVERAGE	1.039	1.002	1.001	1.001
SAMPLE VARIANCE	0.000053	0.000003	0.000002	0.000003
SAMPLE COEFF OF VARIANCE	0.007	0.002	0.001	0.002

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: CONNECTICUT PREMIUM - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.000659	0.000088	0.000003	0.000013	0.000763	
THREE-YEAR STRAIGHT AVERAGE	0.000789	0.000071	0.000003	0.000011	0.000875	
FOUR-YEAR STRAIGHT AVERAGE	0.000826	0.000079	0.000003	0.000010	0.000918	
TWO-YEAR EXPONENTIAL AVG	0.000632	0.000088	0.000003	0.000013	0.000735	*
THREE-YEAR EXPONENTIAL AVG	0.000743	0.000073	0.000003	0.000012	0.000830	
FOUR-YEAR EXPONENTIAL AVG	0.000771	0.000079	0.000003	0.000010	0.000863	

STATE: CONNECTICUT PREMIUM - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	
THREE-YEAR STRAIGHT AVERAGE	0	1	0	0	1	
FOUR-YEAR STRAIGHT AVERAGE	0	0	0	1	1	
TWO-YEAR EXPONENTIAL AVG	1	0	1	0	2	*
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: CONNECTICUT PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.637	1.257	1.118	1.071	1.044	1.038	1.040
1982	1.607	1.249	1.120	1.078	1.049	1.044	1.032
1983	1.602	1.246	1.116	1.066	1.053	1.035	1.034
1984	1.627	1.239	1.133	1.087	1.051	1.040	1.036
1985	1.661	1.267	1.120	1.067	1.053	1.051	1.036
1986	1.682	1.258	1.104	1.069	1.050	1.037	1.034
1987	1.670	1.270	1.143	1.075	1.067	1.045	1.043
1988	1.691	1.258	1.126	1.064	1.053	1.040	1.043
1989	1.685	1.293	1.127	1.077	1.058	1.045	1.044
POINTS	9	9	9	9	9	9	9
AVERAGE	1.651	1.260	1.123	1.073	1.053	1.042	1.038
SAMPLE VARIANCE	0.001161	0.000252	0.000122	0.000053	0.000041	0.000025	0.000021
SAMPLE COEFF OF VARIANCE	0.021	0.013	0.010	0.007	0.006	0.005	0.004

REGION: NORTHERN PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	1.600	1.252	1.126	1.078	1.048	1.041	1.029
1983	1.592	1.250	1.126	1.070	1.048	1.031	1.025
1984	1.610	1.261	1.129	1.073	1.044	1.031	1.021
1985	1.660	1.288	1.140	1.079	1.050	1.034	1.028
1986	1.641	1.287	1.146	1.079	1.050	1.036	1.025
1987	1.654	1.301	1.156	1.094	1.062	1.039	1.029
1988	1.669	1.311	1.164	1.100	1.063	1.044	1.030
1989	1.682	1.315	1.160	1.097	1.061	1.048	1.036
POINTS	8	8	8	8	8	8	8
AVERAGE	1.639	1.283	1.143	1.084	1.053	1.038	1.028
SAMPLE VARIANCE	0.001141	0.000672	0.000241	0.000133	0.000056	0.000038	0.000020
SAMPLE COEFF OF VARIANCE	0.021	0.020	0.014	0.011	0.007	0.006	0.004

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: CONNECTICUT PAID - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: INDEMNITY (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.000771	0.000312	0.000310	0.000065	0.000056	0.000053	0.000018	0.001584	
THREE-YEAR STRAIGHT AVERAGE	0.001140	0.000360	0.000193	0.000044	0.000054	0.000039	0.000022	0.001851	
FOUR-YEAR STRAIGHT AVERAGE	0.001387	0.000324	0.000193	0.000058	0.000052	0.000040	0.000025	0.002078	
TWO-YEAR EXPONENTIAL AVG	0.000747	0.000317	0.000311	0.000066	0.000057	0.000053	0.000018	0.001570	*
THREE-YEAR EXPONENTIAL AVG	0.001071	0.000357	0.000203	0.000047	0.000055	0.000041	0.000021	0.001795	
FOUR-YEAR EXPONENTIAL AVG	0.001274	0.000325	0.000201	0.000058	0.000052	0.000041	0.000023	0.001974	

STATE: CONNECTICUT PAID - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: INDEMNITY ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	1	0	0	0	0	0	1	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	1	0	1	0	2	*
FOUR-YEAR STRAIGHT AVERAGE	0	0	1	0	1	0	0	2	*
TWO-YEAR EXPONENTIAL AVG	1	0	0	0	0	0	1	2	*
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: CONNECTICUT PAID + O/S - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.102	1.055	1.036	1.011	1.023	1.018	1.021
1982	1.080	1.063	1.019	1.030	1.041	1.000	1.012
1983	1.093	1.060	1.038	1.044	1.032	1.047	1.027
1984	1.065	1.049	1.041	1.048	1.048	1.053	1.027
1985	1.102	1.067	1.039	1.023	1.023	1.010	1.011
1986	1.118	1.058	1.044	1.028	1.025	1.021	0.994
1987	1.122	1.064	1.041	1.025	1.042	1.040	1.000
1988	1.117	1.062	1.039	1.020	1.026	1.025	1.042
1989	1.120	1.061	1.031	1.016	0.999	1.029	1.019
POINTS	9	9	9	9	9	9	9
AVERAGE	1.102	1.060	1.036	1.027	1.029	1.027	1.017
SAMPLE VARIANCE	0.000392	0.000029	0.000056	0.000148	0.000210	0.000298	0.000215
SAMPLE COEFF OF VARIANCE	0.018	0.005	0.007	0.012	0.014	0.017	0.014

REGION: NORTHERN PAID + O/S - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	1.109	1.027	1.004	1.001	1.000	1.004	1.004
1983	1.120	1.043	1.014	1.006	1.002	1.002	0.998
1984	1.109	1.055	1.020	1.012	1.004	1.010	1.000
1985	1.132	1.065	1.029	1.007	1.007	1.002	1.002
1986	1.137	1.071	1.040	1.018	1.009	1.002	1.002
1987	1.159	1.083	1.037	1.022	1.009	1.007	1.003
1988	1.143	1.076	1.043	1.017	1.019	1.016	1.009
1989	1.148	1.083	1.037	1.026	1.008	1.003	1.014
POINTS	8	8	8	8	8	8	8
AVERAGE	1.132	1.063	1.028	1.014	1.007	1.006	1.004
SAMPLE VARIANCE	0.000333	0.000400	0.000195	0.000074	0.000034	0.000025	0.000027
SAMPLE COEFF OF VARIANCE	0.016	0.019	0.014	0.008	0.006	0.005	0.005

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: CONNECTICUT PAID + O/S - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989

LOSS TYPE: INDEMNITY (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.000375	0.000033	0.000022	0.000134	0.000401	0.000471	0.000583	0.002018	
THREE-YEAR STRAIGHT AVERAGE	0.000447	0.000026	0.000035	0.000116	0.000306	0.000187	0.000535	0.001652	
FOUR-YEAR STRAIGHT AVERAGE	0.000479	0.000030	0.000045	0.000095	0.000272	0.000107	0.000436	0.001464	*
TWO-YEAR EXPONENTIAL AVG	0.000366	0.000034	0.000022	0.000133	0.000396	0.000466	0.000577	0.001995	
THREE-YEAR EXPONENTIAL AVG	0.000428	0.000028	0.000032	0.000115	0.000311	0.000202	0.000528	0.001643	
FOUR-YEAR EXPONENTIAL AVG	0.000450	0.000030	0.000041	0.000093	0.000281	0.000128	0.000442	0.001465	

STATE: CONNECTICUT PAID + O/S - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS

LOSS TYPE: INDEMNITY ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
THREE-YEAR STRAIGHT AVERAGE	0	1	0	0	0	0	0	1	
FOUR-YEAR STRAIGHT AVERAGE	0	0	0	0	1	1	1	3	*
TWO-YEAR EXPONENTIAL AVG	1	0	1	0	0	0	0	2	
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	1	0	0	0	1	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: CONNECTICUT INCURRED - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	0.973	1.017	1.040	0.994	1.022	1.017	1.021
1982	0.957	1.013	1.016	0.992	1.040	1.000	1.012
1983	0.969	0.996	1.010	0.978	1.021	1.040	1.025
1984	0.933	0.983	1.022	1.007	1.043	1.050	1.025
1985	0.992	1.017	1.035	0.984	1.019	1.006	1.007
1986	1.013	1.022	1.053	0.988	1.024	1.020	0.985
1987	1.028	1.033	1.032	1.012	1.040	1.042	1.003
1988	1.004	1.020	1.035	1.012	1.054	1.022	1.040
1989	1.052	1.045	1.027	0.998	0.993	1.009	1.016
POINTS	9	9	9	9	9	9	9
AVERAGE	0.991	1.016	1.030	0.996	1.028	1.023	1.015
SAMPLE VARIANCE	0.001384	0.000335	0.000169	0.000149	0.000324	0.000305	0.000247
SAMPLE COEFF OF VARIANCE	0.038	0.018	0.013	0.012	0.018	0.017	0.015

REGION: NORTHERN INCURRED - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	0.985	0.983	0.992	0.983	0.999	1.003	1.003
1983	1.006	0.994	0.999	0.982	0.997	0.999	0.997
1984	1.010	1.012	1.011	0.994	1.002	1.008	0.999
1985	1.039	1.025	1.021	0.983	1.003	1.000	1.000
1986	1.045	1.038	1.034	0.993	1.005	0.998	0.993
1987	1.040	1.046	1.024	1.012	1.007	1.006	1.004
1988	1.024	1.038	1.030	1.008	1.026	1.014	1.009
1989	1.039	1.050	1.020	1.012	1.004	0.995	1.013
POINTS	8	8	8	8	8	8	8
AVERAGE	1.024	1.023	1.016	0.996	1.005	1.003	1.002
SAMPLE VARIANCE	0.000455	0.000610	0.000216	0.000172	0.000080	0.000038	0.000042
SAMPLE COEFF OF VARIANCE	0.021	0.024	0.014	0.013	0.009	0.006	0.006

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: CONNECTICUT INCURRED - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: INDENNITY (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.001290	0.000364	0.000241	0.000229	0.000792	0.000607	0.000696	0.004219	
THREE-YEAR STRAIGHT AVERAGE	0.001529	0.000401	0.000303	0.000154	0.000646	0.000272	0.000626	0.003931	
FOUR-YEAR STRAIGHT AVERAGE	0.001658	0.000389	0.000270	0.000161	0.000517	0.000171	0.000513	0.003678	
TWO-YEAR EXPONENTIAL AVG	0.001281	0.000363	0.000236	0.000226	0.000797	0.000601	0.000686	0.004189	
THREE-YEAR EXPONENTIAL AVG	0.001482	0.000391	0.000290	0.000156	0.000661	0.000291	0.000616	0.003888	
FOUR-YEAR EXPONENTIAL AVG	0.001580	0.000375	0.000260	0.000161	0.000547	0.000200	0.000518	0.003641	*

STATE: CONNECTICUT INCURRED - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: INDENNITY ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	1	0	0	0	1	
FOUR-YEAR STRAIGHT AVERAGE	0	0	0	0	1	1	1	3	*
TWO-YEAR EXPONENTIAL AVG	1	1	1	0	0	0	0	3	*
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: CONNECTICUT
 LOSS TYPE: MEDICAL

PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.225	1.083	1.038	1.053	1.017	1.018	1.017
1982	1.246	1.082	1.046	1.024	1.021	1.017	1.014
1983	1.239	1.090	1.044	1.027	1.021	1.018	1.017
1984	1.248	1.088	1.051	1.028	1.024	1.022	1.012
1985	1.256	1.091	1.043	1.028	1.027	1.021	1.012
1986	1.258	1.090	1.047	1.028	1.024	1.018	1.014
1987	1.315	1.106	1.060	1.031	1.028	1.023	1.011
1988	1.326	1.103	1.055	1.023	1.023	1.014	1.016
1989	1.362	1.122	1.069	1.047	1.025	1.018	1.021
POINTS	9	9	9	9	9	9	9
AVERAGE	1.275	1.095	1.050	1.032	1.023	1.019	1.015
SAMPLE VARIANCE	0.002223	0.000168	0.000093	0.000111	0.000011	0.000008	0.000010
SAMPLE COEFF OF VARIANCE	0.037	0.012	0.009	0.010	0.003	0.003	0.003

REGION: NORTHERN
 LOSS TYPE: MEDICAL

PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	1.224	1.079	1.041	1.027	1.018	1.017	1.017
1983	1.217	1.076	1.041	1.028	1.020	1.016	1.015
1984	1.226	1.078	1.045	1.026	1.020	1.016	1.014
1985	1.235	1.080	1.042	1.025	1.018	1.016	1.013
1986	1.250	1.080	1.039	1.026	1.017	1.016	1.013
1987	1.269	1.086	1.044	1.025	1.020	1.016	1.013
1988	1.285	1.093	1.049	1.030	1.021	1.016	1.012
1989	1.295	1.096	1.047	1.030	1.019	1.018	1.015
POINTS	8	8	8	8	8	8	8
AVERAGE	1.250	1.084	1.043	1.027	1.019	1.016	1.014
SAMPLE VARIANCE	0.000882	0.000055	0.000011	0.000004	0.000002	0.000001	0.000003
SAMPLE COEFF OF VARIANCE	0.024	0.007	0.003	0.002	0.001	0.001	0.002

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: CONNECTICUT PAID - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: MEDICAL (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.001368	0.000115	0.000076	0.000090	0.000008	0.000014	0.000017	0.001687	
THREE-YEAR STRAIGHT AVERAGE	0.002063	0.000168	0.000087	0.000087	0.000009	0.000012	0.000015	0.002441	
FOUR-YEAR STRAIGHT AVERAGE	0.002633	0.000197	0.000106	0.000090	0.000013	0.000014	0.000018	0.003070	
TWO-YEAR EXPONENTIAL AVG	0.001337	0.000115	0.000076	0.000092	0.000008	0.000014	0.000016	0.001658	*
THREE-YEAR EXPONENTIAL AVG	0.001954	0.000161	0.000085	0.000089	0.000009	0.000013	0.000015	0.002325	
FOUR-YEAR EXPONENTIAL AVG	0.002443	0.000186	0.000101	0.000090	0.000012	0.000014	0.000018	0.002863	

STATE: CONNECTICUT PAID - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: MEDICAL ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	1	0	1	0	0	2	*
THREE-YEAR STRAIGHT AVERAGE	0	0	0	1	0	1	0	2	*
FOUR-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
TWO-YEAR EXPONENTIAL AVG	1	1	0	0	0	0	0	2	*
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	1	1	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: CONNECTICUT PAID + O/S - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.012	1.004	1.008	1.019	1.008	1.005	1.039
1982	1.056	1.014	1.012	1.007	1.014	1.027	0.996
1983	1.034	0.989	1.008	1.015	1.012	1.030	0.989
1984	1.050	0.993	1.034	1.018	1.015	1.012	0.988
1985	1.050	1.076	1.018	1.007	1.007	1.000	1.007
1986	1.076	1.024	1.016	1.004	1.014	1.020	1.012
1987	1.092	1.037	1.022	1.013	1.013	1.008	0.994
1988	1.077	1.045	1.016	1.002	1.016	1.009	1.005
1989	1.060	0.999	1.016	0.996	0.998	1.009	1.000
POINTS	9	9	9	9	9	9	9
AVERAGE	1.056	1.020	1.017	1.009	1.011	1.013	1.003
SAMPLE VARIANCE	0.000581	0.000811	0.000063	0.000060	0.000032	0.000103	0.000245
SAMPLE COEFF OF VARIANCE	0.023	0.028	0.008	0.008	0.006	0.010	0.016

REGION: NORTHERN PAID + O/S - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	1.039	1.009	0.997	1.004	1.003	1.008	1.012
1983	1.036	0.999	0.996	0.997	1.002	1.009	1.010
1984	1.055	1.011	1.008	1.006	1.000	1.006	1.010
1985	1.044	1.010	1.007	0.998	1.001	1.007	1.003
1986	1.057	1.009	1.002	1.003	1.003	1.007	1.006
1987	1.073	1.020	1.008	1.005	1.002	1.003	1.006
1988	1.066	1.009	1.009	0.996	1.004	1.001	1.003
1989	1.048	1.004	0.997	0.996	1.000	0.999	1.007
POINTS	8	8	8	8	8	8	8
AVERAGE	1.052	1.009	1.003	1.001	1.002	1.005	1.007
SAMPLE VARIANCE	0.000168	0.000036	0.000032	0.000018	0.000002	0.000013	0.000011
SAMPLE COEFF OF VARIANCE	0.012	0.006	0.006	0.004	0.001	0.004	0.003

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: CONNECTICUT PAID + O/S - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: MEDICAL (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW
TWO-YEAR STRAIGHT AVERAGE	0.000446	0.001896	0.000030	0.000079	0.000067	0.000133	0.000159	0.002811	
THREE-YEAR STRAIGHT AVERAGE	0.000518	0.001472	0.000006	0.000056	0.000068	0.000117	0.000128	0.002365	*
FOUR-YEAR STRAIGHT AVERAGE	0.000561	0.001681	0.000013	0.000061	0.000051	0.000081	0.000075	0.002523	
TWO-YEAR EXPONENTIAL AVG	0.000434	0.001897	0.000030	0.000078	0.000068	0.000131	0.000158	0.002796	
THREE-YEAR EXPONENTIAL AVG	0.000498	0.001499	0.000006	0.000057	0.000069	0.000114	0.000128	0.002371	
FOUR-YEAR EXPONENTIAL AVG	0.000530	0.001662	0.000012	0.000061	0.000054	0.000084	0.000077	0.002479	

STATE: CONNECTICUT PAID + O/S - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: MEDICAL ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
THREE-YEAR STRAIGHT AVERAGE	0	1	1	1	0	0	0	3	*
FOUR-YEAR STRAIGHT AVERAGE	0	0	0	0	1	1	1	3	*
TWO-YEAR EXPONENTIAL AVG	1	0	0	0	0	0	0	1	
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: CONNECTICUT INCURRED - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	0.944	0.981	1.012	1.010	1.008	1.004	1.039
1982	0.977	0.988	1.017	0.985	1.013	1.026	0.995
1983	0.944	0.944	0.983	0.964	1.003	1.024	0.987
1984	0.941	0.940	1.012	0.981	1.011	1.010	0.986
1985	0.967	1.034	1.012	0.973	1.003	0.997	1.005
1986	0.996	0.999	1.024	0.972	1.014	1.019	1.009
1987	1.012	1.013	1.015	1.008	1.013	1.009	0.995
1988	1.004	1.022	1.021	0.999	1.041	1.007	1.004
1989	1.005	0.989	1.018	0.979	0.991	0.998	1.003
POINTS	9	9	9	9	9	9	9
AVERAGE	0.977	0.990	1.013	0.986	1.011	1.010	1.003
SAMPLE VARIANCE	0.000834	0.001034	0.000142	0.000269	0.000182	0.000111	0.000251
SAMPLE COEFF OF VARIANCE	0.030	0.032	0.012	0.017	0.013	0.010	0.016

REGION: NORTHERN INCURRED - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	0.966	0.983	0.990	0.991	1.001	1.007	1.009
1983	0.971	0.968	0.985	0.979	0.997	1.006	1.010
1984	0.988	0.981	1.000	0.991	0.997	1.004	1.010
1985	0.983	0.985	0.999	0.978	0.996	1.004	1.000
1986	0.999	0.991	0.999	0.986	1.002	1.004	1.002
1987	0.999	0.998	1.000	0.999	0.999	1.001	1.005
1988	0.996	0.989	1.005	0.991	1.013	1.000	1.003
1989	0.989	0.990	0.993	0.987	0.997	0.994	1.007
POINTS	8	8	8	8	8	8	8
AVERAGE	0.986	0.986	0.996	0.988	1.000	1.003	1.006
SAMPLE VARIANCE	0.000155	0.000079	0.000042	0.000048	0.000031	0.000017	0.000015
SAMPLE COEFF OF VARIANCE	0.013	0.009	0.007	0.007	0.006	0.004	0.004

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: CONNECTICUT INCURRED - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: MEDICAL (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.000661	0.001938	0.000073	0.000393	0.000427	0.000158	0.000137	0.003787	
THREE-YEAR STRAIGHT AVERAGE	0.000863	0.001520	0.000111	0.000298	0.000417	0.000159	0.000108	0.003474	
FOUR-YEAR STRAIGHT AVERAGE	0.000994	0.001617	0.000088	0.000348	0.000353	0.000100	0.000058	0.003558	
TWO-YEAR EXPONENTIAL AVG	0.000641	0.001930	0.000069	0.000388	0.000439	0.000156	0.000135	0.003758	
THREE-YEAR EXPONENTIAL AVG	0.000814	0.001532	0.000103	0.000301	0.000424	0.000155	0.000107	0.003436	*
FOUR-YEAR EXPONENTIAL AVG	0.000920	0.001596	0.000083	0.000338	0.000367	0.000105	0.000059	0.003467	

STATE: CONNECTICUT INCURRED - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: MEDICAL ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
THREE-YEAR STRAIGHT AVERAGE	0	1	0	1	0	0	0	2	
FOUR-YEAR STRAIGHT AVERAGE	0	0	0	0	1	1	1	3	*
TWO-YEAR EXPONENTIAL AVG	1	0	1	0	0	0	0	2	
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
CONNECTICUT INDEMNITY COMPARISON OF PROJECTIONS

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	ACTUAL 8TH	AVERAGE	*=LOW AVG
1978 PAID				72,928,961	72,348,349	72,348,955	73,361,175	73,240,068		
1978 PAID + O/S				84,016,768	87,825,291	91,769,051	87,585,468	85,421,912		
1978 INCURRED				88,193,259	87,981,680	91,813,705	87,611,082	84,958,505		
1978 PAID (1)				0.42%	1.22%	1.22%	0.17%		0.76%	*
1978 PAID + O/S (1)				1.64%	2.81%	7.43%	2.53%		3.61%	
1978 INCURRED (1)				3.81%	3.56%	8.07%	3.12%		4.64%	
1978 PAID (2)					0.80%	0.00%	1.40%	0.17%	0.59%	*
1978 PAID + O/S (2)					4.53%	4.49%	4.56%	2.47%	4.01%	
1978 INCURRED (2)					0.24%	4.36%	4.58%	3.03%	3.05%	
1979 PAID			95,248,151	94,766,936	96,185,202	97,112,745	96,230,235	96,983,901		
1979 PAID + O/S			113,441,699	118,992,648	124,695,664	119,557,636	116,424,405	116,154,386		
1979 INCURRED			119,181,950	117,650,284	124,192,930	119,574,349	116,308,301	117,073,843		
1979 PAID (1)			1.79%	2.29%	0.82%	0.13%	0.78%		1.16%	*
1979 PAID + O/S (1)			2.34%	2.44%	7.35%	2.93%	0.23%		3.06%	
1979 INCURRED (1)			1.80%	0.49%	6.08%	2.14%	0.65%		2.23%	
1979 PAID (2)				0.51%	1.50%	0.96%	0.91%	0.78%	0.93%	*
1979 PAID + O/S (2)				4.89%	4.79%	4.12%	2.62%	0.23%	3.33%	
1979 INCURRED (2)				1.29%	5.56%	3.72%	2.73%	0.66%	2.79%	
1980 PAID		102,910,082	102,000,616	103,902,695	103,880,142	103,433,959	103,883,146	104,333,651		
1980 PAID + O/S		124,707,556	129,734,961	137,342,543	130,361,537	124,981,038	127,294,112	133,030,617		
1980 INCURRED		132,197,707	128,436,299	134,813,744	130,204,018	124,924,506	128,242,791	134,184,980		
1980 PAID (1)		1.36%	2.24%	0.41%	0.43%	0.86%	0.43%		0.96%	*
1980 PAID + O/S (1)		6.26%	2.48%	3.24%	2.01%	6.05%	4.31%		4.06%	
1980 INCURRED (1)		1.48%	4.28%	0.47%	2.97%	6.90%	4.43%		3.42%	
1980 PAID (2)			0.88%	1.86%	0.02%	0.43%	0.43%	0.43%	0.68%	*
1980 PAID + O/S (2)			4.03%	5.86%	5.08%	4.13%	1.85%	4.51%	4.24%	
1980 INCURRED (2)			2.85%	4.97%	3.42%	4.05%	2.66%	4.63%	3.76%	
1981 PAID	110,611,504	108,412,495	108,858,829	109,415,595	108,290,865	109,941,928	110,312,256	110,365,626		
1981 PAID + O/S	126,120,962	131,631,877	137,511,300	132,053,008	125,563,107	128,946,234	131,345,475	131,103,366		
1981 INCURRED	132,482,077	130,349,106	133,106,980	132,490,231	125,852,314	130,146,484	132,579,585	131,851,969		
1981 PAID (1)	0.22%	1.77%	1.37%	0.86%	1.88%	0.38%	0.05%		0.93%	*
1981 PAID + O/S (1)	3.80%	0.40%	4.89%	0.72%	4.23%	1.65%	0.18%		2.27%	
1981 INCURRED (1)	0.48%	1.14%	0.95%	0.48%	4.55%	1.29%	0.55%		1.35%	
1981 PAID (2)		1.99%	0.41%	0.51%	1.03%	1.52%	0.34%	0.05%	0.84%	*
1981 PAID + O/S (2)		4.37%	4.47%	3.97%	4.91%	2.69%	1.86%	0.18%	3.21%	
1981 INCURRED (2)		1.61%	2.12%	0.46%	5.01%	3.41%	1.87%	0.55%	2.15%	
1982 PAID	111,929,846	114,288,663	117,818,126	114,171,086	115,742,087	115,806,240	116,139,602			
1982 PAID + O/S	135,294,954	139,267,534	135,455,119	128,978,966	131,309,595	133,753,757	134,540,661			
1982 INCURRED	132,999,520	132,452,600	134,651,939	130,687,487	137,643,338	144,606,957	142,283,762			
1982 PAID (1)	3.62%	1.59%	1.45%	1.69%	0.34%	0.29%			1.50%	*
1982 PAID + O/S (1)	0.56%	3.51%	0.68%	4.13%	2.40%	0.58%			1.98%	
1982 INCURRED (1)	6.53%	6.91%	5.36%	8.15%	3.26%	1.63%			5.31%	
1982 PAID (2)		2.11%	3.09%	3.10%	1.38%	0.06%	0.29%		1.67%	*
1982 PAID + O/S (2)		2.94%	2.74%	4.78%	1.81%	1.86%	0.59%		2.45%	
1982 INCURRED (2)		0.41%	1.66%	2.94%	5.32%	5.06%	1.61%		2.83%	
1983 PAID	128,995,523	135,297,458	132,586,388	137,772,292	137,729,468	137,535,502				
1983 PAID + O/S	169,006,352	166,467,694	158,129,248	161,144,809	164,376,694	159,436,528				
1983 INCURRED	154,984,579	161,603,520	158,926,102	163,499,003	172,677,449	162,178,457				
1983 PAID (1)	6.21%	1.63%	3.60%	0.17%	0.14%				2.35%	*
1983 PAID + O/S (1)	6.00%	4.41%	0.82%	1.07%	3.10%				3.08%	
1983 INCURRED (1)	4.44%	0.35%	2.01%	0.81%	6.47%				2.82%	
1983 PAID (2)		4.89%	2.00%	3.91%	0.03%	0.14%			2.19%	*
1983 PAID + O/S (2)		1.50%	5.01%	1.91%	2.01%	3.01%			2.69%	
1983 INCURRED (2)		4.27%	1.66%	2.88%	5.61%	6.08%			4.10%	
1984 PAID	158,660,884	159,644,550	164,027,332	165,190,734	165,722,362					
1984 PAID + O/S	189,918,916	186,941,888	191,050,757	194,704,198	190,187,880					
1984 INCURRED	182,205,058	188,126,461	198,097,602	207,713,164	198,294,281					
1984 PAID (1)	4.26%	3.67%	1.02%	0.32%					2.32%	
1984 PAID + O/S (1)	0.14%	1.71%	0.45%	2.37%					1.17%	*
1984 INCURRED (1)	8.11%	5.13%	0.10%	4.75%					4.52%	
1984 PAID (2)		0.62%	2.75%	0.71%	0.32%				1.10%	*
1984 PAID + O/S (2)		1.57%	2.20%	1.91%	2.32%				2.00%	
1984 INCURRED (2)		3.25%	5.30%	4.85%	4.53%				4.48%	

NOTES: (1) ABSOLUTE DEVIATION FROM LAST PROJECTION (OR REPORT), RATIOED TO SAME.
(2) ABSOLUTE CHANGE RELATIVE TO PRIOR PROJECTION OR REPORT.
WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.
LOSSES HAVE BEEN RESTATED TO THE LATEST DIAGONAL.

N-4 0.0000
N-3 0.0000
N-2 0.5000
N-1 0.5000
WEIGHTS ASSIGNED TO PRECEDING YEARS:
04:55 PM
03/13/91

NATIONAL COUNCIL ON COMPENSATION INSURANCE
CONNECTICUT INDEMNITY COMPARISON OF PROJECTIONS RESTATED TO INCURRED LEVEL

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	RESTATED 8TH	AVERAGE	*=LOW AVG
1978 PAID				87,898,661	87,597,625	89,489,214	90,595,505	87,682,619		
1978 PAID + O/S				84,548,811	88,506,698	92,558,845	88,285,196	85,481,221		
1978 INCURRED				88,193,259	87,981,680	91,813,705	87,611,082	84,958,505		
1978 PAID (1)				0.25%	0.10%	2.06%	3.32%		1.43%	*
1978 PAID + O/S (1)				1.09%	3.54%	8.28%	3.28%		4.05%	
1978 INCURRED (1)				3.81%	3.56%	8.07%	3.12%		4.64%	
1978 PAID (2)					0.34%	2.16%	1.24%	3.22%	1.74%	*
1978 PAID + O/S (2)					4.68%	4.58%	4.62%	3.18%	4.26%	
1978 INCURRED (2)					0.24%	4.36%	4.58%	3.05%	3.05%	
1979 PAID			114,799,181	114,741,507	118,972,529	119,926,898	115,206,324	114,742,066		
1979 PAID + O/S			114,160,076	119,915,872	125,768,835	120,512,792	116,505,240	116,293,889		
1979 INCURRED			119,181,950	117,650,284	124,192,930	119,574,349	116,308,301	117,073,843		
1979 PAID (1)			0.05%	0.00%	3.69%	4.52%	0.40%		1.73%	*
1979 PAID + O/S (1)			1.83%	3.11%	8.15%	3.63%	0.18%		3.38%	
1979 INCURRED (1)			1.80%	0.49%	6.08%	2.14%	0.65%		2.23%	
1979 PAID (2)				0.05%	3.69%	0.80%	3.94%	0.40%	1.78%	*
1979 PAID + O/S (2)				5.04%	4.88%	4.18%	3.33%	0.18%	3.52%	
1979 INCURRED (2)				1.29%	5.56%	3.72%	2.73%	0.66%	2.79%	
1980 PAID		124,033,832	123,499,870	128,518,381	128,284,122	123,830,585	122,904,592	129,935,055		
1980 PAID + O/S		125,497,276	130,741,530	138,524,557	131,403,006	125,067,813	127,446,993	134,134,302		
1980 INCURRED		132,197,707	128,436,299	134,813,744	130,204,018	124,924,506	128,242,791	134,184,980		
1980 PAID (1)		4.54%	4.95%	1.09%	1.27%	4.70%	5.41%		3.66%	
1980 PAID + O/S (1)		6.44%	2.53%	3.27%	2.04%	6.76%	4.99%		4.34%	
1980 INCURRED (1)		1.48%	4.28%	0.47%	2.97%	6.90%	4.43%		3.42%	*
1980 PAID (2)				0.43%	0.18%	3.47%	0.75%	5.72%	2.44%	*
1980 PAID + O/S (2)				4.18%	5.95%	5.14%	4.82%	1.90%	5.25%	4.54%
1980 INCURRED (2)			2.85%	4.97%	3.42%	4.05%	2.66%	4.63%	3.76%	
1981 PAID	133,316,079	131,263,218	134,648,677	135,119,988	129,645,247	130,072,763	137,380,690	136,711,428		
1981 PAID + O/S	126,919,632	132,653,164	138,694,767	133,107,990	125,650,287	129,101,100	132,435,180	132,046,201		
1981 INCURRED	132,482,077	130,349,106	133,106,980	132,490,231	125,852,314	130,146,484	132,579,585	131,851,969		
1981 PAID (1)	2.48%	3.99%	1.51%	1.16%	5.17%	4.86%	0.49%		2.81%	
1981 PAID + O/S (1)	3.88%	0.46%	5.04%	0.80%	4.84%	2.23%	0.29%		2.51%	
1981 INCURRED (1)	0.48%	1.14%	0.95%	0.48%	4.55%	1.29%	0.55%		1.35%	*
1981 PAID (2)		1.54%	2.58%	0.35%	4.05%	0.33%	5.62%	0.49%	2.14%	*
1981 PAID + O/S (2)		4.52%	4.55%	4.03%	5.60%	2.75%	2.58%	0.29%	3.48%	
1981 INCURRED (2)		1.61%	2.12%	0.46%	5.01%	3.41%	1.87%	0.55%	2.15%	
1982 PAID	135,521,942	141,364,898	145,496,478	136,685,016	136,934,956	144,222,789	143,863,732			
1982 PAID + O/S	136,344,662	140,466,116	136,537,282	129,068,517	131,467,299	134,863,442	135,508,215			
1982 INCURRED	132,999,520	132,452,600	134,651,939	130,687,487	137,643,338	144,606,937	142,283,762			
1982 PAID (1)	5.80%	1.74%	1.13%		4.99%	4.82%	0.25%		3.12%	
1982 PAID + O/S (1)	0.62%	3.66%	0.76%	4.75%	2.98%	0.48%			2.21%	*
1982 INCURRED (1)	6.53%	6.91%	5.36%	8.15%	3.26%	1.63%			5.31%	
1982 PAID (2)		4.31%	2.92%	6.06%	0.18%	5.32%	0.25%		3.17%	
1982 PAID + O/S (2)		3.02%	2.80%	5.47%	1.86%	2.58%	0.48%		2.70%	*
1982 INCURRED (2)		0.41%	1.66%	2.94%	5.32%	5.06%	1.61%		2.83%	
1983 PAID	159,555,974	167,082,131	158,731,718	162,998,985	171,525,541	170,367,130				
1983 PAID + O/S	170,460,875	167,797,618	158,239,039	161,338,345	165,740,442	160,583,122				
1983 INCURRED	154,984,579	161,603,520	158,926,102	163,499,003	172,677,449	162,178,457				
1983 PAID (1)	6.35%	1.95%	6.83%	4.32%	0.68%				4.02%	
1983 PAID + O/S (1)	6.15%	4.49%	1.46%	0.47%	3.21%				3.16%	
1983 INCURRED (1)	4.44%	0.35%	2.01%	0.81%	6.47%				2.82%	*
1983 PAID (2)		4.72%	5.00%	2.69%	5.23%	0.68%			3.66%	
1983 PAID + O/S (2)		1.56%	5.70%	1.96%	2.73%	3.11%			3.01%	*
1983 INCURRED (2)		4.27%	1.66%	2.88%	5.61%	6.08%			4.10%	
1984 PAID	195,934,197	191,125,605	194,061,435	205,725,256	205,282,583					
1984 PAID + O/S	191,436,194	187,071,684	191,280,211	196,319,557	191,555,623					
1984 INCURRED	182,205,058	188,126,461	198,097,602	207,713,164	198,294,281					
1984 PAID (1)	4.55%	6.90%	5.47%	0.22%					4.28%	
1984 PAID + O/S (1)	0.06%	2.34%	0.14%	2.49%					1.26%	*
1984 INCURRED (1)	8.11%	5.13%	0.10%	4.75%					4.52%	
1984 PAID (2)		2.45%	1.54%	6.01%	0.22%				2.55%	
1984 PAID + O/S (2)		2.28%	2.25%	2.63%	2.43%				2.40%	*
1984 INCURRED (2)		3.25%	5.30%	4.85%	4.53%				4.48%	

NOTES: (1) ABSOLUTE DEVIATION FROM LAST PROJECTION (OR REPORT), RATIOED TO SAME.
(2) ABSOLUTE CHANGE RELATIVE TO PRIOR PROJECTION OR REPORT.
WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.
LOSSES RESTATED TO INCURRED LEVEL OF 8TH REPORT, AND TO LAST DIAGONAL.

WEIGHTS ASSIGNED TO PRECEDING YEARS:
N-4 0.0000
N-3 0.0000
N-2 0.5000
N-1 0.5000

NATIONAL COUNCIL ON COMPENSATION INSURANCE
CONNECTICUT MEDICAL COMPARISON OF PROJECTIONS

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	ACTUAL 8TH	AVERAGE	*=LOW AVG
1978 PAID				31,297,384	31,011,555	31,148,392	31,102,097	31,171,199		
1978 PAID + O/S				33,235,466	32,947,567	32,639,804	32,259,530	32,738,248		
1978 INCURRED				34,829,642	33,040,597	32,730,982	32,380,042	32,820,726		
1978 PAID (1)				0.40%	0.51%	0.07%	0.22%		0.30%	*
1978 PAID + O/S (1)				1.52%	0.64%	0.30%	1.46%		0.98%	
1978 INCURRED (1)				6.12%	0.67%	0.27%	1.34%		2.10%	
1978 PAID (2)					0.91%	0.44%	0.15%	0.22%	0.43%	*
1978 PAID + O/S (2)					0.87%	0.93%	1.17%	1.48%	1.11%	
1978 INCURRED (2)					5.14%	0.94%	1.07%	1.36%	2.13%	
1979 PAID			39,453,077	39,110,592	39,321,247	39,454,912	39,358,579	39,292,903		
1979 PAID + O/S			41,996,233	41,386,260	41,222,537	40,723,857	41,787,320	41,151,777		
1979 INCURRED			44,667,249	41,504,420	41,225,979	40,886,792	41,997,946	41,502,342		
1979 PAID (1)			0.41%	0.46%	0.07%	0.41%	0.17%		0.30%	*
1979 PAID + O/S (1)			2.05%	0.57%	0.17%	1.04%	1.54%		1.08%	
1979 INCURRED (1)			7.63%	0.01%	0.67%	1.48%	1.19%		2.19%	
1979 PAID (2)				0.87%	0.54%	0.34%	0.24%	0.17%	0.43%	*
1979 PAID + O/S (2)				1.45%	0.40%	1.21%	2.61%	1.52%	1.44%	
1979 INCURRED (2)				7.08%	0.67%	0.82%	2.72%	1.18%	2.49%	
1980 PAID		43,191,150	43,154,159	43,614,480	43,720,084	43,613,714	43,741,842	43,901,429		
1980 PAID + O/S		48,852,188	47,281,999	48,142,998	47,303,262	48,205,290	47,800,063	47,917,043		
1980 INCURRED		52,647,260	47,718,159	47,551,193	47,372,384	48,469,115	48,276,300	48,388,209		
1980 PAID (1)		1.62%	1.70%	0.65%	0.41%	0.66%	0.36%		0.90%	*
1980 PAID + O/S (1)		1.95%	1.33%	0.47%	1.28%	0.60%	0.24%		0.98%	
1980 INCURRED (1)		8.80%	1.38%	1.73%	2.10%	0.17%	0.23%		2.40%	
1980 PAID (2)			0.09%	1.07%	0.24%	0.24%	0.25%	0.36%	0.38%	*
1980 PAID + O/S (2)			3.21%	1.82%	1.74%	1.91%	0.84%	0.24%	1.63%	
1980 INCURRED (2)			9.36%	0.35%	0.38%	2.32%	0.40%	0.23%	2.17%	
1981 PAID	47,020,500	46,940,425	47,370,225	47,280,930	47,234,988	47,373,189	47,117,939	47,460,052		
1981 PAID + O/S	52,362,594	51,320,116	51,159,752	50,393,438	50,747,499	50,745,666	50,319,236	50,357,261		
1981 INCURRED	57,151,748	52,097,535	49,794,117	50,534,875	51,161,196	51,438,691	50,956,137	51,120,258		
1981 PAID (1)	0.95%	1.09%	0.19%	0.38%	0.47%	0.18%	0.72%		0.57%	*
1981 PAID + O/S (1)	3.98%	1.91%	1.59%	0.07%	0.77%	0.77%	0.08%		1.31%	
1981 INCURRED (1)	11.80%	1.91%	2.59%	1.15%	0.08%	0.62%	0.32%		2.64%	
1981 PAID (2)		0.17%	0.92%	0.19%	0.10%	0.29%	0.54%	0.73%	0.42%	*
1981 PAID + O/S (2)		1.99%	0.31%	1.50%	0.70%	0.00%	0.84%	0.08%	0.77%	
1981 INCURRED (2)		8.84%	4.42%	1.49%	1.24%	0.54%	0.94%	0.32%	2.54%	
1982 PAID	52,256,067	53,016,655	53,217,214	53,165,503	53,372,622	53,164,723	53,400,778			
1982 PAID + O/S	55,293,317	55,272,724	59,579,194	59,501,784	59,973,029	59,586,208	59,794,687			
1982 INCURRED	56,401,243	52,925,483	58,958,664	60,428,236	63,004,905	64,171,027	63,788,675			
1982 PAID (1)	2.14%	0.72%	0.34%	0.44%	0.05%	0.44%			0.69%	*
1982 PAID + O/S (1)	7.53%	7.56%	0.36%	0.49%	0.30%	0.35%			2.76%	
1982 INCURRED (1)	11.58%	17.03%	7.57%	5.27%	1.23%	0.60%			7.21%	
1982 PAID (2)		1.46%	0.38%	0.10%	0.39%	0.39%	0.44%		0.53%	*
1982 PAID + O/S (2)		0.04%	7.79%	0.13%	0.79%	0.64%	0.35%		1.62%	
1982 INCURRED (2)		6.16%	11.40%	2.49%	4.26%	1.85%	0.60%		4.46%	
1983 PAID	64,313,347	65,115,932	64,958,191	66,051,061	65,538,142	65,667,772				
1983 PAID + O/S	69,969,409	73,068,765	72,304,252	72,909,855	71,866,445	70,944,952				
1983 INCURRED	64,662,001	70,546,207	72,754,877	74,283,008	75,318,926	72,571,443				
1983 PAID (1)	2.06%	0.84%	1.08%	0.58%	0.20%				0.95%	*
1983 PAID + O/S (1)	1.38%	2.99%	1.92%	2.77%	1.30%				2.07%	
1983 INCURRED (1)	10.90%	2.79%	0.25%	2.36%	3.79%				4.02%	
1983 PAID (2)		1.25%	0.24%	1.68%	0.78%	0.20%			0.83%	*
1983 PAID + O/S (2)		4.43%	1.05%	0.84%	1.43%	1.28%			1.81%	
1983 INCURRED (2)		9.10%	3.13%	2.10%	1.39%	3.65%			3.87%	
1984 PAID	74,679,529	74,889,981	76,758,720	76,569,319	78,138,536					
1984 PAID + O/S	82,923,362	86,222,634	85,616,294	84,604,452	83,310,888					
1984 INCURRED	79,100,452	86,660,316	88,566,787	90,339,135	87,060,856					
1984 PAID (1)	4.43%	4.16%	1.77%	2.01%					3.09%	
1984 PAID + O/S (1)	0.47%	3.50%	2.77%	1.55%					2.07%	*
1984 INCURRED (1)	9.14%	0.46%	1.73%	3.77%					3.77%	
1984 PAID (2)		0.28%	2.50%	0.25%	2.05%				1.27%	*
1984 PAID + O/S (2)		3.98%	0.70%	1.18%	1.53%				1.85%	
1984 INCURRED (2)		9.56%	2.20%	2.00%	3.63%				4.35%	

NOTES: (1) ABSOLUTE DEVIATION FROM LAST PROJECTION (OR REPORT), RATIOED TO SAME.

(2) ABSOLUTE CHANGE RELATIVE TO PRIOR PROJECTION OR REPORT.

WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.

LOSSES HAVE BEEN RESTATED TO THE LATEST DIAGONAL.

WEIGHTS ASSIGNED TO PRECEDING YEARS:

N-4	0.0000
N-3	0.0000
N-2	0.5000
N-1	0.5000

05:01 PM
03/13/91

NATIONAL COUNCIL ON COMPENSATION INSURANCE
CONNECTICUT MEDICAL COMPARISON OF PROJECTIONS RESTATED TO INCURRED LEVEL

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	RESTATED 8TH	AVERAGE	*=LOW AVG
1978 PAID				35,075,318	32,812,760	33,579,432	33,282,267	32,839,351		
1978 PAID + O/S				33,389,179	33,176,979	32,892,667	32,497,547	32,891,195		
1978 INCURRED				34,829,642	33,040,597	32,730,982	32,380,042	32,820,726		
1978 PAID (1)				6.81%	0.08%	2.25%	1.35%		2.62%	
1978 PAID + O/S (1)				1.51%	0.87%	0.00%	1.20%		0.90%	*
1978 INCURRED (1)				6.12%	0.67%	0.27%	1.34%		2.10%	
1978 PAID (2)					6.45%	2.34%	0.88%	1.33%	2.75%	
1978 PAID + O/S (2)					0.64%	0.86%	1.20%	1.21%	0.98%	*
1978 INCURRED (2)					5.14%	0.94%	1.07%	1.36%	2.13%	
1979 PAID			44,215,492	41,382,202	42,390,155	42,220,591	41,464,885	41,437,177		
1979 PAID + O/S			42,190,465	41,674,430	41,541,891	41,024,325	41,982,542	41,378,528		
1979 INCURRED			44,667,249	41,504,420	41,225,979	40,886,792	41,997,946	41,502,342		
1979 PAID (1)			6.70%	0.13%	2.30%	1.89%	0.07%		2.22%	
1979 PAID + O/S (1)			1.96%	0.72%	0.39%	0.86%	1.46%		1.08%	*
1979 INCURRED (1)			7.63%	0.01%	0.67%	1.48%	1.19%		2.19%	
1979 PAID (2)				6.41%	2.44%	0.40%	1.79%	0.07%	2.22%	
1979 PAID + O/S (2)				1.22%	0.32%	1.25%	2.34%	1.44%	1.31%	*
1979 INCURRED (2)				7.08%	0.67%	0.82%	2.72%	1.18%	2.49%	
1980 PAID		48,404,791	45,660,627	47,018,461	46,784,741	45,947,737	46,128,901	47,357,615		
1980 PAID + O/S		49,078,128	47,611,220	48,515,965	47,652,274	48,430,496	48,063,448	48,356,704		
1980 INCURRED		52,647,260	47,718,159	47,551,193	47,372,384	48,469,115	48,276,300	48,388,209		
1980 PAID (1)		2.21%	3.58%	0.72%	1.21%	2.98%	2.59%		2.22%	
1980 PAID + O/S (1)		1.49%	1.54%	0.33%	1.46%	0.15%	0.61%		0.93%	*
1980 INCURRED (1)		8.80%	1.38%	1.73%	2.10%	0.17%	0.23%		2.40%	
1980 PAID (2)			5.67%	2.97%	0.50%	1.79%	0.39%	2.66%	2.33%	
1980 PAID + O/S (2)			2.99%	1.90%	1.78%	1.63%	0.76%	0.61%	1.61%	*
1980 INCURRED (2)			9.36%	0.35%	0.38%	2.32%	0.40%	0.23%	2.17%	
1981 PAID	52,696,385	49,666,806	51,067,331	50,595,192	49,762,806	49,958,417	50,827,348	51,708,544		
1981 PAID + O/S	52,604,770	51,677,454	51,556,090	50,765,250	50,984,581	51,025,281	50,780,938	50,985,988		
1981 INCURRED	57,151,748	52,097,535	49,794,117	50,534,875	51,161,196	51,438,691	50,956,137	51,120,258		
1981 PAID (1)	1.91%	3.95%	1.24%	2.15%	3.76%	3.38%	1.70%		2.59%	
1981 PAID + O/S (1)	3.17%	1.36%	1.12%	0.43%	0.00%	0.08%	0.40%		0.94%	*
1981 INCURRED (1)	11.80%	1.91%	2.59%	1.15%	0.08%	0.62%	0.32%		2.64%	
1981 PAID (2)		5.75%	2.82%	0.92%	1.65%	0.39%	1.74%	1.73%	2.14%	
1981 PAID + O/S (2)		1.76%	0.23%	1.53%	0.43%	0.08%	0.48%	0.40%	0.70%	*
1981 INCURRED (2)		8.84%	4.42%	1.49%	1.24%	0.54%	0.94%	0.32%	2.54%	
1982 PAID	55,291,190	57,154,448	56,947,593	56,010,698	56,285,248	57,350,172	58,181,067			
1982 PAID + O/S	55,678,321	55,700,925	60,018,780	59,779,765	60,303,488	60,132,939	60,541,243			
1982 INCURRED	56,401,243	52,925,483	58,958,664	60,428,236	63,004,905	64,171,027	63,788,675			
1982 PAID (1)	4.97%	1.76%	2.12%	3.73%	3.26%	1.43%			2.88%	*
1982 PAID + O/S (1)	8.03%	8.00%	0.86%	1.26%	0.39%	0.67%			3.20%	
1982 INCURRED (1)	11.58%	17.03%	7.57%	5.27%	1.23%	0.60%			7.21%	
1982 PAID (2)		3.37%	0.36%	1.65%	0.49%	1.89%	1.45%		1.53%	*
1982 PAID + O/S (2)		0.04%	7.75%	0.40%	0.88%	0.28%	0.68%		1.67%	
1982 INCURRED (2)		6.16%	11.40%	2.49%	4.26%	1.85%	0.60%		4.46%	
1983 PAID	69,332,814	69,680,377	68,434,481	69,655,569	70,697,701	71,546,169				
1983 PAID + O/S	70,511,466	73,607,879	72,642,043	73,311,597	72,525,853	71,830,723				
1983 INCURRED	64,662,001	70,546,207	72,754,877	74,283,008	75,318,926	72,571,443				
1983 PAID (1)	3.09%	2.61%	4.35%	2.64%	1.19%				2.78%	
1983 PAID + O/S (1)	1.84%	2.47%	1.13%	2.06%	0.97%				1.69%	*
1983 INCURRED (1)	10.90%	2.79%	0.25%	2.36%	3.79%				4.02%	
1983 PAID (2)		0.50%	1.79%	1.78%	1.50%	1.20%			1.35%	*
1983 PAID + O/S (2)		4.39%	1.31%	0.92%	1.07%	0.96%			1.73%	
1983 INCURRED (2)		9.10%	3.13%	2.10%	1.39%	3.65%			3.87%	
1984 PAID	79,914,356	78,897,778	80,947,561	82,597,319	85,133,281					
1984 PAID + O/S	83,535,185	86,625,449	86,088,051	85,380,737	84,351,052					
1984 INCURRED	79,100,452	86,660,316	88,566,787	90,339,135	87,060,856					
1984 PAID (1)	6.13%	7.32%	4.92%	2.98%					5.34%	
1984 PAID + O/S (1)	0.97%	2.70%	2.06%	1.22%					1.74%	*
1984 INCURRED (1)	9.14%	0.46%	1.73%	3.77%					3.77%	
1984 PAID (2)		1.27%	2.60%	2.04%	3.07%				2.24%	
1984 PAID + O/S (2)		3.70%	0.62%	0.82%	1.21%				1.59%	*
1984 INCURRED (2)		9.56%	2.20%	2.00%	3.63%				4.35%	

NOTES: (1) ABSOLUTE DEVIATION FROM LAST PROJECTION (OR REPORT), RATIOW TO SAME.
(2) ABSOLUTE CHANGE RELATIVE TO PRIOR PROJECTION OR REPORT.
WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.
LOSSES RESTATED TO INCURRED LEVEL OF 8TH REPORT, AND TO LAST DIAGONAL.

WEIGHTS ASSIGNED TO PRECEDING YEARS:
N-4 0.0000
N-3 0.0000
N-2 0.5000
N-1 0.5000

FLORIDA

NATIONAL COUNCIL ON COMPENSATION INSURANCE
ANALYSIS OF FACTOR SELECTION METHODS AND PROJECTION METHODS
STATE: FLORIDA

ORDER OF PRESENTATION FOR TESTS AND ANALYSIS

Premium: Development by Diagonal, Showing Variance

Premium: Tests of Minimum Average Squared Deviations

Indemnity: Paid - Development by Diagonal, Showing Variance

Indemnity: Paid - Tests of Minimum Average Squared Deviations

Indemnity: Paid+O/S - Development by Diagonal, Showing Variance

Indemnity: Paid+O/S - Tests of Minimum Average Squared Deviations

Indemnity: Incurred - Development by Diagonal, Showing Variance

Indemnity: Incurred - Tests of Minimum Average Squared Deviations

Medical: Paid - Development by Diagonal, Showing Variance

Medical: Paid - Tests of Minimum Average Squared Deviations

Medical: Paid+O/S - Development by Diagonal, Showing Variance

Medical: Paid+O/S - Tests of Minimum Average Squared Deviations

Medical: Incurred - Development by Diagonal, Showing Variance

Medical: Incurred - Tests of Minimum Average Squared Deviations

Indemnity: Comparison of Projections - Deviations by Loss Statistic Type

Indemnity: Comparison of Restated Projections - Deviations by Loss Statistic Type

Medical: Comparison of Projections - Deviations by Loss Statistic Type

Medical: Comparison of Restated Projections - Deviations by Loss Statistic Type

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: FLORIDA

PREMIUM - DEVELOPMENT DIAGONALS BY EVALUATION DATE

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH
1981	1.043	1.007	1.003	1.000
1982	1.037	1.009	1.003	0.997
1983	1.007	1.001	0.999	1.001
1984	1.035	0.996	1.002	1.001
1985	1.043	1.002	1.003	1.001
1986	1.061	1.003	1.001	1.000
1987	1.044	1.001	1.003	1.006
1988	1.050	0.998	1.000	1.002
1989	1.063	1.009	1.001	0.999
POINTS	9	9	9	9
AVERAGE	1.043	1.003	1.002	1.001
SAMPLE VARIANCE	0.000271	0.000021	0.000002	0.000006
SAMPLE COEFF OF VARIANCE	0.016	0.005	0.001	0.002

REGION: SOUTHERN

PREMIUM - DEVELOPMENT DIAGONALS BY EVALUATION DATE

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH
1981				
1982	1.051	1.007	1.001	0.999
1983	1.037	1.009	1.005	1.000
1984	1.050	1.004	1.000	0.998
1985	1.048	0.998	1.002	1.000
1986	1.053	1.001	0.999	1.000
1987	1.043	1.004	1.004	1.002
1988	1.036	1.004	0.999	1.001
1989	1.051	1.006	1.000	0.999
POINTS	8	8	8	8
AVERAGE	1.046	1.004	1.001	1.000
SAMPLE VARIANCE	0.000044	0.000012	0.000005	0.000002
SAMPLE COEFF OF VARIANCE	0.006	0.003	0.002	0.001

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: FLORIDA
 PREMIUM - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.000259	0.000027	0.000003	0.000011	0.000030	
THREE-YEAR STRAIGHT AVERAGE	0.000296	0.000019	0.000002	0.000009	0.000326	
FOUR-YEAR STRAIGHT AVERAGE	0.000269	0.000015	0.000002	0.000008	0.000293	
TWO-YEAR EXPONENTIAL AVG	0.000251	0.000028	0.000003	0.000011	0.000292	
THREE-YEAR EXPONENTIAL AVG	0.000283	0.000020	0.000002	0.000009	0.000314	
FOUR-YEAR EXPONENTIAL AVG	0.000257	0.000015	0.000002	0.000008	0.000283	*

STATE: FLORIDA
 PREMIUM - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	
THREE-YEAR STRAIGHT AVERAGE	0	0	1	0	1	
FOUR-YEAR STRAIGHT AVERAGE	0	1	0	1	2	*
TWO-YEAR EXPONENTIAL AVG	1	0	0	0	1	
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: FLORIDA PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.425	1.234	1.106	1.066	1.036	1.026	1.014
1982	1.452	1.260	1.116	1.071	1.034	1.029	1.022
1983	1.548	1.298	1.175	1.074	1.036	1.024	1.017
1984	1.567	1.316	1.185	1.112	1.045	1.029	1.014
1985	1.628	1.328	1.198	1.129	1.078	1.037	1.023
1986	1.720	1.372	1.204	1.133	1.087	1.065	1.031
1987	1.748	1.413	1.234	1.140	1.099	1.076	1.040
1988	1.827	1.413	1.219	1.138	1.107	1.065	1.055
1989	1.958	1.447	1.241	1.151	1.091	1.063	1.056
POINTS	9	9	9	9	9	9	9
AVERAGE	1.653	1.342	1.186	1.113	1.068	1.046	1.030
SAMPLE VARIANCE	0.031031	0.005400	0.002288	0.001118	0.000901	0.000432	0.000274
SAMPLE COEFF OF VARIANCE	0.107	0.055	0.040	0.030	0.028	0.020	0.016

REGION: SOUTHERN PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	1.517	1.184	1.085	1.046	1.028	1.017	1.011
1983	1.543	1.182	1.081	1.043	1.027	1.017	1.012
1984	1.562	1.184	1.085	1.044	1.028	1.022	1.013
1985	1.628	1.211	1.093	1.053	1.032	1.020	1.014
1986	1.638	1.224	1.092	1.051	1.034	1.027	1.014
1987	1.657	1.235	1.107	1.062	1.039	1.028	1.016
1988	1.686	1.236	1.104	1.058	1.039	1.027	1.018
1989	1.716	1.241	1.108	1.058	1.036	1.025	1.020
POINTS	8	8	8	8	8	8	8
AVERAGE	1.618	1.212	1.094	1.052	1.033	1.023	1.015
SAMPLE VARIANCE	0.005030	0.000651	0.000114	0.000051	0.000024	0.000020	0.000009
SAMPLE COEFF OF VARIANCE	0.044	0.021	0.010	0.007	0.005	0.004	0.003

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: FLORIDA PAID - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: INDEMNITY (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.012634	0.001697	0.000356	0.000336	0.000534	0.000369	0.000167	0.016093	
THREE-YEAR STRAIGHT AVERAGE	0.019246	0.002854	0.000775	0.000622	0.000795	0.000486	0.000251	0.025028	
FOUR-YEAR STRAIGHT AVERAGE	0.028272	0.004450	0.001368	0.000958	0.001083	0.000582	0.000334	0.037048	
TWO-YEAR EXPONENTIAL AVG	0.012303	0.001649	0.000353	0.000319	0.000519	0.000358	0.000162	0.015664	*
THREE-YEAR EXPONENTIAL AVG	0.018195	0.002669	0.000715	0.000570	0.000749	0.000460	0.000236	0.023595	
FOUR-YEAR EXPONENTIAL AVG	0.025801	0.004001	0.001199	0.000849	0.000989	0.000539	0.000307	0.033686	

STATE: FLORIDA PAID - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: INDEMNITY ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
FOUR-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
TWO-YEAR EXPONENTIAL AVG	1	1	1	1	1	1	1	7	*
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: FLORIDA PAID + O/S - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.174	1.052	1.024	1.007	1.004	0.996	0.998
1982	1.201	1.125	1.024	1.010	0.994	0.996	1.005
1983	1.304	1.177	1.103	1.038	1.002	1.000	1.005
1984	1.232	1.129	1.085	1.040	1.006	1.005	1.006
1985	1.282	1.140	1.105	1.055	1.010	1.008	0.998
1986	1.296	1.192	1.100	1.062	1.033	1.028	1.016
1987	1.295	1.198	1.108	1.066	1.051	1.036	1.016
1988	1.323	1.186	1.110	1.058	1.017	1.022	1.033
1989	1.310	1.159	1.165	1.090	1.069	1.012	1.020
POINTS	9	9	9	9	9	9	9
AVERAGE	1.269	1.151	1.092	1.047	1.021	1.011	1.011
SAMPLE VARIANCE	0.002802	0.002117	0.001945	0.000715	0.000636	0.000206	0.000131
SAMPLE COEFF OF VARIANCE	0.042	0.040	0.040	0.026	0.025	0.014	0.011

REGION: SOUTHERN PAID + O/S - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	1.072	1.020	1.004	0.999	1.001	0.995	0.999
1983	1.103	1.021	1.010	1.005	1.001	1.001	1.001
1984	1.089	1.028	1.010	1.000	0.999	1.004	1.002
1985	1.140	1.039	1.019	1.007	1.003	0.999	0.998
1986	1.163	1.075	1.029	1.010	1.009	1.012	1.004
1987	1.165	1.074	1.022	1.015	1.011	1.004	1.002
1988	1.174	1.073	1.031	1.018	1.008	1.008	1.007
1989	1.165	1.059	1.034	1.017	1.009	1.002	1.004
POINTS	8	8	8	8	8	8	8
AVERAGE	1.134	1.049	1.020	1.009	1.005	1.003	1.002
SAMPLE VARIANCE	0.001604	0.000592	0.000123	0.000055	0.000021	0.000028	0.000008
SAMPLE COEFF OF VARIANCE	0.035	0.023	0.011	0.007	0.005	0.005	0.003

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: FLORIDA PAID + O/S - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989

LOSS TYPE: INDEMNITY (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.000502	0.001134	0.000670	0.000269	0.000676	0.000241	0.000128	0.003620	
THREE-YEAR STRAIGHT AVERAGE	0.000708	0.001007	0.000965	0.000390	0.000694	0.000280	0.000168	0.004213	
FOUR-YEAR STRAIGHT AVERAGE	0.001445	0.001026	0.001252	0.000571	0.000840	0.000309	0.000175	0.005618	
TWO-YEAR EXPONENTIAL AVG	0.000492	0.001100	0.000669	0.000268	0.000685	0.000235	0.000129	0.003579	*
THREE-YEAR EXPONENTIAL AVG	0.000672	0.000981	0.000927	0.000374	0.000694	0.000269	0.000163	0.004079	
FOUR-YEAR EXPONENTIAL AVG	0.001280	0.000978	0.001159	0.000522	0.000812	0.000292	0.000168	0.005210	

STATE: FLORIDA PAID + O/S - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS

LOSS TYPE: INDEMNITY ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	1	0	1	2	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
FOUR-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
TWO-YEAR EXPONENTIAL AVG	1	0	1	1	0	1	0	4	*
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	1	0	0	0	0	0	1	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: FLORIDA INCURRED - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.018	0.995	1.008	0.994	1.003	0.995	1.000
1982	1.004	1.043	1.002	0.989	0.992	0.996	1.005
1983	1.151	1.096	1.067	0.999	0.992	0.995	1.002
1984	1.128	1.097	1.079	1.032	1.008	1.006	1.007
1985	1.154	1.096	1.095	1.039	1.009	1.007	0.997
1986	1.184	1.150	1.092	1.044	1.031	1.025	0.990
1987	1.174	1.170	1.100	1.062	1.054	1.036	1.020
1988	1.178	1.139	1.098	1.053	1.021	1.019	1.034
1989	1.175	1.112	1.139	1.067	1.059	1.006	1.021
POINTS	9	9	9	9	9	9	9
AVERAGE	1.130	1.100	1.076	1.031	1.019	1.009	1.008
SAMPLE VARIANCE	0.004828	0.002922	0.001979	0.000891	0.000613	0.000208	0.000193
SAMPLE COEFF OF VARIANCE	0.062	0.049	0.041	0.029	0.024	0.014	0.014

REGION: SOUTHERN INCURRED - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	0.968	0.981	0.994	0.978	0.996	0.992	0.997
1983	1.014	0.978	0.995	0.982	0.995	0.998	1.000
1984	1.020	1.003	1.006	0.986	0.998	1.002	1.002
1985	1.064	1.010	1.015	0.987	1.000	0.996	0.996
1986	1.084	1.047	1.025	0.988	1.005	1.008	0.993
1987	1.081	1.049	1.012	1.006	1.009	1.001	1.002
1988	1.071	1.042	1.021	1.012	1.015	1.005	1.007
1989	1.065	1.032	1.023	1.007	1.005	0.996	1.005
POINTS	8	8	8	8	8	8	8
AVERAGE	1.046	1.018	1.011	0.993	1.003	1.000	1.000
SAMPLE VARIANCE	0.001680	0.000833	0.000147	0.000169	0.000048	0.000028	0.000022
SAMPLE COEFF OF VARIANCE	0.039	0.028	0.012	0.013	0.007	0.005	0.005

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: FLORIDA INCURRED - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: INDEMNITY (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.000417	0.001464	0.000431	0.000227	0.000534	0.000276	0.000356	0.003704	
THREE-YEAR STRAIGHT AVERAGE	0.001110	0.001592	0.000830	0.000450	0.000606	0.000310	0.000346	0.005243	
FOUR-YEAR STRAIGHT AVERAGE	0.002502	0.002083	0.001253	0.000724	0.000784	0.000335	0.000338	0.008019	
TWO-YEAR EXPONENTIAL AVG	0.000408	0.001429	0.000428	0.000218	0.000537	0.000269	0.000349	0.003638	*
THREE-YEAR EXPONENTIAL AVG	0.000994	0.001533	0.000772	0.000413	0.000595	0.000298	0.000337	0.004942	
FOUR-YEAR EXPONENTIAL AVG	0.002128	0.001918	0.001116	0.000641	0.000742	0.000319	0.000330	0.007193	

STATE: FLORIDA INCURRED - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: INDEMNITY ('1' INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	1	0	0	1	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
FOUR-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
TWO-YEAR EXPONENTIAL AVG	1	1	1	1	0	1	0	5	*
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	1	1	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: FLORIDA PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.239	1.089	1.052	1.031	1.023	1.020	1.020
1982	1.241	1.113	1.056	1.038	1.020	1.019	1.012
1983	1.255	1.106	1.072	1.034	1.029	1.013	1.011
1984	1.261	1.097	1.070	1.044	1.025	1.017	1.013
1985	1.264	1.096	1.062	1.043	1.033	1.019	1.017
1986	1.301	1.107	1.065	1.042	1.034	1.036	1.018
1987	1.288	1.115	1.063	1.043	1.035	1.032	1.026
1988	1.349	1.142	1.073	1.047	1.041	1.033	1.027
1989	1.381	1.156	1.077	1.058	1.041	1.033	1.033
POINTS	9	9	9	9	9	9	9
AVERAGE	1.287	1.113	1.066	1.042	1.031	1.025	1.020
SAMPLE VARIANCE	0.002441	0.000487	0.000068	0.000061	0.000057	0.000075	0.000057
SAMPLE COEFF OF VARIANCE	0.038	0.020	0.008	0.007	0.007	0.008	0.007

REGION: SOUTHERN PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	1.215	1.079	1.044	1.027	1.015	1.013	1.009
1983	1.216	1.070	1.042	1.021	1.019	1.012	1.010
1984	1.233	1.073	1.039	1.026	1.017	1.014	1.012
1985	1.245	1.073	1.037	1.025	1.017	1.013	1.013
1986	1.267	1.082	1.042	1.022	1.017	1.018	1.012
1987	1.283	1.093	1.043	1.028	1.020	1.016	1.012
1988	1.314	1.101	1.048	1.029	1.021	1.015	1.013
1989	1.340	1.112	1.055	1.033	1.022	1.018	1.013
POINTS	8	8	8	8	8	8	8
AVERAGE	1.264	1.085	1.044	1.026	1.019	1.015	1.012
SAMPLE VARIANCE	0.002096	0.000229	0.000031	0.000015	0.000006	0.000005	0.000002
SAMPLE COEFF OF VARIANCE	0.036	0.014	0.005	0.004	0.002	0.002	0.001

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: FLORIDA PAID - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: MEDICAL (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.001685	0.000408	0.000049	0.000042	0.000023	0.000072	0.000035	0.002313	
THREE-YEAR STRAIGHT AVERAGE	0.002166	0.000573	0.000045	0.000047	0.000036	0.000095	0.000055	0.003017	
FOUR-YEAR STRAIGHT AVERAGE	0.002817	0.000674	0.000042	0.000054	0.000053	0.000108	0.000070	0.003817	
TWO-YEAR EXPONENTIAL AVG	0.001649	0.000396	0.000048	0.000041	0.000022	0.000071	0.000034	0.002261	*
THREE-YEAR EXPONENTIAL AVG	0.002083	0.000543	0.000044	0.000046	0.000034	0.000091	0.000052	0.002893	
FOUR-YEAR EXPONENTIAL AVG	0.002636	0.000631	0.000040	0.000051	0.000048	0.000101	0.000065	0.003573	

STATE: FLORIDA PAID - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: MEDICAL ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
FOUR-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
TWO-YEAR EXPONENTIAL AVG	1	1	0	1	1	1	1	6	*
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	1	0	0	0	0	1	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: FLORIDA PAID + O/S - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.069	1.023	1.017	1.014	1.018	1.002	1.008
1982	1.093	1.061	1.015	1.022	1.001	0.996	1.021
1983	1.117	1.060	1.064	1.015	0.997	1.005	1.008
1984	1.125	1.049	1.042	1.023	1.014	1.015	1.013
1985	1.101	1.057	1.039	1.029	1.002	1.012	1.006
1986	1.112	1.069	1.046	1.027	1.022	1.028	1.006
1987	1.128	1.088	1.052	1.045	1.035	1.038	1.021
1988	1.131	1.077	1.052	1.034	1.019	1.027	1.034
1989	1.098	1.050	1.065	1.040	1.040	1.035	1.034
POINTS	9	9	9	9	9	9	9
AVERAGE	1.108	1.059	1.044	1.028	1.016	1.018	1.017
SAMPLE VARIANCE	0.000401	0.000344	0.000321	0.000112	0.000221	0.000228	0.000129
SAMPLE COEFF OF VARIANCE	0.018	0.018	0.017	0.010	0.015	0.015	0.011

REGION: SOUTHERN PAID + O/S - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	1.042	1.020	1.009	1.006	1.008	1.003	1.013
1983	1.054	1.015	1.023	1.013	1.004	1.005	1.008
1984	1.067	1.020	1.010	1.006	1.008	1.013	1.007
1985	1.072	1.019	1.004	1.011	0.999	1.010	1.006
1986	1.083	1.026	1.018	1.009	1.011	1.011	1.008
1987	1.100	1.043	1.018	1.015	1.013	1.011	1.008
1988	1.101	1.038	1.015	1.012	1.007	1.006	1.010
1989	1.093	1.031	1.022	1.013	1.014	1.011	1.012
POINTS	8	8	8	8	8	8	8
AVERAGE	1.077	1.027	1.015	1.011	1.008	1.009	1.009
SAMPLE VARIANCE	0.000468	0.000100	0.000045	0.000011	0.000024	0.000013	0.000006
SAMPLE COEFF OF VARIANCE	0.020	0.010	0.007	0.003	0.005	0.004	0.002

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: FLORIDA PAID + O/S - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: MEDICAL (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.000395	0.000389	0.000099	0.000079	0.000199	0.000116	0.000144	0.001422	
THREE-YEAR STRAIGHT AVERAGE	0.000263	0.000377	0.000073	0.000095	0.000206	0.000150	0.000190	0.001353	
FOUR-YEAR STRAIGHT AVERAGE	0.000164	0.000345	0.000088	0.000129	0.000296	0.000223	0.000209	0.001456	
TWO-YEAR EXPONENTIAL AVG	0.000394	0.000382	0.000095	0.000079	0.000201	0.000114	0.000140	0.001404	
THREE-YEAR EXPONENTIAL AVG	0.000270	0.000370	0.000070	0.000092	0.000204	0.000143	0.000180	0.001329	*
FOUR-YEAR EXPONENTIAL AVG	0.000178	0.000340	0.000081	0.000120	0.000279	0.000204	0.000197	0.001399	

STATE: FLORIDA PAID + O/S - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: MEDICAL ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	1	0	0	1	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
FOUR-YEAR STRAIGHT AVERAGE	1	0	0	0	0	0	0	1	
TWO-YEAR EXPONENTIAL AVG	0	0	0	1	0	1	1	3	*
THREE-YEAR EXPONENTIAL AVG	0	0	1	0	0	0	0	1	
FOUR-YEAR EXPONENTIAL AVG	0	1	0	0	0	0	0	1	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: FLORIDA INCURRED - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.009	1.002	1.015	1.008	1.019	1.002	1.010
1982	1.008	1.028	1.002	1.008	0.997	0.994	1.020
1983	1.061	1.033	1.050	1.000	0.994	1.003	1.007
1984	1.085	1.037	1.039	1.019	1.014	1.016	1.015
1985	1.057	1.039	1.031	1.020	1.000	1.010	1.005
1986	1.065	1.054	1.045	1.020	1.022	1.028	1.002
1987	1.079	1.078	1.048	1.041	1.036	1.037	1.021
1988	1.071	1.059	1.049	1.032	1.022	1.025	1.034
1989	1.048	1.042	1.067	1.033	1.041	1.040	1.040
POINTS	9	9	9	9	9	9	9
AVERAGE	1.054	1.041	1.038	1.020	1.016	1.017	1.017
SAMPLE VARIANCE	0.000779	0.000455	0.000391	0.000180	0.000276	0.000264	0.000171
SAMPLE COEFF OF VARIANCE	0.026	0.020	0.019	0.013	0.016	0.016	0.013

REGION: SOUTHERN INCURRED - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	0.981	0.998	1.003	0.995	1.006	1.001	1.011
1983	1.005	0.990	1.013	1.001	1.001	1.003	1.007
1984	1.025	1.003	1.006	0.998	1.007	1.013	1.007
1985	1.030	1.002	1.001	1.000	0.997	1.008	1.005
1986	1.038	1.011	1.017	0.998	1.009	1.009	1.005
1987	1.052	1.029	1.013	1.011	1.011	1.009	1.008
1988	1.049	1.024	1.012	1.009	1.012	1.004	1.010
1989	1.048	1.022	1.020	1.007	1.012	1.008	1.012
POINTS	8	8	8	8	8	8	8
AVERAGE	1.029	1.010	1.011	1.002	1.007	1.007	1.008
SAMPLE VARIANCE	0.000609	0.000194	0.000045	0.000034	0.000030	0.000015	0.000007
SAMPLE COEFF OF VARIANCE	0.024	0.014	0.007	0.006	0.005	0.004	0.003

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: FLORIDA INCURRED - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: MEDICAL (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.000269	0.000403	0.000146	0.000113	0.000212	0.000137	0.000214	0.001495	
THREE-YEAR STRAIGHT AVERAGE	0.000143	0.000405	0.000113	0.000131	0.000233	0.000166	0.000273	0.001464	
FOUR-YEAR STRAIGHT AVERAGE	0.000192	0.000453	0.000182	0.000191	0.000347	0.000256	0.000298	0.001918	
TWO-YEAR EXPONENTIAL AVG	0.000268	0.000394	0.000144	0.000111	0.000212	0.000137	0.000208	0.001473	
THREE-YEAR EXPONENTIAL AVG	0.000142	0.000396	0.000111	0.000125	0.000228	0.000160	0.000260	0.001422	*
FOUR-YEAR EXPONENTIAL AVG	0.000168	0.000431	0.000166	0.000176	0.000324	0.000235	0.000282	0.001781	

STATE: FLORIDA INCURRED - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: MEDICAL ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	1	0	0	1	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
FOUR-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
TWO-YEAR EXPONENTIAL AVG	0	1	0	1	0	1	1	4	*
THREE-YEAR EXPONENTIAL AVG	1	0	1	0	0	0	0	2	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
FLORIDA INDEMNITY COMPARISON OF PROJECTIONS

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	ACTUAL 8TH	AVERAGE	*=LOW AVG
1978 PAID				141,171,967	141,969,416	142,778,704	144,665,291	146,491,347		
1978 PAID + O/S				156,478,608	161,781,102	163,894,765	164,220,314	166,558,964		
1978 INCURRED				159,567,605	160,047,634	163,608,744	164,261,835	162,227,094		
1978 PAID (1)				3.63%	3.09%	2.53%	1.25%		2.62%	
1978 PAID + O/S (1)				6.05%	2.87%	1.60%	1.40%		2.98%	
1978 INCURRED (1)				1.64%	1.34%	0.85%	1.25%		1.27%	*
1978 PAID (2)					0.56%	0.57%	1.32%	1.26%	0.95%	*
1978 PAID + O/S (2)					3.39%	1.31%	0.20%	1.42%	1.58%	
1978 INCURRED (2)					0.30%	2.23%	0.40%	1.24%	1.04%	
1979 PAID			130,412,524	138,510,424	143,808,441	150,377,731	156,329,963	158,330,748		
1979 PAID + O/S			162,480,312	178,505,548	183,298,169	184,484,903	189,365,961	191,042,844		
1979 INCURRED			164,145,720	173,921,531	183,123,206	185,416,772	187,223,022	192,232,059		
1979 PAID (1)			17.63%	12.52%	9.17%	5.02%	1.26%		9.12%	
1979 PAID + O/S (1)			14.95%	6.56%	4.05%	3.43%	0.88%		5.98%	*
1979 INCURRED (1)			14.61%	9.53%	4.74%	3.55%	2.61%		7.01%	
1979 PAID (2)				6.21%	3.82%	4.57%	3.96%	1.28%	3.97%	
1979 PAID + O/S (2)				9.86%	2.68%	0.65%	2.65%	0.89%	3.35%	
1979 INCURRED (2)				5.96%	5.29%	1.25%	0.97%	2.68%	3.23%	*
1980 PAID		138,569,409	149,346,823	157,665,452	167,691,368	176,170,042	181,853,336	185,355,927		
1980 PAID + O/S		171,284,245	196,190,693	205,333,241	209,429,587	218,159,221	224,000,913	227,819,026		
1980 INCURRED		171,034,950	188,977,935	204,217,197	211,455,167	216,362,077	223,174,916	229,583,934		
1980 PAID (1)		25.24%	19.43%	14.94%	9.53%	4.96%	1.89%		12.66%	
1980 PAID + O/S (1)		24.82%	13.88%	9.87%	8.07%	4.24%	1.68%		10.43%	*
1980 INCURRED (1)		25.50%	17.69%	11.05%	7.90%	5.76%	2.79%		11.78%	
1980 PAID (2)			7.78%	5.57%	6.36%	5.06%	3.23%	1.93%	4.99%	
1980 PAID + O/S (2)			14.54%	4.66%	1.99%	4.17%	2.68%	1.70%	4.96%	*
1980 INCURRED (2)			10.49%	8.06%	3.54%	2.32%	3.15%	2.87%	5.07%	
1981 PAID	150,591,753	172,102,332	186,155,687	199,500,140	211,047,866	220,046,451	221,452,829	223,185,064		
1981 PAID + O/S	192,611,365	236,911,274	245,229,544	250,840,752	261,964,334	275,678,355	275,291,068	273,997,575		
1981 INCURRED	178,945,614	219,655,304	242,117,970	254,977,563	260,229,609	275,898,683	278,791,929	277,265,880		
1981 PAID (1)	32.53%	22.89%	16.59%	10.61%	5.44%	1.41%	0.78%		12.89%	
1981 PAID + O/S (1)	29.70%	13.54%	10.50%	8.45%	4.39%	0.61%	0.47%		9.67%	*
1981 INCURRED (1)	35.46%	20.78%	12.68%	8.04%	6.14%	0.49%	0.55%		12.02%	
1981 PAID (2)		14.28%	8.17%	7.17%	5.79%	4.26%	0.64%	0.78%	5.87%	
1981 PAID + O/S (2)		23.00%	3.51%	2.29%	4.43%	5.24%	0.14%	0.47%	5.58%	*
1981 INCURRED (2)		22.75%	10.23%	5.31%	2.06%	6.02%	1.05%	0.55%	6.85%	
1982 PAID	173,296,284	194,480,578	210,621,572	224,753,129	234,911,276	240,677,367	240,816,395			
1982 PAID + O/S	261,472,305	271,882,400	272,479,469	284,919,890	299,374,368	293,779,698	289,490,229			
1982 INCURRED	231,152,600	266,610,925	278,593,017	284,955,366	304,698,596	304,059,339	297,841,962			
1982 PAID (1)	28.04%	19.24%	12.54%	6.67%	2.45%	0.06%			11.50%	
1982 PAID + O/S (1)	9.68%	6.08%	5.88%	1.58%	3.41%	1.48%			4.69%	*
1982 INCURRED (1)	22.39%	10.49%	6.46%	4.33%	2.30%	2.09%			8.01%	
1982 PAID (2)		12.22%	8.30%	6.71%	4.52%	2.45%	0.06%		5.71%	
1982 PAID + O/S (2)		3.98%	0.22%	4.57%	5.07%	1.87%	1.46%		2.86%	*
1982 INCURRED (2)		15.34%	4.49%	2.28%	6.93%	0.21%	2.04%		5.22%	
1983 PAID	217,792,760	245,431,203	271,126,426	290,273,045	296,714,527	293,952,230				
1983 PAID + O/S	297,674,120	300,166,477	330,528,445	348,374,431	345,618,566	353,839,897				
1983 INCURRED	291,890,832	309,031,180	331,966,505	354,050,842	359,017,724	361,283,671				
1983 PAID (1)	25.90%	16.50%	7.76%	1.24%	0.95%				10.47%	
1983 PAID + O/S (1)	15.87%	15.17%	6.59%	1.54%	2.32%				8.30%	*
1983 INCURRED (1)	19.21%	14.46%	8.11%	2.00%	0.63%				8.88%	
1983 PAID (2)		12.69%	10.47%	7.06%	2.22%	0.94%			6.68%	*
1983 PAID + O/S (2)		0.84%	10.12%	5.40%	0.79%	2.38%			3.90%	*
1983 INCURRED (2)		5.87%	7.42%	6.65%	1.40%	0.63%			4.40%	
1984 PAID	287,984,931	337,038,158	373,087,648	381,701,999	384,908,389					
1984 PAID + O/S	374,098,371	415,455,476	448,280,142	448,841,543	460,162,652					
1984 INCURRED	387,348,755	421,640,292	466,807,091	476,246,167	474,881,618					
1984 PAID (1)	25.18%	12.44%	3.07%	0.83%					10.38%	
1984 PAID + O/S (1)	18.70%	9.72%	2.58%	2.46%					8.37%	*
1984 INCURRED (1)	18.43%	11.21%	1.70%	0.29%					7.91%	*
1984 PAID (2)		17.03%	10.70%	2.31%	0.84%				7.72%	*
1984 PAID + O/S (2)		11.06%	7.90%	0.13%	2.52%				5.40%	*
1984 INCURRED (2)		8.85%	10.71%	2.02%	0.29%				5.47%	

NOTES: (1) ABSOLUTE DEVIATION FROM LAST PROJECTION (OR REPORT), RATIOED TO SAME.
(2) ABSOLUTE CHANGE RELATIVE TO PRIOR PROJECTION OR REPORT.
WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.
LOSSES HAVE BEEN RESTATED TO THE LATEST DIAGONAL.

N-4 0.0000
N-3 0.0000
N-2 0.5000
N-1 0.5000
WEIGHTS ASSIGNED TO PRECEDING YEARS:
04:07 PM
03/13/91

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 FLORIDA INDEMNITY COMPARISON OF PROJECTIONS RESTATED TO INCURRED LEVEL

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	RESTATED 8TH	AVERAGE	*=LOW AVG
1978 PAID				157,369,423	159,138,183	160,052,912	161,487,282	162,578,966		
1978 PAID + Q/S				157,209,099	162,503,780	164,655,915	165,230,138	164,893,980		
1978 INCURRED				159,567,605	160,047,634	163,608,744	164,261,835	162,227,094		
1978 PAID (1)				3.20%	2.12%	1.55%	0.67%		1.89%	
1978 PAID + Q/S (1)				4.66%	1.45%	0.14%	0.20%		1.61%	
1978 INCURRED (1)				1.64%	1.34%	0.85%	1.25%		1.27%	*
1978 PAID (2)					1.12%	0.57%	0.90%	0.68%	0.82%	*
1978 PAID + Q/S (2)					3.37%	1.32%	0.35%	0.20%	1.31%	
1978 INCURRED (2)					0.30%	2.23%	0.40%	1.24%	1.04%	
1979 PAID			145,375,489	155,260,885	161,207,232	167,863,978	173,498,055	183,396,931		
1979 PAID + Q/S			163,238,821	179,302,935	184,149,431	185,619,338	187,472,991	189,103,011		
1979 INCURRED			164,145,720	173,921,531	183,123,206	185,416,772	187,223,022	192,232,059		
1979 PAID (1)			20.73%	15.34%	12.10%	8.47%	5.40%		12.41%	
1979 PAID + Q/S (1)			13.68%	5.18%	2.62%	1.84%	0.86%		4.84%	*
1979 INCURRED (1)			14.61%	9.53%	4.74%	3.55%	2.61%		7.01%	
1979 PAID (2)				6.80%	3.83%	4.13%	3.36%	5.71%	4.76%	
1979 PAID + Q/S (2)				9.84%	2.70%	0.80%	1.00%	0.87%	3.04%	*
1979 INCURRED (2)				5.96%	5.29%	1.25%	0.97%	2.68%	3.23%	
1980 PAID		154,468,259	167,407,761	176,740,746	187,190,881	195,516,963	210,643,505	227,291,192		
1980 PAID + Q/S		172,083,853	197,067,080	206,286,837	210,717,412	215,978,423	221,726,427	229,410,420		
1980 INCURRED		171,034,950	188,977,935	204,217,197	211,455,167	216,362,077	223,174,916	229,583,934		
1980 PAID (1)		32.04%	26.35%	22.24%	17.64%	13.98%	7.32%		19.93%	
1980 PAID + Q/S (1)		24.99%	14.10%	10.08%	8.15%	5.86%	3.35%		11.09%	*
1980 INCURRED (1)		25.50%	17.69%	11.05%	7.90%	5.76%	2.79%		11.78%	
1980 PAID (2)			8.38%	5.58%	5.91%	4.45%	7.74%	7.90%	6.66%	
1980 PAID + Q/S (2)			14.52%	4.68%	2.15%	2.50%	2.66%	3.47%	4.99%	*
1980 INCURRED (2)			10.49%	8.06%	3.54%	2.32%	3.15%	2.87%	5.07%	
1981 PAID	167,869,995	192,915,158	208,677,897	222,698,446	234,225,055	254,883,175	271,554,722	276,852,087		
1981 PAID + Q/S	193,510,535	237,969,561	246,368,424	252,383,222	259,345,643	272,879,139	277,214,071	276,691,868		
1981 INCURRED	178,945,614	219,655,304	242,117,970	254,977,563	260,229,609	275,898,683	278,791,929	277,265,880		
1981 PAID (1)	39.36%	30.32%	24.62%	19.56%	15.40%	7.94%	1.91%		19.87%	
1981 PAID + Q/S (1)	30.06%	13.99%	10.96%	8.79%	6.27%	1.38%	0.19%		10.23%	*
1981 INCURRED (1)	35.46%	20.78%	12.68%	8.04%	6.14%	0.49%	0.55%		12.02%	
1981 PAID (2)		14.92%	8.17%	6.72%	5.18%	8.82%	6.54%	1.95%	7.47%	
1981 PAID + Q/S (2)		22.97%	3.53%	2.44%	2.76%	5.22%	1.59%	0.19%	5.53%	*
1981 INCURRED (2)		22.75%	10.23%	5.31%	2.06%	6.02%	1.05%	0.55%	6.85%	
1982 PAID	194,253,498	218,009,983	235,113,103	249,435,424	272,101,330	295,128,656	298,723,044			
1982 PAID + Q/S	262,640,305	273,145,060	274,155,000	282,071,727	296,334,546	295,831,850	292,336,865			
1982 INCURRED	231,152,600	266,610,925	278,593,017	284,955,366	304,698,596	304,059,339	297,841,962			
1982 PAID (1)	34.97%	27.02%	21.29%	16.50%	8.91%	1.20%			18.32%	
1982 PAID + Q/S (1)	10.16%	6.56%	6.22%	3.51%	1.37%	1.20%			4.84%	*
1982 INCURRED (1)	22.39%	10.49%	6.46%	4.33%	2.30%	2.09%			8.01%	
1982 PAID (2)		12.23%	7.85%	6.09%	9.09%	8.46%	1.22%		7.49%	
1982 PAID + Q/S (2)		4.00%	0.37%	2.89%	5.06%	0.17%	1.18%		2.28%	*
1982 INCURRED (2)		15.34%	4.49%	2.28%	6.93%	0.21%	2.04%		5.22%	
1983 PAID	244,142,609	273,970,473	300,901,418	336,227,715	363,843,785	364,611,099				
1983 PAID + Q/S	299,056,560	302,012,261	327,224,363	344,837,066	348,032,830	357,319,301				
1983 INCURRED	291,890,832	309,031,180	331,966,505	354,050,842	359,017,724	361,283,671				
1983 PAID (1)	33.04%	24.86%	17.47%	7.78%	0.21%				16.67%	
1983 PAID + Q/S (1)	16.31%	15.48%	8.42%	3.49%	2.60%				9.26%	
1983 INCURRED (1)	19.21%	14.46%	8.11%	2.00%	0.63%				8.88%	*
1983 PAID (2)		12.22%	9.83%	11.74%	8.21%	0.21%			8.44%	
1983 PAID + Q/S (2)		0.99%	8.35%	5.38%	0.93%	2.67%			3.66%	*
1983 INCURRED (2)		5.87%	7.42%	6.65%	1.40%	0.63%			4.40%	
1984 PAID	321,472,439	374,051,549	432,153,139	468,058,958	477,463,361					
1984 PAID + Q/S	376,398,777	411,302,433	443,728,342	451,976,855	464,687,556					
1984 INCURRED	387,348,755	421,640,292	466,807,091	476,246,167	474,881,618					
1984 PAID (1)	32.67%	21.66%	9.49%	1.97%					16.45%	
1984 PAID + Q/S (1)	19.00%	11.49%	4.51%	2.74%					9.43%	
1984 INCURRED (1)	18.43%	11.21%	1.70%	0.29%					7.91%	*
1984 PAID (2)		16.36%	15.53%	8.31%	2.01%				10.55%	
1984 PAID + Q/S (2)		9.27%	7.88%	1.86%	2.81%				5.46%	*
1984 INCURRED (2)		8.85%	10.71%	2.02%	0.29%				5.47%	

NOTES: (1) ABSOLUTE DEVIATION FROM LAST PROJECTION (OR REPORT), RATI0ED TO SAME.
 (2) ABSOLUTE CHANGE RELATIVE TO PRIOR PROJECTION OR REPORT.
 WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.
 LOSSES RESTATED TO INCURRED LEVEL OF 8TH REPORT, AND TO LAST DIAGONAL.

WEIGHTS ASSIGNED TO
 PRECEDING YEARS:
 N-4 0.0000
 N-3 0.0000
 N-2 0.5000
 N-1 0.5000

NATIONAL COUNCIL ON COMPENSATION INSURANCE
FLORIDA MEDICAL COMPARISON OF PROJECTIONS

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	ACTUAL 8TH	AVERAGE	*=LOW AVG
1978 PAID				113,445,098	112,830,894	112,830,598	113,611,047	113,916,089		
1978 PAID + O/S				121,937,730	120,494,476	122,978,206	123,099,786	122,729,701		
1978 INCURRED				123,090,838	120,481,722	123,766,615	123,705,435	122,772,979		
1978 PAID (1)				0.41%	0.95%	0.95%	0.27%		0.65%	*
1978 PAID + O/S (1)				0.65%	1.82%	0.20%	0.30%		0.74%	
1978 INCURRED (1)				0.26%	1.87%	0.81%	0.76%		0.92%	
1978 PAID (2)					0.54%	0.00%	0.69%	0.27%	0.38%	*
1978 PAID + O/S (2)					1.18%	2.06%	0.10%	0.30%	0.91%	
1978 INCURRED (2)					2.12%	2.73%	0.05%	0.75%	1.41%	
1979 PAID			128,598,953	130,338,619	131,601,033	133,154,682	135,842,854	136,928,556		
1979 PAID + O/S			144,124,827	149,661,724	152,135,469	151,980,724	153,620,625	155,877,132		
1979 INCURRED			144,830,228	148,184,153	152,974,957	152,742,525	154,006,708	156,691,301		
1979 PAID (1)			6.08%	4.81%	3.89%	2.76%	0.79%		3.67%	
1979 PAID + O/S (1)			7.54%	3.99%	2.40%	2.50%	1.45%		3.57%	*
1979 INCURRED (1)			7.57%	5.43%	2.37%	2.52%	1.71%		3.92%	
1979 PAID (2)				1.35%	0.97%	1.18%	2.02%	0.80%	1.26%	*
1979 PAID + O/S (2)				3.84%	1.65%	0.10%	1.08%	1.47%	1.63%	
1979 INCURRED (2)				2.32%	3.23%	0.15%	0.83%	1.74%	1.65%	
1980 PAID		149,834,942	151,413,095	153,005,422	154,805,996	157,396,609	158,785,088	159,534,616		
1980 PAID + O/S		168,049,935	173,432,828	176,032,483	178,642,524	181,653,298	186,237,117	190,038,257		
1980 INCURRED		167,952,609	170,891,965	176,986,665	179,805,716	182,383,548	187,084,903	191,291,500		
1980 PAID (1)		6.08%	5.09%	4.09%	2.96%	1.34%	0.47%		3.34%	*
1980 PAID + O/S (1)		11.57%	8.74%	7.37%	6.00%	4.41%	2.00%		6.68%	
1980 INCURRED (1)		12.20%	10.66%	7.48%	6.00%	4.66%	2.20%		7.20%	
1980 PAID (2)			1.05%	1.05%	1.18%	1.67%	0.88%	0.47%	1.05%	*
1980 PAID + O/S (2)			3.20%	1.50%	1.48%	1.69%	2.52%	2.04%	2.07%	
1980 INCURRED (2)			1.75%	3.57%	1.59%	1.43%	2.58%	2.25%	2.19%	
1981 PAID	168,793,011	173,180,510	173,191,834	173,840,739	176,410,471	178,570,377	179,183,186	180,400,434		
1981 PAID + O/S	182,653,416	194,873,615	197,715,182	197,401,848	198,958,434	207,609,926	209,255,226	210,554,940		
1981 INCURRED	177,923,928	190,001,225	199,066,858	199,525,858	200,306,275	209,636,810	211,405,991	214,059,126		
1981 PAID (1)	6.43%	4.00%	4.00%	3.64%	2.21%	1.01%	0.67%		3.14%	*
1981 PAID + O/S (1)	13.25%	7.45%	6.10%	6.25%	5.51%	1.40%	0.62%		5.80%	
1981 INCURRED (1)	16.88%	11.24%	7.00%	6.79%	6.42%	2.07%	1.24%		7.38%	
1981 PAID (2)		2.60%	0.01%	0.37%	1.48%	1.22%	0.34%	0.68%	0.96%	*
1981 PAID + O/S (2)		6.69%	1.46%	0.16%	0.79%	4.35%	0.79%	0.62%	2.12%	
1981 INCURRED (2)		6.79%	4.77%	0.23%	0.39%	4.66%	0.84%	1.25%	2.71%	
1982 PAID	194,282,313	197,124,243	197,616,374	200,445,575	202,899,006	204,775,377	205,573,091			
1982 PAID + O/S	224,148,491	232,747,024	233,265,371	236,577,633	249,371,354	250,359,611	252,553,427			
1982 INCURRED	212,813,679	233,401,120	235,754,529	238,963,380	253,519,002	255,405,700	260,017,265			
1982 PAID (1)	5.49%	4.11%	3.87%	2.49%	1.30%	0.39%			2.94%	*
1982 PAID + O/S (1)	11.25%	7.84%	7.64%	6.33%	1.26%	0.87%			5.86%	
1982 INCURRED (1)	18.15%	10.24%	9.33%	8.10%	2.50%	1.77%			8.35%	
1982 PAID (2)		1.46%	0.25%	1.43%	1.22%	0.92%	0.39%		0.95%	*
1982 PAID + O/S (2)		3.84%	0.22%	1.42%	5.41%	0.40%	0.88%		2.03%	
1982 INCURRED (2)		9.67%	1.01%	1.36%	6.09%	0.74%	1.81%		3.45%	
1983 PAID	226,307,921	228,058,970	233,210,219	235,840,587	238,360,125	239,980,256				
1983 PAID + O/S	263,608,326	258,499,882	265,263,486	279,726,425	282,493,359	287,460,682				
1983 INCURRED	264,740,392	263,168,792	269,048,154	285,279,376	289,792,156	296,312,724				
1983 PAID (1)	5.70%	4.97%	2.82%	1.73%	0.68%				3.18%	*
1983 PAID + O/S (1)	8.30%	10.07%	7.72%	2.69%	1.73%				6.10%	
1983 INCURRED (1)	10.66%	11.19%	9.20%	3.72%	2.20%				7.39%	
1983 PAID (2)		0.77%	2.26%	1.13%	1.07%	0.68%			1.18%	*
1983 PAID + O/S (2)		1.94%	2.62%	5.45%	0.99%	1.76%			2.55%	
1983 INCURRED (2)		0.59%	2.23%	6.03%	1.58%	2.25%			2.54%	
1984 PAID	250,230,838	262,375,959	268,839,908	273,486,881	278,771,122					
1984 PAID + O/S	296,769,518	302,553,093	325,621,445	331,536,961	334,121,189					
1984 INCURRED	306,285,956	309,158,699	337,193,589	344,843,007	348,204,690					
1984 PAID (1)	10.24%	5.88%	3.56%	1.90%					5.39%	*
1984 PAID + O/S (1)	11.18%	9.45%	2.54%	0.77%					5.99%	
1984 INCURRED (1)	12.04%	11.21%	3.16%	0.97%					6.84%	
1984 PAID (2)		4.85%	2.46%	1.73%	1.93%				2.74%	*
1984 PAID + O/S (2)		1.95%	7.62%	1.82%	0.78%				3.04%	
1984 INCURRED (2)		0.94%	9.07%	2.27%	0.97%				3.31%	

NOTES: (1) ABSOLUTE DEVIATION FROM LAST PROJECTION (OR REPORT), RATIODE TO SAME.
(2) ABSOLUTE CHANGE RELATIVE TO PRIOR PROJECTION OR REPORT.
WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.
LOSSES HAVE BEEN RESTATED TO THE LATEST DIAGONAL.

WEIGHTS ASSIGNED TO PRECEDING YEARS: N-4 0.0000
N-3 0.0000
N-2 0.5000
N-1 0.5000
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NATIONAL COUNCIL ON COMPENSATION INSURANCE
 FLORIDA MEDICAL COMPARISON OF PROJECTIONS RESTATED TO INCURRED LEVEL

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	RESTATED 8TH	AVERAGE	%LOW AVG
1978 PAID				123,466,694	122,766,645	120,838,027	122,880,525	123,577,094		
1978 PAID + Q/S				122,449,666	120,918,138	123,496,584	123,701,491	123,049,332		
1978 INCURRED				123,090,838	120,481,722	123,766,615	123,705,435	122,772,979		
1978 PAID (1)				0.09%	0.66%	2.22%	0.56%		0.88%	
1978 PAID + Q/S (1)				0.49%	1.73%	0.36%	0.53%		0.78%	*
1978 INCURRED (1)				0.26%	1.87%	0.81%	0.76%		0.92%	
1978 PAID (2)					0.57%	1.57%	1.69%	0.57%	1.10%	
1978 PAID + Q/S (2)					1.25%	2.13%	0.17%	0.53%	1.02%	*
1978 INCURRED (2)					2.12%	2.73%	0.05%	0.75%	1.41%	
1979 PAID			139,959,221	141,816,079	140,940,574	144,018,717	147,363,425	151,996,394		
1979 PAID + Q/S			144,729,913	150,187,939	152,776,751	152,723,598	154,020,707	156,310,778		
1979 INCURRED			144,830,228	148,184,153	152,974,957	152,742,525	154,006,708	156,691,301		
1979 PAID (1)			7.92%	6.70%	7.27%	5.25%	3.05%		6.04%	
1979 PAID + Q/S (1)			12.71%	7.41%	3.92%	2.26%	1.47%		3.47%	*
1979 INCURRED (1)			7.57%	5.43%	2.37%	2.52%	1.71%		3.92%	
1979 PAID (2)				1.33%	0.62%	2.18%	2.32%	3.14%	1.92%	
1979 PAID + Q/S (2)				3.77%	1.72%	0.03%	0.85%	1.49%	1.57%	*
1979 INCURRED (2)				2.32%	3.23%	0.15%	0.83%	1.74%	1.65%	
1980 PAID		163,071,171	164,746,348	163,864,002	167,436,553	170,745,113	176,258,055	186,823,821		
1980 PAID + Q/S		168,755,466	174,042,622	176,774,496	179,515,720	182,126,386	186,755,224	191,161,088		
1980 INCURRED		167,952,609	170,891,965	176,986,665	179,805,716	182,383,548	187,084,903	191,291,500		
1980 PAID (1)		12.71%	11.82%	12.25%	10.38%	8.61%	5.66%		10.26%	
1980 PAID + Q/S (1)		11.72%	8.95%	7.53%	6.09%	4.73%	2.30%		6.89%	*
1980 INCURRED (1)		12.20%	10.66%	7.48%	6.00%	4.66%	2.20%		7.20%	
1980 PAID (2)			1.03%	0.54%	2.18%	1.98%	3.23%	5.99%	2.49%	
1980 PAID + Q/S (2)			3.13%	1.57%	1.55%	1.45%	2.54%	2.36%	2.10%	*
1980 INCURRED (2)			1.75%	3.57%	1.59%	1.43%	2.58%	2.25%	2.19%	
1981 PAID	183,703,972	188,430,575	185,483,016	188,024,332	191,371,504	198,220,548	209,833,380	215,179,101		
1981 PAID + Q/S	183,420,257	195,558,796	198,548,592	198,366,738	199,476,590	208,187,491	210,491,600	212,996,052		
1981 INCURRED	177,923,928	190,001,225	199,066,858	199,525,858	200,306,275	209,636,810	211,405,991	214,059,126		
1981 PAID (1)	14.63%	12.43%	13.80%	12.62%	11.06%	7.88%	2.48%		10.70%	
1981 PAID + Q/S (1)	13.89%	8.19%	6.78%	6.87%	6.35%	2.26%	1.18%		6.50%	*
1981 INCURRED (1)	16.88%	11.24%	7.00%	6.79%	6.42%	2.07%	1.24%		7.38%	
1981 PAID (2)		2.57%	1.56%	1.37%	1.78%	3.58%	5.86%	2.55%	2.75%	
1981 PAID + Q/S (2)		6.62%	1.53%	0.09%	0.56%	4.37%	1.11%	1.19%	2.21%	*
1981 INCURRED (2)		6.79%	4.77%	0.23%	0.39%	4.66%	0.84%	1.25%	2.71%	
1982 PAID	211,390,577	211,113,874	213,739,812	217,444,980	225,226,339	239,803,244	245,204,692			
1982 PAID + Q/S	224,936,603	233,728,100	234,405,560	237,193,763	250,065,099	251,838,848	255,481,456			
1982 INCURRED	212,813,679	233,401,120	235,754,529	238,963,380	253,519,002	255,405,700	260,017,265			
1982 PAID (1)	13.79%	13.90%	12.83%	11.32%	8.15%	2.20%			10.37%	
1982 PAID + Q/S (1)	11.96%	8.51%	8.25%	7.16%	2.12%	1.43%			6.57%	*
1982 INCURRED (1)	18.15%	10.24%	9.33%	8.10%	2.50%	1.77%			8.35%	
1982 PAID (2)		0.13%	1.24%	1.73%	3.58%	6.47%	2.25%		2.57%	
1982 PAID + Q/S (2)		3.91%	0.29%	1.19%	5.43%	0.71%	1.45%		2.16%	*
1982 INCURRED (2)		9.67%	1.01%	1.36%	6.09%	0.74%	1.81%		3.45%	
1983 PAID	242,368,676	246,666,206	252,988,330	261,792,865	279,132,833	286,245,075				
1983 PAID + Q/S	264,719,489	259,763,416	265,954,324	280,504,617	284,162,457	290,793,416				
1983 INCURRED	264,740,392	263,168,792	269,048,154	285,279,376	289,792,156	296,312,724				
1983 PAID (1)	15.33%	13.83%	11.62%	8.54%	2.48%				10.36%	
1983 PAID + Q/S (1)	8.97%	10.67%	8.54%	3.54%	2.28%				6.80%	*
1983 INCURRED (1)	10.66%	11.19%	9.20%	3.72%	2.20%				7.39%	
1983 PAID (2)		1.77%	2.56%	3.48%	6.62%	2.55%			3.40%	
1983 PAID + Q/S (2)		1.87%	2.38%	5.47%	1.30%	2.33%			2.67%	*
1983 INCURRED (2)		0.59%	2.23%	6.03%	1.58%	2.25%			2.54%	*
1984 PAID	270,647,067	284,627,560	298,423,484	320,268,199	332,514,275					
1984 PAID + Q/S	298,220,112	303,341,046	326,527,315	333,493,831	337,994,891					
1984 INCURRED	306,285,956	309,158,699	337,193,589	344,843,007	348,204,690					
1984 PAID (1)	18.61%	14.40%	10.25%	3.68%					11.74%	
1984 PAID + Q/S (1)	11.77%	10.25%	3.39%	1.33%					6.69%	*
1984 INCURRED (1)	12.04%	11.21%	3.16%	0.97%					6.84%	
1984 PAID (2)		5.17%	4.85%		3.82%				5.29%	
1984 PAID + Q/S (2)		1.72%	7.64%	2.13%	1.35%				3.21%	*
1984 INCURRED (2)		0.94%	9.07%	2.27%	0.97%				3.31%	

NOTES: (1) ABSOLUTE DEVIATION FROM LAST PROJECTION (OR REPORT), RATIOED TO SAME.
 (2) ABSOLUTE CHANGE RELATIVE TO PRIOR PROJECTION OR REPORT.
 WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.
 LOSSES RESTATED TO INCURRED LEVEL OF 8TH REPORT, AND TO LAST DIAGONAL.

WEIGHTS ASSIGNED TO PRECEDING YEARS:
 N-4 0.0000
 N-3 0.0000
 N-2 0.5000
 N-1 0.5000

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ILLINOIS

NATIONAL COUNCIL ON COMPENSATION INSURANCE
ANALYSIS OF FACTOR SELECTION METHODS AND PROJECTION METHODS
STATE: ILLINOIS

ORDER OF PRESENTATION FOR TESTS AND ANALYSIS

Premium: Development by Diagonal, Showing Variance

Premium: Tests of Minimum Average Squared Deviations

Indemnity: Paid - Development by Diagonal, Showing Variance

Indemnity: Paid - Tests of Minimum Average Squared Deviations

Indemnity: Paid+O/S - Development by Diagonal, Showing Variance

Indemnity: Paid+O/S - Tests of Minimum Average Squared Deviations

Indemnity: Incurred - Development by Diagonal, Showing Variance

Indemnity: Incurred - Tests of Minimum Average Squared Deviations

Medical: Paid - Development by Diagonal, Showing Variance

Medical: Paid - Tests of Minimum Average Squared Deviations

Medical: Paid+O/S - Development by Diagonal, Showing Variance

Medical: Paid+O/S - Tests of Minimum Average Squared Deviations

Medical: Incurred - Development by Diagonal, Showing Variance

Medical: Incurred - Tests of Minimum Average Squared Deviations

Indemnity: Comparison of Projections - Deviations by Loss Statistic Type

Indemnity: Comparison of Restated Projections - Deviations by Loss Statistic Type

Medical: Comparison of Projections - Deviations by Loss Statistic Type

Medical: Comparison of Restated Projections - Deviations by Loss Statistic Type

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: ILLINOIS

PREMIUM - DEVELOPMENT DIAGONALS BY EVALUATION DATE

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH
1981	1.043	1.007	1.003	1.000
1982	1.037	1.009	1.003	0.997
1983	1.007	1.001	0.999	1.001
1984	1.035	0.996	1.002	1.001
1985	1.043	1.002	1.003	1.001
1986	1.018	0.999	0.999	0.999
1987	1.031	0.988	0.998	1.013
1988	1.029	1.000	1.001	0.999
1989	1.038	0.995	1.000	0.999
POINTS	9	9	9	9
AVERAGE	1.031	1.000	1.001	1.001
SAMPLE VARIANCE	0.000142	0.000040	0.000004	0.000022
SAMPLE COEFF OF VARIANCE	0.012	0.006	0.002	0.005

REGION: NORTHERN

PREMIUM - DEVELOPMENT DIAGONALS BY EVALUATION DATE

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH
1981				
1982	1.034	1.001	1.002	1.000
1983	1.027	1.004	1.000	1.001
1984	1.036	1.002	1.002	0.999
1985	1.049	1.000	1.000	0.999
1986	1.047	1.002	1.002	1.001
1987	1.039	0.999	0.999	1.004
1988	1.035	1.001	1.002	1.002
1989	1.043	1.003	1.000	1.000
POINTS	8	8	8	8
AVERAGE	1.039	1.002	1.001	1.001
SAMPLE VARIANCE	0.000053	0.000003	0.000002	0.000003
SAMPLE COEFF OF VARIANCE	0.007	0.002	0.001	0.002

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: ILLINOIS

PREMIUM - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.000202	0.000042	0.000007	0.000054	0.000305	
THREE-YEAR STRAIGHT AVERAGE	0.000106	0.000027	0.000004	0.000043	0.000181	
FOUR-YEAR STRAIGHT AVERAGE	0.000082	0.000032	0.000003	0.000039	0.000156	*
TWO-YEAR EXPONENTIAL AVG	0.000197	0.000043	0.000007	0.000055	0.000301	
THREE-YEAR EXPONENTIAL AVG	0.000110	0.000028	0.000004	0.000045	0.000187	
FOUR-YEAR EXPONENTIAL AVG	0.000088	0.000032	0.000004	0.000040	0.000164	

STATE: ILLINOIS

PREMIUM - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	
THREE-YEAR STRAIGHT AVERAGE	0	1	0	0	1	
FOUR-YEAR STRAIGHT AVERAGE	1	0	1	1	3	*
TWO-YEAR EXPONENTIAL AVG	0	0	0	0	0	
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: ILLINOIS PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.581	1.225	1.095	1.046	1.034	1.013	1.077
1982	1.632	1.218	1.097	1.056	1.024	1.022	1.009
1983	1.590	1.227	1.101	1.051	1.027	1.012	1.008
1984	1.626	1.243	1.115	1.054	1.025	1.012	1.005
1985	1.689	1.273	1.121	1.066	1.033	1.017	1.011
1986	1.662	1.269	1.123	1.064	1.040	1.024	1.011
1987	1.688	1.307	1.140	1.074	1.045	1.027	1.011
1988	1.720	1.337	1.162	1.095	1.051	1.031	1.013
1989	1.793	1.341	1.182	1.089	1.048	1.039	1.020
POINTS	9	9	9	9	9	9	9
AVERAGE	1.665	1.271	1.126	1.066	1.036	1.022	1.018
SAMPLE VARIANCE	0.004477	0.002276	0.000901	0.000288	0.000103	0.000088	0.000501
SAMPLE COEFF OF VARIANCE	0.040	0.038	0.027	0.016	0.010	0.009	0.022

REGION: NORTHERN PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	1.600	1.252	1.126	1.078	1.048	1.041	1.029
1983	1.592	1.250	1.126	1.070	1.048	1.031	1.025
1984	1.610	1.261	1.129	1.073	1.044	1.031	1.021
1985	1.660	1.288	1.140	1.079	1.050	1.034	1.028
1986	1.641	1.287	1.146	1.079	1.050	1.036	1.025
1987	1.654	1.301	1.156	1.094	1.062	1.039	1.029
1988	1.669	1.311	1.164	1.100	1.063	1.044	1.030
1989	1.682	1.315	1.160	1.097	1.061	1.048	1.036
POINTS	8	8	8	8	8	8	8
AVERAGE	1.639	1.283	1.143	1.084	1.053	1.038	1.028
SAMPLE VARIANCE	0.001141	0.000672	0.000241	0.000133	0.000056	0.000038	0.000020
SAMPLE COEFF OF VARIANCE	0.021	0.020	0.014	0.011	0.007	0.006	0.004

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: ILLINOIS PAID - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: INDENNITY (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.003337	0.001125	0.000482	0.000195	0.000063	0.000058	0.000019	0.005278	
THREE-YEAR STRAIGHT AVERAGE	0.003827	0.001735	0.000718	0.000244	0.000098	0.000080	0.000020	0.006722	
FOUR-YEAR STRAIGHT AVERAGE	0.004628	0.002364	0.000931	0.000324	0.000130	0.000103	0.000057	0.008537	
TWO-YEAR EXPONENTIAL AVG	0.003265	0.001091	0.000467	0.000191	0.000061	0.000056	0.000019	0.005150	*
THREE-YEAR EXPONENTIAL AVG	0.003700	0.001631	0.000677	0.000233	0.000092	0.000076	0.000020	0.006429	
FOUR-YEAR EXPONENTIAL AVG	0.004385	0.002165	0.000861	0.000301	0.000118	0.000095	0.000043	0.007968	

STATE: ILLINOIS PAID - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: INDENNITY (*1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
FOUR-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
TWO-YEAR EXPONENTIAL AVG	1	1	1	1	1	1	1	7	*
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: ILLINOIS PAID + O/S - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.058	1.007	0.994	0.992	0.992	0.996	1.069
1982	1.084	1.002	0.984	0.988	0.991	0.990	0.994
1983	1.088	1.029	0.997	0.991	0.986	0.996	0.992
1984	1.061	1.023	0.991	0.992	0.985	0.993	0.987
1985	1.075	1.030	1.003	0.997	0.993	0.993	0.993
1986	1.091	1.048	1.016	1.005	0.997	0.991	0.998
1987	1.152	1.083	1.020	0.996	0.992	0.985	0.996
1988	1.114	1.078	1.024	1.005	0.997	1.004	0.997
1989	1.125	1.074	1.028	1.011	0.994	0.986	0.999
POINTS	9	9	9	9	9	9	9
AVERAGE	1.094	1.042	1.006	0.997	0.992	0.993	1.003
SAMPLE VARIANCE	0.000952	0.000942	0.000256	0.000061	0.000018	0.000033	0.000630
SAMPLE COEFF OF VARIANCE	0.028	0.029	0.016	0.008	0.004	0.006	0.025

REGION: NORTHERN PAID + O/S - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	1.109	1.027	1.004	1.001	1.000	1.004	1.004
1983	1.120	1.043	1.014	1.006	1.002	1.002	0.998
1984	1.109	1.055	1.020	1.012	1.004	1.010	1.000
1985	1.132	1.065	1.029	1.007	1.007	1.002	1.002
1986	1.137	1.071	1.040	1.018	1.009	1.002	1.002
1987	1.159	1.083	1.037	1.022	1.009	1.007	1.003
1988	1.143	1.076	1.043	1.017	1.019	1.016	1.009
1989	1.148	1.083	1.037	1.026	1.008	1.003	1.014
POINTS	8	8	8	8	8	8	8
AVERAGE	1.132	1.063	1.028	1.014	1.007	1.006	1.004
SAMPLE VARIANCE	0.000333	0.000400	0.000195	0.000074	0.000034	0.000025	0.000027
SAMPLE COEFF OF VARIANCE	0.016	0.019	0.014	0.008	0.006	0.005	0.005

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: ILLINOIS PAID + O/S - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: INDEMNITY (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.001082	0.000523	0.000125	0.000059	0.000027	0.000077	0.000017	0.001909	
THREE-YEAR STRAIGHT AVERAGE	0.001240	0.000723	0.000195	0.000060	0.000025	0.000064	0.000015	0.002322	
FOUR-YEAR STRAIGHT AVERAGE	0.001245	0.000945	0.000277	0.000074	0.000024	0.000061	0.000076	0.002702	
TWO-YEAR EXPONENTIAL AVG	0.001070	0.000508	0.000121	0.000058	0.000027	0.000079	0.000016	0.001880	*
THREE-YEAR EXPONENTIAL AVG	0.001201	0.000683	0.000183	0.000059	0.000024	0.000067	0.000015	0.002233	
FOUR-YEAR EXPONENTIAL AVG	0.001198	0.000867	0.000251	0.000070	0.000023	0.000064	0.000055	0.002529	

STATE: ILLINOIS PAID + O/S - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: INDEMNITY ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
FOUR-YEAR STRAIGHT AVERAGE	0	0	0	0	0	1	0	1	
TWO-YEAR EXPONENTIAL AVG	1	1	1	1	0	0	0	4	*
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	1	1	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	1	0	0	1	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: ILLINOIS INCURRED - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	0.977	0.980	0.990	0.981	0.990	0.992	1.069
1982	0.981	0.968	0.976	0.976	0.991	0.989	0.994
1983	0.994	0.988	0.983	0.975	0.982	0.994	0.992
1984	0.988	0.995	0.989	0.986	0.985	0.993	0.987
1985	1.014	1.007	1.005	0.986	0.992	0.993	0.993
1986	1.017	1.022	1.012	0.987	0.993	0.987	0.988
1987	1.043	1.050	1.013	0.990	0.990	0.984	0.998
1988	1.019	1.044	1.013	0.998	1.000	1.002	0.999
1989	1.036	1.051	1.015	1.002	0.991	0.981	0.999
POINTS	9	9	9	9	9	9	9
AVERAGE	1.008	1.012	1.000	0.987	0.990	0.991	1.002
SAMPLE VARIANCE	0.000567	0.000992	0.000227	0.000082	0.000025	0.000038	0.000649
SAMPLE COEFF OF VARIANCE	0.024	0.031	0.015	0.009	0.005	0.006	0.025

REGION: NORTHERN INCURRED - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	0.985	0.983	0.992	0.983	0.999	1.003	1.003
1983	1.006	0.994	0.999	0.982	0.997	0.999	0.997
1984	1.010	1.012	1.011	0.994	1.002	1.008	0.999
1985	1.039	1.025	1.021	0.983	1.003	1.000	1.000
1986	1.045	1.038	1.034	0.993	1.005	0.998	0.993
1987	1.040	1.046	1.024	1.012	1.007	1.006	1.004
1988	1.024	1.038	1.030	1.008	1.026	1.014	1.009
1989	1.039	1.050	1.020	1.012	1.004	0.995	1.013
POINTS	8	8	8	8	8	8	8
AVERAGE	1.024	1.023	1.016	0.996	1.005	1.003	1.002
SAMPLE VARIANCE	0.000455	0.000610	0.000216	0.000172	0.000080	0.000038	0.000042
SAMPLE COEFF OF VARIANCE	0.021	0.024	0.014	0.013	0.009	0.006	0.006

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: ILLINOIS INCURRED - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: INDEMNITY (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.000337	0.000404	0.000122	0.000040	0.000037	0.000098	0.000022	0.001060	
THREE-YEAR STRAIGHT AVERAGE	0.000500	0.000683	0.000204	0.000060	0.000032	0.000077	0.000028	0.001584	
FOUR-YEAR STRAIGHT AVERAGE	0.000623	0.000983	0.000264	0.000075	0.000033	0.000072	0.000092	0.002142	
TWO-YEAR EXPONENTIAL AVG	0.000338	0.000393	0.000118	0.000038	0.000038	0.000100	0.000022	0.001047	*
THREE-YEAR EXPONENTIAL AVG	0.000480	0.000638	0.000190	0.000056	0.000032	0.000080	0.000027	0.001504	
FOUR-YEAR EXPONENTIAL AVG	0.000581	0.000889	0.000240	0.000069	0.000033	0.000075	0.000070	0.001957	

STATE: ILLINOIS INCURRED - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: INDEMNITY ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	1	0	0	0	0	0	1	2	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	0	1	0	0	1	
FOUR-YEAR STRAIGHT AVERAGE	0	0	0	0	0	1	0	1	
TWO-YEAR EXPONENTIAL AVG	0	1	1	1	0	0	0	3	*
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: ILLINOIS PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.201	1.059	1.030	1.007	1.005	1.005	1.003
1982	1.227	1.061	1.026	1.017	1.005	1.005	1.014
1983	1.213	1.060	1.023	1.011	1.008	1.002	1.004
1984	1.206	1.057	1.030	1.015	1.004	1.003	1.002
1985	1.215	1.058	1.025	1.013	1.007	1.004	1.002
1986	1.220	1.066	1.023	1.011	1.008	1.008	1.003
1987	1.272	1.070	1.031	1.007	1.007	1.006	1.004
1988	1.293	1.092	1.036	1.034	1.013	1.002	1.004
1989	1.322	1.085	1.036	1.018	1.008	1.004	1.003
POINTS	9	9	9	9	9	9	9
AVERAGE	1.241	1.068	1.029	1.015	1.007	1.004	1.004
SAMPLE VARIANCE	0.001893	0.000161	0.000025	0.000067	0.000007	0.000004	0.000014
SAMPLE COEFF OF VARIANCE	0.035	0.012	0.005	0.008	0.003	0.002	0.004

REGION: NORTHERN PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	1.224	1.079	1.041	1.027	1.018	1.017	1.017
1983	1.217	1.076	1.041	1.028	1.020	1.016	1.015
1984	1.226	1.078	1.045	1.026	1.020	1.016	1.014
1985	1.235	1.080	1.042	1.025	1.018	1.016	1.013
1986	1.250	1.080	1.039	1.026	1.017	1.016	1.013
1987	1.269	1.086	1.044	1.025	1.020	1.016	1.013
1988	1.285	1.093	1.049	1.030	1.021	1.016	1.012
1989	1.295	1.096	1.047	1.030	1.019	1.018	1.015
POINTS	8	8	8	8	8	8	8
AVERAGE	1.250	1.084	1.043	1.027	1.019	1.016	1.014
SAMPLE VARIANCE	0.000882	0.000055	0.000011	0.000004	0.000002	0.000001	0.000003
SAMPLE COEFF OF VARIANCE	0.024	0.007	0.003	0.002	0.001	0.001	0.002

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: ILLINOIS PAID - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: MEDICAL (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.001372	0.000146	0.000032	0.000133	0.000008	0.000010	0.000001	0.001701	
THREE-YEAR STRAIGHT AVERAGE	0.002081	0.000196	0.000033	0.000120	0.000008	0.000009	0.000005	0.002453	
FOUR-YEAR STRAIGHT AVERAGE	0.002566	0.000237	0.000035	0.000110	0.000010	0.000007	0.000005	0.002970	
TWO-YEAR EXPONENTIAL AVG	0.001335	0.000143	0.000031	0.000135	0.000009	0.000009	0.000001	0.001662	*
THREE-YEAR EXPONENTIAL AVG	0.001964	0.000188	0.000032	0.000122	0.000008	0.000009	0.000004	0.002326	
FOUR-YEAR EXPONENTIAL AVG	0.002383	0.000222	0.000034	0.000112	0.000010	0.000007	0.000004	0.002771	

STATE: ILLINOIS PAID - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: MEDICAL ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	0	1	0	0	1	
FOUR-YEAR STRAIGHT AVERAGE	0	0	0	1	0	1	0	2	
TWO-YEAR EXPONENTIAL AVG	1	1	1	0	0	0	1	4	*
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: ILLINOIS PAID + O/S - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.014	0.992	0.999	0.985	0.988	1.014	1.001
1982	1.022	0.992	0.966	0.991	0.987	0.995	1.000
1983	1.008	0.980	0.978	0.986	0.980	0.995	0.997
1984	1.030	0.982	0.980	0.994	0.992	0.986	1.000
1985	1.040	0.986	0.987	0.990	0.984	1.003	1.003
1986	1.029	0.993	0.978	0.986	0.985	0.992	0.989
1987	1.089	1.000	0.998	0.988	0.990	0.992	0.999
1988	1.063	0.990	1.004	0.963	0.985	0.984	1.000
1989	1.069	0.984	0.971	0.987	0.989	0.992	0.995
POINTS	9	9	9	9	9	9	9
AVERAGE	1.040	0.989	0.985	0.986	0.987	0.995	0.998
SAMPLE VARIANCE	0.000752	0.000040	0.000176	0.000080	0.000013	0.000082	0.000017
SAMPLE COEFF OF VARIANCE	0.026	0.006	0.013	0.009	0.004	0.009	0.004

REGION: NORTHERN PAID + O/S - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	1.039	1.009	0.997	1.004	1.003	1.008	1.012
1983	1.036	0.999	0.996	0.997	1.002	1.009	1.010
1984	1.055	1.011	1.008	1.006	1.000	1.006	1.010
1985	1.044	1.010	1.007	0.998	1.001	1.007	1.003
1986	1.057	1.009	1.002	1.003	1.003	1.007	1.006
1987	1.073	1.020	1.008	1.005	1.002	1.003	1.006
1988	1.066	1.009	1.009	0.996	1.004	1.001	1.003
1989	1.048	1.004	0.997	0.996	1.000	0.999	1.007
POINTS	8	8	8	8	8	8	8
AVERAGE	1.052	1.009	1.003	1.001	1.002	1.005	1.007
SAMPLE VARIANCE	0.000168	0.000036	0.000032	0.000018	0.000002	0.000013	0.000011
SAMPLE COEFF OF VARIANCE	0.012	0.006	0.006	0.004	0.001	0.004	0.003

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: ILLINOIS PAID + O/S - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: MEDICAL (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.000702	0.000076	0.000298	0.000149	0.000010	0.000055	0.000048	0.001339	
THREE-YEAR STRAIGHT AVERAGE	0.000745	0.000079	0.000240	0.000142	0.000004	0.000055	0.000030	0.001295	
FOUR-YEAR STRAIGHT AVERAGE	0.000960	0.000070	0.000220	0.000150	0.000009	0.000026	0.000030	0.001465	
TWO-YEAR EXPONENTIAL AVG	0.000701	0.000074	0.000298	0.000152	0.000011	0.000056	0.000049	0.001340	
THREE-YEAR EXPONENTIAL AVG	0.000733	0.000076	0.000244	0.000144	0.000005	0.000055	0.000032	0.001288	*
FOUR-YEAR EXPONENTIAL AVG	0.000910	0.000068	0.000225	0.000149	0.000009	0.000029	0.000031	0.001421	

STATE: ILLINOIS PAID + O/S - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: MEDICAL ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	1	1	0	0	2	
FOUR-YEAR STRAIGHT AVERAGE	0	0	1	0	0	1	1	3	*
TWO-YEAR EXPONENTIAL AVG	1	0	0	0	0	0	0	1	
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	1	0	0	0	0	0	1	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: ILLINOIS INCURRED - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	0.969	0.976	0.999	0.979	0.988	1.014	1.001
1982	0.961	0.972	0.962	0.981	0.986	0.994	0.999
1983	0.952	0.955	0.968	0.972	0.977	0.992	0.996
1984	0.981	0.963	0.976	0.987	0.991	0.986	1.000
1985	0.995	0.969	0.986	0.978	0.981	1.001	1.002
1986	0.979	0.978	0.976	0.972	0.983	0.989	0.985
1987	1.023	0.981	0.991	0.983	0.986	0.989	0.997
1988	1.004	0.974	0.997	0.959	0.991	0.983	1.001
1989	1.016	0.972	0.962	0.978	0.984	0.984	0.992
POINTS	9	9	9	9	9	9	9
AVERAGE	0.987	0.971	0.980	0.977	0.985	0.992	0.997
SAMPLE VARIANCE	0.000602	0.000064	0.000204	0.000066	0.000021	0.000096	0.000030
SAMPLE COEFF OF VARIANCE	0.025	0.008	0.015	0.008	0.005	0.010	0.005

REGION: NORTHERN INCURRED - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	0.966	0.983	0.990	0.991	1.001	1.007	1.009
1983	0.971	0.968	0.985	0.979	0.997	1.006	1.010
1984	0.988	0.981	1.000	0.991	0.997	1.004	1.010
1985	0.983	0.985	0.999	0.978	0.996	1.004	1.000
1986	0.999	0.991	0.999	0.986	1.002	1.004	1.002
1987	0.999	0.998	1.000	0.999	0.999	1.001	1.005
1988	0.996	0.989	1.005	0.991	1.013	1.000	1.003
1989	0.989	0.990	0.993	0.987	0.997	0.994	1.007
POINTS	8	8	8	8	8	8	8
AVERAGE	0.986	0.986	0.996	0.988	1.000	1.003	1.006
SAMPLE VARIANCE	0.000155	0.000079	0.000042	0.000048	0.000031	0.000017	0.000015
SAMPLE COEFF OF VARIANCE	0.013	0.009	0.007	0.007	0.006	0.004	0.004

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: ILLINOIS INCURRED - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: MEDICAL (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.000441	0.000072	0.000305	0.000114	0.000019	0.000048	0.000087	0.001086	
THREE-YEAR STRAIGHT AVERAGE	0.000519	0.000087	0.000255	0.000092	0.000016	0.000048	0.000053	0.001070	
FOUR-YEAR STRAIGHT AVERAGE	0.000676	0.000083	0.000236	0.000112	0.000013	0.000032	0.000051	0.001202	
TWO-YEAR EXPONENTIAL AVG	0.000439	0.000070	0.000306	0.000117	0.000019	0.000049	0.000087	0.001087	
THREE-YEAR EXPONENTIAL AVG	0.000504	0.000082	0.000258	0.000097	0.000016	0.000048	0.000056	0.001061	*
FOUR-YEAR EXPONENTIAL AVG	0.000634	0.000078	0.000240	0.000112	0.000013	0.000032	0.000054	0.001164	

STATE: ILLINOIS INCURRED - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: MEDICAL ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	1	0	0	0	1	
FOUR-YEAR STRAIGHT AVERAGE	0	0	1	0	1	1	1	4	*
TWO-YEAR EXPONENTIAL AVG	1	1	0	0	0	0	0	2	
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
ILLINOIS INDEMNITY COMPARISON OF PROJECTIONS

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	ACTUAL 8TH	AVERAGE	*=LOW AVG
1978 PAID				393,091,650	378,610,137	375,818,258	378,237,921	379,386,238		
1978 PAID + O/S				426,788,348	410,029,388	407,752,498	407,343,216	410,471,807		
1978 INCURRED				428,491,044	409,775,888	408,533,094	408,533,822	407,781,123		
1978 PAID (1)				3.61%	0.20%	0.94%	0.30%		1.27%	*
1978 PAID + O/S (1)				3.98%	0.11%	0.66%	0.76%		1.38%	
1978 INCURRED (1)				5.08%	0.49%	0.18%	0.18%		1.48%	
1978 PAID (2)					3.68%	0.74%	0.64%	0.30%	1.34%	
1978 PAID + O/S (2)					3.93%	0.56%	0.10%	0.77%	1.34%	
1978 INCURRED (2)					4.37%	0.30%	0.00%	0.18%	1.21%	*
1979 PAID			402,301,656	390,174,451	387,859,141	392,053,453	396,902,480	396,726,373		
1979 PAID + O/S			438,527,308	424,072,475	422,997,697	425,789,041	427,292,190	427,538,839		
1979 INCURRED			440,842,020	421,803,610	424,403,456	428,072,168	425,700,521	429,131,864		
1979 PAID (1)			1.41%	1.65%	2.24%	1.18%	0.04%		1.30%	
1979 PAID + O/S (1)			2.57%	0.81%	1.06%	0.41%	0.06%		0.98%	*
1979 INCURRED (1)			2.73%	1.71%	1.10%	0.25%	0.80%		1.32%	
1979 PAID (2)				3.01%	0.59%	1.08%	1.24%	0.04%	1.19%	
1979 PAID + O/S (2)				3.30%	0.25%	0.66%	0.35%	0.06%	0.92%	*
1979 INCURRED (2)				4.32%	0.62%	0.86%	0.55%	0.81%	1.43%	
1980 PAID		356,995,448	347,161,176	349,627,048	356,554,916	363,576,643	365,892,417	366,633,612		
1980 PAID + O/S		394,921,701	388,668,368	387,683,515	390,825,862	395,777,094	393,576,453	393,733,016		
1980 INCURRED		398,703,428	385,590,378	389,544,737	393,722,053	394,518,658	393,117,357	395,367,039		
1980 PAID (1)		2.63%	5.31%	4.64%	2.75%	0.83%	0.20%		2.73%	
1980 PAID + O/S (1)		0.30%	1.29%	1.54%	0.74%	0.52%	0.04%		0.74%	*
1980 INCURRED (1)		0.84%	2.47%	1.47%	0.42%	0.21%	0.57%		1.00%	
1980 PAID (2)			2.75%	0.71%	1.98%	1.97%	0.64%	0.20%	1.38%	
1980 PAID + O/S (2)			1.58%	0.25%	0.81%	1.27%	0.56%	0.04%	0.75%	*
1980 INCURRED (2)			3.29%	1.03%	1.07%	0.20%	0.36%	0.57%	1.09%	
1981 PAID	320,546,548	307,383,305	312,781,676	320,905,545	327,354,636	331,666,212	333,764,770	336,393,699		
1981 PAID + O/S	349,946,403	345,281,817	348,000,833	353,110,328	360,634,256	358,636,705	364,261,816	365,277,138		
1981 INCURRED	349,820,177	340,021,733	348,419,681	358,941,956	359,851,681	358,215,536	366,230,349	366,408,984		
1981 PAID (1)	4.71%	8.62%	7.02%	4.60%	2.69%	1.41%	0.78%		4.26%	
1981 PAID + O/S (1)	4.20%	5.47%	4.73%	3.33%	1.27%	1.82%	0.28%		3.01%	*
1981 INCURRED (1)	4.53%	7.20%	4.91%	2.04%	1.79%	2.24%	0.05%		3.25%	
1981 PAID (2)		4.11%	1.76%	2.60%	2.01%	1.31%	0.64%	0.79%	1.89%	
1981 PAID + O/S (2)		1.33%	0.79%	1.47%	2.13%	0.55%	1.57%	0.28%	1.16%	*
1981 INCURRED (2)		2.80%	2.47%	3.02%	0.25%	0.45%	2.24%	0.05%	1.61%	
1982 PAID	278,510,234	284,199,307	299,748,191	307,428,254	313,348,676	317,295,260	321,803,399			
1982 PAID + O/S	339,789,064	335,562,373	339,771,919	352,217,237	349,395,044	352,400,973	349,914,923			
1982 INCURRED	327,406,870	334,482,399	347,184,768	353,122,399	353,298,486	361,027,678	356,843,406			
1982 PAID (1)	13.45%	11.69%	6.85%	4.47%	2.63%	1.40%			6.75%	
1982 PAID + O/S (1)	2.89%	4.10%	2.90%	0.66%	0.15%	0.71%			1.90%	*
1982 INCURRED (1)	8.25%	6.27%	2.71%	1.04%	0.99%	1.17%			3.41%	
1982 PAID (2)		2.04%	5.47%	2.56%	1.93%	1.26%	1.42%		2.45%	
1982 PAID + O/S (2)		1.24%	1.25%	3.66%	0.80%	0.86%	0.71%		1.42%	*
1982 INCURRED (2)		2.16%	3.80%	1.71%	0.05%	2.19%	1.16%		1.84%	
1983 PAID	303,395,960	332,153,775	343,336,900	353,907,680	366,033,375	369,804,790				
1983 PAID + O/S	370,853,227	374,403,641	393,711,526	396,402,027	400,603,577	401,206,492				
1983 INCURRED	362,424,865	382,625,833	395,959,802	397,322,017	407,866,749	405,816,559				
1983 PAID (1)	17.96%	10.18%	7.16%	4.30%	1.02%				8.12%	
1983 PAID + O/S (1)	7.57%	6.68%	1.87%	1.20%	0.15%				3.49%	*
1983 INCURRED (1)	10.69%	5.71%	2.43%	2.09%	0.51%				4.29%	
1983 PAID (2)		9.48%	3.37%	3.08%	3.43%	1.03%			4.08%	
1983 PAID + O/S (2)		0.96%	5.16%	0.68%	1.06%	0.15%			1.60%	*
1983 INCURRED (2)		5.57%	3.48%	0.34%	2.65%	0.50%			2.51%	
1984 PAID	361,496,326	375,272,368	394,816,993	415,330,231	421,953,771					
1984 PAID + O/S	404,231,329	430,502,620	450,914,344	456,327,054	462,506,977					
1984 INCURRED	420,949,062	439,333,568	456,046,109	466,503,259	470,018,651					
1984 PAID (1)	14.33%	11.06%	6.43%	1.57%					8.35%	
1984 PAID + O/S (1)	12.60%	6.92%	2.51%	1.34%					5.84%	
1984 INCURRED (1)	10.44%	6.53%	2.97%	0.75%					5.17%	*
1984 PAID (2)		3.81%	5.21%	5.20%	1.59%				3.95%	
1984 PAID + O/S (2)		6.50%	4.74%	1.20%	1.35%				3.45%	
1984 INCURRED (2)		4.37%	3.80%	2.29%	0.75%				2.80%	*

NOTES: (1) ABSOLUTE DEVIATION FROM LAST PROJECTION (OR REPORT), RATIOED TO SAME.

(2) ABSOLUTE CHANGE RELATIVE TO PRIOR PROJECTION OR REPORT.

WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.

LOSSES HAVE BEEN RESTATED TO THE LATEST DIAGONAL.

WEIGHTS ASSIGNED TO PRECEDING YEARS:
N-4 0.0000
N-3 0.0000
N-2 0.5000
N-1 0.5000

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NATIONAL COUNCIL ON COMPENSATION INSURANCE
ILLINOIS INDEMNITY COMPARISON OF PROJECTIONS RESTATED TO INCURRED LEVEL

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	RESTATED 8TH	AVERAGE	*=LOW AVG
1978 PAID				411,540,386	407,592,427	407,421,671	408,999,037	409,598,938		
1978 PAID + Q/S				428,933,668	412,306,446	409,995,170	409,346,497	410,134,547		
1978 INCURRED				428,491,044	409,775,888	408,533,094	408,533,822	407,781,123		
1978 PAID (1)				0.47%	0.49%	0.53%	0.15%		0.41%	*
1978 PAID + Q/S (1)				4.58%	0.53%	0.03%	0.19%		1.33%	
1978 INCURRED (1)				5.08%	0.49%	0.18%	0.18%		1.48%	
1978 PAID (2)					0.96%	0.04%	0.39%	0.15%		*
1978 PAID + Q/S (2)					3.88%	0.56%	0.16%	0.19%	1.20%	
1978 INCURRED (2)					4.37%	0.30%	0.00%	0.18%	1.21%	
1979 PAID			421,182,639	420,041,979	420,475,100	423,938,151	428,510,099	427,771,165		
1979 PAID + Q/S			440,731,636	426,427,520	425,324,218	427,883,037	426,941,110	426,922,758		
1979 INCURRED			440,842,020	421,803,610	424,403,456	428,072,168	425,700,521	429,131,864		
1979 PAID (1)			1.54%	1.81%	1.71%	0.90%	0.17%		1.22%	
1979 PAID + Q/S (1)			3.23%	0.12%	0.37%	0.22%	0.00%		0.79%	*
1979 INCURRED (1)			2.73%	1.71%	1.10%	0.25%	0.80%		1.32%	
1979 PAID (2)				0.27%	0.10%	0.82%	1.08%	0.17%	0.49%	*
1979 PAID + Q/S (2)				3.25%	0.26%	0.60%	0.22%	0.00%	0.87%	
1979 INCURRED (2)				4.32%	0.62%	0.86%	0.55%	0.81%	1.43%	
1980 PAID		373,750,102	373,736,074	379,027,983	385,552,609	392,530,334	394,524,378	395,973,119		
1980 PAID + Q/S		396,906,839	390,826,799	389,815,806	392,747,912	395,451,907	393,009,311	395,283,542		
1980 INCURRED		398,703,428	385,590,378	389,544,737	393,722,053	394,518,658	393,117,357	395,367,039		
1980 PAID (1)		5.61%	5.62%	4.28%	2.63%	0.87%	0.37%		3.23%	
1980 PAID + Q/S (1)		0.41%	1.13%	1.38%	0.64%	0.04%	0.58%		0.70%	*
1980 INCURRED (1)		0.84%	2.47%	1.47%	0.42%	0.21%	0.57%		1.00%	
1980 PAID (2)			0.00%	1.42%	1.72%	1.81%	0.51%	0.37%	0.97%	
1980 PAID + Q/S (2)			1.53%	0.26%	0.75%	0.69%	0.62%	0.58%	0.74%	*
1980 INCURRED (2)			3.29%	1.03%	1.07%	0.20%	0.36%	0.57%	1.09%	
1981 PAID	335,590,568	330,913,241	339,084,200	347,003,966	353,423,762	357,609,107	360,473,979	364,573,945		
1981 PAID + Q/S	351,705,465	347,199,306	349,914,865	354,846,896	360,337,945	358,119,911	365,696,283	366,600,925		
1981 INCURRED	349,820,177	340,021,733	348,419,681	358,941,956	359,851,681	358,215,536	366,230,349	366,408,984		
1981 PAID (1)	7.95%	9.23%	6.99%	4.82%	3.06%	1.91%	1.12%		5.01%	
1981 PAID + Q/S (1)	4.06%	5.29%	4.55%	3.21%	1.71%	2.31%	0.25%		3.05%	*
1981 INCURRED (1)	4.53%	7.20%	4.91%	2.04%	1.79%	2.24%	0.05%		3.25%	
1981 PAID (2)		1.39%	2.47%	2.34%	1.85%	1.18%	0.80%	1.14%	1.60%	
1981 PAID + Q/S (2)		1.28%	0.78%	1.41%	1.55%	0.62%	2.12%	0.25%	1.14%	*
1981 INCURRED (2)		2.80%	2.47%	3.02%	0.25%	0.45%	2.24%	0.05%	1.61%	
1982 PAID	299,829,960	308,098,274	324,125,939	331,910,527	337,868,963	342,686,512	348,761,392			
1982 PAID + Q/S	341,676,049	337,407,993	341,442,890	351,927,841	348,891,567	353,788,732	351,183,036			
1982 INCURRED	327,406,870	334,482,399	347,184,768	353,122,399	353,298,486	361,027,678	356,843,406			
1982 PAID (1)	14.03%	11.66%	7.06%	4.83%	3.12%	1.74%			7.07%	
1982 PAID + Q/S (1)	2.71%	3.92%	2.77%	0.21%	0.65%	0.74%			1.83%	*
1982 INCURRED (1)	8.25%	6.27%	2.71%	1.04%	0.99%	1.17%			3.41%	
1982 PAID (2)		2.76%	5.20%	2.40%	1.80%	1.43%	1.77%		2.56%	
1982 PAID + Q/S (2)		1.25%	1.20%	3.07%	0.86%	1.40%	0.74%		1.42%	*
1982 INCURRED (2)		2.16%	3.80%	1.71%	0.05%	2.19%	1.16%		1.84%	
1983 PAID	328,909,218	359,166,986	370,678,785	381,601,806	395,324,849	400,783,937				
1983 PAID + Q/S	372,892,950	376,244,927	393,388,037	395,830,814	402,181,159	402,660,489				
1983 INCURRED	362,424,865	382,625,833	395,959,802	397,322,017	407,866,749	405,816,559				
1983 PAID (1)	17.93%	10.38%	7.51%	4.79%	1.36%				8.40%	
1983 PAID + Q/S (1)	7.39%	6.56%	2.30%	1.70%	0.12%				3.61%	*
1983 INCURRED (1)	10.69%	5.71%	2.43%	2.09%	0.51%				4.29%	
1983 PAID (2)		9.20%	3.21%	2.95%	3.60%	1.38%			4.07%	
1983 PAID + Q/S (2)		0.90%	4.56%	0.62%	1.60%	0.12%			1.56%	*
1983 INCURRED (2)		5.57%	3.48%	0.34%	2.65%	0.50%			2.51%	
1984 PAID	390,895,891	405,157,457	425,712,371	448,566,638	457,301,523					
1984 PAID + Q/S	406,219,305	430,148,902	450,264,579	458,124,076	464,183,130					
1984 INCURRED	420,949,062	439,333,568	456,046,109	466,503,259	470,018,651					
1984 PAID (1)	14.52%	11.40%	6.91%	1.91%					8.69%	
1984 PAID + Q/S (1)	12.49%	7.33%	3.00%	1.31%					6.03%	
1984 INCURRED (1)	10.44%	6.53%	2.97%	0.75%					5.17%	*
1984 PAID (2)		3.65%	5.07%	5.37%	1.95%				4.01%	
1984 PAID + Q/S (2)		5.89%	4.68%	1.75%	1.32%				3.41%	
1984 INCURRED (2)		4.37%	3.80%	2.29%	0.75%				2.80%	*

NOTES: (1) ABSOLUTE DEVIATION FROM LAST PROJECTION (OR REPORT), RATIOW TO SAME.
(2) ABSOLUTE CHANGE RELATIVE TO PRIOR PROJECTION OR REPORT.
WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.
LOSSES RESTATED TO INCURRED LEVEL OF 8TH REPORT, AND TO LAST DIAGONAL.

WEIGHTS ASSIGNED TO PRECEDING YEARS:
N-4 0.0000
N-3 0.0000
N-2 0.5000
N-1 0.5000

NATIONAL COUNCIL ON COMPENSATION INSURANCE
ILLINOIS MEDICAL COMPARISON OF PROJECTIONS

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	ACTUAL 8TH	AVERAGE	*=LOW AVG
1978 PAID				122,527,789	122,467,129	121,315,485	121,375,871	121,490,874		
1978 PAID + O/S				127,668,580	125,442,695	125,954,614	127,927,355	126,326,690		
1978 INCURRED				129,147,708	125,669,094	126,437,679	128,356,491	126,357,673		
1978 PAID (1)				0.85%	0.80%	0.14%	0.09%		0.47%	*
1978 PAID + O/S (1)				1.06%	0.70%	0.29%	1.27%		0.83%	
1978 INCURRED (1)				2.21%	0.54%	0.06%	1.58%		1.10%	
1978 PAID (2)					0.05%	0.94%	0.05%	0.09%	0.28%	*
1978 PAID + O/S (2)					1.74%	0.41%	1.57%	1.25%	1.24%	
1978 INCURRED (2)					2.69%	0.61%	1.52%	1.56%	1.59%	
1979 PAID			138,570,673	138,237,409	137,345,566	137,482,024	138,167,447	138,352,450		
1979 PAID + O/S			144,826,885	142,009,236	142,514,893	143,229,220	142,084,563	142,453,816		
1979 INCURRED			147,018,079	141,888,196	143,271,777	143,916,196	142,190,927	142,741,865		
1979 PAID (1)			0.16%	0.08%	0.73%	0.63%	0.13%		0.35%	*
1979 PAID + O/S (1)			1.67%	0.31%	0.04%	0.54%	0.26%		0.56%	
1979 INCURRED (1)			3.00%	0.60%	0.37%	0.82%	0.39%		1.03%	
1979 PAID (2)				0.24%	0.65%	0.10%	0.50%	0.13%	0.32%	*
1979 PAID + O/S (2)				1.95%	0.36%	0.50%	0.80%	0.26%	0.70%	
1979 INCURRED (2)				3.49%	0.98%	0.45%	1.20%	0.39%	1.30%	
1980 PAID		140,605,747	140,473,260	140,039,769	139,970,097	140,737,873	140,878,260	140,981,664		
1980 PAID + O/S		150,630,296	145,017,877	146,141,589	147,471,143	146,657,013	145,555,509	146,424,351		
1980 INCURRED		153,718,993	145,010,492	146,968,275	148,154,533	146,818,421	145,565,864	146,982,743		
1980 PAID (1)		0.27%	0.36%	0.67%	0.72%	0.17%	0.07%		0.38%	*
1980 PAID + O/S (1)		2.87%	0.96%	0.19%	0.71%	0.16%	0.59%		0.92%	
1980 INCURRED (1)		4.58%	1.34%	0.01%	0.80%	0.11%	0.96%		1.30%	
1980 PAID (2)			0.09%	0.31%	0.05%	0.55%	0.10%	0.07%	0.20%	*
1980 PAID + O/S (2)			3.73%	0.77%	0.91%	0.55%	0.75%	0.60%	1.22%	
1980 INCURRED (2)			5.67%	1.35%	0.81%	0.90%	0.85%	0.97%	1.76%	
1981 PAID	139,455,804	139,275,300	137,917,022	137,782,852	138,060,237	138,266,674	137,648,696	137,542,422		
1981 PAID + O/S	146,807,890	140,806,338	141,177,561	143,916,250	142,183,878	141,904,328	141,538,791	140,959,722		
1981 INCURRED	149,424,425	140,297,996	141,535,914	145,399,313	142,403,164	141,763,380	142,040,803	141,090,542		
1981 PAID (1)	1.39%	1.26%	0.27%	0.17%	0.38%	0.53%	0.08%		0.58%	*
1981 PAID + O/S (1)	4.15%	0.11%	0.15%	2.10%	0.87%	0.67%	0.41%		1.21%	
1981 INCURRED (1)	5.91%	0.56%	0.32%	3.05%	0.93%	0.48%	0.67%		1.70%	
1981 PAID (2)		0.13%	0.98%	0.10%	0.20%	0.15%	0.45%	0.08%	0.30%	*
1981 PAID + O/S (2)		4.09%	0.26%	1.94%	1.20%	0.20%	0.26%	0.41%	1.19%	
1981 INCURRED (2)		6.11%	0.88%	2.73%	2.06%	0.45%	0.20%	0.67%	1.87%	
1982 PAID	144,324,544	141,477,479	141,617,650	141,421,027	141,002,701	141,420,510	141,350,082			
1982 PAID + O/S	142,533,242	144,873,294	147,910,027	145,607,135	144,953,883	144,800,702	145,096,020			
1982 INCURRED	140,429,598	144,693,890	149,431,844	146,056,066	146,369,884	148,075,129	147,404,967			
1982 PAID (1)	2.10%	0.09%	0.19%	0.05%	0.25%	0.05%			0.45%	*
1982 PAID + O/S (1)	1.77%	0.15%	1.94%	0.35%	0.10%	0.20%			0.75%	
1982 INCURRED (1)	4.73%	1.84%	1.38%	0.92%	0.70%	0.45%			1.67%	
1982 PAID (2)		1.97%	0.10%	0.14%	0.30%	0.30%	0.05%		0.48%	*
1982 PAID + O/S (2)		1.64%	2.10%	1.56%	0.45%	0.11%	0.20%		1.01%	
1982 INCURRED (2)		3.04%	3.27%	2.26%	0.21%	1.17%	0.45%		1.73%	
1983 PAID	168,425,979	169,279,459	170,569,752	171,567,833	175,817,515	175,207,293				
1983 PAID + O/S	175,005,007	181,985,628	181,622,641	183,474,357	179,277,669	179,190,709				
1983 INCURRED	172,856,652	183,211,881	182,226,274	183,447,171	181,612,723	179,876,306				
1983 PAID (1)	3.87%	3.38%	2.65%	2.08%	0.35%				2.47%	
1983 PAID + O/S (1)	2.34%	1.56%	1.36%	2.39%	0.05%				1.54%	*
1983 INCURRED (1)	3.90%	1.85%	1.31%	1.99%	0.97%				2.00%	
1983 PAID (2)		0.51%	0.76%	0.59%	2.48%	0.35%			0.94%	*
1983 PAID + O/S (2)		3.99%	0.20%	1.02%	2.29%	0.05%			1.51%	
1983 INCURRED (2)		5.99%	0.54%	0.67%	1.00%	0.96%			1.83%	
1984 PAID	183,361,588	185,510,488	187,272,218	191,065,118	190,406,602					
1984 PAID + O/S	196,343,302	194,129,064	196,203,411	197,349,090	199,175,154					
1984 INCURRED	199,874,735	196,082,173	197,411,249	200,598,908	200,825,050					
1984 PAID (1)	3.70%	2.57%	1.65%	0.35%					2.07%	
1984 PAID + O/S (1)	1.42%	2.53%	1.49%	0.92%					1.59%	
1984 INCURRED (1)	0.47%	2.36%	1.70%	0.11%					1.16%	*
1984 PAID (2)		1.17%	0.95%	2.03%	0.34%				1.12%	
1984 PAID + O/S (2)		1.13%	1.07%	0.58%	0.93%				0.93%	*
1984 INCURRED (2)		1.90%	0.68%	1.61%	0.11%				1.08%	

NOTES: (1) ABSOLUTE DEVIATION FROM LAST PROJECTION (OR REPORT), RATIODED TO SAME.
(2) ABSOLUTE CHANGE RELATIVE TO PRIOR PROJECTION OR REPORT.
WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.
LOSSES HAVE BEEN RESTATED TO THE LATEST DIAGONAL.

N-4 0.0000
N-3 0.0000
N-2 0.5000
N-1 0.5000
WEIGHTS ASSIGNED TO PRECEDING YEARS:
05:27 PM
03/13/91

NATIONAL COUNCIL ON COMPENSATION INSURANCE
ILLINOIS MEDICAL COMPARISON OF PROJECTIONS RESTATED TO INCURRED LEVEL

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	RESTATED 8TH	AVERAGE	*=LOW AVG
1978 PAID				128,131,742	128,592,388	126,555,690	126,233,927	126,342,948		
1978 PAID + O/S				128,312,282	126,171,390	126,675,834	128,561,768	126,602,297		
1978 INCURRED				129,147,708	125,669,094	126,437,679	128,356,491	126,357,673		
1978 PAID (1)				1.42%	1.78%	0.17%	0.09%		0.86%	
1978 PAID + O/S (1)				1.35%	0.34%	0.06%	1.55%		0.82%	*
1978 INCURRED (1)				2.21%	0.54%	0.06%	1.58%		1.10%	
1978 PAID (2)					0.36%	1.58%	0.25%	0.09%	0.57%	*
1978 PAID + O/S (2)					1.67%	0.40%	1.49%	1.52%	1.27%	
1978 INCURRED (2)					2.69%	0.61%	1.52%	1.56%	1.59%	
1979 PAID			144,908,367	145,151,427	143,278,188	142,984,727	143,685,547	143,315,967		
1979 PAID + O/S			145,557,099	142,834,166	143,330,937	143,939,519	142,394,950	142,615,197		
1979 INCURRED			147,018,079	141,888,196	143,271,777	143,916,196	142,190,927	142,741,865		
1979 PAID (1)			1.11%	1.28%	0.03%	0.23%	0.26%		0.58%	*
1979 PAID + O/S (1)			2.06%	0.15%	0.50%	0.93%	0.15%		0.76%	
1979 INCURRED (1)			3.00%	0.60%	0.37%	0.82%	0.39%		1.03%	
1979 PAID (2)				0.17%	1.29%	0.20%	0.49%	0.26%	0.48%	*
1979 PAID + O/S (2)				1.87%	0.35%	0.42%	1.07%	0.15%	0.77%	
1979 INCURRED (2)				3.49%	0.98%	0.45%	1.20%	0.39%	1.30%	
1980 PAID		147,036,518	147,499,105	146,088,766	145,572,385	146,358,630	145,932,393	146,214,625		
1980 PAID + O/S		151,389,770	145,860,284	146,978,400	148,202,478	146,976,975	145,720,404	146,851,469		
1980 INCURRED		153,718,993	145,010,492	146,968,275	148,154,533	146,818,421	145,565,864	146,982,743		
1980 PAID (1)		0.56%	0.88%	0.09%	0.44%	0.10%	0.19%		0.38%	*
1980 PAID + O/S (1)		3.09%	0.67%	0.09%	0.92%	0.09%	0.77%		0.94%	
1980 INCURRED (1)		4.58%	1.34%	0.01%	0.80%	0.11%	0.96%		1.30%	
1980 PAID (2)			0.31%	0.96%	0.35%	0.54%	0.29%	0.19%	0.44%	*
1980 PAID + O/S (2)			3.65%	0.77%	0.83%	0.83%	0.85%	0.78%	1.28%	
1980 INCURRED (2)			5.67%	1.35%	0.81%	0.90%	0.85%	0.97%	1.76%	
1981 PAID	145,833,980	146,241,229	143,874,327	143,297,596	143,574,055	143,227,114	142,757,944	142,234,473		
1981 PAID + O/S	147,548,091	141,624,280	141,985,947	144,629,955	142,494,081	142,065,087	141,951,658	141,293,616		
1981 INCURRED	149,424,425	140,297,996	141,535,914	145,399,313	142,403,164	141,763,380	142,040,803	141,090,542		
1981 PAID (1)	2.53%	2.82%	1.15%	0.75%	0.94%	0.70%	0.37%		1.32%	*
1981 PAID + O/S (1)	4.43%	0.23%	0.49%	2.36%	0.85%	0.55%	0.47%		1.34%	
1981 INCURRED (1)	5.91%	0.56%	0.32%	3.05%	0.93%	0.48%	0.67%		1.70%	
1981 PAID (2)		0.28%	1.62%	0.40%	0.19%	0.24%	0.33%	0.37%	0.49%	*
1981 PAID + O/S (2)		4.01%	0.26%	1.85%	1.48%	0.30%	0.08%	0.46%	1.21%	
1981 INCURRED (2)		6.11%	0.88%	2.73%	2.06%	0.45%	0.20%	0.67%	1.87%	
1982 PAID	151,543,014	147,588,578	147,285,881	147,069,068	146,061,298	146,669,761	146,172,025			
1982 PAID + O/S	143,361,216	145,702,843	148,643,538	145,924,806	145,118,096	145,223,083	145,439,711			
1982 INCURRED	140,429,598	144,693,890	149,431,844	146,056,066	146,369,884	148,075,129	147,404,967			
1982 PAID (1)	3.67%	0.97%	0.76%	0.61%	0.08%	0.34%			1.07%	
1982 PAID + O/S (1)	1.43%	0.18%	2.20%	0.33%	0.22%	0.15%			0.75%	*
1982 INCURRED (1)	4.73%	1.84%	1.38%	0.92%	0.70%	0.45%			1.67%	
1982 PAID (2)		2.61%	0.21%	0.15%	0.69%	0.42%	0.34%		0.73%	*
1982 PAID + O/S (2)		1.63%	2.02%	1.83%	0.55%	0.07%	0.15%		1.04%	
1982 INCURRED (2)		3.04%	3.27%	2.26%	0.21%	1.17%	0.45%		1.73%	
1983 PAID	175,701,114	176,054,851	177,381,928	177,722,982	182,343,514	181,184,223				
1983 PAID + O/S	176,007,090	182,888,126	182,018,888	183,682,209	179,800,619	179,615,161				
1983 INCURRED	172,856,652	183,211,881	182,226,274	183,447,171	181,612,723	179,876,306				
1983 PAID (1)	3.03%	2.83%	2.10%	1.91%	0.64%				2.10%	
1983 PAID + O/S (1)	2.01%	1.82%	1.34%	2.26%	0.10%				1.51%	*
1983 INCURRED (1)	3.90%	1.85%	1.31%	1.99%	0.97%				2.00%	
1983 PAID (2)		0.20%	0.75%	0.19%	2.60%	0.64%			0.88%	*
1983 PAID + O/S (2)		3.91%	0.48%	0.91%	2.11%	0.10%			1.50%	
1983 INCURRED (2)		5.99%	0.54%	0.67%	1.00%	0.96%			1.83%	
1984 PAID	190,700,616	192,919,363	193,990,775	198,157,078	196,902,034					
1984 PAID + O/S	197,317,002	194,552,596	196,425,683	197,924,755	199,646,943					
1984 INCURRED	199,874,735	196,082,173	197,411,249	200,598,908	200,825,050					
1984 PAID (1)	3.15%	2.02%	1.48%	0.64%					1.82%	
1984 PAID + O/S (1)	1.17%	2.55%	1.61%	0.86%					1.55%	
1984 INCURRED (1)	0.47%	2.36%	1.70%	0.11%					1.16%	*
1984 PAID (2)		1.16%	0.56%	2.15%	0.63%				1.12%	
1984 PAID + O/S (2)		1.40%	0.96%	0.76%	0.87%				1.00%	*
1984 INCURRED (2)		1.90%	0.68%	1.61%	0.11%				1.08%	

NOTES: (1) ABSOLUTE DEVIATION FROM LAST PROJECTION (OR REPORT), RATIOED TO SAME.
(2) ABSOLUTE CHANGE RELATIVE TO PRIOR PROJECTION OR REPORT.
WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.
LOSSES RESTATED TO INCURRED LEVEL OF 8TH REPORT, AND TO LAST DIAGONAL.

WEIGHTS ASSIGNED TO PRECEDING YEARS:
N-4 0.0000
N-3 0.0000
N-2 0.5000
N-1 0.5000

LOUISIANA

NATIONAL COUNCIL ON COMPENSATION INSURANCE
ANALYSIS OF FACTOR SELECTION METHODS AND PROJECTION METHODS
STATE: LOUISIANA

ORDER OF PRESENTATION FOR TESTS AND ANALYSIS

Premium: Development by Diagonal, Showing Variance

Premium: Tests of Minimum Average Squared Deviations

Indemnity: Paid - Development by Diagonal, Showing Variance

Indemnity: Paid - Tests of Minimum Average Squared Deviations

Indemnity: Paid+O/S - Development by Diagonal, Showing Variance

Indemnity: Paid+O/S - Tests of Minimum Average Squared Deviations

Indemnity: Incurred - Development by Diagonal, Showing Variance

Indemnity: Incurred - Tests of Minimum Average Squared Deviations

Medical: Paid - Development by Diagonal, Showing Variance

Medical: Paid - Tests of Minimum Average Squared Deviations

Medical: Paid+O/S - Development by Diagonal, Showing Variance

Medical: Paid+O/S - Tests of Minimum Average Squared Deviations

Medical: Incurred - Development by Diagonal, Showing Variance

Medical: Incurred - Tests of Minimum Average Squared Deviations

Indemnity: Comparison of Projections - Deviations by Loss Statistic Type

Indemnity: Comparison of Restated Projections - Deviations by Loss Statistic Type

Medical: Comparison of Projections - Deviations by Loss Statistic Type

Medical: Comparison of Restated Projections - Deviations by Loss Statistic Type

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: LOUISIANA

PREMIUM - DEVELOPMENT DIAGONALS BY EVALUATION DATE

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH
1981	1.045	1.014	1.011	1.003
1982	1.083	1.002	1.008	0.997
1983	1.065	1.015	0.998	0.998
1984	1.053	1.000	1.007	0.999
1985	1.017	0.996	1.001	0.989
1986	1.038	1.006	0.975	1.000
1987	1.019	1.014	1.025	1.003
1988	1.025	1.014	0.998	1.000
1989	1.030	1.001	0.996	0.999
POINTS	9	9	9	9
AVERAGE	1.042	1.007	1.002	0.999
SAMPLE VARIANCE	0.000493	0.000055	0.000184	0.000017
SAMPLE COEFF OF VARIANCE	0.021	0.007	0.014	0.004

REGION: SOUTHERN

PREMIUM - DEVELOPMENT DIAGONALS BY EVALUATION DATE

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH
1981				
1982	1.051	1.007	1.001	0.999
1983	1.037	1.009	1.005	1.000
1984	1.050	1.004	1.000	0.998
1985	1.048	0.998	1.002	1.000
1986	1.053	1.001	0.999	1.000
1987	1.043	1.004	1.004	1.002
1988	1.036	1.004	0.999	1.001
1989	1.051	1.006	1.000	0.999
POINTS	8	8	8	8
AVERAGE	1.046	1.004	1.001	1.000
SAMPLE VARIANCE	0.000044	0.000012	0.000005	0.000002
SAMPLE COEFF OF VARIANCE	0.006	0.003	0.002	0.001

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: LOUISIANA PREMIUM - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.000384	0.000110	0.000491	0.000041	0.001027	
THREE-YEAR STRAIGHT AVERAGE	0.000569	0.000092	0.000339	0.000033	0.001033	
FOUR-YEAR STRAIGHT AVERAGE	0.000583	0.000077	0.000350	0.000034	0.001044	
TWO-YEAR EXPONENTIAL AVG	0.000381	0.000107	0.000497	0.000041	0.001026	
THREE-YEAR EXPONENTIAL AVG	0.000541	0.000090	0.000357	0.000033	0.001021	*
FOUR-YEAR EXPONENTIAL AVG	0.000549	0.000076	0.000362	0.000034	0.001022	

STATE: LOUISIANA PREMIUM - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	
THREE-YEAR STRAIGHT AVERAGE	0	0	1	1	2	*
FOUR-YEAR STRAIGHT AVERAGE	0	0	0	0	0	
TWO-YEAR EXPONENTIAL AVG	1	0	0	0	1	
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	1	0	0	1	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: LOUISIANA PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.622	1.316	1.140	1.077	1.028	1.023	1.017
1982	1.704	1.268	1.154	1.081	1.052	1.027	1.013
1983	1.748	1.281	1.115	1.078	1.045	1.027	1.019
1984	1.691	1.282	1.129	1.052	1.036	1.046	1.029
1985	1.767	1.324	1.128	1.069	1.040	1.026	1.023
1986	1.758	1.392	1.129	1.068	1.044	1.029	1.013
1987	1.797	1.420	1.204	1.097	1.057	1.027	1.028
1988	1.850	1.395	1.219	1.109	1.056	1.041	1.022
1989	1.736	1.359	1.195	1.117	1.065	1.033	1.024
POINTS	9	9	9	9	9	9	9
AVERAGE	1.741	1.337	1.157	1.083	1.047	1.031	1.021
SAMPLE VARIANCE	0.004261	0.003162	0.001496	0.000434	0.000134	0.000059	0.000034
SAMPLE COEFF OF VARIANCE	0.037	0.042	0.033	0.019	0.011	0.007	0.006

REGION: SOUTHERN PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	1.517	1.184	1.085	1.046	1.028	1.017	1.011
1983	1.543	1.182	1.081	1.043	1.027	1.017	1.012
1984	1.562	1.184	1.085	1.044	1.028	1.022	1.013
1985	1.628	1.211	1.093	1.053	1.032	1.020	1.014
1986	1.638	1.224	1.092	1.051	1.034	1.027	1.014
1987	1.657	1.235	1.107	1.062	1.039	1.028	1.016
1988	1.686	1.236	1.104	1.058	1.039	1.027	1.018
1989	1.716	1.241	1.108	1.058	1.036	1.025	1.020
POINTS	8	8	8	8	8	8	8
AVERAGE	1.618	1.212	1.094	1.052	1.033	1.023	1.015
SAMPLE VARIANCE	0.005030	0.000651	0.000114	0.000051	0.000024	0.000020	0.000009
SAMPLE COEFF OF VARIANCE	0.044	0.021	0.010	0.007	0.005	0.004	0.003

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: LOUISIANA PAID - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: INDEMNITY (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.003440	0.003209	0.001753	0.000357	0.000073	0.000066	0.000055	0.008952	
THREE-YEAR STRAIGHT AVERAGE	0.003356	0.004252	0.002022	0.000556	0.000113	0.000060	0.000034	0.010393	
FOUR-YEAR STRAIGHT AVERAGE	0.004483	0.004860	0.002397	0.000662	0.000127	0.000028	0.000027	0.012584	
TWO-YEAR EXPONENTIAL AVG	0.003469	0.003116	0.001713	0.000347	0.000071	0.000067	0.000055	0.008839	*
THREE-YEAR EXPONENTIAL AVG	0.003362	0.004034	0.001939	0.000522	0.000106	0.000061	0.000035	0.010058	
FOUR-YEAR EXPONENTIAL AVG	0.004277	0.004525	0.002251	0.000612	0.000118	0.000032	0.000028	0.011843	

STATE: LOUISIANA PAID - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: INDEMNITY (*1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
THREE-YEAR STRAIGHT AVERAGE	1	0	0	0	0	0	0	1	
FOUR-YEAR STRAIGHT AVERAGE	0	0	0	0	0	1	1	2	
TWO-YEAR EXPONENTIAL AVG	0	1	1	1	1	0	0	4	*
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: LOUISIANA PAID + O/S - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.110	1.017	1.002	0.993	1.009	0.990	1.005
1982	1.149	1.012	1.018	1.005	1.015	0.996	0.996
1983	1.182	1.022	1.004	1.006	1.004	1.016	1.001
1984	1.124	1.037	0.996	0.991	1.002	1.015	0.998
1985	1.224	1.038	1.004	1.003	1.003	0.999	0.999
1986	1.220	1.119	1.032	0.986	1.009	1.016	0.997
1987	1.282	1.171	1.061	1.010	1.026	0.990	1.011
1988	1.299	1.102	1.069	1.040	1.023	1.015	1.000
1989	1.145	1.044	1.022	1.026	1.008	1.004	1.003
POINTS	9	9	9	9	9	9	9
AVERAGE	1.193	1.062	1.023	1.007	1.011	1.005	1.001
SAMPLE VARIANCE	0.004607	0.003047	0.000695	0.000297	0.000074	0.000126	0.000022
SAMPLE COEFF OF VARIANCE	0.057	0.052	0.026	0.017	0.009	0.011	0.005

REGION: SOUTHERN PAID + O/S - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	1.072	1.020	1.004	0.999	1.001	0.995	0.999
1983	1.103	1.021	1.010	1.005	1.001	1.001	1.001
1984	1.089	1.028	1.010	1.000	0.999	1.004	1.002
1985	1.140	1.039	1.019	1.007	1.003	0.999	0.998
1986	1.163	1.075	1.029	1.010	1.009	1.012	1.004
1987	1.165	1.074	1.022	1.015	1.011	1.004	1.002
1988	1.174	1.073	1.031	1.018	1.008	1.008	1.007
1989	1.165	1.059	1.034	1.017	1.009	1.002	1.004
POINTS	8	8	8	8	8	8	8
AVERAGE	1.134	1.049	1.020	1.009	1.005	1.003	1.002
SAMPLE VARIANCE	0.001604	0.000592	0.000123	0.000055	0.000021	0.000028	0.000008
SAMPLE COEFF OF VARIANCE	0.035	0.023	0.011	0.007	0.005	0.005	0.003

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: LOUISIANA PAID + O/S - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: INDEMNITY (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.006846	0.005135	0.001049	0.000429	0.000149	0.000161	0.000039	0.013808	
THREE-YEAR STRAIGHT AVERAGE	0.006766	0.005318	0.001169	0.000460	0.000148	0.000145	0.000036	0.014042	
FOUR-YEAR STRAIGHT AVERAGE	0.007632	0.005302	0.001176	0.000501	0.000143	0.000136	0.000031	0.014921	
TWO-YEAR EXPONENTIAL AVG	0.006841	0.005012	0.001031	0.000424	0.000146	0.000169	0.000039	0.013662	*
THREE-YEAR EXPONENTIAL AVG	0.006735	0.005166	0.001132	0.000447	0.000145	0.000151	0.000037	0.013812	
FOUR-YEAR EXPONENTIAL AVG	0.007420	0.005130	0.001129	0.000482	0.000138	0.000141	0.000032	0.014472	

STATE: LOUISIANA PAID + O/S - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: INDEMNITY ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
FOUR-YEAR STRAIGHT AVERAGE	0	0	0	0	0	1	1	2	
TWO-YEAR EXPONENTIAL AVG	0	1	1	1	0	0	0	3	*
THREE-YEAR EXPONENTIAL AVG	1	0	0	0	0	0	0	1	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	1	0	0	1	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: LOUISIANA INCURRED - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.013	0.983	1.003	0.987	1.015	0.991	1.010
1982	1.036	0.977	1.009	0.983	1.010	0.992	0.992
1983	1.087	0.987	0.993	0.986	0.999	1.014	1.002
1984	1.053	1.013	0.994	0.976	0.999	1.012	0.996
1985	1.138	1.010	1.001	0.983	0.998	0.995	0.994
1986	1.132	1.094	1.037	0.969	1.008	1.013	0.991
1987	1.170	1.133	1.049	1.000	1.023	0.987	1.011
1988	1.156	1.071	1.055	1.032	1.032	1.012	0.999
1989	1.031	1.010	1.010	1.018	1.004	0.996	1.003
POINTS	9	9	9	9	9	9	9
AVERAGE	1.091	1.031	1.017	0.993	1.010	1.001	1.000
SAMPLE VARIANCE	0.003566	0.003042	0.000567	0.000418	0.000138	0.000124	0.000054
SAMPLE COEFF OF VARIANCE	0.055	0.054	0.023	0.021	0.012	0.011	0.007

REGION: SOUTHERN INCURRED - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	0.968	0.981	0.994	0.978	0.996	0.992	0.997
1983	1.014	0.978	0.995	0.982	0.995	0.998	1.000
1984	1.020	1.003	1.006	0.986	0.998	1.002	1.002
1985	1.064	1.010	1.015	0.987	1.000	0.996	0.996
1986	1.084	1.047	1.025	0.988	1.005	1.008	0.993
1987	1.081	1.049	1.012	1.006	1.009	1.001	1.002
1988	1.071	1.042	1.021	1.012	1.015	1.005	1.007
1989	1.065	1.032	1.023	1.007	1.005	0.996	1.005
POINTS	8	8	8	8	8	8	8
AVERAGE	1.046	1.018	1.011	0.993	1.003	1.000	1.000
SAMPLE VARIANCE	0.001680	0.000833	0.000147	0.000169	0.000048	0.000028	0.000022
SAMPLE COEFF OF VARIANCE	0.039	0.028	0.012	0.013	0.007	0.005	0.005

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: LOUISIANA INCURRED - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: INDEMNITY (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW
TWO-YEAR STRAIGHT AVERAGE	0.004926	0.004748	0.000885	0.000590	0.000263	0.000172	0.000078	0.011662	
THREE-YEAR STRAIGHT AVERAGE	0.005323	0.005083	0.001040	0.000671	0.000270	0.000159	0.000071	0.012617	
FOUR-YEAR STRAIGHT AVERAGE	0.006130	0.005174	0.001022	0.000723	0.000268	0.000150	0.000063	0.013529	
TWO-YEAR EXPONENTIAL AVG	0.004900	0.004635	0.000872	0.000579	0.000261	0.000181	0.000079	0.011506	*
THREE-YEAR EXPONENTIAL AVG	0.005247	0.004925	0.001006	0.000646	0.000265	0.000166	0.000071	0.012326	
FOUR-YEAR EXPONENTIAL AVG	0.005903	0.004983	0.000984	0.000692	0.000260	0.000155	0.000063	0.013040	

STATE: LOUISIANA INCURRED - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: INDEMNITY ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
FOUR-YEAR STRAIGHT AVERAGE	0	0	0	0	0	1	1	2	
TWO-YEAR EXPONENTIAL AVG	1	1	1	1	0	0	0	4	*
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	1	0	0	1	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: LOUISIANA PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.224	1.092	1.048	1.032	1.019	1.002	1.001
1982	1.254	1.086	1.060	1.037	1.021	1.006	1.001
1983	1.293	1.090	1.041	1.019	1.017	1.019	1.006
1984	1.289	1.114	1.048	1.033	1.023	1.026	1.017
1985	1.280	1.095	1.051	1.023	1.019	1.017	1.021
1986	1.305	1.116	1.047	1.026	1.019	1.019	1.011
1987	1.342	1.113	1.063	1.028	1.017	1.014	1.017
1988	1.355	1.126	1.063	1.037	1.023	1.015	1.013
1989	1.344	1.122	1.079	1.041	1.027	1.020	1.011
POINTS	9	9	9	9	9	9	9
AVERAGE	1.298	1.106	1.056	1.031	1.021	1.015	1.011
SAMPLE VARIANCE	0.001899	0.000230	0.000138	0.000052	0.000011	0.000054	0.000050
SAMPLE COEFF OF VARIANCE	0.034	0.014	0.011	0.007	0.003	0.007	0.007

REGION: SOUTHERN PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	1.215	1.079	1.044	1.027	1.015	1.013	1.009
1983	1.216	1.070	1.042	1.021	1.019	1.012	1.010
1984	1.233	1.073	1.039	1.026	1.017	1.014	1.012
1985	1.245	1.073	1.037	1.025	1.017	1.013	1.013
1986	1.267	1.082	1.042	1.022	1.017	1.018	1.012
1987	1.283	1.093	1.043	1.028	1.020	1.016	1.012
1988	1.314	1.101	1.048	1.029	1.021	1.015	1.013
1989	1.340	1.112	1.055	1.033	1.022	1.018	1.013
POINTS	8	8	8	8	8	8	8
AVERAGE	1.264	1.085	1.044	1.026	1.019	1.015	1.012
SAMPLE VARIANCE	0.002096	0.000229	0.000031	0.000015	0.000006	0.000005	0.000002
SAMPLE COEFF OF VARIANCE	0.036	0.014	0.005	0.004	0.002	0.002	0.001

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: LOUISIANA PAID - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: MEDICAL (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.000801	0.000075	0.000113	0.000039	0.000017	0.000017	0.000034	0.001096	
THREE-YEAR STRAIGHT AVERAGE	0.001019	0.000126	0.000150	0.000058	0.000018	0.000013	0.000040	0.001424	
FOUR-YEAR STRAIGHT AVERAGE	0.001316	0.000168	0.000184	0.000062	0.000015	0.000017	0.000052	0.001815	
TWO-YEAR EXPONENTIAL AVG	0.000778	0.000078	0.000112	0.000039	0.000016	0.000017	0.000034	0.001073	*
THREE-YEAR EXPONENTIAL AVG	0.000965	0.000121	0.000144	0.000055	0.000017	0.000013	0.000038	0.001353	
FOUR-YEAR EXPONENTIAL AVG	0.001203	0.000155	0.000174	0.000059	0.000015	0.000015	0.000047	0.001668	

STATE: LOUISIANA PAID - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: MEDICAL ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	1	0	0	0	0	0	1	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
FOUR-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
TWO-YEAR EXPONENTIAL AVG	1	0	1	1	0	0	1	4	*
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	1	0	1	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	1	0	0	1	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: LOUISIANA PAID + O/S - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.054	0.997	0.999	0.993	1.009	0.997	0.996
1982	1.066	1.004	1.017	1.002	1.008	1.003	0.998
1983	1.098	0.992	1.006	0.995	1.002	0.991	1.002
1984	1.132	1.051	1.020	1.014	1.015	1.043	1.017
1985	1.113	1.035	1.007	0.987	0.996	1.008	1.006
1986	1.121	1.041	1.019	1.007	1.011	1.011	1.034
1987	1.174	1.053	1.040	1.007	1.001	1.008	1.028
1988	1.142	1.057	1.017	1.047	0.999	1.006	1.010
1989	1.090	1.064	1.011	1.003	1.011	1.001	1.004
POINTS	9	9	9	9	9	9	9
AVERAGE	1.110	1.033	1.015	1.006	1.006	1.008	1.011
SAMPLE VARIANCE	0.001419	0.000768	0.000136	0.000303	0.000042	0.000215	0.000175
SAMPLE COEFF OF VARIANCE	0.034	0.027	0.012	0.017	0.006	0.015	0.013

REGION: SOUTHERN PAID + O/S - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	1.042	1.020	1.009	1.006	1.008	1.003	1.013
1983	1.054	1.015	1.023	1.013	1.004	1.005	1.008
1984	1.067	1.020	1.010	1.006	1.008	1.013	1.007
1985	1.072	1.019	1.004	1.011	0.999	1.010	1.006
1986	1.083	1.026	1.018	1.009	1.011	1.011	1.008
1987	1.100	1.043	1.018	1.015	1.013	1.011	1.008
1988	1.101	1.038	1.015	1.012	1.007	1.006	1.010
1989	1.093	1.031	1.022	1.013	1.014	1.011	1.012
POINTS	8	8	8	8	8	8	8
AVERAGE	1.077	1.027	1.015	1.011	1.008	1.009	1.009
SAMPLE VARIANCE	0.000468	0.000100	0.000045	0.000011	0.000024	0.000013	0.000006
SAMPLE COEFF OF VARIANCE	0.020	0.010	0.007	0.003	0.005	0.004	0.002

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: LOUISIANA PAID + O/S - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: MEDICAL (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.001582	0.000118	0.000252	0.000525	0.000073	0.000068	0.000250	0.002867	
THREE-YEAR STRAIGHT AVERAGE	0.001218	0.000219	0.000191	0.000569	0.000061	0.000050	0.000260	0.002568	
FOUR-YEAR STRAIGHT AVERAGE	0.001334	0.000397	0.000180	0.000449	0.000069	0.000043	0.000270	0.002741	
TWO-YEAR EXPONENTIAL AVG	0.001558	0.000108	0.000249	0.000539	0.000075	0.000068	0.000247	0.002843	
THREE-YEAR EXPONENTIAL AVG	0.001223	0.000193	0.000194	0.000571	0.000064	0.000048	0.000254	0.002547	*
FOUR-YEAR EXPONENTIAL AVG	0.001301	0.000340	0.000182	0.000463	0.000070	0.000038	0.000261	0.002656	

STATE: LOUISIANA PAID + O/S - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: MEDICAL ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
THREE-YEAR STRAIGHT AVERAGE	1	0	0	0	1	0	0	2	*
FOUR-YEAR STRAIGHT AVERAGE	0	0	1	1	0	0	0	2	*
TWO-YEAR EXPONENTIAL AVG	0	1	0	0	0	0	1	2	*
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	1	0	1	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: LOUISIANA INCURRED - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.003	0.977	1.001	0.988	1.012	0.998	1.000
1982	0.991	0.983	1.012	0.988	1.006	1.001	0.995
1983	1.041	0.967	0.998	0.980	0.999	0.990	1.004
1984	1.076	1.027	1.016	1.003	1.012	1.041	1.016
1985	1.069	1.014	1.004	0.972	0.991	1.005	1.003
1986	1.077	1.028	1.025	0.995	1.010	1.010	1.030
1987	1.111	1.032	1.030	0.999	0.997	1.004	1.026
1988	1.081	1.041	1.012	1.043	1.008	1.005	1.010
1989	1.035	1.047	1.006	1.000	1.010	0.996	1.002
POINTS	9	9	9	9	9	9	9
AVERAGE	1.054	1.013	1.012	0.996	1.005	1.006	1.010
SAMPLE VARIANCE	0.001539	0.000879	0.000116	0.000405	0.000057	0.000211	0.000146
SAMPLE COEFF OF VARIANCE	0.037	0.029	0.011	0.020	0.007	0.014	0.012

REGION: SOUTHERN INCURRED - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	0.981	0.998	1.003	0.995	1.006	1.001	1.011
1983	1.005	0.990	1.013	1.001	1.001	1.003	1.007
1984	1.025	1.003	1.006	0.998	1.007	1.013	1.007
1985	1.030	1.002	1.001	1.000	0.997	1.008	1.005
1986	1.038	1.011	1.017	0.998	1.009	1.009	1.005
1987	1.052	1.029	1.013	1.011	1.011	1.009	1.008
1988	1.049	1.024	1.012	1.009	1.012	1.004	1.010
1989	1.048	1.022	1.020	1.007	1.012	1.008	1.012
POINTS	8	8	8	8	8	8	8
AVERAGE	1.029	1.010	1.011	1.002	1.007	1.007	1.008
SAMPLE VARIANCE	0.000609	0.000194	0.000045	0.000034	0.000030	0.000015	0.000007
SAMPLE COEFF OF VARIANCE	0.024	0.014	0.007	0.006	0.005	0.004	0.003

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: LOUISIANA INCURRED - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: MEDICAL (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.001093	0.000140	0.000188	0.000647	0.000074	0.000074	0.000228	0.002443	
THREE-YEAR STRAIGHT AVERAGE	0.001139	0.000327	0.000187	0.000724	0.000091	0.000072	0.000218	0.002758	
FOUR-YEAR STRAIGHT AVERAGE	0.001455	0.000535	0.000174	0.000623	0.000093	0.000053	0.000225	0.003157	
TWO-YEAR EXPONENTIAL AVG	0.001072	0.000127	0.000185	0.000659	0.000079	0.000075	0.000226	0.002422	*
THREE-YEAR EXPONENTIAL AVG	0.001100	0.000292	0.000183	0.000719	0.000093	0.000069	0.000215	0.002672	
FOUR-YEAR EXPONENTIAL AVG	0.001352	0.000464	0.000172	0.000627	0.000094	0.000050	0.000220	0.002979	

STATE: LOUISIANA INCURRED - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: MEDICAL ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	1	0	0	1	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
FOUR-YEAR STRAIGHT AVERAGE	0	0	0	1	0	0	0	1	
TWO-YEAR EXPONENTIAL AVG	1	1	0	0	0	0	0	2	*
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	1	1	
FOUR-YEAR EXPONENTIAL AVG	0	0	1	0	0	1	0	2	*

NATIONAL COUNCIL ON COMPENSATION INSURANCE
LOUISIANA INDEMNITY COMPARISON OF PROJECTIONS

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	ACTUAL 8TH	AVERAGE	*=LOW AVG
1978 PAID				139,186,629	140,606,103	141,319,016	140,160,637	138,387,285		
1978 PAID + O/S				159,696,062	162,193,041	162,671,058	159,867,846	159,599,159		
1978 INCURRED				161,978,798	162,077,624	163,123,845	159,583,755	158,982,647		
1978 PAID (1)				0.58%	1.60%	2.12%	1.28%		1.40%	
1978 PAID + O/S (1)				0.06%	1.63%	1.92%	0.17%		0.94%	*
1978 INCURRED (1)				1.88%	1.95%	2.60%	0.38%		1.70%	
1978 PAID (2)					1.02%	0.51%	0.82%	1.27%	0.90%	
1978 PAID + O/S (2)					1.56%	0.29%	1.72%	0.17%	0.94%	
1978 INCURRED (2)					0.06%	0.65%	2.17%	0.38%	0.81%	*
1979 PAID			177,431,830	174,483,162	171,642,716	171,812,392	169,320,882	170,933,210		
1979 PAID + O/S			194,249,735	196,017,515	193,953,555	192,137,687	193,757,833	196,285,049		
1979 INCURRED			197,972,569	195,236,036	194,799,782	192,007,876	193,338,590	197,035,713		
1979 PAID (1)			3.80%	2.08%	0.42%	0.51%	0.94%		1.55%	
1979 PAID + O/S (1)			1.04%	0.14%	1.19%	2.11%	1.29%		1.15%	*
1979 INCURRED (1)			0.48%	0.91%	1.13%	2.55%	1.88%		1.39%	
1979 PAID (2)				1.66%	1.63%	0.10%	1.45%	0.95%	1.16%	
1979 PAID + O/S (2)				0.91%	1.05%	0.94%	0.84%	1.30%	1.01%	*
1979 INCURRED (2)				1.38%	0.22%	1.43%	0.69%	1.91%	1.13%	
1980 PAID		187,352,733	185,865,280	184,201,616	184,720,313	182,826,983	183,186,783	183,489,500		
1980 PAID + O/S		205,990,111	210,861,409	207,101,177	205,984,097	207,318,727	204,942,413	204,128,892		
1980 INCURRED		207,990,332	208,244,729	207,383,405	204,930,508	206,463,293	204,705,660	204,377,690		
1980 PAID (1)		2.11%	1.29%	0.39%	0.67%	0.36%	0.16%		0.83%	*
1980 PAID + O/S (1)		0.91%	3.30%	1.46%	0.91%	1.56%	0.40%		1.42%	
1980 INCURRED (1)		1.77%	1.89%	1.47%	0.27%	1.02%	0.16%		1.10%	
1980 PAID (2)			0.79%	0.90%	0.28%	1.02%	0.20%	0.17%	0.56%	*
1980 PAID + O/S (2)			2.36%	1.78%	0.54%	0.65%	1.15%	0.40%	1.15%	
1980 INCURRED (2)			0.12%	0.41%	1.18%	0.75%	0.85%	0.16%	0.58%	
1981 PAID	187,654,146	194,686,704	192,876,163	192,907,445	191,912,130	195,247,827	198,588,767	198,391,708		
1981 PAID + O/S	208,148,075	221,883,205	223,104,514	221,455,985	219,776,288	224,486,001	227,511,176	226,931,888		
1981 INCURRED	204,928,655	216,593,527	222,394,940	220,635,121	218,811,739	224,189,448	227,786,333	227,346,618		
1981 PAID (1)	5.41%	1.87%	2.78%	2.78%	3.27%	1.58%	0.10%		2.54%	*
1981 PAID + O/S (1)	8.28%	2.22%	1.69%	2.41%	3.15%	1.08%	0.26%		2.73%	
1981 INCURRED (1)	9.86%	4.73%	2.18%	2.95%	3.75%	1.39%	0.19%		3.58%	
1981 PAID (2)		3.75%	0.93%	0.02%	0.52%	1.74%	1.71%	0.10%	1.25%	*
1981 PAID + O/S (2)		6.60%	0.55%	0.74%	0.76%	2.14%	1.35%	0.25%	1.77%	
1981 INCURRED (2)		5.69%	2.68%	0.79%	0.83%	2.46%	1.60%	0.19%	2.03%	
1982 PAID	189,348,325	183,711,834	189,919,431	189,111,740	196,315,886	199,370,816	198,789,361			
1982 PAID + O/S	218,334,291	210,187,801	209,519,216	216,433,679	222,657,288	224,083,532	223,526,054			
1982 INCURRED	207,351,421	208,490,068	208,178,232	216,183,816	225,279,776	229,740,075	228,026,396			
1982 PAID (1)	4.75%	7.58%	4.46%	4.87%	1.24%	0.29%			3.87%	
1982 PAID + O/S (1)	2.32%	5.97%	6.27%	3.17%	0.39%	0.25%			3.06%	*
1982 INCURRED (1)	9.07%	8.57%	8.70%	5.19%	1.20%	0.75%			5.58%	
1982 PAID (2)		2.98%	3.38%	0.43%	3.81%	1.56%	0.29%		2.07%	
1982 PAID + O/S (2)		3.73%	0.32%	3.30%	2.88%	0.64%	0.25%		1.85%	*
1982 INCURRED (2)		0.55%	0.15%	3.85%	4.21%	1.98%	0.75%		1.91%	
1983 PAID	148,924,752	155,700,481	165,554,689	180,935,856	188,338,890	190,033,470				
1983 PAID + O/S	170,118,762	179,933,252	197,752,723	209,513,166	220,051,064	217,151,515				
1983 INCURRED	169,388,674	180,151,262	198,825,478	209,984,910	223,495,483	218,494,023				
1983 PAID (1)	21.63%	18.07%	12.88%	4.79%	0.89%				11.65%	
1983 PAID + O/S (1)	21.66%	17.14%	8.93%	3.52%	1.34%				10.52%	*
1983 INCURRED (1)	22.47%	17.55%	9.00%	3.89%	2.29%				11.04%	
1983 PAID (2)		4.55%	6.33%	9.29%	4.09%	0.90%			5.03%	*
1983 PAID + O/S (2)		5.77%	9.90%	5.95%	5.03%	1.32%			5.59%	
1983 INCURRED (2)		6.35%	10.37%	5.61%	6.43%	2.24%			6.20%	
1984 PAID	164,430,832	173,427,993	192,021,202	207,743,516	211,376,302					
1984 PAID + O/S	188,997,547	208,041,036	236,046,980	249,597,138	248,383,008					
1984 INCURRED	192,162,813	210,734,935	238,328,280	252,602,941	250,886,533					
1984 PAID (1)	22.21%	17.95%	9.16%	1.72%					12.76%	
1984 PAID + O/S (1)	23.91%	16.24%	4.97%	0.49%					11.40%	
1984 INCURRED (1)	23.41%	16.00%	5.01%	0.68%					11.28%	*
1984 PAID (2)		5.47%	10.72%	8.19%	1.75%				6.53%	*
1984 PAID + O/S (2)		10.08%	13.46%	5.74%	0.49%				7.44%	
1984 INCURRED (2)		9.66%	13.09%	5.99%	0.68%				7.36%	

NOTES: (1) ABSOLUTE DEVIATION FROM LAST PROJECTION (OR REPORT), RATIOED TO SAME.

(2) ABSOLUTE CHANGE RELATIVE TO PRIOR PROJECTION OR REPORT.

WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.

LOSSES HAVE BEEN RESTATED TO THE LATEST DIAGONAL.

N-4 0.0000
N-3 0.0000
N-2 0.5000
N-1 0.5000

WEIGHTS ASSIGNED TO
PRECEDING YEARS:

08:51 AM
03/14/91

NATIONAL COUNCIL ON COMPENSATION INSURANCE
LOUISIANA INDEMNITY COMPARISON OF PROJECTIONS RESTATED TO INCURRED LEVEL

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	RESTATED 8TH	AVERAGE	*=LOW AVG
1978 PAID				157,034,045	159,212,463	162,904,689	163,130,698	158,723,792		
1978 PAID + Q/S				161,113,803	163,492,440	163,945,231	160,742,801	159,604,225		
1978 INCURRED				161,978,798	162,077,624	163,123,845	159,583,755	158,982,647		
1978 PAID (1)				1.06%	0.31%	2.63%	2.78%		1.70%	*
1978 PAID + Q/S (1)				0.95%	2.44%	2.72%	0.71%		1.70%	
1978 INCURRED (1)				1.88%	1.95%	2.60%	0.38%		1.70%	
1978 PAID (2)					1.39%	2.32%	0.14%	2.70%	1.64%	
1978 PAID + Q/S (2)					1.48%	0.28%	1.95%	0.71%	1.10%	
1978 INCURRED (2)					0.06%	0.65%	2.17%	0.38%	0.81%	*
1979 PAID			200,183,295	197,572,462	197,860,162	199,969,664	194,203,191	196,703,392		
1979 PAID + Q/S			195,974,235	197,587,896	195,472,758	193,189,255	193,763,983	196,278,369		
1979 INCURRED			197,972,569	195,236,036	194,799,782	192,007,876	193,338,590	197,035,713		
1979 PAID (1)				1.77%	0.44%	0.59%	1.66%	1.27%		1.15%
1979 PAID + Q/S (1)				0.15%	0.67%	0.41%	1.57%	1.28%	0.82%	*
1979 INCURRED (1)				0.48%	0.91%	1.13%	2.55%	1.88%	1.39%	
1979 PAID (2)					1.30%	0.15%	1.07%	2.88%	1.29%	1.34%
1979 PAID + Q/S (2)					0.82%	1.07%	1.17%	0.30%	1.30%	0.93%
1979 INCURRED (2)					1.38%	0.22%	1.43%	0.69%	1.91%	1.13%
1980 PAID		211,376,320	210,460,772	212,337,362	214,992,983	209,694,062	210,804,335	207,882,408		
1980 PAID + Q/S		207,818,839	212,550,710	208,723,362	207,111,446	207,325,308	204,935,438	204,643,276		
1980 INCURRED		207,990,332	208,244,729	207,383,405	204,930,508	206,463,293	204,705,660	204,377,690		
1980 PAID (1)				1.68%	1.24%	2.14%	3.42%	0.87%	1.41%	1.79%
1980 PAID + Q/S (1)				1.55%	3.86%	1.99%	1.21%	1.31%	0.14%	1.68%
1980 INCURRED (1)				1.77%	1.89%	1.47%	0.27%	1.02%	0.16%	1.10%
1980 PAID (2)					0.43%	0.89%	1.25%	2.46%	0.53%	1.39%
1980 PAID + Q/S (2)					2.28%	1.80%	0.77%	0.10%	1.15%	0.14%
1980 INCURRED (2)					0.12%	0.41%	1.18%	0.75%	0.85%	0.16%
1981 PAID	211,716,383	220,449,532	222,336,897	224,521,853	220,114,304	224,683,722	224,988,956	224,116,223		
1981 PAID + Q/S	209,995,961	223,660,806	224,852,051	222,668,011	219,783,264	224,478,361	228,084,481	227,277,527		
1981 INCURRED	204,928,655	216,593,527	222,394,940	220,635,121	218,811,739	224,189,448	227,786,333	227,346,618		
1981 PAID (1)				5.53%	1.64%	0.79%	0.18%	1.79%	0.25%	0.39%
1981 PAID + Q/S (1)				7.60%	1.59%	1.07%	2.03%	3.30%	1.23%	0.36%
1981 INCURRED (1)				9.86%	4.73%	2.18%	2.95%	3.75%	1.39%	0.19%
1981 PAID (2)					4.12%	0.86%	0.98%	1.96%	2.08%	0.14%
1981 PAID + Q/S (2)					6.51%	0.53%	0.97%	1.30%	2.14%	1.61%
1981 INCURRED (2)					5.69%	2.68%	0.79%	0.83%	2.46%	1.60%
1982 PAID	214,404,726	211,772,769	221,044,153	216,902,387	225,912,803	225,874,970	224,565,438			
1982 PAID + Q/S	220,083,461	211,834,163	210,665,912	216,440,549	222,649,710	224,648,200	223,866,506			
1982 INCURRED	207,351,421	208,490,068	208,178,232	216,183,816	225,279,776	229,740,075	228,024,396			
1982 PAID (1)				4.52%	5.70%	1.57%	3.41%	0.60%	0.58%	
1982 PAID + Q/S (1)				1.69%	5.37%	5.90%	3.32%	0.54%	0.35%	
1982 INCURRED (1)				9.07%	8.57%	8.70%	5.19%	1.20%	0.75%	
1982 PAID (2)					1.23%	4.38%	1.87%	4.15%	0.02%	0.58%
1982 PAID + Q/S (2)					3.75%	0.55%	2.74%	2.87%	0.90%	0.35%
1982 INCURRED (2)					0.55%	0.15%	3.85%	4.21%	1.98%	0.75%
1983 PAID	171,672,158	181,217,270	189,883,543	208,214,054	213,376,470	214,674,212				
1983 PAID + Q/S	171,451,271	180,918,025	197,759,000	209,506,035	220,605,571	217,482,258				
1983 INCURRED	169,388,674	180,151,262	198,825,478	209,984,910	223,495,483	218,494,023				
1983 PAID (1)				20.03%	15.58%	11.55%	3.01%	0.60%		10.16%
1983 PAID + Q/S (1)				21.17%	16.81%	9.07%	3.67%	1.44%		10.43%
1983 INCURRED (1)				22.47%	17.55%	9.00%	3.89%	2.29%		11.04%
1983 PAID (2)					5.56%	4.78%	9.65%	2.48%	0.61%	
1983 PAID + Q/S (2)					5.52%	9.31%	5.94%	5.30%	1.42%	
1983 INCURRED (2)					6.35%	10.37%	5.61%	6.43%	2.24%	
1984 PAID	191,378,385	198,913,857	220,970,645	235,360,728	238,784,468					
1984 PAID + Q/S	190,031,929	208,047,640	236,038,947	250,226,098	248,761,320					
1984 INCURRED	192,162,813	210,734,935	238,328,280	252,602,941	250,886,533					
1984 PAID (1)				19.85%	16.70%	7.46%	1.43%			11.36%
1984 PAID + Q/S (1)				23.61%	16.37%	5.11%	0.59%			11.42%
1984 INCURRED (1)				23.41%	16.00%	5.01%	0.68%			11.28%
1984 PAID (2)					3.94%	11.09%	6.51%		1.45%	
1984 PAID + Q/S (2)					9.48%	13.45%	6.01%		0.59%	
1984 INCURRED (2)					9.66%	13.09%	5.99%		0.68%	

NOTES: (1) ABSOLUTE DEVIATION FROM LAST PROJECTION (OR REPORT), RATIENCED TO SAME.
(2) ABSOLUTE CHANGE RELATIVE TO PRIOR PROJECTION OR REPORT.
WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.
LOSSES RESTATED TO INCURRED LEVEL OF 8TH REPORT, AND TO LAST DIAGONAL.

WEIGHTS ASSIGNED TO PRECEDING YEARS:
N-4 0.0000
N-3 0.0000
N-2 0.5000
N-1 0.5000

NATIONAL COUNCIL ON COMPENSATION INSURANCE
LOUISIANA MEDICAL COMPARISON OF PROJECTIONS

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	ACTUAL 8TH	AVERAGE	*=LOW AVG
1978 PAID				58,179,787	57,880,789	59,149,720	59,267,775	58,817,120		
1978 PAID + Q/S				61,819,270	61,450,328	63,908,159	63,468,093	64,856,936		
1978 INCURRED				62,797,556	61,763,720	64,269,780	63,573,760	64,894,903		
1978 PAID (1)				1.08%	1.59%	0.57%	0.77%		1.00%	*
1978 PAID + Q/S (1)				4.68%	5.25%	1.46%	2.14%		3.39%	
1978 INCURRED (1)				3.23%	4.83%	0.96%	2.04%		2.76%	
1978 PAID (2)					0.51%	2.19%	0.20%	0.76%	0.92%	*
1978 PAID + Q/S (2)					0.60%	4.00%	0.69%	2.19%	1.87%	
1978 INCURRED (2)					1.65%	4.06%	1.08%	2.08%	2.22%	
1979 PAID			77,406,028	76,730,168	78,562,653	78,990,253	78,564,950	78,651,976		
1979 PAID + Q/S			82,853,136	82,484,381	86,557,273	86,369,674	85,863,988	86,495,836		
1979 INCURRED			84,403,145	82,648,528	87,099,546	86,434,699	85,928,044	86,712,758		
1979 PAID (1)			1.58%	2.44%	0.11%	0.43%	0.11%		0.94%	*
1979 PAID + Q/S (1)			4.21%	4.64%	0.07%	0.15%	0.73%		1.96%	
1979 INCURRED (1)			2.66%	4.69%	0.45%	0.32%	0.90%		1.80%	
1979 PAID (2)				0.87%	2.39%	0.54%	0.54%	0.11%	0.89%	*
1979 PAID + Q/S (2)				0.45%	4.94%	0.22%	0.59%	0.74%	1.38%	
1979 INCURRED (2)				2.08%	5.39%	0.76%	0.59%	0.91%	1.95%	
1980 PAID		84,875,697	84,980,380	86,214,621	86,600,045	85,880,683	85,374,842	85,282,375		
1980 PAID + Q/S		90,354,190	89,675,448	94,005,155	93,046,347	92,869,552	93,731,605	91,864,386		
1980 INCURRED		92,171,002	89,682,296	94,451,078	92,860,282	92,869,028	93,593,414	91,968,355		
1980 PAID (1)		0.48%	0.35%	1.09%	1.55%	0.70%	0.11%		0.71%	*
1980 PAID + Q/S (1)		1.64%	2.38%	2.33%	1.29%	1.09%	2.03%		1.80%	
1980 INCURRED (1)		0.22%	2.49%	2.70%	0.97%	0.98%	1.77%		1.52%	
1980 PAID (2)			0.12%	1.45%	0.45%	0.83%	0.59%	0.11%	0.59%	*
1980 PAID + Q/S (2)			0.75%	4.83%	1.02%	0.19%	0.93%	1.99%	1.62%	
1980 INCURRED (2)			2.70%	5.32%	1.68%	0.01%	0.78%	1.74%	2.04%	
1981 PAID	88,363,347	92,158,858	95,411,956	96,906,240	95,914,300	95,396,839	95,350,007	94,971,009		
1981 PAID + Q/S	92,883,226	96,067,810	105,326,452	105,052,183	104,750,886	105,616,774	104,025,563	102,456,276		
1981 INCURRED	93,865,842	96,150,978	105,719,596	105,281,886	105,093,596	105,858,190	104,620,242	102,996,315		
1981 PAID (1)	6.96%	2.96%	0.46%	2.04%	0.99%	0.45%	0.40%		2.04%	*
1981 PAID + Q/S (1)	9.34%	6.26%	2.80%	2.53%	2.24%	3.08%	1.53%		3.97%	
1981 INCURRED (1)	8.86%	6.65%	2.64%	2.22%	2.04%	2.78%	1.58%		3.82%	
1981 PAID (2)		4.30%	3.53%	1.57%	1.02%	0.54%	0.05%	0.40%	1.63%	*
1981 PAID + Q/S (2)		3.43%	9.64%	0.26%	0.29%	0.83%	1.51%	1.51%	2.49%	
1981 INCURRED (2)		2.43%	9.95%	0.41%	0.18%	0.73%	1.17%	1.55%	2.35%	
1982 PAID	101,478,193	105,193,477	106,010,775	104,522,664	104,416,484	104,826,160	105,082,953			
1982 PAID + Q/S	101,710,738	113,391,680	115,330,739	114,475,834	117,162,121	114,707,919	112,681,675			
1982 INCURRED	99,473,446	112,448,128	114,572,621	114,724,777	118,145,933	117,229,541	114,867,367			
1982 PAID (1)	3.43%	0.11%	0.88%	0.53%	0.63%	0.24%			0.97%	*
1982 PAID + Q/S (1)	9.74%	0.63%	2.35%	1.59%	3.98%	1.80%			3.35%	
1982 INCURRED (1)	13.40%	2.11%	0.26%	0.12%	2.85%	2.06%			3.47%	
1982 PAID (2)		3.66%	0.78%	1.40%	0.10%	0.39%	0.24%		1.10%	*
1982 PAID + Q/S (2)		11.48%	1.71%	0.74%	2.35%	2.09%	1.77%		3.36%	
1982 INCURRED (2)		13.04%	1.89%	0.13%	2.98%	0.78%	2.01%		3.47%	
1983 PAID	113,724,514	114,617,416	114,403,248	115,699,654	116,940,655	117,742,331				
1983 PAID + Q/S	123,581,155	126,438,807	124,523,355	130,842,284	133,323,288	132,739,557				
1983 INCURRED	120,966,350	125,272,312	125,066,143	130,501,696	134,724,768	133,598,564				
1983 PAID (1)	3.41%	2.65%	2.84%	1.73%	0.68%				2.26%	*
1983 PAID + Q/S (1)	6.90%	4.75%	6.19%	1.43%	0.44%				3.94%	
1983 INCURRED (1)	9.46%	6.23%	6.39%	2.32%	0.84%				5.05%	
1983 PAID (2)		0.79%	0.19%	1.13%	1.07%	0.69%			0.77%	*
1983 PAID + Q/S (2)		2.31%	1.51%	5.07%	1.90%	0.44%			2.25%	
1983 INCURRED (2)		3.56%	0.16%	4.35%	3.24%	0.84%			2.43%	
1984 PAID	127,500,619	128,076,954	129,425,635	131,233,852	132,961,858					
1984 PAID + Q/S	146,236,356	143,414,039	151,325,807	149,413,301	144,420,553					
1984 INCURRED	144,452,494	143,833,729	151,333,717	150,628,483	146,152,248					
1984 PAID (1)	4.11%	3.67%	2.66%	1.30%					2.94%	
1984 PAID + Q/S (1)	1.26%	0.70%	4.78%	3.46%					2.55%	
1984 INCURRED (1)	1.16%	1.59%	3.55%	3.06%					2.34%	*
1984 PAID (2)		0.45%	1.05%	1.40%	1.32%				1.05%	*
1984 PAID + Q/S (2)		1.93%	5.52%	1.26%	3.34%				3.01%	
1984 INCURRED (2)		0.43%	5.21%	0.47%	2.97%				2.27%	

NOTES: (1) ABSOLUTE DEVIATION FROM LAST PROJECTION (OR REPORT), RATIODE TO SAME.
(2) ABSOLUTE CHANGE RELATIVE TO PRIOR PROJECTION OR REPORT.
WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.
LOSSES HAVE BEEN RESTATED TO THE LATEST DIAGONAL.

N-4 0.0000
N-3 0.0000
N-2 0.5000
N-1 0.5000
WEIGHTS ASSIGNED TO PRECEDING YEARS:

08:55 AM
03/14/91

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 LOUISIANA MEDICAL COMPARISON OF PROJECTIONS RESTATED TO INCURRED LEVEL

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	RESTATED 8TH	AVERAGE	*=LOW AVG
1978 PAID				60,155,068	60,584,974	63,594,240	65,695,388	65,425,981		
1978 PAID + Q/S				62,318,912	61,962,047	64,431,965	63,838,799	65,030,863		
1978 INCURRED				62,797,556	61,763,720	64,269,780	63,573,760	64,894,903		
1978 PAID (1)				8.06%	7.40%	2.80%	0.41%		4.67%	
1978 PAID + Q/S (1)				4.17%	4.72%	0.92%	1.83%		2.91%	
1978 INCURRED (1)				3.23%	4.83%	0.96%	2.04%		2.76%	*
1978 PAID (2)					0.71%	4.97%	3.30%	0.41%	2.35%	
1978 PAID + Q/S (2)					0.57%	3.99%	0.92%	1.87%	1.84%	*
1978 INCURRED (2)					1.65%	4.06%	1.08%	2.08%	2.22%	
1979 PAID			80,034,065	80,314,994	84,465,864	87,556,775	87,392,734	86,746,049		
1979 PAID + Q/S			83,522,780	83,171,259	87,266,717	86,874,143	86,094,250	86,629,534		
1979 INCURRED			84,403,145	82,648,528	87,099,546	86,434,699	85,928,044	86,712,758		
1979 PAID (1)				7.41%	2.63%	0.93%	0.75%		3.89%	
1979 PAID + Q/S (1)				3.59%	3.99%	0.74%	0.62%		1.84%	
1979 INCURRED (1)				2.66%	4.69%	0.45%	0.90%		1.80%	*
1979 PAID (2)					0.35%	5.17%	3.66%	0.19%	0.74%	2.02%
1979 PAID + Q/S (2)					0.42%	4.92%	0.45%	0.90%	0.62%	1.46%
1979 INCURRED (2)					2.08%	5.39%	0.76%	0.99%	0.91%	1.95%
1980 PAID		87,757,339	88,950,655	92,692,803	95,991,853	95,530,484	94,160,765	92,984,175		
1980 PAID + Q/S		91,084,459	90,422,207	94,775,643	93,589,814	93,118,601	93,876,488	92,031,520		
1980 INCURRED		92,171,002	89,682,296	94,451,078	92,860,282	92,869,028	93,593,414	91,968,355		
1980 PAID (1)		5.62%	4.34%	0.31%	3.23%	2.74%	1.27%		2.92%	
1980 PAID + Q/S (1)		1.03%	1.75%	2.98%	1.69%	1.18%	2.00%		1.77%	
1980 INCURRED (1)		0.22%	2.49%	2.70%	0.97%	0.98%	1.77%		1.52%	*
1980 PAID (2)			1.36%	4.21%	3.56%	0.48%	1.43%	1.25%	2.05%	
1980 PAID + Q/S (2)			0.73%	4.81%	1.25%	0.50%	0.81%	1.97%	1.68%	*
1980 INCURRED (2)			2.70%	5.32%	1.68%	0.01%	0.78%	1.74%	2.04%	
1981 PAID	91,363,399	96,464,511	102,581,227	107,415,759	106,691,507	105,214,125	103,961,009	102,705,619		
1981 PAID + Q/S	93,633,936	96,867,802	106,189,732	105,665,774	105,031,797	105,780,028	104,214,822	102,783,836		
1981 INCURRED	93,865,842	96,150,978	105,719,596	105,281,886	105,093,596	105,858,190	104,620,242	102,996,315		
1981 PAID (1)	11.04%	6.08%	0.12%	4.59%	3.88%	2.44%	1.22%		4.20%	
1981 PAID + Q/S (1)	8.90%	5.76%	3.31%	2.80%	2.19%	2.92%	1.39%		3.90%	
1981 INCURRED (1)	8.86%	6.65%	2.64%	2.22%	2.04%	2.78%	1.58%		3.82%	*
1981 PAID (2)		5.58%	6.34%	4.71%	0.67%	1.38%	1.19%	1.21%	3.01%	
1981 PAID + Q/S (2)		3.45%	9.62%	0.49%	0.60%	0.71%	1.48%	1.37%	2.53%	
1981 INCURRED (2)		2.43%	9.95%	0.41%	0.18%	0.73%	1.17%	1.55%	2.35%	*
1982 PAID	106,219,244	113,097,733	117,507,683	116,267,130	115,161,982	114,292,947	113,641,098			
1982 PAID + Q/S	102,557,720	114,321,064	116,004,365	114,782,825	117,343,221	114,916,613	113,041,926			
1982 INCURRED	99,473,446	112,448,128	114,572,621	114,724,777	118,145,933	117,229,541	114,867,367			
1982 PAID (1)	6.53%	0.48%	3.40%	2.31%	1.34%	0.57%			2.44%	*
1982 PAID + Q/S (1)	9.27%	1.13%	2.62%	1.54%	3.81%	1.66%			3.34%	
1982 INCURRED (1)	13.40%	2.11%	0.26%	0.12%	2.85%	2.06%			3.47%	
1982 PAID (2)		6.48%	3.90%	1.06%	0.95%	0.75%	0.57%		2.28%	*
1982 PAID + Q/S (2)		11.47%	1.47%	1.05%	2.23%	2.07%	1.63%		3.32%	
1982 INCURRED (2)		13.04%	1.89%	0.13%	2.98%	0.78%	2.01%		3.47%	
1983 PAID	122,269,794	127,047,718	127,257,926	127,606,302	127,501,494	127,331,479				
1983 PAID + Q/S	124,594,055	127,177,314	124,857,291	131,044,530	133,565,850	133,163,935				
1983 INCURRED	120,966,350	125,272,312	125,066,143	130,501,696	134,724,768	133,598,564				
1983 PAID (1)	3.98%	0.22%	0.06%	0.22%	0.13%				0.92%	*
1983 PAID + Q/S (1)	6.44%	4.50%	6.24%	1.59%	0.30%				3.81%	
1983 INCURRED (1)	9.46%	6.23%	6.39%	2.32%	0.84%				5.05%	
1983 PAID (2)		3.91%	0.17%	0.27%	0.08%	0.13%			0.91%	*
1983 PAID + Q/S (2)		2.07%	1.82%	4.96%	1.92%	0.30%			2.22%	
1983 INCURRED (2)		3.56%	0.16%	4.35%	3.24%	0.84%			2.43%	
1984 PAID	141,328,109	142,468,048	142,744,824	143,085,501	143,790,512					
1984 PAID + Q/S	147,090,496	143,798,634	151,559,715	149,685,136	144,882,276					
1984 INCURRED	144,452,494	143,833,729	151,333,717	150,628,483	146,152,248					
1984 PAID (1)	1.71%	0.92%	0.73%	0.49%					0.96%	*
1984 PAID + Q/S (1)	1.52%	0.75%	4.61%	3.32%					2.55%	
1984 INCURRED (1)	1.16%	1.59%	3.55%	3.06%					2.34%	
1984 PAID (2)		0.81%	0.19%	0.24%	0.49%				0.43%	*
1984 PAID + Q/S (2)		2.24%	5.40%	1.24%	3.21%				3.02%	
1984 INCURRED (2)		0.43%	5.21%	0.47%	2.97%				2.27%	

NOTES: (1) ABSOLUTE DEVIATION FROM LAST PROJECTION (OR REPORT), RATIOED TO SAME.
 (2) ABSOLUTE CHANGE RELATIVE TO PRIOR PROJECTION OR REPORT.
 WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.
 LOSSES RESTATED TO INCURRED LEVEL OF 8TH REPORT, AND TO LAST DIAGONAL.

WEIGHTS ASSIGNED TO PRECEDING YEARS:
 N-4 0.0000
 N-3 0.0000
 N-2 0.5000
 N-1 0.5000

MAINE

NATIONAL COUNCIL ON COMPENSATION INSURANCE
ANALYSIS OF FACTOR SELECTION METHODS AND PROJECTION METHODS
STATE: MAINE

ORDER OF PRESENTATION FOR TESTS AND ANALYSIS

Premium: Development by Diagonal, Showing Variance

Premium: Tests of Minimum Average Squared Deviations

Indemnity: Paid - Development by Diagonal, Showing Variance

Indemnity: Paid - Tests of Minimum Average Squared Deviations

Indemnity: Paid+O/S - Development by Diagonal, Showing Variance

Indemnity: Paid+O/S - Tests of Minimum Average Squared Deviations

Indemnity: Incurred - Development by Diagonal, Showing Variance

Indemnity: Incurred - Tests of Minimum Average Squared Deviations

Medical: Paid - Development by Diagonal, Showing Variance

Medical: Paid - Tests of Minimum Average Squared Deviations

Medical: Paid+O/S - Development by Diagonal, Showing Variance

Medical: Paid+O/S - Tests of Minimum Average Squared Deviations

Medical: Incurred - Development by Diagonal, Showing Variance

Medical: Incurred - Tests of Minimum Average Squared Deviations

Indemnity: Comparison of Projections - Deviations by Loss Statistic Type

Indemnity: Comparison of Restated Projections - Deviations by Loss Statistic Type

Medical: Comparison of Projections - Deviations by Loss Statistic Type

Medical: Comparison of Restated Projections - Deviations by Loss Statistic Type

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: MAINE

PREMIUM - DEVELOPMENT DIAGONALS BY EVALUATION DATE

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH
1981	1.046	1.000	0.999	1.000
1982	1.031	1.001	0.997	1.000
1983	1.080	1.014	1.001	0.998
1984	1.051	1.012	0.998	0.997
1985	1.065	1.001	1.002	0.999
1986	1.054	1.006	1.003	1.000
1987	1.052	0.998	1.000	1.000
1988	1.052	1.000	1.004	1.002
1989	1.032	0.998	1.002	1.000
POINTS	9	9	9	9
AVERAGE	1.051	1.003	1.001	1.000
SAMPLE VARIANCE	0.000229	0.000036	0.000005	0.000002
SAMPLE COEFF OF VARIANCE	0.014	0.006	0.002	0.001

REGION: NORTHERN

PREMIUM - DEVELOPMENT DIAGONALS BY EVALUATION DATE

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH
1981				
1982	1.034	1.001	1.002	1.000
1983	1.027	1.004	1.000	1.001
1984	1.036	1.002	1.002	0.999
1985	1.049	1.000	1.000	0.999
1986	1.047	1.002	1.002	1.001
1987	1.039	0.999	0.999	1.004
1988	1.035	1.001	1.002	1.002
1989	1.043	1.003	1.000	1.000
POINTS	8	8	8	8
AVERAGE	1.039	1.002	1.001	1.001
SAMPLE VARIANCE	0.000053	0.000003	0.000002	0.000003
SAMPLE COEFF OF VARIANCE	0.007	0.002	0.001	0.002

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: MAINE
 PREMIUM - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.000095	0.000036	0.000006	0.000002	0.000138	
THREE-YEAR STRAIGHT AVERAGE	0.000145	0.000031	0.000005	0.000002	0.000183	
FOUR-YEAR STRAIGHT AVERAGE	0.000173	0.000034	0.000007	0.000003	0.000216	
TWO-YEAR EXPONENTIAL AVG	0.000094	0.000036	0.000006	0.000002	0.000138	*
THREE-YEAR EXPONENTIAL AVG	0.000138	0.000031	0.000005	0.000002	0.000177	
FOUR-YEAR EXPONENTIAL AVG	0.000161	0.000032	0.000007	0.000003	0.000203	

STATE: MAINE
 PREMIUM - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	TOTAL	METHOD	* FOR BEST
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0		
THREE-YEAR STRAIGHT AVERAGE	0	0	1	0	1		
FOUR-YEAR STRAIGHT AVERAGE	0	0	0	0	0		
TWO-YEAR EXPONENTIAL AVG	1	0	0	1	2		*
THREE-YEAR EXPONENTIAL AVG	0	1	0	0	1		
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0		

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: MAINE PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.959	1.517	1.231	1.115	1.108	1.080	1.088
1982	1.762	1.342	1.197	1.122	1.082	1.051	1.075
1983	1.880	1.415	1.228	1.118	1.104	1.050	1.047
1984	1.869	1.431	1.223	1.129	1.077	1.065	1.040
1985	1.957	1.465	1.293	1.157	1.092	1.077	1.060
1986	1.941	1.563	1.331	1.171	1.104	1.077	1.057
1987	2.021	1.545	1.323	1.236	1.144	1.090	1.077
1988	2.088	1.561	1.318	1.207	1.140	1.098	1.074
1989	1.978	1.553	1.267	1.182	1.119	1.091	1.084
POINTS	9	9	9	9	9	9	9
AVERAGE	1.939	1.488	1.268	1.160	1.108	1.075	1.067
SAMPLE VARIANCE	0.008860	0.006211	0.002519	0.001849	0.000546	0.000293	0.000278
SAMPLE COEFF OF VARIANCE	0.049	0.053	0.040	0.037	0.021	0.016	0.016

REGION: NORTHERN PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	1.600	1.252	1.126	1.078	1.048	1.041	1.029
1983	1.592	1.250	1.126	1.070	1.048	1.031	1.025
1984	1.610	1.261	1.129	1.073	1.044	1.031	1.021
1985	1.660	1.288	1.140	1.079	1.050	1.034	1.028
1986	1.641	1.287	1.146	1.079	1.050	1.036	1.025
1987	1.654	1.301	1.156	1.094	1.062	1.039	1.029
1988	1.669	1.311	1.164	1.100	1.063	1.044	1.030
1989	1.682	1.315	1.160	1.097	1.061	1.048	1.036
POINTS	8	8	8	8	8	8	8
AVERAGE	1.639	1.283	1.143	1.084	1.053	1.038	1.028
SAMPLE VARIANCE	0.001141	0.000672	0.000241	0.000133	0.000056	0.000038	0.000020
SAMPLE COEFF OF VARIANCE	0.021	0.020	0.014	0.011	0.007	0.006	0.004

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: MAINE PAID - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: INDEMNITY (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.006015	0.003200	0.002590	0.001733	0.000657	0.000161	0.000157	0.014512	
THREE-YEAR STRAIGHT AVERAGE	0.008075	0.005087	0.003545	0.002070	0.000763	0.000242	0.000202	0.019985	
FOUR-YEAR STRAIGHT AVERAGE	0.009173	0.006752	0.004110	0.002524	0.000797	0.000297	0.000243	0.023897	
TWO-YEAR EXPONENTIAL AVG	0.005977	0.003123	0.002533	0.001696	0.000641	0.000155	0.000156	0.014281	*
THREE-YEAR EXPONENTIAL AVG	0.007744	0.004772	0.003372	0.001990	0.000732	0.000227	0.000193	0.019030	
FOUR-YEAR EXPONENTIAL AVG	0.008623	0.006150	0.003837	0.002360	0.000755	0.000272	0.000221	0.022218	

STATE: MAINE PAID - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: INDEMNITY (*1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
FOUR-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
TWO-YEAR EXPONENTIAL AVG	1	1	1	1	1	1	1	7	*
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: MAINE PAID + O/S - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.247	1.123	1.102	1.015	1.052	1.042	1.013
1982	1.280	1.119	1.096	1.062	1.030	1.002	1.017
1983	1.307	1.186	1.083	1.099	1.029	1.030	1.007
1984	1.314	1.255	1.128	1.125	1.066	1.053	1.027
1985	1.428	1.249	1.137	1.074	1.051	1.016	1.059
1986	1.292	1.215	1.137	1.102	1.043	1.008	1.038
1987	1.302	1.240	1.136	1.090	1.048	1.065	1.027
1988	1.405	1.165	1.117	1.062	1.087	1.065	1.039
1989	1.482	1.287	1.130	1.092	1.057	1.039	1.094
POINTS	9	9	9	9	9	9	9
AVERAGE	1.340	1.204	1.118	1.080	1.051	1.036	1.036
SAMPLE VARIANCE	0.006237	0.003570	0.000407	0.001003	0.000319	0.000549	0.000725
SAMPLE COEFF OF VARIANCE	0.059	0.050	0.018	0.029	0.017	0.023	0.026

REGION: NORTHERN PAID + O/S - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY-

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	1.109	1.027	1.004	1.001	1.000	1.004	1.004
1983	1.120	1.043	1.014	1.006	1.002	1.002	0.998
1984	1.109	1.055	1.020	1.012	1.004	1.010	1.000
1985	1.132	1.065	1.029	1.007	1.007	1.002	1.002
1986	1.137	1.071	1.040	1.018	1.009	1.002	1.002
1987	1.159	1.083	1.037	1.022	1.009	1.007	1.003
1988	1.143	1.076	1.043	1.017	1.019	1.016	1.009
1989	1.148	1.083	1.037	1.026	1.008	1.003	1.014
POINTS	8	8	8	8	8	8	8
AVERAGE	1.132	1.063	1.028	1.014	1.007	1.006	1.004
SAMPLE VARIANCE	0.000333	0.000400	0.000195	0.000074	0.000034	0.000025	0.000027
SAMPLE COEFF OF VARIANCE	0.016	0.019	0.014	0.008	0.006	0.005	0.005

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: MAINE PAID + O/S - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: INDEMNITY (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.010317	0.002658	0.000281	0.000573	0.000417	0.001130	0.001203	0.016580	
THREE-YEAR STRAIGHT AVERAGE	0.009557	0.003083	0.000407	0.000267	0.000345	0.000724	0.001109	0.015492	
FOUR-YEAR STRAIGHT AVERAGE	0.008667	0.003385	0.000482	0.000325	0.000254	0.000576	0.000966	0.014655	
TWO-YEAR EXPONENTIAL AVG	0.010176	0.002723	0.000267	0.000586	0.000416	0.001114	0.001184	0.016465	
THREE-YEAR EXPONENTIAL AVG	0.009463	0.003035	0.000376	0.000295	0.000345	0.000736	0.001098	0.015347	
FOUR-YEAR EXPONENTIAL AVG	0.008708	0.003229	0.000437	0.000316	0.000265	0.000604	0.000974	0.014532	*

STATE: MAINE PAID + O/S - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: INDEMNITY ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	1	0	0	0	0	0	1	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	1	0	0	0	1	
FOUR-YEAR STRAIGHT AVERAGE	1	0	0	0	1	1	1	4	*
TWO-YEAR EXPONENTIAL AVG	0	0	1	0	0	0	0	1	
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: MAINE INCURRED - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.171	1.094	1.099	1.010	1.053	1.044	1.019
1982	1.160	1.090	1.084	1.046	1.027	1.000	1.015
1983	1.207	1.144	1.075	1.083	1.025	1.029	1.007
1984	1.238	1.212	1.119	1.107	1.064	1.051	1.026
1985	1.296	1.195	1.125	1.050	1.048	1.014	1.057
1986	1.224	1.181	1.140	1.081	1.042	1.007	1.037
1987	1.175	1.177	1.125	1.072	1.047	1.065	1.027
1988	1.258	1.136	1.104	1.049	1.087	1.066	1.040
1989	1.318	1.237	1.107	1.079	1.053	1.036	1.093
POINTS	9	9	9	9	9	9	9
AVERAGE	1.227	1.163	1.109	1.064	1.050	1.035	1.036
SAMPLE VARIANCE	0.003108	0.002575	0.000435	0.000806	0.000352	0.000586	0.000622
SAMPLE COEFF OF VARIANCE	0.045	0.044	0.019	0.027	0.018	0.023	0.025

REGION: NORTHERN INCURRED - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	0.985	0.983	0.992	0.983	0.999	1.003	1.003
1983	1.006	0.994	0.999	0.982	0.997	0.999	0.997
1984	1.010	1.012	1.011	0.994	1.002	1.008	0.999
1985	1.039	1.025	1.021	0.983	1.003	1.000	1.000
1986	1.045	1.038	1.034	0.993	1.005	0.998	0.993
1987	1.040	1.046	1.024	1.012	1.007	1.006	1.004
1988	1.024	1.038	1.030	1.008	1.026	1.014	1.009
1989	1.039	1.050	1.020	1.012	1.004	0.995	1.013
POINTS	8	8	8	8	8	8	8
AVERAGE	1.024	1.023	1.016	0.996	1.005	1.003	1.002
SAMPLE VARIANCE	0.000455	0.000610	0.000216	0.000172	0.000080	0.000038	0.000042
SAMPLE COEFF OF VARIANCE	0.021	0.024	0.014	0.013	0.009	0.006	0.006

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: MAINE INCURRED - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: INDEMNITY (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.005640	0.001849	0.000407	0.000634	0.000443	0.001213	0.001133	0.011319	
THREE-YEAR STRAIGHT AVERAGE	0.005191	0.002017	0.000624	0.000272	0.000372	0.000785	0.001060	0.010322	
FOUR-YEAR STRAIGHT AVERAGE	0.004353	0.002262	0.000681	0.000272	0.000280	0.000631	0.000910	0.009389	
TWO-YEAR EXPONENTIAL AVG	0.005522	0.001865	0.000388	0.000648	0.000443	0.001196	0.001115	0.011178	
THREE-YEAR EXPONENTIAL AVG	0.005101	0.001970	0.000578	0.000307	0.000372	0.000798	0.001049	0.010175	*
FOUR-YEAR EXPONENTIAL AVG	0.004365	0.002134	0.000626	0.000283	0.000291	0.000660	0.000919	0.009277	*

STATE: MAINE INCURRED - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: INDEMNITY ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	1	0	0	0	0	0	1	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
FOUR-YEAR STRAIGHT AVERAGE	1	0	0	1	1	1	1	5	*
TWO-YEAR EXPONENTIAL AVG	0	0	1	0	0	0	0	1	
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: MAINE PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.262	1.112	1.061	1.031	1.023	1.014	1.020
1982	1.303	1.107	1.053	1.046	1.036	1.014	1.020
1983	1.312	1.116	1.081	1.049	1.028	1.023	1.017
1984	1.312	1.144	1.081	1.043	1.035	1.029	1.021
1985	1.345	1.161	1.089	1.040	1.039	1.019	1.026
1986	1.366	1.139	1.087	1.061	1.044	1.036	1.017
1987	1.370	1.151	1.088	1.064	1.056	1.032	1.026
1988	1.377	1.155	1.096	1.050	1.043	1.039	1.032
1989	1.385	1.180	1.097	1.060	1.044	1.045	1.032
POINTS	9	9	9	9	9	9	9
AVERAGE	1.337	1.141	1.081	1.049	1.039	1.028	1.023
SAMPLE VARIANCE	0.001741	0.000606	0.000227	0.000117	0.000094	0.000124	0.000034
SAMPLE COEFF OF VARIANCE	0.031	0.022	0.014	0.010	0.009	0.011	0.006

REGION: NORTHERN PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	1.224	1.079	1.041	1.027	1.018	1.017	1.017
1983	1.217	1.076	1.041	1.028	1.020	1.016	1.015
1984	1.226	1.078	1.045	1.026	1.020	1.016	1.014
1985	1.235	1.080	1.042	1.025	1.018	1.016	1.013
1986	1.250	1.080	1.039	1.026	1.017	1.016	1.013
1987	1.269	1.086	1.044	1.025	1.020	1.016	1.013
1988	1.285	1.093	1.049	1.030	1.021	1.016	1.012
1989	1.295	1.096	1.047	1.030	1.019	1.018	1.015
POINTS	8	8	8	8	8	8	8
AVERAGE	1.250	1.084	1.043	1.027	1.019	1.016	1.014
SAMPLE VARIANCE	0.000882	0.000055	0.000011	0.000004	0.000002	0.000001	0.000003
SAMPLE COEFF OF VARIANCE	0.024	0.007	0.003	0.002	0.001	0.001	0.002

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: MAINE PAID - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: MEDICAL (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.000584	0.000395	0.000033	0.000153	0.000079	0.000066	0.000046	0.001355	
THREE-YEAR STRAIGHT AVERAGE	0.000892	0.000506	0.000085	0.000122	0.000088	0.000073	0.000043	0.001808	
FOUR-YEAR STRAIGHT AVERAGE	0.001429	0.000545	0.000135	0.000114	0.000109	0.000106	0.000045	0.002483	
TWO-YEAR EXPONENTIAL AVG	0.000567	0.000386	0.000032	0.000151	0.000078	0.000066	0.000045	0.001325	*
THREE-YEAR EXPONENTIAL AVG	0.000839	0.000481	0.000077	0.000122	0.000085	0.000072	0.000042	0.001718	
FOUR-YEAR EXPONENTIAL AVG	0.001285	0.000512	0.000118	0.000114	0.000102	0.000099	0.000044	0.002274	

STATE: MAINE PAID - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: MEDICAL ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	1	0	1	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
FOUR-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
TWO-YEAR EXPONENTIAL AVG	1	1	1	0	1	0	0	4	*
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	1	1	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	1	0	0	0	1	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: MAINE PAID + O/S - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.010	0.994	0.995	0.971	1.003	1.014	0.998
1982	1.104	1.014	1.001	1.032	1.015	0.998	0.997
1983	1.121	1.051	1.033	1.035	0.994	1.003	1.020
1984	1.091	1.079	1.060	1.049	1.050	1.015	1.035
1985	1.173	1.070	1.062	0.991	1.045	1.007	1.032
1986	1.150	1.046	1.033	1.028	1.012	1.026	1.011
1987	1.099	1.056	1.023	1.001	1.014	1.016	0.999
1988	1.126	1.027	1.019	0.988	1.047	0.997	1.014
1989	1.115	1.071	1.034	1.013	1.018	0.979	1.038
POINTS	9	9	9	9	9	9	9
AVERAGE	1.110	1.045	1.029	1.012	1.022	1.006	1.016
SAMPLE VARIANCE	0.002061	0.000812	0.000523	0.000672	0.000414	0.000191	0.000265
SAMPLE COEFF OF VARIANCE	0.041	0.027	0.022	0.026	0.020	0.014	0.016

REGION: NORTHERN PAID + O/S - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	1.039	1.009	0.997	1.004	1.003	1.008	1.012
1983	1.036	0.999	0.996	0.997	1.002	1.009	1.010
1984	1.055	1.011	1.008	1.006	1.000	1.006	1.010
1985	1.044	1.010	1.007	0.998	1.001	1.007	1.003
1986	1.057	1.009	1.002	1.003	1.003	1.007	1.006
1987	1.073	1.020	1.008	1.005	1.002	1.003	1.006
1988	1.066	1.009	1.009	0.996	1.004	1.001	1.003
1989	1.048	1.004	0.997	0.996	1.000	0.999	1.007
POINTS	8	8	8	8	8	8	8
AVERAGE	1.052	1.009	1.003	1.001	1.002	1.005	1.007
SAMPLE VARIANCE	0.000168	0.000036	0.000032	0.000018	0.000002	0.000013	0.000011
SAMPLE COEFF OF VARIANCE	0.012	0.006	0.006	0.004	0.001	0.004	0.003

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: MAINE PAID + O/S - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: MEDICAL (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.001746	0.000458	0.000375	0.000756	0.000662	0.000312	0.000421	0.004730	
THREE-YEAR STRAIGHT AVERAGE	0.001377	0.000539	0.000521	0.000631	0.000402	0.000369	0.000434	0.004272	
FOUR-YEAR STRAIGHT AVERAGE	0.002168	0.000615	0.000568	0.000507	0.000321	0.000368	0.000347	0.004894	
TWO-YEAR EXPONENTIAL AVG	0.001738	0.000465	0.000363	0.000768	0.000646	0.000306	0.000411	0.004697	
THREE-YEAR EXPONENTIAL AVG	0.001389	0.000524	0.000484	0.000646	0.000404	0.000356	0.000419	0.004223	*
FOUR-YEAR EXPONENTIAL AVG	0.002037	0.000569	0.000512	0.000525	0.000330	0.000358	0.000341	0.004671	

STATE: MAINE PAID + O/S - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: MEDICAL ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	1	0	0	0	0	0	1	
THREE-YEAR STRAIGHT AVERAGE	1	0	0	0	0	0	0	1	
FOUR-YEAR STRAIGHT AVERAGE	0	0	0	1	1	0	0	2	*
TWO-YEAR EXPONENTIAL AVG	0	0	1	0	0	1	0	2	*
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	1	1	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: MAINE INCURRED - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	0.965	0.973	0.995	0.966	1.005	1.015	1.000
1982	1.041	1.001	0.999	1.020	1.015	0.998	0.995
1983	1.055	1.016	1.016	1.015	0.989	0.999	1.021
1984	1.028	1.037	1.046	1.027	1.047	1.013	1.034
1985	1.081	1.029	1.056	0.964	1.041	1.003	1.029
1986	1.097	1.034	1.046	1.007	1.014	1.025	1.011
1987	0.992	1.027	1.014	0.986	1.010	1.015	0.999
1988	1.024	1.003	1.013	0.981	1.055	0.999	1.016
1989	1.022	1.038	1.015	1.002	1.010	0.975	1.038
POINTS	9	9	9	9	9	9	9
AVERAGE	1.034	1.018	1.022	0.996	1.021	1.005	1.016
SAMPLE VARIANCE	0.001684	0.000470	0.000474	0.000538	0.000480	0.000211	0.000252
SAMPLE COEFF OF VARIANCE	0.040	0.021	0.021	0.023	0.021	0.014	0.016

REGION: NORTHERN INCURRED - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	0.966	0.983	0.990	0.991	1.001	1.007	1.009
1983	0.971	0.968	0.985	0.979	0.997	1.006	1.010
1984	0.988	0.981	1.000	0.991	0.997	1.004	1.010
1985	0.983	0.985	0.999	0.978	0.996	1.004	1.000
1986	0.999	0.991	0.999	0.986	1.002	1.004	1.002
1987	0.999	0.998	1.000	0.999	0.999	1.001	1.005
1988	0.996	0.989	1.005	0.991	1.013	1.000	1.003
1989	0.989	0.990	0.993	0.987	0.997	0.994	1.007
POINTS	8	8	8	8	8	8	8
AVERAGE	0.986	0.986	0.996	0.988	1.000	1.003	1.006
SAMPLE VARIANCE	0.000155	0.000079	0.000042	0.000048	0.000031	0.000017	0.000015
SAMPLE COEFF OF VARIANCE	0.013	0.009	0.007	0.007	0.006	0.004	0.004

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: MAINE INCURRED - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: MEDICAL (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.002678	0.000263	0.000462	0.000793	0.000818	0.000353	0.000383	0.005750	
THREE-YEAR STRAIGHT AVERAGE	0.002111	0.000242	0.000662	0.000710	0.000533	0.000416	0.000394	0.005069	
FOUR-YEAR STRAIGHT AVERAGE	0.002453	0.000344	0.000765	0.000536	0.000420	0.000399	0.000311	0.005227	
TWO-YEAR EXPONENTIAL AVG	0.002657	0.000266	0.000445	0.000806	0.000811	0.000347	0.000374	0.005706	*
THREE-YEAR EXPONENTIAL AVG	0.002123	0.000243	0.000617	0.000722	0.000545	0.000404	0.000380	0.005034	*
FOUR-YEAR EXPONENTIAL AVG	0.002393	0.000318	0.000697	0.000562	0.000442	0.000391	0.000306	0.005110	

STATE: MAINE INCURRED - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: MEDICAL ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
THREE-YEAR STRAIGHT AVERAGE	1	1	0	0	0	0	0	2	*
FOUR-YEAR STRAIGHT AVERAGE	0	0	0	1	1	0	0	2	*
TWO-YEAR EXPONENTIAL AVG	0	0	1	0	0	1	0	2	*
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	1	1	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 MAINE INDemnITY COMPARISON OF PROJECTIONS

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	ACTUAL 8TH	AVERAGE	*=LOW AVG
1978 PAID				61,292,857	59,149,787	57,704,558	59,134,685	59,532,231		
1978 PAID + Q/S				68,020,485	70,560,852	75,266,319	75,300,605	74,967,506		
1978 INCURRED				68,805,087	70,566,938	75,428,080	75,351,094	74,989,353		
1978 PAID (1)				2.96%	0.64%	3.07%	0.67%		1.83%	*
1978 PAID + Q/S (1)				9.27%	5.88%	0.40%	0.44%		4.00%	
1978 INCURRED (1)				8.25%	5.90%	0.59%	0.48%		3.80%	
1978 PAID (2)					3.50%	2.44%	2.48%	0.67%	2.27%	*
1978 PAID + Q/S (2)					3.73%	6.67%	0.05%	0.44%	2.72%	
1978 INCURRED (2)					2.56%	6.89%	0.10%	0.48%	2.51%	
1979 PAID			83,904,750	82,051,357	81,701,228	83,374,164	84,519,961	85,992,991		
1979 PAID + Q/S			98,774,613	99,272,115	108,339,971	110,731,702	108,464,130	106,274,361		
1979 INCURRED			100,261,172	99,544,079	108,621,548	110,860,654	108,693,671	106,611,221		
1979 PAID (1)			2.43%	4.58%	4.99%	3.05%	1.71%		3.35%	*
1979 PAID + Q/S (1)			7.06%	6.59%	1.94%	4.19%	2.06%		4.37%	
1979 INCURRED (1)			5.96%	6.63%	1.89%	3.99%	1.95%		4.06%	
1979 PAID (2)				2.21%	0.43%	2.05%	1.37%	1.74%	1.56%	*
1979 PAID + Q/S (2)				0.50%	9.13%	2.21%	2.05%	2.02%	3.18%	
1979 INCURRED (2)				0.72%	9.12%	2.06%	1.95%	1.92%	3.15%	
1980 PAID		87,083,510	83,232,091	83,187,384	86,821,558	89,597,293	91,406,955	91,977,805		
1980 PAID + Q/S		95,796,251	102,472,729	114,446,858	113,782,317	110,256,033	114,259,701	115,004,117		
1980 INCURRED		98,805,997	103,200,911	115,467,037	113,866,845	110,543,893	114,836,794	115,736,801		
1980 PAID (1)		5.32%	9.51%	9.56%	5.61%	2.59%	0.62%		5.53%	
1980 PAID + Q/S (1)		16.70%	10.90%	0.48%	1.06%	4.13%	0.65%		5.65%	
1980 INCURRED (1)		14.63%	10.83%	0.23%	1.62%	4.69%	0.78%		5.43%	*
1980 PAID (2)			4.42%	0.05%	4.37%	3.20%	2.02%	0.62%	2.45%	*
1980 PAID + Q/S (2)			6.97%	11.69%	0.58%	3.10%	3.63%	0.65%	4.44%	
1980 INCURRED (2)			4.45%	11.89%	1.39%	2.92%	3.88%	0.78%	4.22%	
1981 PAID	93,716,053	88,175,387	91,671,377	99,724,518	104,860,806	110,795,888	113,173,061	114,086,276		
1981 PAID + Q/S	100,913,907	108,509,409	129,334,803	135,387,628	131,994,338	133,254,021	136,984,328	145,007,520		
1981 INCURRED	103,803,808	109,631,574	130,477,651	135,535,212	132,264,630	133,915,413	137,993,554	145,904,792		
1981 PAID (1)	17.86%	22.71%	19.65%	12.59%	8.09%	2.88%	0.80%		12.08%	*
1981 PAID + Q/S (1)	30.41%	25.17%	10.81%	6.63%	8.97%	8.11%	5.53%		13.66%	
1981 INCURRED (1)	28.86%	24.86%	10.57%	7.11%	9.35%	8.22%	5.42%		13.48%	
1981 PAID (2)		5.91%	3.96%	8.78%	5.15%	5.66%	2.15%	0.81%	4.63%	*
1981 PAID + Q/S (2)		7.53%	19.19%	4.68%	2.51%	0.95%	2.80%	5.86%	6.22%	
1981 INCURRED (2)		5.61%	19.01%	3.88%	2.41%	1.25%	3.05%	5.73%	5.85%	
1982 PAID	87,549,924	92,898,088	101,225,471	111,942,384	123,398,756	127,374,861	127,438,950			
1982 PAID + Q/S	122,036,420	143,701,220	153,329,750	148,174,103	149,505,677	159,791,529	160,946,016			
1982 INCURRED	120,137,635	145,369,940	152,775,451	149,308,630	151,731,184	162,637,403	163,183,825			
1982 PAID (1)	31.30%	27.10%	20.57%	12.16%	3.17%	0.05%			15.73%	
1982 PAID + Q/S (1)	24.18%	10.71%	4.73%	7.94%	7.11%	0.72%			9.23%	*
1982 INCURRED (1)	26.38%	10.92%	6.38%	8.50%	7.02%	0.33%			9.92%	
1982 PAID (2)		6.11%	8.96%	10.59%	10.23%	3.22%	0.05%		6.53%	
1982 PAID + Q/S (2)		17.75%	6.70%	3.36%	0.90%	6.88%	0.72%		6.05%	*
1982 INCURRED (2)		21.00%	5.09%	2.27%	1.62%	7.19%	0.34%		6.25%	
1983 PAID	104,846,202	117,888,666	138,714,862	150,138,771	155,699,862	153,130,494				
1983 PAID + Q/S	155,016,139	180,665,805	169,431,357	171,743,808	174,674,481	176,385,644				
1983 INCURRED	160,254,891	179,814,445	171,314,087	173,666,709	178,056,768	178,863,646				
1983 PAID (1)	31.53%	23.01%	9.41%	1.95%	1.68%				13.52%	
1983 PAID + Q/S (1)	12.12%	2.43%	3.94%	2.63%	0.97%				4.42%	
1983 INCURRED (1)	10.40%	0.53%	4.22%	2.91%	0.45%				3.70%	*
1983 PAID (2)		12.44%	17.67%	8.24%	3.70%	1.65%			8.74%	
1983 PAID + Q/S (2)		16.55%	6.22%	1.36%	1.71%	0.98%			5.36%	
1983 INCURRED (2)		12.21%	4.73%	1.37%	2.53%	0.45%			4.26%	*
1984 PAID	126,796,848	146,634,735	162,450,260	169,334,897	162,667,233					
1984 PAID + Q/S	207,830,167	186,245,549	190,097,012	192,528,554	200,105,529					
1984 INCURRED	207,277,504	191,907,530	194,026,578	196,051,055	203,609,930					
1984 PAID (1)	22.05%	9.86%	0.13%	4.10%					9.03%	
1984 PAID + Q/S (1)	3.86%	6.93%	5.00%	3.79%					4.89%	
1984 INCURRED (1)	1.80%	5.75%	4.71%	3.71%					3.99%	*
1984 PAID (2)		15.65%	10.79%	4.24%	3.94%				8.65%	
1984 PAID + Q/S (2)		10.39%	2.07%	1.28%	3.94%				4.42%	
1984 INCURRED (2)		7.42%	1.10%	1.04%	3.86%				3.35%	*

NOTES: (1) ABSOLUTE DEVIATION FROM LAST PROJECTION (OR REPORT), RATIOED TO SAME.

(2) ABSOLUTE CHANGE RELATIVE TO PRIOR PROJECTION OR REPORT.

WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.

LOSSES HAVE BEEN RESTATED TO THE LATEST DIAGONAL.

N-4 0.0000
 N-3 0.0000
 N-2 0.5000
 N-1 0.5000

WEIGHTS ASSIGNED TO
 PRECEDING YEARS:

08:15 AM
 03/14/91

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 MAINE INDEMNITY COMPARISON OF PROJECTIONS RESTATED TO INCURRED LEVEL

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	RESTATED 8TH	AVERAGE	*=LOW AVG
1978 PAID				79,813,777	76,330,655	73,296,299	71,652,300	73,609,611		
1978 PAID + O/S				68,392,481	70,881,555	75,666,345	75,636,684	75,094,396		
1978 INCURRED				68,805,087	70,566,938	75,428,080	75,351,094	74,989,353		
1978 PAID (1)				8.43%	3.70%	0.43%	2.66%		3.80%	*
1978 PAID + O/S (1)				8.92%	5.61%	0.76%	0.72%		4.00%	
1978 INCURRED (1)				8.25%	5.90%	0.59%	0.48%		3.80%	
1978 PAID (2)					4.36%	3.98%	2.24%	2.73%	3.33%	
1978 PAID + O/S (2)					3.64%	6.75%	0.04%	0.72%	2.79%	
1978 INCURRED (2)					2.56%	6.89%	0.10%	0.48%	2.51%	*
1979 PAID			109,258,327	105,884,299	103,776,857	101,022,785	104,506,103	107,459,045		
1979 PAID + O/S			99,314,800	99,723,312	108,915,777	111,225,915	108,647,717	106,458,056		
1979 INCURRED			100,261,172	99,544,079	108,621,548	110,860,654	108,693,671	106,611,221		
1979 PAID (1)			1.67%	1.47%	3.43%	5.99%	2.75%		3.06%	*
1979 PAID + O/S (1)			6.71%	6.33%	2.31%	4.48%	2.06%		4.38%	
1979 INCURRED (1)			5.96%	6.63%	1.89%	3.99%	1.95%		4.08%	
1979 PAID (2)				3.09%	1.99%	2.65%	3.45%	2.83%	2.80%	*
1979 PAID + O/S (2)				0.41%	9.22%	2.12%	2.32%	2.02%	3.22%	
1979 INCURRED (2)				0.72%	9.12%	2.06%	1.95%	1.92%	3.15%	
1980 PAID		113,397,616	107,407,994	105,664,571	105,199,923	110,784,054	114,224,473	114,877,565		
1980 PAID + O/S		96,320,150	102,938,473	115,055,121	114,290,146	110,442,653	114,457,200	115,552,431		
1980 INCURRED		98,805,997	103,200,911	115,467,037	113,866,845	110,543,893	114,836,794	115,736,801		
1980 PAID (1)		1.29%	6.50%	8.02%	8.42%	3.56%	0.57%		4.73%	*
1980 PAID + O/S (1)		16.64%	10.92%	0.43%	1.09%	4.42%	0.95%		5.74%	
1980 INCURRED (1)		14.63%	10.83%	0.23%	1.62%	4.49%	0.78%		5.43%	
1980 PAID (2)			5.28%	1.62%	0.44%	5.31%	3.11%	0.57%	2.72%	*
1980 PAID + O/S (2)			6.87%	11.77%	0.66%	3.37%	3.63%	0.96%	4.54%	
1980 INCURRED (2)			4.45%	11.89%	1.39%	2.92%	3.88%	0.78%	4.22%	
1981 PAID	122,034,320	113,787,138	116,440,935	120,834,178	129,656,877	138,453,381	141,349,815	144,720,949		
1981 PAID + O/S	101,465,794	109,002,590	130,022,193	135,991,884	132,217,752	133,484,351	137,637,439	145,918,072		
1981 INCURRED	103,803,808	109,631,574	130,477,651	135,535,212	132,264,630	133,915,413	137,993,554	145,904,792		
1981 PAID (1)	15.68%	21.37%	19.54%	16.51%	10.41%	4.33%	2.33%		12.88%	*
1981 PAID + O/S (1)	30.46%	25.30%	10.89%	6.80%	9.39%	8.52%	5.67%		13.86%	
1981 INCURRED (1)	28.86%	24.86%	10.57%	7.11%	9.35%	8.22%	5.42%		13.48%	
1981 PAID (2)		6.76%	2.33%	3.77%	7.30%	6.78%	2.09%	2.38%	4.49%	*
1981 PAID + O/S (2)		7.43%	19.28%	4.59%	2.78%	0.96%	3.11%	6.02%	6.31%	
1981 INCURRED (2)		5.61%	19.01%	3.88%	2.41%	1.25%	3.05%	5.73%	5.85%	
1982 PAID	112,980,000	117,999,103	122,652,852	138,413,011	154,202,248	159,087,444	161,659,108			
1982 PAID + O/S	122,591,082	144,464,965	154,014,085	148,424,902	149,764,098	160,553,380	161,956,651			
1982 INCURRED	120,137,635	145,369,940	152,775,451	149,308,630	151,731,184	162,637,403	163,183,825			
1982 PAID (1)	30.11%	27.01%	24.13%	14.38%	4.61%	1.59%			16.97%	
1982 PAID + O/S (1)	24.31%	10.80%	4.90%	8.36%	7.53%	0.87%			9.46%	*
1982 INCURRED (1)	26.38%	10.92%	6.38%	8.50%	7.02%	0.33%			9.92%	
1982 PAID (2)		4.44%	3.94%	12.85%	11.41%	3.17%	1.62%		6.24%	
1982 PAID + O/S (2)		17.84%	6.61%	3.63%	0.90%	7.20%	0.87%		6.18%	*
1982 INCURRED (2)		21.00%	5.09%	2.27%	1.62%	7.19%	0.34%		6.25%	
1983 PAID	133,175,591	142,843,308	171,516,284	187,617,256	194,464,533	194,249,397				
1983 PAID + O/S	155,840,020	181,472,145	169,718,136	172,040,668	175,507,290	177,493,229				
1983 INCURRED	160,254,891	179,814,445	171,314,087	173,666,709	178,056,768	178,863,646				
1983 PAID (1)	31.44%	26.46%	11.70%	3.41%	0.11%				14.63%	
1983 PAID + O/S (1)	12.20%	2.24%	4.38%	3.07%	1.12%				4.60%	
1983 INCURRED (1)	10.40%	0.53%	4.22%	2.91%	0.45%				3.70%	*
1983 PAID (2)		7.26%	20.07%	9.39%	3.65%	0.11%			8.10%	
1983 PAID + O/S (2)		16.45%	6.48%	1.37%	2.02%	1.13%			5.49%	
1983 INCURRED (2)		12.21%	4.73%	1.37%	2.53%	0.45%			4.26%	*
1984 PAID	153,637,171	181,308,942	203,002,008	211,494,291	206,346,960					
1984 PAID + O/S	208,757,746	186,560,789	190,425,595	193,446,488	201,362,060					
1984 INCURRED	207,277,504	191,907,530	194,026,578	196,051,055	203,609,930					
1984 PAID (1)	25.54%	12.13%	1.62%	2.49%					10.45%	
1984 PAID + O/S (1)	3.67%	7.35%	5.43%	3.93%					5.10%	
1984 INCURRED (1)	1.80%	5.75%	4.71%	3.71%					3.99%	*
1984 PAID (2)		18.01%	11.96%	4.18%	2.43%				9.15%	
1984 PAID + O/S (2)		10.63%	2.07%	1.59%	4.09%				4.60%	
1984 INCURRED (2)		7.42%	1.10%	1.04%	3.86%				3.35%	*

NOTES: (1) ABSOLUTE DEVIATION FROM LAST PROJECTION (OR REPORT), RATIOW TO SAME.
 (2) ABSOLUTE CHANGE RELATIVE TO PRIOR PROJECTION OR REPORT.
 WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.
 LOSSES RESTATED TO INCURRED LEVEL OF 8TH REPORT, AND TO LAST DIAGONAL.

WEIGHTS ASSIGNED TO
 PRECEDING YEARS:
 N-4 0.0000
 N-3 0.0000
 N-2 0.5000
 N-1 0.5000

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 MAINE MEDICAL COMPARISON OF PROJECTIONS

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	ACTUAL 8TH	AVERAGE	*±LOW AVG
1978 PAID				11,654,682	11,836,048	11,963,737	11,934,585	11,862,238		
1978 PAID + Q/S				12,170,382	12,590,254	13,522,403	13,574,406	13,282,268		
1978 INCURRED				12,456,251	12,662,878	13,588,847	13,601,066	13,324,410		
1978 PAID (1)				1.75%	0.22%	0.86%	0.61%		0.86%	*
1978 PAID + Q/S (1)				8.37%	5.21%	1.81%	2.20%		4.40%	
1978 INCURRED (1)				6.52%	4.96%	1.98%	2.08%		3.89%	
1978 PAID (2)					1.56%	1.08%	0.24%	0.61%	0.87%	*
1978 PAID + Q/S (2)					3.45%	7.40%	0.38%	2.15%	3.35%	
1978 INCURRED (2)					1.66%	7.31%	0.09%	2.03%	2.77%	
1979 PAID			14,854,706	15,406,344	15,453,216	15,603,839	15,755,848	15,832,467		
1979 PAID + Q/S			16,191,201	17,312,080	18,369,410	18,929,941	18,987,743	18,571,278		
1979 INCURRED			16,861,486	17,510,874	18,441,452	18,969,156	19,074,022	18,680,896		
1979 PAID (1)			6.18%	2.69%	2.40%	1.44%	0.48%		2.64%	*
1979 PAID + Q/S (1)			12.82%	6.78%	1.09%	1.93%	2.24%		4.97%	
1979 INCURRED (1)			9.74%	6.26%	1.28%	1.54%	2.10%		4.19%	
1979 PAID (2)				3.71%	0.30%	0.97%	0.97%	0.49%	1.29%	*
1979 PAID + Q/S (2)				6.92%	6.11%	3.05%	0.31%	2.19%	3.72%	
1979 INCURRED (2)				3.85%	5.31%	2.86%	0.55%	2.06%	2.93%	
1980 PAID		17,026,221	17,531,917	17,867,235	17,903,370	18,050,487	18,129,540	18,318,373		
1980 PAID + Q/S		18,026,474	19,864,178	21,821,958	21,438,353	20,582,685	20,240,258	20,418,386		
1980 INCURRED		19,098,356	20,245,844	22,007,216	21,434,782	20,709,274	20,424,849	20,656,959		
1980 PAID (1)		7.05%	4.29%	2.46%	2.27%	1.46%	1.03%		3.09%	*
1980 PAID + Q/S (1)		11.71%	2.71%	6.87%	5.00%	0.80%	0.87%		4.66%	
1980 INCURRED (1)		7.55%	1.99%	6.54%	3.77%	0.25%	1.12%		3.54%	
1980 PAID (2)			2.97%	1.91%	0.20%	0.82%	0.44%	1.04%	1.23%	*
1980 PAID + Q/S (2)			10.19%	9.86%	1.76%	3.99%	1.66%	0.88%	4.72%	
1980 INCURRED (2)			6.01%	8.70%	2.60%	3.38%	1.37%	1.14%	3.87%	
1981 PAID	20,082,033	21,068,836	22,099,632	22,340,383	22,890,729	23,356,263	23,641,498	23,709,253		
1981 PAID + Q/S	20,869,747	23,960,450	27,157,065	27,867,137	27,404,360	26,699,270	26,110,580	26,927,346		
1981 INCURRED	22,284,384	24,664,610	27,172,732	27,993,471	27,722,644	27,008,614	26,518,357	27,317,196		
1981 PAID (1)	15.30%	11.14%	6.79%	5.77%	3.45%	1.49%	0.29%		6.32%	
1981 PAID + Q/S (1)	22.50%	11.02%	0.85%	3.49%	1.77%	0.85%	3.03%		6.22%	
1981 INCURRED (1)	18.42%	9.71%	0.53%	2.48%	1.48%	1.13%	2.92%		5.24%	*
1981 PAID (2)		4.91%	4.89%	1.09%	2.46%	2.03%	1.22%	0.29%	2.41%	*
1981 PAID + Q/S (2)		14.81%	13.34%	2.61%	1.66%	2.57%	2.20%	3.13%	5.76%	
1981 INCURRED (2)		10.68%	10.17%	3.02%	0.97%	2.58%	1.82%	3.01%	4.61%	
1982 PAID	22,767,301	23,670,127	24,494,117	24,894,952	25,581,476	25,634,637	25,945,240			
1982 PAID + Q/S	27,943,764	30,656,718	31,576,225	29,688,324	28,652,640	29,237,324	28,989,460			
1982 INCURRED	28,451,542	30,435,251	31,282,075	30,173,771	29,469,764	30,405,832	30,009,408			
1982 PAID (1)	12.25%	8.77%	5.59%	4.05%	1.40%	1.20%			5.54%	
1982 PAID + Q/S (1)	3.61%	5.75%	8.92%	2.41%	1.16%	0.86%			3.78%	
1982 INCURRED (1)	5.19%	1.42%	4.24%	0.55%	1.80%	1.32%			2.42%	*
1982 PAID (2)		3.97%	3.48%	1.64%	2.76%	0.21%	1.21%		2.21%	*
1982 PAID + Q/S (2)		9.71%	3.00%	5.98%	3.49%	2.04%	0.85%		4.18%	
1982 INCURRED (2)		6.97%	2.78%	3.54%	2.33%	3.18%	1.30%		3.35%	
1983 PAID	29,138,078	30,684,515	30,849,697	31,655,744	31,543,697	31,667,413				
1983 PAID + Q/S	35,548,862	38,996,513	36,193,470	34,573,930	33,816,445	33,427,545				
1983 INCURRED	35,714,168	38,248,162	37,105,292	35,336,095	35,125,951	34,329,895				
1983 PAID (1)	7.99%	3.10%	2.58%	0.04%	0.39%				2.82%	*
1983 PAID + Q/S (1)	6.35%	16.66%	8.27%	3.43%	1.16%				7.17%	
1983 INCURRED (1)	4.03%	11.41%	8.08%	2.93%	2.32%				5.76%	
1983 PAID (2)		5.31%	0.54%	2.61%	0.35%	0.39%			1.84%	*
1983 PAID + Q/S (2)		9.70%	7.19%	4.47%	2.19%	1.15%			4.94%	
1983 INCURRED (2)		7.10%	2.99%	4.77%	0.59%	2.27%			3.54%	
1984 PAID	34,206,649	35,703,060	36,650,922	37,052,025	37,285,054					
1984 PAID + Q/S	44,328,096	42,275,516	40,504,491	39,528,587	40,367,770					
1984 INCURRED	43,335,906	43,629,666	42,020,873	41,186,245	41,923,605					
1984 PAID (1)	8.26%	4.24%	1.70%	0.62%					3.71%	
1984 PAID + Q/S (1)	9.81%	4.73%	0.34%	2.08%					4.24%	
1984 INCURRED (1)	3.37%	4.07%	0.23%	1.76%					2.36%	*
1984 PAID (2)		4.37%	2.65%	1.09%	0.63%				2.19%	
1984 PAID + Q/S (2)		4.63%	4.19%	2.41%	2.12%				3.34%	
1984 INCURRED (2)		0.68%	3.69%	1.99%	1.79%				2.04%	

NOTES: (1) ABSOLUTE DEVIATION FROM LAST PROJECTION (OR REPORT), RATIODE TO SAME.
 (2) ABSOLUTE CHANGE RELATIVE TO PRIOR PROJECTION OR REPORT.
 WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.
 LOSSES HAVE BEEN RESTATED TO THE LATEST DIAGONAL.

WEIGHTS ASSIGNED TO PRECEDING YEARS: N-4 0.0000
 N-3 0.0000
 N-2 0.5000
 N-1 0.5000
 08:19 AM
 03/14/91

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 MAINE MEDICAL COMPARISON OF PROJECTIONS RESTATED TO INCURRED LEVEL

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	RESTATED 8TH	AVERAGE	*=LOW AVG
1978 PAID				12,437,285	12,810,048	13,067,117	12,929,126	13,082,067		
1978 PAID + Q/S				12,245,445	12,698,153	13,641,438	13,657,097	13,332,877		
1978 INCURRED				12,456,251	12,662,878	13,588,847	13,601,066	13,324,410		
1978 PAID (1)				4.93%	2.08%	0.11%	1.17%		2.07%	*
1978 PAID + Q/S (1)				8.16%	4.76%	2.31%	2.43%		4.42%	
1978 INCURRED (1)				6.52%	4.96%	1.98%	2.08%		3.89%	
1978 PAID (2)					3.00%	2.01%	1.06%	1.18%	1.81%	*
1978 PAID + Q/S (2)					3.70%	7.43%	0.11%	2.37%	3.40%	
1978 INCURRED (2)					1.66%	7.31%	0.09%	2.03%	2.77%	
1979 PAID			15,852,187	16,674,147	16,878,421	16,904,149	17,376,068	18,221,429		
1979 PAID + Q/S			16,291,062	17,460,445	18,531,113	19,045,257	19,060,091	18,655,514		
1979 INCURRED			16,861,486	17,510,874	18,441,452	18,969,156	19,074,022	18,680,896		
1979 PAID (1)			13.00%	8.49%	7.37%	7.23%	4.64%		8.15%	
1979 PAID + Q/S (1)			12.67%	6.41%	0.67%	2.09%	2.17%		4.80%	
1979 INCURRED (1)			9.74%	6.26%	1.28%	1.54%	2.10%		4.19%	*
1979 PAID (2)				5.19%	1.23%	0.15%	2.79%	4.87%	2.84%	*
1979 PAID + Q/S (2)				7.18%	6.13%	2.77%	0.08%	2.12%	3.66%	
1979 INCURRED (2)				3.85%	5.31%	2.86%	0.55%	2.06%	2.93%	
1980 PAID		18,169,518	18,974,635	19,515,078	19,395,306	19,906,671	20,865,107	21,124,666		
1980 PAID + Q/S		18,137,654	20,034,415	22,014,052	21,568,950	20,661,110	20,332,064	20,597,764		
1980 INCURRED		19,098,356	20,245,844	22,007,216	21,434,782	20,709,274	20,424,849	20,656,959		
1980 PAID (1)		13.99%	10.18%	7.62%	8.19%	5.77%	1.23%		7.83%	
1980 PAID + Q/S (1)		11.94%	2.74%	6.88%	4.72%	0.31%	1.29%		4.64%	
1980 INCURRED (1)		7.55%	1.99%	6.54%	3.77%	0.25%	1.12%		3.54%	*
1980 PAID (2)			4.43%	2.85%	0.61%	2.64%	4.81%	1.24%	2.76%	*
1980 PAID + Q/S (2)			10.46%	9.88%	2.02%	4.21%	1.59%	1.31%	4.91%	
1980 INCURRED (2)			6.01%	8.70%	2.60%	3.38%	1.37%	1.14%	3.87%	
1981 PAID	21,430,525	22,802,611	24,137,817	24,202,067	25,244,650	26,880,467	27,263,270	27,023,503		
1981 PAID + Q/S	20,998,463	24,165,792	27,396,124	28,036,896	27,508,778	26,820,373	26,339,964	27,279,532		
1981 INCURRED	22,284,384	24,664,610	27,172,752	27,993,471	27,722,644	27,008,614	26,518,357	27,317,196		
1981 PAID (1)	20.70%	15.62%	10.68%	10.44%	6.58%	0.53%	0.89%		9.35%	
1981 PAID + Q/S (1)	23.02%	11.41%	0.43%	2.78%	0.84%	1.68%	3.44%		6.23%	
1981 INCURRED (1)	18.42%	9.71%	0.53%	2.48%	1.48%	1.13%	2.92%		5.24%	*
1981 PAID (2)		6.40%	5.86%	0.27%	4.31%	6.48%	1.42%	0.88%	3.66%	*
1981 PAID + Q/S (2)		15.08%	13.37%	2.34%	1.88%	2.50%	1.79%	3.57%	5.79%	
1981 INCURRED (2)		10.68%	10.17%	3.02%	0.97%	2.58%	1.82%	3.01%	4.61%	
1982 PAID	24,640,844	25,853,154	26,535,278	27,454,973	29,441,466	29,561,749	29,572,051			
1982 PAID + Q/S	28,183,243	30,926,583	31,768,579	29,801,444	28,782,603	29,494,177	29,368,616			
1982 INCURRED	28,451,542	30,435,251	31,282,075	30,173,771	29,469,764	30,405,832	30,009,408			
1982 PAID (1)	16.68%	12.58%	10.27%	7.16%	0.44%	0.03%			7.86%	
1982 PAID + Q/S (1)	4.04%	5.30%	8.17%	1.47%	2.00%	0.43%			3.57%	
1982 INCURRED (1)	5.19%	1.42%	4.24%	0.55%	1.80%	1.32%			2.42%	*
1982 PAID (2)		4.92%	2.64%	3.47%	7.24%	0.41%	0.03%		3.12%	*
1982 PAID + Q/S (2)		9.73%	2.72%	6.19%	3.42%	2.47%	0.43%		4.16%	
1982 INCURRED (2)		6.97%	2.78%	3.54%	2.33%	3.18%	1.30%		3.35%	
1983 PAID	31,825,398	33,241,538	34,022,062	36,432,280	36,376,051	36,094,111				
1983 PAID + Q/S	35,861,792	39,234,069	36,331,376	34,730,752	34,113,526	33,864,747				
1983 INCURRED	35,714,168	38,248,162	37,105,292	35,336,095	35,125,951	34,329,895				
1983 PAID (1)	11.83%	7.90%	5.74%	0.94%	0.78%				5.44%	*
1983 PAID + Q/S (1)	5.90%	15.86%	7.28%	2.56%	0.73%				6.47%	
1983 INCURRED (1)	4.03%	11.41%	8.08%	2.93%	2.32%				5.76%	
1983 PAID (2)		4.45%	2.35%	7.08%	0.15%	0.78%			2.96%	*
1983 PAID + Q/S (2)		9.40%	7.40%	4.41%	1.78%	0.73%			4.74%	
1983 INCURRED (2)		7.10%	2.99%	4.77%	0.59%	2.27%			3.54%	
1984 PAID	37,057,181	39,374,509	42,181,181	42,728,230	42,497,027					
1984 PAID + Q/S	44,598,131	42,436,596	40,688,212	39,875,850	40,895,745					
1984 INCURRED	43,335,906	43,629,666	42,020,873	41,186,245	41,923,605					
1984 PAID (1)	12.80%	7.35%	0.74%	0.54%					5.36%	
1984 PAID + Q/S (1)	9.05%	3.77%	0.51%	2.49%					3.96%	
1984 INCURRED (1)	3.37%	4.07%	0.23%	1.76%					2.36%	*
1984 PAID (2)		6.25%	7.13%	1.30%	0.54%				3.80%	
1984 PAID + Q/S (2)		4.85%	4.12%	2.00%	2.56%				3.38%	
1984 INCURRED (2)		0.68%	3.69%	1.99%	1.79%				2.04%	*

NOTES: (1) ABSOLUTE DEVIATION FROM LAST PROJECTION (OR REPORT), RATI0ED TO SAME.
 (2) ABSOLUTE CHANGE RELATIVE TO PRIOR PROJECTION OR REPORT.
 WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.
 LOSSES RESTATED TO INCURRED LEVEL OF 8TH REPORT, AND TO LAST DIAGONAL.

WEIGHTS ASSIGNED TO PRECEDING YEARS:
 N-4 0.0000
 N-3 0.0000
 N-2 0.5000
 N-1 0.5000

MICHIGAN

NATIONAL COUNCIL ON COMPENSATION INSURANCE
ANALYSIS OF FACTOR SELECTION METHODS AND PROJECTION METHODS
STATE: MICHIGAN

ORDER OF PRESENTATION FOR TESTS AND ANALYSIS

Premium: Development by Diagonal, Showing Variance
Premium: Tests of Minimum Average Squared Deviations
Indemnity: Paid - Development by Diagonal, Showing Variance
Indemnity: Paid - Tests of Minimum Average Squared Deviations
Indemnity: Paid+O/S - Development by Diagonal, Showing Variance
Indemnity: Paid+O/S - Tests of Minimum Average Squared Deviations
Indemnity: Incurred - Development by Diagonal, Showing Variance
Indemnity: Incurred - Tests of Minimum Average Squared Deviations
Medical: Paid - Development by Diagonal, Showing Variance
Medical: Paid - Tests of Minimum Average Squared Deviations
Medical: Paid+O/S - Development by Diagonal, Showing Variance
Medical: Paid+O/S - Tests of Minimum Average Squared Deviations
Medical: Incurred - Development by Diagonal, Showing Variance
Medical: Incurred - Tests of Minimum Average Squared Deviations
Indemnity: Comparison of Projections - Deviations by Loss Statistic Type
Indemnity: Comparison of Restated Projections - Deviations by Loss Statistic Type
Medical: Comparison of Projections - Deviations by Loss Statistic Type
Medical: Comparison of Restated Projections - Deviations by Loss Statistic Type

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: MICHIGAN

PREMIUM - DEVELOPMENT DIAGONALS BY EVALUATION DATE

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH
1981	1.026	1.006	1.000	0.999
1982	1.032	0.992	1.000	1.000
1983	1.024	1.008	1.002	1.003
1984	1.016	1.001	1.005	0.998
1985	1.044	0.998	0.999	1.000
1986	1.053	0.999	1.000	1.003
1987	1.036	1.000	1.004	1.002
1988	0.992	0.998	1.002	1.002
1989	1.035	1.001	1.002	0.999
POINTS	9	9	9	9
AVERAGE	1.029	1.000	1.002	1.001
SAMPLE VARIANCE	0.000308	0.000022	0.000004	0.000003
SAMPLE COEFF OF VARIANCE	0.017	0.005	0.002	0.002

REGION: NORTHERN

PREMIUM - DEVELOPMENT DIAGONALS BY EVALUATION DATE

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH
1981				
1982	1.034	1.001	1.002	1.000
1983	1.027	1.004	1.000	1.001
1984	1.036	1.002	1.002	0.999
1985	1.049	1.000	1.000	0.999
1986	1.047	1.002	1.002	1.001
1987	1.039	0.999	0.999	1.004
1988	1.035	1.001	1.002	1.002
1989	1.043	1.003	1.000	1.000
POINTS	8	8	8	8
AVERAGE	1.039	1.002	1.001	1.001
SAMPLE VARIANCE	0.000053	0.000003	0.000002	0.000003
SAMPLE COEFF OF VARIANCE	0.007	0.002	0.001	0.002

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: MICHIGAN PREMIUM - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.000892	0.000010	0.000009	0.000005	0.000916	
THREE-YEAR STRAIGHT AVERAGE	0.000766	0.000004	0.000005	0.000004	0.000779	
FOUR-YEAR STRAIGHT AVERAGE	0.000604	0.000005	0.000003	0.000004	0.000616	*
TWO-YEAR EXPONENTIAL AVG	0.000889	0.000010	0.000009	0.000005	0.000913	
THREE-YEAR EXPONENTIAL AVG	0.000766	0.000004	0.000005	0.000004	0.000780	
FOUR-YEAR EXPONENTIAL AVG	0.000624	0.000005	0.000004	0.000004	0.000636	

STATE: MICHIGAN PREMIUM - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	0	0	
FOUR-YEAR STRAIGHT AVERAGE	1	0	1	1	3	*
TWO-YEAR EXPONENTIAL AVG	0	0	0	0	0	
THREE-YEAR EXPONENTIAL AVG	0	1	0	0	1	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: MICHIGAN PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.911	1.369	1.184	1.106	1.074	1.046	1.041
1982	1.826	1.337	1.161	1.102	1.066	1.054	1.035
1983	1.849	1.334	1.151	1.089	1.066	1.044	1.034
1984	1.796	1.351	1.150	1.084	1.060	1.047	1.029
1985	1.834	1.391	1.174	1.092	1.064	1.048	1.036
1986	1.790	1.339	1.177	1.086	1.058	1.043	1.034
1987	1.808	1.354	1.173	1.103	1.070	1.041	1.038
1988	1.799	1.378	1.191	1.121	1.073	1.058	1.039
1989	1.753	1.386	1.170	1.120	1.074	1.056	1.053
POINTS	9	9	9	9	9	9	9
AVERAGE	1.818	1.360	1.170	1.100	1.067	1.049	1.038
SAMPLE VARIANCE	0.001985	0.000476	0.000194	0.000191	0.000035	0.000037	0.000045
SAMPLE COEFF OF VARIANCE	0.025	0.016	0.012	0.013	0.006	0.006	0.006

REGION: NORTHERN PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	1.600	1.252	1.126	1.078	1.048	1.041	1.029
1983	1.592	1.250	1.126	1.070	1.048	1.031	1.025
1984	1.610	1.261	1.129	1.073	1.044	1.031	1.021
1985	1.660	1.288	1.140	1.079	1.050	1.034	1.028
1986	1.641	1.287	1.146	1.079	1.050	1.036	1.025
1987	1.654	1.301	1.156	1.094	1.062	1.039	1.029
1988	1.669	1.311	1.164	1.100	1.063	1.044	1.030
1989	1.682	1.315	1.160	1.097	1.061	1.048	1.036
POINTS	8	8	8	8	8	8	8
AVERAGE	1.639	1.283	1.143	1.084	1.053	1.038	1.028
SAMPLE VARIANCE	0.001141	0.000672	0.000241	0.000133	0.000056	0.000038	0.000020
SAMPLE COEFF OF VARIANCE	0.021	0.020	0.014	0.011	0.007	0.006	0.004

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: MICHIGAN PAID - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: INDEMNITY (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.000665	0.000978	0.000237	0.000199	0.000037	0.000069	0.000050	0.002235	
THREE-YEAR STRAIGHT AVERAGE	0.000736	0.000816	0.000232	0.000255	0.000049	0.000061	0.000060	0.002210	
FOUR-YEAR STRAIGHT AVERAGE	0.000919	0.000573	0.000233	0.000308	0.000053	0.000059	0.000062	0.002207	
TWO-YEAR EXPONENTIAL AVG	0.000675	0.000967	0.000236	0.000194	0.000037	0.000068	0.000050	0.002228	
THREE-YEAR EXPONENTIAL AVG	0.000736	0.000814	0.000229	0.000243	0.000047	0.000061	0.000059	0.002189	
FOUR-YEAR EXPONENTIAL AVG	0.000868	0.000606	0.000226	0.000288	0.000050	0.000059	0.000061	0.002157	*

STATE: MICHIGAN PAID - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: INDEMNITY (*1st INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	1	0	0	0	0	0	0	1	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
FOUR-YEAR STRAIGHT AVERAGE	0	1	0	0	0	0	0	1	
TWO-YEAR EXPONENTIAL AVG	0	0	0	1	1	0	1	3	*
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	1	0	0	1	0	2	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: MICHIGAN PAID + O/S - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.294	1.099	1.038	1.018	1.006	1.013	1.006
1982	1.165	1.046	1.026	0.998	0.999	1.007	1.008
1983	1.245	1.049	1.023	1.008	1.019	1.003	1.011
1984	1.194	1.063	1.023	0.999	1.001	1.009	1.002
1985	1.240	1.074	1.026	0.999	1.010	1.009	0.998
1986	1.257	1.071	1.032	1.011	0.999	1.001	0.999
1987	1.256	1.090	1.033	1.034	1.005	1.004	1.000
1988	1.251	1.073	1.061	1.037	1.031	1.019	1.012
1989	1.187	1.086	1.043	1.047	1.020	1.009	1.018
POINTS	9	9	9	9	9	9	9
AVERAGE	1.232	1.072	1.034	1.017	1.010	1.008	1.006
SAMPLE VARIANCE	0.001700	0.000318	0.000150	0.000339	0.000123	0.000030	0.000047
SAMPLE COEFF OF VARIANCE	0.033	0.017	0.012	0.018	0.011	0.005	0.007

REGION: NORTHERN PAID + O/S - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	1.109	1.027	1.004	1.001	1.000	1.004	1.004
1983	1.120	1.043	1.014	1.006	1.002	1.002	0.998
1984	1.109	1.055	1.020	1.012	1.004	1.010	1.000
1985	1.132	1.065	1.029	1.007	1.007	1.002	1.002
1986	1.137	1.071	1.040	1.018	1.009	1.002	1.002
1987	1.159	1.083	1.037	1.022	1.009	1.007	1.003
1988	1.143	1.076	1.043	1.017	1.019	1.016	1.009
1989	1.148	1.083	1.037	1.026	1.008	1.003	1.014
POINTS	8	8	8	8	8	8	8
AVERAGE	1.132	1.063	1.028	1.014	1.007	1.006	1.004
SAMPLE VARIANCE	0.000333	0.000400	0.000195	0.000074	0.000034	0.000025	0.000027
SAMPLE COEFF OF VARIANCE	0.016	0.019	0.014	0.008	0.006	0.005	0.005

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: MICHIGAN PAID + O/S - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: INDEMNITY (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.001306	0.000143	0.000182	0.000270	0.000177	0.000070	0.000075	0.002223	
THREE-YEAR STRAIGHT AVERAGE	0.001535	0.000211	0.000209	0.000387	0.000180	0.000051	0.000095	0.002668	
FOUR-YEAR STRAIGHT AVERAGE	0.001428	0.000202	0.000238	0.000487	0.000181	0.000043	0.000103	0.002682	
TWO-YEAR EXPONENTIAL AVG	0.001293	0.000143	0.000182	0.000262	0.000176	0.000070	0.000073	0.002199	*
THREE-YEAR EXPONENTIAL AVG	0.001495	0.000202	0.000205	0.000365	0.000177	0.000052	0.000091	0.002586	
FOUR-YEAR EXPONENTIAL AVG	0.001393	0.000191	0.000228	0.000450	0.000178	0.000045	0.000097	0.002582	

STATE: MICHIGAN PAID + O/S - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: INDEMNITY ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	1	1	0	0	0	0	2	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
FOUR-YEAR STRAIGHT AVERAGE	0	0	0	0	0	1	0	1	
TWO-YEAR EXPONENTIAL AVG	1	0	0	1	1	0	1	4	*
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: MICHIGAN INCURRED - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.142	1.044	1.027	1.004	1.002	1.010	1.004
1982	0.967	0.993	1.008	0.979	0.996	1.007	1.007
1983	1.066	0.991	1.000	0.981	1.009	0.998	1.010
1984	1.038	1.006	1.009	0.979	0.999	1.008	1.002
1985	1.099	1.028	1.017	0.974	1.006	1.007	0.996
1986	1.120	1.044	1.024	0.984	0.993	0.997	0.985
1987	1.059	1.040	1.010	1.020	1.003	1.004	1.000
1988	1.057	1.024	1.040	1.022	1.037	1.017	1.012
1989	1.049	1.038	1.019	1.034	1.017	1.001	1.016
POINTS	9	9	9	9	9	9	9
AVERAGE	1.066	1.023	1.017	0.997	1.007	1.005	1.004
SAMPLE VARIANCE	0.002598	0.000454	0.000146	0.000522	0.000178	0.000039	0.000087
SAMPLE COEFF OF VARIANCE	0.048	0.021	0.012	0.023	0.013	0.006	0.009

REGION: NORTHERN INCURRED - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	0.985	0.983	0.992	0.983	0.999	1.003	1.003
1983	1.006	0.994	0.999	0.982	0.997	0.999	0.997
1984	1.010	1.012	1.011	0.994	1.002	1.008	0.999
1985	1.039	1.025	1.021	0.983	1.003	1.000	1.000
1986	1.045	1.038	1.034	0.993	1.005	0.998	0.993
1987	1.040	1.046	1.024	1.012	1.007	1.006	1.004
1988	1.024	1.038	1.030	1.008	1.026	1.014	1.009
1989	1.039	1.050	1.020	1.012	1.004	0.995	1.013
POINTS	8	8	8	8	8	8	8
AVERAGE	1.024	1.023	1.016	0.996	1.005	1.003	1.002
SAMPLE VARIANCE	0.000455	0.000610	0.000216	0.000172	0.000080	0.000038	0.000042
SAMPLE COEFF OF VARIANCE	0.021	0.024	0.014	0.013	0.009	0.006	0.006

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: MICHIGAN INCURRED - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: INDEMNITY (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.001710	0.000395	0.000191	0.000468	0.000327	0.000099	0.000173	0.003363	
THREE-YEAR STRAIGHT AVERAGE	0.002255	0.000526	0.000194	0.000650	0.000305	0.000058	0.000215	0.004205	
FOUR-YEAR STRAIGHT AVERAGE	0.002053	0.000501	0.000184	0.000808	0.000303	0.000053	0.000206	0.004108	
TWO-YEAR EXPONENTIAL AVG	0.001682	0.000384	0.000195	0.000457	0.000326	0.000098	0.000168	0.003310	*
THREE-YEAR EXPONENTIAL AVG	0.002146	0.000498	0.000195	0.000616	0.000303	0.000061	0.000205	0.004025	
FOUR-YEAR EXPONENTIAL AVG	0.001961	0.000471	0.000185	0.000749	0.000301	0.000056	0.000198	0.003921	

STATE: MICHIGAN INCURRED - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: INDEMNITY ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
FOUR-YEAR STRAIGHT AVERAGE	0	0	1	0	0	1	0	2	
TWO-YEAR EXPONENTIAL AVG	1	1	0	1	0	0	1	4	*
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	1	0	0	1	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: MICHIGAN PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.261	1.106	1.068	1.040	1.024	1.033	1.019
1982	1.256	1.107	1.054	1.037	1.024	1.023	1.018
1983	1.249	1.096	1.058	1.050	1.026	1.022	1.016
1984	1.256	1.108	1.057	1.035	1.027	1.022	1.018
1985	1.255	1.105	1.049	1.031	1.021	1.016	1.017
1986	1.271	1.093	1.043	1.033	1.018	1.017	1.014
1987	1.283	1.090	1.041	1.034	1.020	1.014	1.012
1988	1.288	1.086	1.049	1.025	1.021	1.018	1.011
1989	1.284	1.104	1.045	1.030	1.019	1.017	1.018
POINTS	9	9	9	9	9	9	9
AVERAGE	1.267	1.099	1.052	1.035	1.022	1.020	1.016
SAMPLE VARIANCE	0.000219	0.000069	0.000074	0.000050	0.000010	0.000032	0.000008
SAMPLE COEFF OF VARIANCE	0.012	0.008	0.008	0.007	0.003	0.006	0.003

REGION: NORTHERN PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	1.224	1.079	1.041	1.027	1.018	1.017	1.017
1983	1.217	1.076	1.041	1.028	1.020	1.016	1.015
1984	1.226	1.078	1.045	1.026	1.020	1.016	1.014
1985	1.235	1.080	1.042	1.025	1.018	1.016	1.013
1986	1.250	1.080	1.039	1.026	1.017	1.016	1.013
1987	1.269	1.086	1.044	1.025	1.020	1.016	1.013
1988	1.285	1.093	1.049	1.030	1.021	1.016	1.012
1989	1.295	1.096	1.047	1.030	1.019	1.018	1.015
POINTS	8	8	8	8	8	8	8
AVERAGE	1.250	1.084	1.043	1.027	1.019	1.016	1.014
SAMPLE VARIANCE	0.000882	0.000055	0.000011	0.000004	0.000002	0.000001	0.000003
SAMPLE COEFF OF VARIANCE	0.024	0.007	0.003	0.002	0.001	0.001	0.002

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: MICHIGAN PAID - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: MEDICAL (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.000154	0.000112	0.000049	0.000042	0.000015	0.000011	0.000014	0.000396	
THREE-YEAR STRAIGHT AVERAGE	0.000232	0.000110	0.000057	0.000037	0.000014	0.000015	0.000014	0.000480	
FOUR-YEAR STRAIGHT AVERAGE	0.000299	0.000102	0.000071	0.000039	0.000014	0.000025	0.000014	0.000564	
TWO-YEAR EXPONENTIAL AVG	0.000149	0.000110	0.000048	0.000040	0.000014	0.000011	0.000014	0.000387	*
THREE-YEAR EXPONENTIAL AVG	0.000218	0.000108	0.000055	0.000036	0.000014	0.000014	0.000014	0.000460	
FOUR-YEAR EXPONENTIAL AVG	0.000274	0.000101	0.000066	0.000037	0.000014	0.000022	0.000013	0.000528	

STATE: MICHIGAN PAID - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: MEDICAL (*1* INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
FOUR-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
TWO-YEAR EXPONENTIAL AVG	1	0	1	0	0	1	0	3	*
THREE-YEAR EXPONENTIAL AVG	0	0	0	1	0	0	0	1	
FOUR-YEAR EXPONENTIAL AVG	0	1	0	0	1	0	1	3	*

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: MICHIGAN PAID + O/S - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.061	1.018	1.010	1.000	0.994	1.013	1.007
1982	1.044	1.010	1.011	0.999	1.004	1.009	1.015
1983	1.056	0.992	1.002	0.999	1.011	1.004	1.023
1984	1.083	1.028	1.007	1.003	0.999	1.017	1.008
1985	1.051	1.001	1.003	0.996	0.994	1.004	0.992
1986	1.072	1.011	1.004	0.996	0.991	1.010	0.998
1987	1.083	1.017	1.002	1.010	0.994	0.997	1.000
1988	1.086	1.009	1.013	1.006	0.995	1.003	1.000
1989	1.029	1.025	0.994	0.991	1.006	0.983	1.013
POINTS	9	9	9	9	9	9	9
AVERAGE	1.063	1.012	1.005	1.000	0.999	1.004	1.006
SAMPLE VARIANCE	0.000390	0.000128	0.000034	0.000032	0.000047	0.000100	0.000094
SAMPLE COEFF OF VARIANCE	0.019	0.011	0.006	0.006	0.007	0.010	0.010

REGION: NORTHERN PAID + O/S - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	1.039	1.009	0.997	1.004	1.003	1.008	1.012
1983	1.036	0.999	0.996	0.997	1.002	1.009	1.010
1984	1.055	1.011	1.008	1.006	1.000	1.006	1.010
1985	1.044	1.010	1.007	0.998	1.001	1.007	1.003
1986	1.057	1.009	1.002	1.003	1.003	1.007	1.006
1987	1.073	1.020	1.008	1.005	1.002	1.003	1.006
1988	1.066	1.009	1.009	0.996	1.004	1.001	1.003
1989	1.048	1.004	0.997	0.996	1.000	0.999	1.007
POINTS	8	8	8	8	8	8	8
AVERAGE	1.052	1.009	1.003	1.001	1.002	1.005	1.007
SAMPLE VARIANCE	0.000168	0.000036	0.000032	0.000018	0.000002	0.000013	0.000011
SAMPLE COEFF OF VARIANCE	0.012	0.006	0.006	0.004	0.001	0.004	0.003

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: MICHIGAN PAID + O/S - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: MEDICAL (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.000796	0.000077	0.000058	0.000106	0.000058	0.000086	0.000150	0.001332	
THREE-YEAR STRAIGHT AVERAGE	0.000663	0.000054	0.000055	0.000073	0.000077	0.000126	0.000167	0.001215	
FOUR-YEAR STRAIGHT AVERAGE	0.000543	0.000096	0.000048	0.000061	0.000073	0.000124	0.000170	0.001115	*
TWO-YEAR EXPONENTIAL AVG	0.000800	0.000080	0.000059	0.000105	0.000057	0.000089	0.000146	0.001335	
THREE-YEAR EXPONENTIAL AVG	0.000674	0.000058	0.000056	0.000075	0.000073	0.000124	0.000160	0.001220	
FOUR-YEAR EXPONENTIAL AVG	0.000568	0.000093	0.000050	0.000064	0.000069	0.000122	0.000162	0.001129	

STATE: MICHIGAN PAID + O/S - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: MEDICAL ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	1	0	1	
THREE-YEAR STRAIGHT AVERAGE	0	1	0	0	0	0	0	1	
FOUR-YEAR STRAIGHT AVERAGE	1	0	1	1	0	0	0	3	*
TWO-YEAR EXPONENTIAL AVG	0	0	0	0	1	0	1	2	
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: MICHIGAN INCURRED - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.012	0.995	1.011	0.996	0.995	1.013	1.007
1982	0.949	0.975	1.000	0.987	1.001	1.007	1.013
1983	0.974	0.962	0.992	0.983	1.006	1.001	1.022
1984	0.989	0.990	0.997	0.986	0.996	1.015	1.008
1985	0.968	0.971	0.993	0.975	0.988	1.001	0.990
1986	0.995	0.989	0.990	0.980	0.990	1.007	0.994
1987	1.008	0.994	0.991	1.010	0.991	0.994	0.999
1988	0.972	0.977	1.000	0.997	1.004	1.001	1.000
1989	0.934	0.988	0.978	0.981	1.004	0.975	1.008
POINTS	9	9	9	9	9	9	9
AVERAGE	0.978	0.982	0.995	0.988	0.997	1.002	1.005
SAMPLE VARIANCE	0.000674	0.000132	0.000082	0.000118	0.000046	0.000142	0.000098
SAMPLE COEFF OF VARIANCE	0.027	0.012	0.009	0.011	0.007	0.012	0.010

REGION: NORTHERN INCURRED - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	0.966	0.983	0.990	0.991	1.001	1.007	1.009
1983	0.971	0.968	0.985	0.979	0.997	1.006	1.010
1984	0.988	0.981	1.000	0.991	0.997	1.004	1.010
1985	0.983	0.985	0.999	0.978	0.996	1.004	1.000
1986	0.999	0.991	0.999	0.986	1.002	1.004	1.002
1987	0.999	0.998	1.000	0.999	0.999	1.001	1.005
1988	0.996	0.989	1.005	0.991	1.013	1.000	1.003
1989	0.989	0.990	0.993	0.987	0.997	0.994	1.007
POINTS	8	8	8	8	8	8	8
AVERAGE	0.986	0.986	0.996	0.988	1.000	1.003	1.006
SAMPLE VARIANCE	0.000155	0.000079	0.000042	0.000048	0.000031	0.000017	0.000015
SAMPLE COEFF OF VARIANCE	0.013	0.009	0.007	0.007	0.006	0.004	0.004

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: MICHIGAN INCURRED - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: MEDICAL (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.001033	0.000102	0.000085	0.000331	0.000080	0.000131	0.000157	0.001919	
THREE-YEAR STRAIGHT AVERAGE	0.000914	0.000082	0.000071	0.000256	0.000100	0.000178	0.000179	0.001780	
FOUR-YEAR STRAIGHT AVERAGE	0.000900	0.000133	0.000075	0.000239	0.000097	0.000177	0.000177	0.001797	
TWO-YEAR EXPONENTIAL AVG	0.001014	0.000104	0.000086	0.000326	0.000078	0.000135	0.000152	0.001895	
THREE-YEAR EXPONENTIAL AVG	0.000906	0.000085	0.000073	0.000257	0.000095	0.000176	0.000170	0.001762	*
FOUR-YEAR EXPONENTIAL AVG	0.000896	0.000127	0.000076	0.000240	0.000093	0.000174	0.000168	0.001774	

STATE: MICHIGAN INCURRED - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: MEDICAL ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	1	0	1	
THREE-YEAR STRAIGHT AVERAGE	0	1	1	0	0	0	0	2	*
FOUR-YEAR STRAIGHT AVERAGE	0	0	0	1	0	0	0	1	
TWO-YEAR EXPONENTIAL AVG	0	0	0	0	1	0	1	2	*
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	1	0	0	0	0	0	0	1	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
MICHIGAN INDENITY COMPARISON OF PROJECTIONS

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	ACTUAL 8TH	AVERAGE	*=LOW AVG
1978 PAID				245,737,644	240,449,195	237,606,984	238,406,052	238,748,852		
1978 PAID + Q/S				289,802,499	290,958,099	288,079,754	287,072,865	286,670,145		
1978 INCURRED				293,916,424	290,951,998	289,361,722	288,494,226	284,526,014		
1978 PAID (1)				2.93%	0.71%	0.48%	0.48%	0.14%		1.07%
1978 PAID + Q/S (1)				1.09%	1.50%	0.49%	0.14%			0.81% *
1978 INCURRED (1)				3.30%	2.26%	1.70%	1.39%			2.16%
1978 PAID (2)					2.15%	1.18%	0.34%	0.14%		0.95%
1978 PAID + Q/S (2)					0.40%	0.99%	0.35%	0.14%		0.47% *
1978 INCURRED (2)					1.01%	0.55%	0.30%	1.38%		0.81%
1979 PAID			274,538,440	265,278,284	260,124,912	261,120,598	260,628,376	261,415,381		
1979 PAID + Q/S			321,050,534	317,934,795	316,353,175	315,247,465	312,278,859	312,625,358		
1979 INCURRED			327,026,848	317,836,337	317,357,031	317,193,312	311,216,860	314,323,242		
1979 PAID (1)			5.02%	1.48%	0.49%	0.11%	0.30%			1.48%
1979 PAID + Q/S (1)			2.69%	1.70%	1.19%	0.84%	0.11%			1.31% *
1979 INCURRED (1)			4.04%	1.12%	0.97%	0.91%	0.99%			1.61%
1979 PAID (2)				3.37%	1.94%	0.38%	0.19%	0.30%		1.24%
1979 PAID + Q/S (2)				0.97%	0.50%	0.35%	0.94%	0.11%		0.57% *
1979 INCURRED (2)				2.81%	0.15%	0.05%	1.88%	1.00%		1.18%
1980 PAID		254,399,610	243,419,588	237,999,598	239,668,637	238,887,075	238,088,682	238,682,534		
1980 PAID + Q/S		295,133,208	286,284,120	285,724,154	282,185,812	278,831,319	278,832,847	282,322,441		
1980 INCURRED		301,323,494	286,087,885	287,372,286	284,472,351	277,853,958	278,970,714	284,427,952		
1980 PAID (1)		6.58%	1.98%	0.29%	0.41%	0.09%	0.25%			1.60% *
1980 PAID + Q/S (1)		4.54%	1.40%	1.20%	0.05%	1.24%	1.24%			1.61%
1980 INCURRED (1)		5.94%	0.58%	1.04%	0.02%	2.31%	1.92%			1.97%
1980 PAID (2)			4.32%	2.23%	0.70%	0.33%	0.33%	0.25%		1.36%
1980 PAID + Q/S (2)			3.00%	0.20%	1.24%	1.19%	0.00%	1.25%		1.15% *
1980 INCURRED (2)			5.06%	0.45%	1.01%	2.33%	0.40%	1.96%		1.87%
1981 PAID	226,092,231	214,316,986	212,069,168	217,120,208	216,626,877	217,943,449	221,823,990	224,827,079		
1981 PAID + Q/S	267,053,090	261,936,577	265,292,565	262,775,593	264,217,466	263,955,485	270,044,712	273,132,772		
1981 INCURRED	270,793,366	260,167,553	263,841,818	265,108,170	262,637,078	263,693,594	271,688,280	274,299,393		
1981 PAID (1)	0.56%	4.67%	5.67%	3.43%	3.65%	3.06%	1.34%			3.20%
1981 PAID + Q/S (1)	2.23%	4.10%	2.87%	3.79%	3.26%	3.36%	1.13%			2.96% *
1981 INCURRED (1)	1.28%	5.15%	3.81%	3.35%	4.25%	3.87%	0.95%			3.24%
1981 PAID (2)		5.21%	1.05%	2.38%	0.23%	0.61%	1.78%			1.80%
1981 PAID + Q/S (2)		1.92%	1.28%	0.95%	0.55%	0.10%	2.31%	1.35%		1.18% *
1981 INCURRED (2)		3.92%	1.41%	0.48%	0.95%	0.40%	3.03%	0.96%		1.59%
1982 PAID	201,526,779	193,683,059	203,359,851	206,084,674	208,825,082	212,619,075	215,480,951			
1982 PAID + Q/S	241,856,299	241,120,572	242,548,826	244,207,117	250,255,495	261,499,735	263,187,097			
1982 INCURRED	230,595,754	237,018,291	244,227,679	243,335,747	253,277,461	269,421,003	269,010,469			
1982 PAID (1)	6.48%	10.12%	5.63%	4.36%	3.09%	1.33%				5.17% *
1982 PAID + Q/S (1)	8.10%	8.38%	7.84%	7.21%	4.91%	0.64%				6.18%
1982 INCURRED (1)	14.28%	11.89%	9.21%	9.54%	5.85%	0.15%				8.49%
1982 PAID (2)		3.89%	5.00%	1.34%	1.33%	1.82%	1.35%			2.45%
1982 PAID + Q/S (2)		0.30%	0.59%	0.68%	2.48%	4.49%	0.65%			1.53% *
1982 INCURRED (2)		2.79%	3.04%	0.37%	4.09%	6.37%	0.15%			2.80%
1983 PAID	232,487,623	242,111,566	239,323,481	240,125,292	250,057,434	254,255,060				
1983 PAID + Q/S	270,108,410	274,861,013	276,581,358	281,368,798	294,420,550	298,373,770				
1983 INCURRED	256,003,906	272,627,337	277,890,072	281,215,708	300,109,035	301,158,187				
1983 PAID (1)	8.56%	4.78%	5.87%	5.56%	1.65%					5.28% *
1983 PAID + Q/S (1)	9.47%	7.88%	7.30%	5.70%	1.32%					6.34%
1983 INCURRED (1)	14.99%	9.47%	7.73%	6.62%	0.35%					7.83%
1983 PAID (2)		4.14%	1.15%	0.34%	4.14%	1.68%				2.29%
1983 PAID + Q/S (2)		1.76%	0.63%	1.73%	4.64%	1.34%				2.02% *
1983 INCURRED (2)		6.49%	1.93%	1.20%	6.72%	0.35%				3.34%
1984 PAID	291,795,441	289,985,814	289,104,743	302,712,357	309,863,903					
1984 PAID + Q/S	307,920,124	320,479,580	331,186,274	355,599,535	366,341,213					
1984 INCURRED	307,325,523	325,840,461	333,307,218	363,388,723	372,933,449					
1984 PAID (1)	5.83%	6.42%	6.70%	2.31%						5.31% *
1984 PAID + Q/S (1)	15.95%	12.52%	9.60%	2.93%						10.25%
1984 INCURRED (1)	17.59%	12.63%	10.63%	2.56%						10.85%
1984 PAID (2)		0.62%	0.30%	4.71%	2.36%					2.00% *
1984 PAID + Q/S (2)		4.08%	3.34%	7.37%	3.02%					4.45%
1984 INCURRED (2)		6.02%	2.29%	9.03%	2.63%					4.99%

NOTES: (1) ABSOLUTE DEVIATION FROM LAST PROJECTION (OR REPORT), RATIOW TO SAME.

(2) ABSOLUTE CHANGE RELATIVE TO PRIOR PROJECTION OR REPORT.

WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.

LOSSES HAVE BEEN RESTATED TO THE LATEST DIAGONAL.

WEIGHTS ASSIGNED TO PRECEDING YEARS:
N-4 0.0000
N-3 0.0000
N-2 0.5000
N-1 0.5000

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NATIONAL COUNCIL ON COMPENSATION INSURANCE
MICHIGAN INDemnITY COMPARISON OF PROJECTIONS RESTATED TO INCURRED LEVEL

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	RESTATED 8TH	AVERAGE	*=LOW AVG
1978 PAID				295,899,517	289,382,577	286,938,474	289,192,142	287,679,799		
1978 PAID + O/S				291,809,202	292,884,512	290,308,517	289,342,125	286,747,662		
1978 INCURRED				293,916,424	290,951,998	289,361,722	288,494,226	284,526,014		
1978 PAID (1)				2.86%	0.59%	0.26%	0.53%		1.06%	*
1978 PAID + O/S (1)				1.77%	2.14%	1.24%	0.90%		1.51%	
1978 INCURRED (1)				3.30%	2.26%	1.70%	1.39%		2.16%	
1978 PAID (2)					2.20%	0.84%	0.79%	0.52%	1.09%	
1978 PAID + O/S (2)					0.37%	0.88%	0.33%	0.90%	0.62%	*
1978 INCURRED (2)					1.01%	0.55%	0.30%	1.38%	0.81%	
1979 PAID			330,579,354	319,264,642	314,131,529	316,745,420	314,043,473	312,924,712		
1979 PAID + O/S			323,273,610	320,039,818	318,800,678	317,739,441	312,363,300	312,292,129		
1979 INCURRED			327,026,848	317,836,337	317,357,031	317,193,312	311,216,860	314,323,242		
1979 PAID (1)			5.64%	2.03%	0.39%	1.22%	0.36%		1.93%	
1979 PAID + O/S (1)			3.52%	2.48%	2.08%	1.74%	0.02%		1.97%	
1979 INCURRED (1)			4.04%	1.12%	0.97%	0.91%	0.99%		1.61%	*
1979 PAID (2)				3.42%	1.61%	0.83%	0.85%	0.36%	1.41%	
1979 PAID + O/S (2)				1.00%	0.39%	0.33%	1.69%	0.02%	0.69%	*
1979 INCURRED (2)				2.81%	0.15%	0.05%	1.88%	1.00%	1.18%	
1980 PAID		306,329,630	292,957,518	287,412,602	290,723,688	287,846,350	285,001,716	285,702,982		
1980 PAID + O/S		297,176,823	288,179,586	287,934,693	284,416,441	278,906,716	278,535,637	284,141,562		
1980 INCURRED		301,323,494	286,087,885	287,372,286	284,472,351	277,853,958	278,970,714	284,427,952		
1980 PAID (1)		7.22%	2.54%	0.60%	1.76%	0.75%	0.25%		2.19%	
1980 PAID + O/S (1)		4.59%	1.42%	1.33%	0.10%	1.84%	1.97%		1.88%	*
1980 INCURRED (1)		5.94%	0.58%	1.04%	0.02%	2.31%	1.92%		1.97%	
1980 PAID (2)			4.37%	1.89%	1.15%	0.99%	0.99%	0.25%	1.61%	
1980 PAID + O/S (2)			3.03%	0.08%	1.22%	1.94%	0.13%	2.01%	1.40%	*
1980 INCURRED (2)			5.06%	0.45%	1.01%	2.33%	0.40%	1.96%	1.87%	
1981 PAID	272,243,929	257,932,292	256,098,547	263,371,913	261,023,983	260,887,063	265,523,306	271,070,627		
1981 PAID + O/S	268,902,267	263,670,840	267,345,032	264,852,787	264,288,911	263,674,134	271,784,722	274,733,881		
1981 INCURRED	270,793,366	260,167,553	263,841,818	265,108,170	262,637,078	263,693,594	271,688,280	274,299,393		
1981 PAID (1)	0.43%	4.85%	5.52%	2.84%	3.71%	3.76%	2.05%		3.31%	
1981 PAID + O/S (1)	2.12%	4.03%	2.69%	3.60%	3.80%	4.03%	1.07%		3.05%	*
1981 INCURRED (1)	1.28%	5.15%	3.81%	3.35%	4.25%	3.87%	0.95%		3.24%	
1981 PAID (2)		5.26%	0.71%	2.84%	0.89%	0.05%	1.78%	2.09%	1.95%	
1981 PAID + O/S (2)		1.95%	1.39%	0.93%	0.21%	0.23%	3.08%	1.09%	1.27%	*
1981 INCURRED (2)		3.92%	1.41%	0.48%	0.93%	0.40%	3.03%	0.96%	1.59%	
1982 PAID	242,539,171	233,895,150	246,680,277	248,321,184	249,972,012	254,505,022	259,802,141			
1982 PAID + O/S	243,457,612	242,986,030	244,466,132	244,273,151	249,988,746	263,184,687	264,729,905			
1982 INCURRED	230,595,754	237,018,291	244,227,679	243,335,747	253,277,461	269,421,003	269,010,469			
1982 PAID (1)	6.64%	9.97%	5.05%	4.42%	3.78%	2.04%			5.32%	*
1982 PAID + O/S (1)	8.04%	8.21%	7.65%	7.73%	5.57%	0.58%			6.30%	
1982 INCURRED (1)	14.28%	11.89%	9.21%	9.54%	5.85%	0.15%			8.49%	
1982 PAID (2)		3.56%	5.47%	0.67%	0.66%	1.81%	2.08%		2.38%	
1982 PAID + O/S (2)		0.19%	0.61%	0.08%	2.34%	5.28%	0.59%		1.51%	*
1982 INCURRED (2)		2.79%	3.04%	0.37%	4.09%	6.37%	0.15%		2.80%	
1983 PAID	280,756,241	293,687,017	288,372,196	287,439,621	299,318,736	306,551,501				
1983 PAID + O/S	272,198,136	277,033,741	276,656,146	281,068,885	296,317,624	300,122,843				
1983 INCURRED	256,003,906	272,627,337	277,890,072	281,215,708	300,109,035	301,158,187				
1983 PAID (1)	8.41%	4.20%	5.93%	6.23%	2.36%				5.43%	*
1983 PAID + O/S (1)	9.30%	7.69%	7.82%	6.35%	1.27%				6.49%	
1983 INCURRED (1)	14.99%	9.47%	7.73%	6.62%	0.35%				7.83%	
1983 PAID (2)		4.61%	1.81%	0.32%	4.13%	2.42%			2.66%	
1983 PAID + O/S (2)		1.78%	0.14%	1.60%	5.43%	1.28%			2.04%	*
1983 INCURRED (2)		6.49%	1.93%	1.20%	6.72%	0.35%			3.34%	
1984 PAID	353,954,726	349,417,640	346,069,990	362,346,676	373,598,246					
1984 PAID + O/S	310,354,178	320,566,239	320,833,261	357,890,811	368,488,711					
1984 INCURRED	307,325,523	325,840,461	333,307,218	363,388,723	372,933,449					
1984 PAID (1)	5.26%	6.47%	7.37%	3.01%					5.53%	*
1984 PAID + O/S (1)	15.78%	13.01%	10.22%	2.88%					10.47%	
1984 INCURRED (1)	17.59%	12.63%	10.63%	2.56%					10.85%	
1984 PAID (2)		1.28%	0.96%	4.70%	3.11%				2.51%	*
1984 PAID + O/S (2)		3.29%	3.20%	8.18%	2.96%				4.41%	
1984 INCURRED (2)		6.02%	2.29%	9.03%	2.63%				4.99%	

NOTES: (1) ABSOLUTE DEVIATION FROM LAST PROJECTION (OR REPORT), RATI0ED TO SAME.
(2) ABSOLUTE CHANGE RELATIVE TO PRIOR PROJECTION OR REPORT.
WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.
LOSSES RESTATED TO INCURRED LEVEL OF 8TH REPORT, AND TO LAST DIAGONAL.

WEIGHTS ASSIGNED TO
PRECEDING YEARS:
N-4 0.0000
N-3 0.0000
N-2 0.5000
N-1 0.5000

NATIONAL COUNCIL ON COMPENSATION INSURANCE
MICHIGAN MEDICAL COMPARISON OF PROJECTIONS

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	ACTUAL 8TH	AVERAGE	*=LOW AVG
1978 PAID				95,186,902	95,678,426	95,818,238	95,302,536	95,016,389		
1978 PAID + Q/S				105,010,191	106,213,411	105,372,691	103,096,884	102,935,129		
1978 INCURRED				106,965,981	106,787,076	106,149,780	103,750,952	103,192,710		
1978 PAID (1)				0.18%	0.70%	0.84%	0.30%		0.51%	*
1978 PAID + Q/S (1)				2.02%	3.18%	2.37%	0.16%		1.93%	
1978 INCURRED (1)				3.66%	3.48%	2.87%	0.54%		2.64%	
1978 PAID (2)					0.52%	0.15%	0.54%	0.30%	0.38%	*
1978 PAID + Q/S (2)					1.15%	0.79%	2.16%	0.16%	1.06%	
1978 INCURRED (2)					0.17%	0.60%	2.26%	0.54%	0.89%	
1979 PAID			105,608,483	105,198,384	104,443,071	103,629,446	103,222,757	102,908,593		
1979 PAID + Q/S			115,313,377	115,653,559	115,889,406	112,871,457	112,251,530	112,809,124		
1979 INCURRED			118,519,725	116,970,397	116,974,660	113,635,520	112,727,332	113,479,531		
1979 PAID (1)			2.62%	2.23%	1.49%	0.70%	0.31%		1.47%	*
1979 PAID + Q/S (1)			2.22%	2.52%	2.73%	0.06%	0.49%		1.60%	
1979 INCURRED (1)			4.44%	3.08%	3.08%	0.14%	0.66%		2.28%	
1979 PAID (2)				0.39%	0.72%	0.78%	0.39%	0.30%	0.52%	*
1979 PAID + Q/S (2)				0.30%	0.20%	2.60%	0.55%	0.50%	0.83%	
1979 INCURRED (2)				1.31%	0.00%	2.85%	0.80%	0.67%	1.13%	
1980 PAID		106,577,582	104,957,510	105,058,420	103,393,020	102,333,482	101,830,492	101,579,625		
1980 PAID + Q/S		116,592,349	114,912,994	114,974,813	111,701,572	110,146,796	109,491,389	109,655,175		
1980 INCURRED		120,121,357	116,249,760	116,193,683	112,240,206	110,787,648	110,181,744	110,528,070		
1980 PAID (1)		4.92%	3.33%	3.42%	1.79%	0.74%	0.25%		2.41%	*
1980 PAID + Q/S (1)		6.33%	4.79%	4.85%	1.87%	0.45%	0.15%		3.07%	
1980 INCURRED (1)		8.68%	5.18%	5.13%	1.55%	0.23%	0.31%		3.51%	
1980 PAID (2)			1.52%	0.10%	1.59%	1.02%	0.49%	0.25%	0.83%	*
1980 PAID + Q/S (2)			1.44%	0.05%	2.85%	1.39%	0.60%	0.15%	1.08%	
1980 INCURRED (2)			3.22%	0.05%	3.40%	1.29%	0.55%	0.31%	1.47%	
1981 PAID	102,928,760	101,103,819	101,846,370	99,619,115	98,743,533	98,451,801	98,548,033	99,166,901		
1981 PAID + Q/S	112,125,731	111,884,157	114,678,412	111,638,167	109,864,829	110,089,238	110,144,530	111,627,358		
1981 INCURRED	117,048,891	113,285,689	115,454,457	111,986,091	110,368,857	110,706,449	111,095,227	112,073,710		
1981 PAID (1)	3.79%	1.95%	2.70%	0.46%	0.43%	0.72%	0.62%		1.53%	
1981 PAID + Q/S (1)	0.45%	0.23%	2.73%	0.01%	1.58%	1.38%	1.33%		1.10%	*
1981 INCURRED (1)	4.44%	1.08%	3.02%	0.08%	1.52%	1.22%	0.87%		1.75%	
1981 PAID (2)		1.77%	0.73%	2.19%	0.88%	0.30%	0.10%	0.63%	0.94%	*
1981 PAID + Q/S (2)		0.22%	2.50%	2.65%	1.59%	0.20%	0.05%	1.35%	1.22%	
1981 INCURRED (2)		3.22%	1.91%	3.00%	1.44%	0.31%	0.35%	0.88%	1.59%	
1982 PAID	102,729,250	103,210,968	101,614,701	99,668,481	99,468,988	99,565,637	99,959,227			
1982 PAID + Q/S	114,200,257	118,617,175	114,671,748	112,737,934	114,383,247	114,385,802	113,172,111			
1982 INCURRED	114,589,778	118,424,936	114,509,042	112,001,811	116,021,067	117,602,727	115,467,568			
1982 PAID (1)	2.77%	3.25%	1.66%	0.29%	0.49%	0.39%			1.48%	*
1982 PAID + Q/S (1)	0.91%	4.81%	1.33%	0.38%	1.07%	1.07%			1.60%	
1982 INCURRED (1)	0.76%	2.56%	0.83%	3.00%	0.48%	1.85%			1.58%	
1982 PAID (2)		0.47%	1.55%	1.92%	0.20%	0.10%	0.40%		0.77%	*
1982 PAID + Q/S (2)		3.87%	3.33%	1.69%	1.46%	0.00%	1.06%		1.90%	
1982 INCURRED (2)		3.35%	3.31%	2.19%	3.59%	1.36%	1.82%		2.60%	
1983 PAID	127,731,376	126,177,935	122,602,925	121,713,759	120,770,845	121,129,564				
1983 PAID + Q/S	137,724,578	132,605,095	129,854,384	130,640,812	130,968,642	132,410,841				
1983 INCURRED	136,039,705	131,001,336	129,439,614	132,026,667	133,227,374	133,416,404				
1983 PAID (1)	5.45%	4.17%	1.22%	0.48%	0.30%				2.32%	
1983 PAID + Q/S (1)	4.01%	0.15%	1.93%	1.34%	1.09%				1.70%	
1983 INCURRED (1)	1.97%	1.81%	2.98%	1.04%	0.14%				1.59%	*
1983 PAID (2)		1.22%	2.83%	0.73%	0.77%	0.30%			1.17%	*
1983 PAID + Q/S (2)		3.72%	2.07%	0.61%	0.25%	1.10%			1.55%	
1983 INCURRED (2)		3.70%	1.19%	2.00%	0.91%	0.14%			1.59%	
1984 PAID	149,265,198	147,632,624	145,501,336	145,982,120	146,630,588					
1984 PAID + Q/S	163,263,421	159,831,541	162,719,996	165,082,274	163,188,255					
1984 INCURRED	160,026,117	159,321,500	164,744,138	168,931,064	165,377,686					
1984 PAID (1)	1.80%	0.68%	0.77%	0.44%					0.92%	
1984 PAID + Q/S (1)	0.05%	2.06%	0.29%	1.16%					0.89%	*
1984 INCURRED (1)	3.24%	3.66%	0.38%	2.15%					2.36%	
1984 PAID (2)		1.09%	1.44%	0.33%	0.44%				0.83%	*
1984 PAID + Q/S (2)		2.10%	1.81%	1.45%	1.15%				1.63%	
1984 INCURRED (2)		0.44%	3.40%	2.54%	2.10%				2.12%	

NOTES: (1) ABSOLUTE DEVIATION FROM LAST PROJECTION (OR REPORT), RATIOED TO SAME.

(2) ABSOLUTE CHANGE RELATIVE TO PRIOR PROJECTION OR REPORT.

WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.

LOSSES HAVE BEEN RESTATED TO THE LATEST DIAGONAL.

N-4 0.0000

N-3 0.0000

N-2 0.5000

N-1 0.5000

WEIGHTS ASSIGNED TO

PRECEDING YEARS:

08:30 AM

03/14/91

NATIONAL COUNCIL ON COMPENSATION INSURANCE
MICHIGAN MEDICAL COMPARISON OF PROJECTIONS RESTATED TO INCURRED LEVEL

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	RESTATED 8TH	AVERAGE	*=LOA AVG
1978 PAID				106,977,454	107,555,221	107,320,680	105,588,461	104,199,837		
1978 PAID + O/S				105,826,535	106,917,700	106,123,561	103,809,382	103,412,115		
1978 INCURRED				106,965,981	106,787,076	106,149,780	103,750,952	103,192,710		
1978 PAID (1)				2.67%	3.22%	3.00%	1.33%		2.55%	
1978 PAID + O/S (1)				2.33%	3.39%	2.62%	0.38%		2.18%	*
1978 INCURRED (1)				3.66%	3.48%	2.87%	0.54%		2.64%	
1978 PAID (2)					0.54%	0.22%	1.61%	1.32%	0.92%	
1978 PAID + O/S (2)					1.03%	0.74%	2.18%	0.38%	1.08%	
1978 INCURRED (2)					0.17%	0.60%	2.26%	0.54%	0.89%	*
1979 PAID			118,689,928	118,256,915	116,980,876	114,814,087	113,199,360	112,615,259		
1979 PAID + O/S			116,209,818	116,420,445	116,715,216	113,651,507	112,771,686	113,285,140		
1979 INCURRED			118,519,725	116,970,397	116,974,660	113,635,520	112,727,332	113,479,531		
1979 PAID (1)			5.39%	5.01%	3.88%	1.95%	0.52%		3.35%	
1979 PAID + O/S (1)			2.58%	2.77%	3.03%	0.32%	0.45%		1.83%	*
1979 INCURRED (1)			4.44%	3.08%	3.08%	0.14%	0.66%		2.28%	
1979 PAID (2)				0.36%	1.08%	1.85%	1.41%	0.52%	1.04%	
1979 PAID + O/S (2)				0.18%	0.25%	2.62%	0.77%	0.46%	0.86%	*
1979 INCURRED (2)				1.31%	0.00%	2.85%	0.80%	0.67%	1.13%	
1980 PAID		119,779,068	117,986,140	117,670,094	114,552,145	112,224,135	111,435,468	111,266,098		
1980 PAID + O/S		117,498,733	115,674,970	115,794,105	112,473,537	110,657,200	109,953,405	110,417,343		
1980 INCURRED		120,121,357	116,249,760	116,193,683	112,240,206	110,787,648	110,181,744	110,528,070		
1980 PAID (1)		7.65%	6.04%	5.76%	2.95%	0.86%	0.15%		3.90%	
1980 PAID + O/S (1)		6.41%	4.76%	4.87%	1.85%	0.22%	0.42%		3.09%	*
1980 INCURRED (1)		8.68%	5.18%	5.13%	1.55%	0.23%	0.31%		3.51%	
1980 PAID (2)			1.50%	0.27%	2.65%	2.03%	0.70%	0.15%	1.22%	
1980 PAID + O/S (2)			1.55%	0.10%	2.87%	1.61%	0.64%	0.42%	1.20%	*
1980 INCURRED (2)			3.22%	0.05%	3.40%	1.29%	0.55%	0.31%	1.47%	
1981 PAID	115,678,275	113,654,081	114,072,455	110,370,925	108,287,214	107,738,088	107,945,418	109,948,714		
1981 PAID + O/S	112,997,391	112,626,048	115,495,593	112,409,694	110,373,926	110,553,777	110,910,100	112,294,396		
1981 INCURRED	117,048,891	113,285,689	115,454,457	111,986,091	110,368,857	110,706,449	111,095,227	112,073,710		
1981 PAID (1)	5.21%	3.37%	3.75%	0.38%	1.51%	2.01%	1.82%		2.58%	
1981 PAID + O/S (1)	0.63%	0.30%	2.85%	0.10%	1.71%	1.55%	1.23%		1.20%	*
1981 INCURRED (1)	4.44%	1.08%	3.02%	0.08%	1.52%	1.22%	0.87%		1.75%	
1981 PAID (2)		1.75%	0.37%	3.24%	1.89%	0.51%	0.19%	1.86%	1.40%	
1981 PAID + O/S (2)		0.33%	2.55%	2.67%	1.81%	0.16%	0.32%	1.25%	1.30%	*
1981 INCURRED (2)		3.22%	1.91%	3.00%	1.44%	0.31%	0.35%	0.88%	1.59%	
1982 PAID	115,481,282	115,600,866	112,581,893	109,301,559	108,851,219	109,060,060	110,827,185			
1982 PAID + O/S	114,957,506	119,462,422	115,464,240	113,260,344	114,865,905	115,180,851	113,848,380			
1982 INCURRED	114,589,778	118,424,936	114,509,042	112,001,811	116,021,067	117,602,727	115,467,568			
1982 PAID (1)	4.20%	4.31%	1.58%	1.38%	1.78%	1.59%			2.47%	
1982 PAID + O/S (1)	0.97%	4.93%	1.42%	0.52%	0.89%	1.17%			1.65%	
1982 INCURRED (1)	0.76%	2.56%	0.83%	3.00%	0.48%	1.85%			1.58%	*
1982 PAID (2)		0.10%	2.61%	2.91%	0.41%	0.19%	1.62%		1.31%	*
1982 PAID + O/S (2)		3.92%	3.35%	1.91%	1.42%	0.27%	1.16%		2.00%	
1982 INCURRED (2)		3.35%	3.31%	2.19%	3.59%	1.36%	1.82%		2.60%	
1983 PAID	143,064,811	139,796,216	134,452,644	133,194,188	132,287,363	134,299,245				
1983 PAID + O/S	138,705,982	133,521,523	130,456,109	131,192,071	131,878,952	133,202,072				
1983 INCURRED	136,039,705	131,001,336	129,439,614	132,026,667	133,227,374	133,416,404				
1983 PAID (1)	6.53%	4.09%	0.11%	0.82%	1.50%				2.61%	
1983 PAID + O/S (1)	4.13%	0.24%	2.06%	1.51%	0.99%				1.79%	
1983 INCURRED (1)	1.97%	1.81%	2.98%	1.04%	0.14%				1.59%	*
1983 PAID (2)		2.28%	3.82%	0.94%	0.68%	1.52%			1.85%	
1983 PAID + O/S (2)		3.74%	2.30%	0.56%	0.52%	1.00%			1.62%	
1983 INCURRED (2)		3.70%	1.19%	2.00%	0.91%	0.14%			1.59%	*
1984 PAID	165,375,269	161,901,494	159,225,484	159,902,746	162,572,839					
1984 PAID + O/S	164,391,727	160,572,176	163,406,618	166,229,694	164,163,399					
1984 INCURRED	160,026,117	159,321,500	164,744,138	168,931,064	165,377,686					
1984 PAID (1)	1.72%	0.41%	2.06%	1.64%					1.46%	
1984 PAID + O/S (1)	0.14%	2.19%	0.46%	1.26%					1.01%	*
1984 INCURRED (1)	3.24%	3.66%	0.38%	2.15%					2.36%	
1984 PAID (2)		2.10%	1.65%	0.43%	1.67%				1.46%	*
1984 PAID + O/S (2)		2.32%	1.77%	1.73%	1.24%				1.76%	
1984 INCURRED (2)		0.44%	3.40%	2.54%	2.10%				2.12%	

NOTES: (1) ABSOLUTE DEVIATION FROM LAST PROJECTION (OR REPORT), RATIOW TO SAME.
(2) ABSOLUTE CHANGE RELATIVE TO PRIOR PROJECTION OR REPORT.
WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.
LOSSES RESTATED TO INCURRED LEVEL OF 8TH REPORT, AND TO LAST DIAGONAL.

WEIGHTS ASSIGNED TO PRECEDING YEARS:
N-4 0.0000
N-3 0.0000
N-2 0.5000
N-1 0.5000

08:30 AM
03/14/91

NEBRASKA

NATIONAL COUNCIL ON COMPENSATION INSURANCE
ANALYSIS OF FACTOR SELECTION METHODS AND PROJECTION METHODS
STATE: NEBRASKA

ORDER OF PRESENTATION FOR TESTS AND ANALYSIS

Premium: Development by Diagonal, Showing Variance

Premium: Tests of Minimum Average Squared Deviations

Indemnity: Paid - Development by Diagonal, Showing Variance

Indemnity: Paid - Tests of Minimum Average Squared Deviations

Indemnity: Paid+O/S - Development by Diagonal, Showing Variance

Indemnity: Paid+O/S - Tests of Minimum Average Squared Deviations

Indemnity: Incurred - Development by Diagonal, Showing Variance

Indemnity: Incurred - Tests of Minimum Average Squared Deviations

Medical: Paid - Development by Diagonal, Showing Variance

Medical: Paid - Tests of Minimum Average Squared Deviations

Medical: Paid+O/S - Development by Diagonal, Showing Variance

Medical: Paid+O/S - Tests of Minimum Average Squared Deviations

Medical: Incurred - Development by Diagonal, Showing Variance

Medical: Incurred - Tests of Minimum Average Squared Deviations

Indemnity: Comparison of Projections - Deviations by Loss Statistic Type

Indemnity: Comparison of Restated Projections - Deviations by Loss Statistic Type

Medical: Comparison of Projections - Deviations by Loss Statistic Type

Medical: Comparison of Restated Projections - Deviations by Loss Statistic Type

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: NEBRASKA

PREMIUM - DEVELOPMENT DIAGONALS BY EVALUATION DATE

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH
1981	1.058	1.002	1.001	0.999
1982	1.060	1.015	1.009	1.002
1983	1.029	0.995	0.999	1.002
1984	1.045	1.008	1.018	0.998
1985	1.043	0.995	1.002	0.998
1986	1.034	0.996	1.000	1.000
1987	1.031	1.002	0.984	1.003
1988	1.042	1.002	1.000	1.002
1989	1.066	0.999	1.005	1.004
POINTS	9	9	9	9
AVERAGE	1.045	1.002	1.002	1.001
SAMPLE VARIANCE	0.000178	0.000043	0.000082	0.000005
SAMPLE COEFF OF VARIANCE	0.013	0.007	0.009	0.002

REGION: WESTERN

PREMIUM - DEVELOPMENT DIAGONALS BY EVALUATION DATE

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH
1981				
1982	1.043	1.008	1.003	1.002
1983	1.033	1.003	0.999	1.001
1984	1.043	1.007	1.002	0.999
1985	1.048	1.003	1.002	0.999
1986	1.051	1.003	1.000	1.001
1987	1.043	1.006	1.002	1.004
1988	1.042	1.006	0.999	0.999
1989	1.028	1.000	1.000	0.999
POINTS	8	8	8	8
AVERAGE	1.041	1.005	1.001	1.001
SAMPLE VARIANCE	0.000056	0.000007	0.000002	0.000003
SAMPLE COEFF OF VARIANCE	0.007	0.003	0.002	0.002

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: NEBRASKA PREMIUM - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	TOTAL	* FOR LOW
TWO-YEAR STRAIGHT AVERAGE	0.000231	0.000027	0.000133	0.000005	0.000395	
THREE-YEAR STRAIGHT AVERAGE	0.000215	0.000031	0.000145	0.000007	0.000399	
FOUR-YEAR STRAIGHT AVERAGE	0.000200	0.000034	0.000115	0.000007	0.000356	
TWO-YEAR EXPONENTIAL AVG	0.000226	0.000026	0.000131	0.000005	0.000389	
THREE-YEAR EXPONENTIAL AVG	0.000212	0.000031	0.000142	0.000007	0.000391	
FOUR-YEAR EXPONENTIAL AVG	0.000199	0.000032	0.000115	0.000006	0.000353	*

STATE: NEBRASKA PREMIUM - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	TOTAL	METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	0	0	
FOUR-YEAR STRAIGHT AVERAGE	0	0	1	0	1	
TWO-YEAR EXPONENTIAL AVG	0	1	0	1	2	*
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	1	0	0	0	1	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: NEBRASKA PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.462	1.233	1.096	1.032	1.031	1.031	1.034
1982	1.498	1.183	1.087	1.063	1.037	1.049	1.033
1983	1.521	1.201	1.095	1.054	1.046	1.031	1.029
1984	1.545	1.205	1.109	1.069	1.036	1.029	1.019
1985	1.541	1.228	1.090	1.049	1.038	1.030	1.033
1986	1.602	1.204	1.086	1.047	1.040	1.031	1.024
1987	1.617	1.257	1.120	1.059	1.045	1.009	1.014
1988	1.649	1.247	1.139	1.081	1.034	1.030	1.017
1989	1.688	1.256	1.107	1.068	1.050	1.017	1.019
POINTS	9	9	9	9	9	9	9
AVERAGE	1.569	1.224	1.103	1.058	1.040	1.029	1.025
SAMPLE VARIANCE	0.005513	0.000714	0.000308	0.000209	0.000038	0.000120	0.000060
SAMPLE COEFF OF VARIANCE	0.047	0.022	0.016	0.014	0.006	0.011	0.008

REGION: WESTERN PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	1.527	1.205	1.099	1.058	1.042	1.033	1.023
1983	1.574	1.212	1.100	1.060	1.041	1.028	1.025
1984	1.623	1.220	1.110	1.066	1.041	1.033	1.022
1985	1.684	1.257	1.109	1.068	1.043	1.034	1.027
1986	1.675	1.273	1.126	1.065	1.043	1.039	1.024
1987	1.687	1.272	1.126	1.072	1.045	1.031	1.021
1988	1.700	1.265	1.124	1.073	1.049	1.031	1.026
1989	1.697	1.269	1.117	1.065	1.038	1.030	1.019
POINTS	8	8	8	8	8	8	8
AVERAGE	1.646	1.247	1.114	1.066	1.043	1.032	1.023
SAMPLE VARIANCE	0.004194	0.000847	0.000123	0.000027	0.000010	0.000011	0.000007
SAMPLE COEFF OF VARIANCE	0.039	0.023	0.010	0.005	0.003	0.003	0.003

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: NEBRASKA PAID - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: INDEMNITY (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.002040	0.000550	0.000630	0.000242	0.000047	0.000114	0.000062	0.003686	
THREE-YEAR STRAIGHT AVERAGE	0.003179	0.000750	0.000502	0.000237	0.000042	0.000113	0.000044	0.004866	
FOUR-YEAR STRAIGHT AVERAGE	0.004753	0.000760	0.000437	0.000178	0.000035	0.000116	0.000046	0.006325	
TWO-YEAR EXPONENTIAL AVG	0.001987	0.000554	0.000623	0.000239	0.000048	0.000117	0.000062	0.003631	*
THREE-YEAR EXPONENTIAL AVG	0.002998	0.000727	0.000501	0.000232	0.000043	0.000114	0.000044	0.004658	
FOUR-YEAR EXPONENTIAL AVG	0.004316	0.000732	0.000442	0.000180	0.000037	0.000116	0.000045	0.005868	

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STATE: NEBRASKA PAID - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: INDEMNITY (*1* INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	1	0	0	0	0	0	1	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	0	0	1	1	2	
FOUR-YEAR STRAIGHT AVERAGE	0	0	1	1	1	0	0	3	*
TWO-YEAR EXPONENTIAL AVG	1	0	0	0	0	0	0	1	
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: NEBRASKA PAID + O/S - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.074	1.048	1.018	0.985	1.001	0.989	1.006
1982	1.011	1.037	0.993	1.018	1.000	1.000	1.010
1983	1.036	1.014	0.982	1.002	1.023	1.000	0.997
1984	0.986	1.003	0.996	1.001	1.033	1.022	0.985
1985	1.047	1.078	0.990	0.979	1.000	0.984	0.982
1986	1.090	1.036	1.015	1.006	1.019	0.969	1.007
1987	1.059	1.067	1.057	0.994	0.988	0.987	1.035
1988	1.104	1.028	1.036	1.002	1.009	1.013	1.001
1989	1.166	1.051	0.990	1.022	1.000	0.995	1.011
POINTS	9	9	9	9	9	9	9
AVERAGE	1.064	1.040	1.009	1.001	1.008	0.995	1.004
SAMPLE VARIANCE	0.002846	0.000571	0.000628	0.000193	0.000202	0.000250	0.000245
SAMPLE COEFF OF VARIANCE	0.050	0.023	0.025	0.014	0.014	0.016	0.016

REGION: WESTERN PAID + O/S - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	1.066	1.008	0.994	1.005	1.003	0.999	1.006
1983	1.085	1.026	1.013	1.003	1.009	1.005	0.998
1984	1.100	1.025	1.020	1.009	1.005	1.007	1.004
1985	1.149	1.068	1.026	1.015	1.012	1.003	1.007
1986	1.141	1.074	1.039	1.013	1.011	1.007	1.005
1987	1.133	1.055	1.036	1.013	1.008	1.011	1.003
1988	1.127	1.064	1.031	1.009	1.008	0.999	0.998
1989	1.136	1.055	1.019	1.015	1.006	1.000	1.003
POINTS	8	8	8	8	8	8	8
AVERAGE	1.117	1.047	1.022	1.010	1.008	1.004	1.003
SAMPLE VARIANCE	0.000890	0.000576	0.000209	0.000021	0.000009	0.000019	0.000011
SAMPLE COEFF OF VARIANCE	0.027	0.023	0.014	0.004	0.003	0.004	0.003

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: NEBRASKA PAID + O/S - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: INDEMNITY (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.002960	0.001103	0.001329	0.000269	0.000257	0.000649	0.000544	0.007112	
THREE-YEAR STRAIGHT AVERAGE	0.002855	0.001100	0.001244	0.000293	0.000256	0.000555	0.000513	0.006816	
FOUR-YEAR STRAIGHT AVERAGE	0.003477	0.000853	0.001214	0.000263	0.000238	0.000401	0.000460	0.006905	
TWO-YEAR EXPONENTIAL AVG	0.002907	0.001130	0.001304	0.000270	0.000267	0.000639	0.000537	0.007054	
THREE-YEAR EXPONENTIAL AVG	0.002809	0.001111	0.001226	0.000290	0.000261	0.000547	0.000503	0.006747	*
FOUR-YEAR EXPONENTIAL AVG	0.003318	0.000886	0.001191	0.000263	0.000240	0.000412	0.000453	0.006764	

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STATE: NEBRASKA PAID + O/S - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: INDEMNITY ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
FOUR-YEAR STRAIGHT AVERAGE	0	1	0	0	1	1	0	3	*
TWO-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
THREE-YEAR EXPONENTIAL AVG	1	0	0	0	0	0	0	1	
FOUR-YEAR EXPONENTIAL AVG	0	0	1	1	0	0	1	3	*

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: NEBRASKA INCURRED - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.008	1.021	1.018	0.977	1.000	0.987	1.010
1982	0.953	1.002	0.985	0.996	0.996	1.000	1.010
1983	0.959	0.972	0.966	0.981	1.017	0.995	0.995
1984	0.925	0.976	0.995	0.989	1.032	1.021	0.985
1985	0.974	1.045	0.988	0.964	0.998	0.982	0.979
1986	1.003	0.996	1.003	0.982	1.010	0.965	1.002
1987	0.976	1.037	1.043	0.984	0.991	0.984	1.033
1988	1.000	0.997	1.027	1.003	1.025	1.009	1.002
1989	1.044	1.016	0.976	1.009	0.995	0.986	1.011
POINTS	9	9	9	9	9	9	9
AVERAGE	0.982	1.007	1.000	0.987	1.007	0.992	1.003
SAMPLE VARIANCE	0.001250	0.000632	0.000630	0.000190	0.000214	0.000270	0.000254
SAMPLE COEFF OF VARIANCE	0.036	0.025	0.025	0.014	0.015	0.017	0.016

REGION: WESTERN INCURRED - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	0.967	0.964	0.977	0.987	1.000	1.000	1.006
1983	0.997	0.984	0.996	0.982	1.002	1.001	0.996
1984	1.017	0.991	1.011	0.994	1.001	1.005	1.003
1985	1.065	1.033	1.016	0.992	1.009	1.002	1.004
1986	1.052	1.034	1.023	0.987	1.004	1.001	0.988
1987	1.038	1.028	1.026	1.004	1.006	1.011	1.003
1988	1.028	1.029	1.018	0.999	1.014	0.996	0.999
1989	1.024	1.020	1.000	1.000	0.999	0.993	1.003
POINTS	8	8	8	8	8	8	8
AVERAGE	1.024	1.010	1.008	0.993	1.004	1.001	1.000
SAMPLE VARIANCE	0.000957	0.000720	0.000270	0.000057	0.000026	0.000030	0.000034
SAMPLE COEFF OF VARIANCE	0.030	0.027	0.016	0.008	0.005	0.005	0.006

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: NEBRASKA INCURRED - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: INDEMNITY (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.001458	0.001181	0.001188	0.000246	0.000333	0.000684	0.000522	0.005612	
THREE-YEAR STRAIGHT AVERAGE	0.001252	0.001133	0.001058	0.000345	0.000330	0.000555	0.000506	0.005178	
FOUR-YEAR STRAIGHT AVERAGE	0.001368	0.000919	0.001069	0.000340	0.000227	0.000406	0.000484	0.004814	
TWO-YEAR EXPONENTIAL AVG	0.001435	0.001206	0.001168	0.000244	0.000347	0.000674	0.000515	0.005590	
THREE-YEAR EXPONENTIAL AVG	0.001245	0.001148	0.001050	0.000331	0.000336	0.000551	0.000496	0.005157	
FOUR-YEAR EXPONENTIAL AVG	0.001327	0.000951	0.001051	0.000327	0.000243	0.000420	0.000471	0.004790	*

STATE: NEBRASKA INCURRED - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: INDEMNITY (*1* INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
FOUR-YEAR STRAIGHT AVERAGE	0	1	0	0	1	1	0	3	*
TWO-YEAR EXPONENTIAL AVG	0	0	0	1	0	0	0	1	
THREE-YEAR EXPONENTIAL AVG	1	0	1	0	0	0	0	2	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	1	1	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: NEBRASKA PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.162	1.069	1.034	1.004	1.005	1.008	1.011
1982	1.165	1.057	1.024	1.019	1.005	1.005	1.011
1983	1.177	1.070	1.024	1.017	1.025	1.007	1.006
1984	1.165	1.054	1.035	1.003	1.011	1.019	1.039
1985	1.180	1.063	1.025	1.021	1.009	1.008	1.020
1986	1.246	1.062	1.025	1.022	1.014	1.006	1.010
1987	1.232	1.091	1.032	1.022	1.011	1.014	1.006
1988	1.240	1.075	1.044	1.014	1.009	1.047	1.008
1989	1.243	1.088	1.032	1.023	1.010	1.008	1.002
POINTS	9	9	9	9	9	9	9
AVERAGE	1.201	1.070	1.031	1.016	1.011	1.014	1.013
SAMPLE VARIANCE	0.001425	0.000166	0.000046	0.000059	0.000036	0.000177	0.000123
SAMPLE COEFF OF VARIANCE	0.031	0.012	0.007	0.008	0.006	0.013	0.011

REGION: WESTERN PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	1.215	1.073	1.042	1.026	1.020	1.017	1.015
1983	1.213	1.077	1.042	1.028	1.021	1.017	1.013
1984	1.233	1.078	1.047	1.029	1.019	1.017	1.016
1985	1.249	1.084	1.041	1.030	1.022	1.015	1.014
1986	1.260	1.086	1.041	1.026	1.022	1.019	1.015
1987	1.278	1.092	1.049	1.028	1.023	1.020	1.012
1988	1.303	1.101	1.052	1.030	1.022	1.021	1.016
1989	1.291	1.102	1.053	1.029	1.022	1.015	1.014
POINTS	8	8	8	8	8	8	8
AVERAGE	1.255	1.087	1.046	1.028	1.021	1.018	1.014
SAMPLE VARIANCE	0.001148	0.000119	0.000025	0.000002	0.000002	0.000005	0.000002
SAMPLE COEFF OF VARIANCE	0.027	0.010	0.005	0.002	0.001	0.002	0.001

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: NEBRASKA PAID - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: MEDICAL (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.001179	0.000171	0.000074	0.000062	0.000022	0.000401	0.000098	0.002007	
THREE-YEAR STRAIGHT AVERAGE	0.001394	0.000228	0.000062	0.000050	0.000006	0.000333	0.000096	0.002170	
FOUR-YEAR STRAIGHT AVERAGE	0.001758	0.000223	0.000052	0.000043	0.000006	0.000278	0.000090	0.002451	
TWO-YEAR EXPONENTIAL AVG	0.001155	0.000172	0.000074	0.000062	0.000021	0.000406	0.000095	0.001985	*
THREE-YEAR EXPONENTIAL AVG	0.001338	0.000222	0.000062	0.000050	0.000006	0.000340	0.000090	0.002109	
FOUR-YEAR EXPONENTIAL AVG	0.001638	0.000217	0.000053	0.000043	0.000006	0.000290	0.000084	0.002330	

STATE: NEBRASKA PAID - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: MEDICAL ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	1	0	0	0	0	0	1	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
FOUR-YEAR STRAIGHT AVERAGE	0	0	1	1	0	1	0	3	*
TWO-YEAR EXPONENTIAL AVG	1	0	0	0	0	0	0	1	
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	1	0	1	2	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: NEBRASKA PAID + O/S - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.035	0.989	0.998	0.998	1.001	1.028	0.994
1982	1.004	1.005	0.993	1.005	1.013	0.935	1.003
1983	1.030	1.059	0.995	1.006	1.024	0.995	1.014
1984	1.037	0.990	1.021	0.972	1.011	1.049	0.988
1985	1.045	0.995	1.014	1.012	0.999	0.988	1.011
1986	1.078	0.980	1.005	1.034	1.011	0.998	0.995
1987	1.033	1.052	1.043	1.000	0.978	1.009	1.005
1988	1.051	1.028	1.014	0.994	0.997	0.992	0.993
1989	1.057	1.020	0.993	1.020	0.995	1.010	0.995
POINTS	9	9	9	9	9	9	9
AVERAGE	1.041	1.013	1.008	1.005	1.003	1.000	1.000
SAMPLE VARIANCE	0.000418	0.000812	0.000274	0.000300	0.000177	0.000978	0.000079
SAMPLE COEFF OF VARIANCE	0.020	0.028	0.016	0.017	0.013	0.031	0.009

REGION: WESTERN PAID + O/S - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	1.030	1.012	1.002	1.012	1.009	1.014	1.017
1983	1.041	1.014	1.011	1.010	1.012	1.009	1.001
1984	1.056	1.006	1.016	1.001	1.011	1.015	1.008
1985	1.058	1.013	1.009	1.012	1.002	1.004	1.008
1986	1.072	1.026	1.015	1.012	1.005	1.012	1.012
1987	1.075	1.026	1.021	1.008	1.001	1.014	1.009
1988	1.061	1.021	1.010	1.001	1.000	1.003	1.006
1989	1.062	1.023	1.010	1.007	1.008	1.003	1.020
POINTS	8	8	8	8	8	8	8
AVERAGE	1.057	1.018	1.012	1.008	1.006	1.009	1.010
SAMPLE VARIANCE	0.000225	0.000055	0.000032	0.000022	0.000022	0.000027	0.000037
SAMPLE COEFF OF VARIANCE	0.014	0.007	0.006	0.005	0.005	0.005	0.006

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: NEBRASKA PAID + O/S - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: MEDICAL (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.000512	0.001146	0.000535	0.000776	0.000234	0.000411	0.000038	0.003652	
THREE-YEAR STRAIGHT AVERAGE	0.000506	0.001229	0.000367	0.000462	0.000226	0.000068	0.000069	0.002928	
FOUR-YEAR STRAIGHT AVERAGE	0.000598	0.000801	0.000409	0.000354	0.000258	0.000153	0.000060	0.002633	*
TWO-YEAR EXPONENTIAL AVG	0.000513	0.001123	0.000529	0.000766	0.000235	0.000419	0.000042	0.003628	
THREE-YEAR EXPONENTIAL AVG	0.000502	0.001189	0.000377	0.000476	0.000226	0.000079	0.000069	0.002918	
FOUR-YEAR EXPONENTIAL AVG	0.000575	0.000819	0.000409	0.000378	0.000251	0.000148	0.000061	0.002641	

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STATE: NEBRASKA PAID + O/S - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: MEDICAL (*1* INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	1	1	
THREE-YEAR STRAIGHT AVERAGE	0	0	1	0	1	1	0	3	*
FOUR-YEAR STRAIGHT AVERAGE	0	1	0	1	0	0	0	2	
TWO-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
THREE-YEAR EXPONENTIAL AVG	1	0	0	0	0	0	0	1	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: NEBRASKA INCURRED - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.006	0.973	1.000	0.995	1.001	1.027	0.995
1982	0.964	0.988	0.991	0.995	1.012	0.935	1.002
1983	0.989	1.031	0.986	0.994	1.021	0.994	1.014
1984	0.995	0.972	1.018	0.968	1.010	1.048	0.987
1985	1.002	0.980	1.012	1.002	0.993	0.987	1.009
1986	1.027	0.964	1.000	1.024	1.007	0.997	0.993
1987	0.977	1.036	1.035	0.995	0.975	1.006	1.003
1988	0.996	1.016	1.011	0.993	1.007	0.993	0.995
1989	1.003	1.005	0.991	1.013	0.991	1.005	0.994
POINTS	9	9	9	9	9	9	9
AVERAGE	0.995	0.996	1.005	0.998	1.002	0.999	0.999
SAMPLE VARIANCE	0.000322	0.000719	0.000245	0.000236	0.000188	0.000947	0.000073
SAMPLE COEFF OF VARIANCE	0.018	0.027	0.016	0.015	0.014	0.031	0.009

REGION: WESTERN INCURRED - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	0.972	0.984	0.990	0.999	1.006	1.013	1.017
1983	0.985	0.986	0.997	0.994	1.007	1.006	1.001
1984	1.003	0.985	1.011	0.991	1.009	1.014	1.007
1985	1.007	0.994	1.000	0.996	0.998	1.002	1.006
1986	1.013	1.001	1.003	0.996	1.001	1.008	1.006
1987	1.013	1.008	1.014	1.001	0.999	1.010	1.006
1988	1.009	1.007	1.005	0.996	1.005	1.002	1.009
1989	1.017	1.014	1.003	0.999	1.003	0.998	1.019
POINTS	8	8	8	8	8	8	8
AVERAGE	1.002	0.997	1.003	0.996	1.003	1.007	1.009
SAMPLE VARIANCE	0.000247	0.000138	0.000058	0.000010	0.000015	0.000032	0.000037
SAMPLE COEFF OF VARIANCE	0.016	0.012	0.008	0.003	0.004	0.006	0.006

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: NEBRASKA INCURRED - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: MEDICAL (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.000525	0.001080	0.000446	0.000584	0.000283	0.000375	0.000027	0.003321	
THREE-YEAR STRAIGHT AVERAGE	0.000477	0.001164	0.000291	0.000370	0.000304	0.000053	0.000054	0.002712	
FOUR-YEAR STRAIGHT AVERAGE	0.000491	0.000839	0.000344	0.000296	0.000307	0.000118	0.000048	0.002443	*
TWO-YEAR EXPONENTIAL AVG	0.000527	0.001063	0.000441	0.000576	0.000291	0.000382	0.000031	0.003310	
THREE-YEAR EXPONENTIAL AVG	0.000476	0.001130	0.000299	0.000377	0.000307	0.000062	0.000054	0.002706	
FOUR-YEAR EXPONENTIAL AVG	0.000485	0.000847	0.000341	0.000310	0.000306	0.000114	0.000049	0.002453	

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STATE: NEBRASKA INCURRED - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: MEDICAL (*1* INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	1	0	1	2	*
THREE-YEAR STRAIGHT AVERAGE	0	0	1	0	0	1	0	2	*
FOUR-YEAR STRAIGHT AVERAGE	0	1	0	1	0	0	0	2	*
TWO-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
THREE-YEAR EXPONENTIAL AVG	1	0	0	0	0	0	0	1	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
NEBRASKA INDEMNITY COMPARISON OF PROJECTIONS

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	ACTUAL 8TH	AVERAGE	*=LOW AVG
1978 PAID				19,939,840	20,160,216	19,726,082	19,764,610	19,720,221		
1978 PAID + Q/S				23,241,454	23,533,196	23,995,111	23,177,545	23,742,520		
1978 INCURRED				23,528,165	23,515,339	24,061,107	23,251,065	23,718,751		
1978 PAID (1)				1.11%	2.23%	0.03%	0.23%		0.90%	*
1978 PAID + Q/S (1)				2.11%	0.88%	1.06%	2.38%		1.61%	
1978 INCURRED (1)				0.80%	0.86%	1.44%	1.97%		1.27%	
1978 PAID (2)					1.11%	2.15%	0.20%	0.22%	0.92%	*
1978 PAID + Q/S (2)					1.26%	1.96%	3.41%	2.44%	2.27%	
1978 INCURRED (2)					0.05%	2.32%	3.37%	2.01%	1.94%	
1979 PAID			22,452,267	22,870,430	22,708,989	22,676,758	22,765,134	22,438,064		
1979 PAID + Q/S			26,909,196	26,822,633	26,974,212	25,834,862	25,238,260	26,277,859		
1979 INCURRED			27,397,854	26,614,210	27,047,668	25,966,602	25,236,811	26,323,136		
1979 PAID (1)			0.06%	1.95%	1.21%	1.06%	1.46%		1.14%	*
1979 PAID + Q/S (1)			2.40%	2.07%	2.65%	1.69%	3.96%		2.55%	
1979 INCURRED (1)			4.08%	1.11%	2.75%	1.35%	4.13%		2.68%	
1979 PAID (2)				1.86%	0.71%	0.14%	0.39%	1.44%	0.91%	*
1979 PAID + Q/S (2)				0.32%	0.57%	4.22%	2.31%	4.12%	2.31%	
1979 INCURRED (2)				2.86%	1.63%	4.00%	2.81%	4.30%	3.12%	
1980 PAID		24,020,093	24,236,814	24,291,151	23,947,939	24,099,126	23,378,377	23,342,177		
1980 PAID + Q/S		29,199,035	28,467,982	28,889,709	27,494,109	27,133,648	28,156,201	27,595,378		
1980 INCURRED		29,820,353	28,109,967	29,020,997	27,731,536	27,055,605	28,092,884	27,654,052		
1980 PAID (1)		2.90%	3.83%	4.07%	2.60%	3.24%	0.16%		2.80%	*
1980 PAID + Q/S (1)		5.81%	3.16%	4.69%	0.37%	1.67%	2.03%		2.96%	
1980 INCURRED (1)		7.83%	1.65%	4.94%	0.28%	2.16%	1.59%		3.08%	
1980 PAID (2)			0.90%	0.22%	1.41%	0.63%	2.99%	0.15%	1.05%	*
1980 PAID + Q/S (2)			2.50%	1.48%	4.83%	1.31%	3.77%	1.99%	2.65%	
1980 INCURRED (2)			5.74%	3.24%	4.44%	2.44%	3.83%	1.56%	3.54%	
1981 PAID	24,638,786	25,358,344	25,530,205	25,132,733	24,980,769	24,639,314	24,795,417	24,869,069		
1981 PAID + Q/S	29,716,529	29,118,412	28,698,314	27,646,762	27,466,779	27,640,502	28,545,559	28,347,979		
1981 INCURRED	30,367,544	28,430,148	28,601,466	27,896,804	27,207,545	27,615,641	28,593,311	28,409,943		
1981 PAID (1)	0.93%	1.97%	2.66%	1.06%	0.45%	0.92%	0.30%		1.18%	*
1981 PAID + Q/S (1)	4.83%	2.72%	1.24%	2.47%	3.11%	2.50%	0.70%		2.51%	
1981 INCURRED (1)	6.87%	0.07%	0.67%	1.81%	4.23%	2.80%	0.65%		2.45%	
1981 PAID (2)		2.92%	0.68%	1.56%	0.60%	1.37%	0.63%	0.30%	1.15%	*
1981 PAID + Q/S (2)		2.01%	1.44%	3.66%	0.65%	0.63%	3.27%	0.69%	1.77%	
1981 INCURRED (2)		6.38%	0.60%	2.46%	2.47%	1.50%	3.54%	0.64%	2.51%	
1982 PAID	24,895,032	25,610,617	25,960,135	25,510,691	25,365,270	25,059,752	25,059,842			
1982 PAID + Q/S	27,392,681	26,150,938	27,010,467	27,061,065	27,701,250	28,395,946	27,920,913			
1982 INCURRED	27,109,573	26,334,485	27,655,665	27,035,137	28,016,897	29,350,957	28,727,725			
1982 PAID (1)	0.66%	2.20%	3.59%	1.80%	1.22%	0.00%			1.58%	*
1982 PAID + Q/S (1)	1.89%	6.34%	3.26%	3.08%	0.79%	1.70%			2.84%	
1982 INCURRED (1)	5.63%	8.33%	3.73%	5.89%	2.47%	2.17%			4.71%	
1982 PAID (2)		2.87%	1.36%	1.73%	0.57%	1.20%	0.00%		1.29%	*
1982 PAID + Q/S (2)		4.53%	3.29%	0.19%	2.37%	2.51%	1.67%		2.43%	
1982 INCURRED (2)		2.86%	5.02%	2.24%	3.63%	4.76%	2.12%		3.44%	
1983 PAID	26,748,853	27,000,157	26,308,435	26,775,267	27,300,611	27,752,726				
1983 PAID + Q/S	29,150,110	30,095,659	29,651,909	32,196,701	32,726,003	32,518,373				
1983 INCURRED	29,353,828	30,821,381	29,475,414	31,970,752	33,607,728	32,848,585				
1983 PAID (1)	3.62%	2.71%	5.20%	3.52%	1.63%				3.34%	*
1983 PAID + Q/S (1)	10.36%	7.45%	8.81%	0.99%	0.64%				5.65%	
1983 INCURRED (1)	10.64%	6.17%	10.27%	2.67%	2.31%				6.41%	
1983 PAID (2)		0.94%	2.56%	1.77%	1.96%	1.66%			1.78%	*
1983 PAID + Q/S (2)		3.24%	1.47%	8.58%	1.64%	0.63%			3.12%	
1983 INCURRED (2)		5.00%	4.37%	8.47%	5.12%	2.26%			5.04%	
1984 PAID	30,520,025	31,182,956	32,308,387	33,671,319	33,904,652					
1984 PAID + Q/S	32,612,462	35,153,352	37,765,883	38,233,500	39,079,608					
1984 INCURRED	33,946,504	35,136,824	37,985,033	39,706,405	40,009,182					
1984 PAID (1)	9.98%	8.03%	4.71%	0.69%					5.85%	*
1984 PAID + Q/S (1)	16.55%	10.05%	3.36%	2.17%					8.03%	
1984 INCURRED (1)	15.15%	12.18%	5.06%	0.76%					8.29%	
1984 PAID (2)		2.17%	3.61%	4.22%	0.69%				2.67%	*
1984 PAID + Q/S (2)		7.79%	7.43%	1.24%	2.21%				4.67%	
1984 INCURRED (2)		3.51%	8.11%	4.53%	0.76%				4.23%	

NOTES: (1) ABSOLUTE DEVIATION FROM LAST PROJECTION (OR REPORT), RATIOED TO SAME.
(2) ABSOLUTE CHANGE RELATIVE TO PRIOR PROJECTION OR REPORT.
WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.
LOSSES HAVE BEEN RESTATED TO THE LATEST DIAGONAL.

WEIGHTS ASSIGNED TO PRECEDING YEARS:
N-4 0.0000
N-3 0.0000
N-2 0.5000
N-1 0.5000

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NATIONAL COUNCIL ON COMPENSATION INSURANCE
NEBRASKA INDEMNITY COMPARISON OF PROJECTIONS RESTATED TO INCURRED LEVEL

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	RESTATED 8TH	AVERAGE	*=LOW AVG
1978 PAID				24,749,938	24,530,795	23,838,765	24,377,774	24,167,005		
1978 PAID + Q/S				23,374,174	23,710,243	24,186,664	23,318,043	23,775,163		
1978 INCURRED				23,528,165	23,515,339	24,061,107	23,251,065	23,718,751		
1978 PAID (1)				2.41%	1.51%	1.36%	0.87%		1.54%	
1978 PAID + Q/S (1)				1.69%	0.27%	1.73%	1.92%		1.40%	
1978 INCURRED (1)				0.80%	0.86%	1.44%	1.97%		1.27%	*
1978 PAID (2)					0.89%	2.82%	2.26%	0.86%	1.71%	*
1978 PAID + Q/S (2)					1.44%	2.01%	3.59%		1.96%	
1978 INCURRED (2)					0.05%	2.32%	3.37%	2.01%	1.94%	
1979 PAID			27,868,439	27,828,562	27,443,577	27,969,633	27,898,527	26,651,262		
1979 PAID + Q/S			27,062,861	27,024,428	27,189,547	25,991,468	25,272,960	26,287,295		
1979 INCURRED			27,397,854	26,614,210	27,047,668	25,966,602	25,236,811	26,323,136		
1979 PAID (1)			4.57%	4.42%	2.97%	4.95%	4.68%		4.32%	
1979 PAID + Q/S (1)			2.95%	2.80%	3.43%	1.13%	3.86%		2.83%	
1979 INCURRED (1)			4.08%	1.11%	2.75%	1.35%	4.13%		2.68%	*
1979 PAID (2)				0.14%	1.38%	1.92%	0.25%	4.47%	1.63%	*
1979 PAID + Q/S (2)				0.14%	0.61%	4.41%	2.76%	4.01%	2.39%	
1979 INCURRED (2)				2.86%	1.63%	4.00%	2.81%	4.30%	3.12%	
1980 PAID		29,814,473	29,491,168	29,355,603	29,537,514	29,533,326	27,768,138	27,518,259		
1980 PAID + Q/S		29,365,776	28,682,156	29,120,335	27,660,774	27,170,954	28,166,311	27,648,487		
1980 INCURRED		29,820,353	28,109,967	29,020,997	27,731,536	27,055,605	28,092,884	27,654,052		
1980 PAID (1)		8.34%	7.17%	6.68%	7.34%	7.32%	0.91%		6.29%	
1980 PAID + Q/S (1)		6.21%	3.74%	5.32%	0.04%	1.73%	1.87%		3.15%	
1980 INCURRED (1)		7.83%	1.65%	4.94%	0.28%	2.16%	1.99%		3.08%	*
1980 PAID (2)			1.08%	0.46%	0.62%	0.01%	5.98%	0.90%	1.51%	*
1980 PAID + Q/S (2)			2.33%	1.53%	5.01%	1.77%	3.66%	1.84%	2.69%	
1980 INCURRED (2)			5.74%	3.24%	4.44%	2.44%	3.83%	1.56%	3.54%	
1981 PAID	30,582,413	30,855,837	30,852,986	30,998,846	30,613,774	29,265,841	29,231,494	28,926,890		
1981 PAID + Q/S	29,886,226	29,337,478	28,927,412	27,814,352	27,504,543	27,650,427	28,600,497	28,409,098		
1981 INCURRED	30,367,544	28,430,148	28,601,466	27,896,804	27,207,545	27,615,641	28,593,311	28,409,943		
1981 PAID (1)	5.72%	6.67%	6.66%	7.16%	5.83%	1.17%	1.05%		4.90%	
1981 PAID + Q/S (1)	5.20%	3.27%	1.82%	2.09%	3.18%	2.67%	0.67%		2.70%	
1981 INCURRED (1)	6.89%	0.07%	0.67%	1.81%	4.23%	2.80%	0.65%		2.45%	*
1981 PAID (2)		0.89%	0.01%	0.47%	1.24%	4.40%	0.12%	1.04%	1.17%	*
1981 PAID + Q/S (2)		1.84%	1.40%	3.85%	1.11%	0.53%	3.44%	0.67%	1.83%	
1981 INCURRED (2)		6.38%	0.60%	2.46%	2.47%	1.50%	3.54%	0.64%	2.51%	
1982 PAID	30,292,083	30,950,164	32,019,368	31,263,190	30,128,110	29,543,120	29,148,791			
1982 PAID + Q/S	27,598,765	26,359,701	27,174,199	27,098,271	27,711,197	28,450,596	27,981,112			
1982 INCURRED	27,109,573	26,334,485	27,655,665	27,035,137	28,016,897	29,350,957	28,727,725			
1982 PAID (1)	3.92%	6.18%	9.85%	7.25%	3.36%	1.35%			5.32%	
1982 PAID + Q/S (1)	1.37%	5.79%	2.88%	3.16%	0.96%	1.68%			2.64%	*
1982 INCURRED (1)	5.63%	8.33%	3.73%	5.89%	2.47%	2.17%			4.71%	
1982 PAID (2)		2.17%	3.45%	2.36%	3.63%	1.94%	1.33%		2.48%	
1982 PAID + Q/S (2)		4.49%	3.09%	0.28%	2.26%	2.67%	1.65%		2.41%	*
1982 INCURRED (2)		2.86%	5.02%	2.24%	3.63%	4.76%	2.12%		3.44%	
1983 PAID	32,325,710	33,302,137	32,240,820	31,802,863	32,184,885	32,281,065				
1983 PAID + Q/S	29,382,815	30,278,094	29,692,677	32,208,262	32,788,987	32,588,484				
1983 INCURRED	29,353,828	30,821,381	29,475,414	31,970,752	33,607,728	32,848,585				
1983 PAID (1)	0.14%	3.16%	0.12%	1.48%	0.30%				1.04%	*
1983 PAID + Q/S (1)	9.84%	7.09%	8.89%	1.17%	0.62%				5.52%	
1983 INCURRED (1)	10.64%	6.17%	10.27%	2.67%	2.31%				6.41%	
1983 PAID (2)		3.02%	3.19%	1.36%	1.20%	0.30%			1.81%	*
1983 PAID + Q/S (2)		3.05%	1.93%	8.47%	1.80%	0.61%			3.17%	
1983 INCURRED (2)		5.00%	4.37%	8.47%	5.12%	2.26%			5.04%	
1984 PAID	37,643,561	38,214,515	38,374,937	39,695,358	39,436,786					
1984 PAID + Q/S	32,810,153	35,201,684	37,779,444	38,307,084	39,163,865					
1984 INCURRED	33,946,504	35,136,824	37,985,033	39,706,405	40,009,182					
1984 PAID (1)	4.55%	3.10%	2.69%	0.66%					2.75%	*
1984 PAID + Q/S (1)	16.22%	10.12%	3.53%	2.19%					8.02%	
1984 INCURRED (1)	15.15%	12.18%	5.06%	0.76%					8.29%	
1984 PAID (2)		1.52%	0.42%	3.44%	0.65%				1.51%	*
1984 PAID + Q/S (2)		7.29%	7.32%	1.40%	2.24%				4.56%	
1984 INCURRED (2)		3.51%	8.11%	4.53%	0.76%				4.23%	

NOTES: (1) ABSOLUTE DEVIATION FROM LAST PROJECTION (OR REPORT), RATIOTED TO SAME.
(2) ABSOLUTE CHANGE RELATIVE TO PRIOR PROJECTION OR REPORT.
WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.
LOSSES RESTATED TO INCURRED LEVEL OF 8TH REPORT, AND TO LAST DIAGONAL.

WEIGHTS ASSIGNED TO PRECEDING YEARS:
N-4 0.0000
N-3 0.0000
N-2 0.5000
N-1 0.5000

NATIONAL COUNCIL ON COMPENSATION INSURANCE
NEBRASKA MEDICAL COMPARISON OF PROJECTIONS

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	ACTUAL 8TH	AVERAGE	*=LOW AVG
1978 PAID				13,649,160	13,818,787	14,052,511	14,078,878	13,813,866		
1978 PAID + Q/S				14,123,215	14,248,758	14,867,875	14,351,711	14,289,371		
1978 INCURRED				14,269,890	14,289,704	14,918,229	14,385,407	14,314,033		
1978 PAID (1)				1.19%	0.04%	1.73%	1.92%		1.22%	*
1978 PAID + Q/S (1)				1.16%	0.28%	4.05%	0.44%		1.48%	
1978 INCURRED (1)				0.31%	0.17%	4.22%	0.50%		1.30%	
1978 PAID (2)					1.24%	1.69%	0.19%	1.88%	1.25%	*
1978 PAID + Q/S (2)					0.89%	4.35%	3.47%	0.43%	2.29%	
1978 INCURRED (2)					0.14%	4.40%	3.57%	0.50%	2.15%	
1979 PAID			16,582,192	16,723,121	16,871,400	16,845,032	16,484,879	16,333,099		
1979 PAID + Q/S			17,154,119	17,289,314	17,551,615	17,147,745	16,861,440	16,898,106		
1979 INCURRED			17,433,222	17,299,530	17,674,922	17,181,020	16,885,473	16,920,897		
1979 PAID (1)			1.53%	2.39%	3.30%	3.13%	0.93%		2.25%	
1979 PAID + Q/S (1)			1.52%	2.32%	3.87%	1.48%	0.22%		1.88%	*
1979 INCURRED (1)			3.03%	2.24%	4.46%	1.54%	0.21%		2.29%	
1979 PAID (2)				0.85%	0.89%	0.16%	2.14%	0.92%	0.99%	*
1979 PAID + Q/S (2)				0.79%	1.52%	2.30%	1.67%	0.22%	1.30%	
1979 INCURRED (2)				0.77%	2.17%	2.79%	1.72%	0.21%	1.53%	
1980 PAID		16,928,022	17,184,312	17,645,206	17,827,155	17,532,508	17,532,628	17,540,037		
1980 PAID + Q/S		17,541,840	18,760,680	19,904,776	20,018,523	19,702,597	19,960,180	19,827,115		
1980 INCURRED		17,956,263	18,783,799	20,029,558	20,056,873	19,720,710	19,939,089	19,873,595		
1980 PAID (1)		3.49%	2.03%	0.60%	1.64%	0.04%	0.04%		1.31%	*
1980 PAID + Q/S (1)		11.53%	5.38%	0.39%	0.97%	0.63%	0.67%		3.26%	
1980 INCURRED (1)		9.65%	5.48%	0.78%	0.92%	0.77%	0.33%		2.99%	
1980 PAID (2)			1.51%	2.68%	1.03%	1.65%	0.00%	0.04%	1.15%	*
1980 PAID + Q/S (2)			6.95%	6.10%	0.57%	1.58%	1.31%	0.67%	2.85%	
1980 INCURRED (2)			4.61%	6.63%	0.14%	1.68%	1.11%	0.33%	2.41%	
1981 PAID	20,604,962	21,031,077	21,288,509	21,225,251	21,028,735	20,935,571	21,680,987	21,577,038		
1981 PAID + Q/S	21,965,033	23,128,052	23,260,103	23,047,369	23,503,718	23,044,992	22,758,118	22,661,761		
1981 INCURRED	22,361,057	22,996,807	23,239,959	23,105,136	23,453,199	23,016,668	22,844,186	22,736,716		
1981 PAID (1)	4.51%	2.53%	1.34%	1.63%	2.54%	2.97%	0.48%		2.29%	
1981 PAID + Q/S (1)	3.07%	2.06%	2.55%	1.70%	3.72%	1.69%	0.43%		2.17%	
1981 INCURRED (1)	1.65%	1.14%	2.21%	1.62%	3.15%	1.23%	0.47%		1.64%	*
1981 PAID (2)		2.07%	1.22%	0.30%	0.93%	0.44%	3.56%	0.48%	1.29%	*
1981 PAID + Q/S (2)		5.29%	0.48%	0.83%	1.98%	1.95%	1.24%	0.42%	1.74%	
1981 INCURRED (2)		2.84%	1.06%	0.58%	1.51%	1.86%	0.75%	0.47%	1.30%	
1982 PAID	22,262,499	22,589,706	22,653,759	22,324,138	22,269,105	22,620,096	22,082,263			
1982 PAID + Q/S	22,670,206	24,037,486	23,231,643	23,151,646	22,563,796	22,530,340	22,630,436			
1982 INCURRED	22,574,611	23,950,998	23,369,931	23,120,352	22,652,570	22,995,353	23,017,738			
1982 PAID (1)	0.82%	2.30%	2.59%	1.10%	0.85%	2.44%			1.68%	
1982 PAID + Q/S (1)	0.18%	6.22%	2.66%	2.30%	0.29%	0.44%			2.01%	
1982 INCURRED (1)	1.93%	4.05%	1.53%	0.45%	1.99%	0.10%			1.61%	*
1982 PAID (2)		1.47%	0.28%	1.46%	0.25%	1.58%	2.38%		1.23%	*
1982 PAID + Q/S (2)		6.03%	3.35%	0.34%	2.54%	0.15%	0.44%		2.14%	
1982 INCURRED (2)		6.10%	2.43%	1.07%	2.02%	1.51%	0.10%		2.20%	
1983 PAID	23,782,828	23,931,830	23,661,593	23,764,456	23,973,798	23,856,530				
1983 PAID + Q/S	26,365,077	25,700,003	25,402,177	26,013,583	25,145,665	25,222,433				
1983 INCURRED	26,326,747	25,841,088	25,402,298	25,978,954	25,528,857	25,401,149				
1983 PAID (1)	0.31%	0.32%	0.82%	0.39%	0.49%				0.46%	*
1983 PAID + Q/S (1)	4.53%	1.89%	0.71%	3.14%	0.30%				2.12%	
1983 INCURRED (1)	3.64%	1.73%	0.00%	2.27%	0.50%				1.63%	
1983 PAID (2)		0.63%	1.13%	0.43%	0.88%	0.49%			0.71%	*
1983 PAID + Q/S (2)		2.52%	1.16%	2.41%	3.34%	0.31%			1.95%	
1983 INCURRED (2)		1.84%	1.70%	2.27%	1.73%	0.50%			1.61%	
1984 PAID	25,955,123	27,283,544	28,041,748	28,828,369	28,813,983					
1984 PAID + Q/S	28,070,733	28,951,468	31,009,453	29,771,713	30,582,216					
1984 INCURRED	28,401,470	28,954,404	31,027,790	30,325,951	30,999,259					
1984 PAID (1)	9.92%	5.31%	2.68%	0.05%					4.49%	
1984 PAID + Q/S (1)	8.21%	5.33%	1.40%	2.65%					4.40%	
1984 INCURRED (1)	8.38%	6.60%	0.09%	2.17%					4.31%	*
1984 PAID (2)		5.12%	2.78%	2.81%	0.05%				2.69%	*
1984 PAID + Q/S (2)		3.14%	7.11%	3.99%	2.72%				4.26%	
1984 INCURRED (2)		1.95%	7.16%	2.26%	2.22%				3.40%	

NOTES: (1) ABSOLUTE DEVIATION FROM LAST PROJECTION (OR REPORT), RATIODE TO SAME.
(2) ABSOLUTE CHANGE RELATIVE TO PRIOR PROJECTION OR REPORT.
WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.
LOSSES HAVE BEEN RESTATED TO THE LATEST DIAGONAL.

N-4 0.0000
N-3 0.0000
N-2 0.5000
N-1 0.5000

WEIGHTS ASSIGNED TO
PRECEDING YEARS:

08:47 AM
03/14/91

NATIONAL COUNCIL ON COMPENSATION INSURANCE
NEBRASKA MEDICAL COMPARISON OF PROJECTIONS RESTATED TO INCURRED LEVEL

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	RESTATED 8TH	AVERAGE	*=LOW AVG
1978 PAID				14,566,315	14,875,402	14,768,258	15,352,059	15,001,367		
1978 PAID + Q/S				14,169,256	14,320,643	14,953,811	14,405,940	14,316,023		
1978 INCURRED				14,269,890	14,289,704	14,918,229	14,385,407	14,314,033		
1978 PAID (1)				2.90%	0.84%	1.55%	2.34%		1.91%	
1978 PAID + Q/S (1)				1.03%	0.03%	4.46%	0.63%		1.54%	
1978 INCURRED (1)				0.31%	0.17%	4.22%	0.50%		1.30%	*
1978 PAID (2)					2.12%	0.72%	3.95%	2.28%	2.27%	
1978 PAID + Q/S (2)					1.07%	4.42%	3.66%	0.62%	2.44%	
1978 INCURRED (2)					0.14%	4.40%	3.57%	0.50%	2.15%	*
1979 PAID			17,696,432	18,001,808	17,730,723	18,368,362	17,901,992	16,922,689		
1979 PAID + Q/S			17,210,040	17,376,538	17,653,063	17,212,540	16,892,889	16,924,083		
1979 INCURRED			17,433,222	17,299,530	17,674,922	17,181,020	16,885,473	16,920,897		
1979 PAID (1)			4.57%	6.38%	4.77%	8.54%	5.79%		6.01%	
1979 PAID + Q/S (1)			1.69%	2.67%	4.31%	1.70%	0.18%		2.11%	*
1979 INCURRED (1)			3.03%	2.24%	4.46%	1.54%	0.21%		2.29%	
1979 PAID (2)				1.73%	1.51%	3.60%	2.54%	5.47%	2.97%	
1979 PAID + Q/S (2)				0.97%	1.59%	2.50%	1.86%	0.18%	1.42%	*
1979 INCURRED (2)				0.77%	2.17%	2.79%	1.72%	0.21%	1.53%	
1980 PAID		18,065,501	18,498,262	18,543,943	19,439,301	19,039,680	18,165,518	18,984,347		
1980 PAID + Q/S		17,599,024	18,855,328	20,019,826	20,094,165	19,739,345	19,990,864	19,863,721		
1980 INCURRED		17,956,263	18,783,799	20,029,558	20,056,873	19,720,710	19,939,089	19,873,595		
1980 PAID (1)		4.84%	2.56%	2.32%	2.40%	0.29%	4.31%		2.79%	*
1980 PAID + Q/S (1)		11.40%	5.08%	0.79%	1.16%	0.63%	0.64%		3.28%	
1980 INCURRED (1)		9.65%	5.48%	0.78%	0.92%	0.77%	0.33%		2.99%	
1980 PAID (2)			2.40%	0.25%	4.83%	2.06%	4.59%	4.51%	3.10%	
1980 PAID + Q/S (2)			7.14%	6.18%	0.37%	1.77%	1.27%	0.64%	2.89%	
1980 INCURRED (2)			4.61%	6.63%	0.14%	1.68%	1.11%	0.33%	2.41%	*
1981 PAID	21,989,512	22,639,160	22,372,812	23,144,693	22,836,458	21,691,300	23,466,278	23,561,180		
1981 PAID + Q/S	22,036,637	23,244,732	23,374,431	23,134,456	23,547,556	23,080,419	22,800,135	22,725,796		
1981 INCURRED	22,361,057	22,996,807	23,239,959	23,105,136	23,453,199	23,016,668	22,844,186	22,736,716		
1981 PAID (1)	6.67%	3.91%	5.04%	1.77%	3.08%	7.94%	0.40%		4.12%	
1981 PAID + Q/S (1)	3.03%	2.28%	2.85%	1.80%	3.62%	1.56%	0.33%		2.21%	
1981 INCURRED (1)	1.65%	1.14%	2.21%	1.62%	3.15%	1.23%	0.47%		1.64%	*
1981 PAID (2)		2.95%	1.18%	3.45%	1.33%	5.01%	8.18%	0.40%	3.22%	
1981 PAID + Q/S (2)		5.48%	0.56%	1.03%	1.79%	1.98%	1.21%	0.33%	1.77%	
1981 INCURRED (2)		2.84%	1.06%	0.58%	1.51%	1.86%	0.75%	0.47%	1.30%	*
1982 PAID	23,964,739	23,740,284	24,702,384	24,243,220	23,072,972	24,482,717	24,112,853			
1982 PAID + Q/S	22,784,577	24,176,422	23,319,426	23,194,828	22,598,483	22,571,936	22,694,382			
1982 INCURRED	22,574,611	23,950,998	23,369,931	23,120,352	22,652,570	22,995,353	23,017,738			
1982 PAID (1)	0.61%	1.55%	2.44%	0.54%	4.31%	1.53%			1.83%	
1982 PAID + Q/S (1)	0.40%	6.53%	2.75%	0.42%	0.42%	0.54%			2.14%	
1982 INCURRED (1)	1.93%	4.05%	1.53%	0.45%	1.59%	0.10%			1.61%	*
1982 PAID (2)		0.94%	4.05%	1.86%	4.83%	6.11%	1.51%		3.22%	
1982 PAID + Q/S (2)		6.11%	3.54%	0.53%	2.57%	0.12%	0.54%		2.24%	
1982 INCURRED (2)		6.10%	2.43%	1.07%	2.02%	1.51%	0.10%		2.20%	*
1983 PAID	24,994,177	26,096,034	25,695,649	24,622,302	25,947,887	26,050,285				
1983 PAID + Q/S	26,517,466	25,797,113	25,449,556	26,053,573	25,192,090	25,293,704				
1983 INCURRED	26,326,747	25,841,088	25,402,298	25,978,954	25,528,857	25,401,149				
1983 PAID (1)	4.05%	0.18%	1.36%	5.48%	0.39%				2.29%	
1983 PAID + Q/S (1)	4.84%	1.99%	0.62%	3.00%	0.40%				2.17%	
1983 INCURRED (1)	3.64%	1.73%	0.00%	2.27%	0.50%				1.63%	*
1983 PAID (2)		4.41%	1.53%	4.18%	5.38%	0.39%			3.18%	
1983 PAID + Q/S (2)		2.72%	1.35%	2.37%	3.31%	0.40%			2.03%	
1983 INCURRED (2)		1.84%	1.70%	2.27%	1.73%	0.50%			1.61%	*
1984 PAID	28,302,297	29,628,958	29,053,995	31,202,201	31,463,607					
1984 PAID + Q/S	28,176,801	29,005,467	31,057,123	29,826,679	30,668,632					
1984 INCURRED	28,401,470	28,954,404	31,027,790	30,325,951	30,999,259					
1984 PAID (1)	10.05%	5.83%	7.66%	0.83%					6.09%	
1984 PAID + Q/S (1)	8.13%	5.42%	1.27%	2.75%					4.39%	
1984 INCURRED (1)	8.38%	6.60%	0.09%	2.17%					4.31%	*
1984 PAID (2)		4.69%	1.94%	7.39%	0.84%				3.71%	
1984 PAID + Q/S (2)		2.94%	7.07%	3.96%	2.82%				4.20%	
1984 INCURRED (2)		1.95%	7.16%	2.26%	2.22%				3.40%	*

NOTES: (1) ABSOLUTE DEVIATION FROM LAST PROJECTION (OR REPORT), RATIOW TO SAME.
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WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.
LOSSES RESTATED TO INCURRED LEVEL OF 8TH REPORT, AND TO LAST DIAGONAL.

WEIGHTS ASSIGNED TO PRECEDING YEARS:
N-4 0.0000
N-3 0.0000
N-2 0.5000
N-1 0.5000

OREGON

NATIONAL COUNCIL ON COMPENSATION INSURANCE
ANALYSIS OF FACTOR SELECTION METHODS AND PROJECTION METHODS
STATE: OREGON

ORDER OF PRESENTATION FOR TESTS AND ANALYSIS

Premium: Development by Diagonal, Showing Variance

Premium: Tests of Minimum Average Squared Deviations

Indemnity: Paid - Development by Diagonal, Showing Variance

Indemnity: Paid - Tests of Minimum Average Squared Deviations

Indemnity: Paid+O/S - Development by Diagonal, Showing Variance

Indemnity: Paid+O/S - Tests of Minimum Average Squared Deviations

Indemnity: Incurred - Development by Diagonal, Showing Variance

Indemnity: Incurred - Tests of Minimum Average Squared Deviations

Medical: Paid - Development by Diagonal, Showing Variance

Medical: Paid - Tests of Minimum Average Squared Deviations

Medical: Paid+O/S - Development by Diagonal, Showing Variance

Medical: Paid+O/S - Tests of Minimum Average Squared Deviations

Medical: Incurred - Development by Diagonal, Showing Variance

Medical: Incurred - Tests of Minimum Average Squared Deviations

Indemnity: Comparison of Projections - Deviations by Loss Statistic Type

Indemnity: Comparison of Restated Projections - Deviations by Loss Statistic Type

Medical: Comparison of Projections - Deviations by Loss Statistic Type

Medical: Comparison of Restated Projections - Deviations by Loss Statistic Type

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: OREGON

PREMIUM - DEVELOPMENT DIAGONALS BY EVALUATION DATE

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH
1981	1.011	1.000	0.999	1.000
1982	1.002	1.002	1.000	1.000
1983	1.012	1.002	1.000	1.000
1984	1.010	0.988	0.996	0.992
1985	1.019	1.002	0.999	0.998
1986	1.021	1.006	0.997	0.994
1987	1.025	0.999	1.000	1.005
1988	1.011	1.009	1.000	0.999
1989	1.012	1.004	0.999	0.999
POINTS	9	9	9	9
AVERAGE	1.014	1.001	0.999	0.999
SAMPLE VARIANCE	0.000048	0.000034	0.000002	0.000014
SAMPLE COEFF OF VARIANCE	0.007	0.006	0.001	0.004

REGION: WESTERN

PREMIUM - DEVELOPMENT DIAGONALS BY EVALUATION DATE

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH
1981				
1982	1.043	1.008	1.003	1.002
1983	1.033	1.003	0.999	1.001
1984	1.043	1.007	1.002	0.999
1985	1.048	1.003	1.002	0.999
1986	1.051	1.003	1.000	1.001
1987	1.043	1.006	1.002	1.004
1988	1.042	1.006	0.999	0.999
1989	1.028	1.000	1.000	0.999
POINTS	8	8	8	8
AVERAGE	1.041	1.005	1.001	1.001
SAMPLE VARIANCE	0.000056	0.000007	0.000002	0.000003
SAMPLE COEFF OF VARIANCE	0.007	0.003	0.002	0.002

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: OREGON

PREMIUM - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.000062	0.000047	0.000002	0.000019	0.000130	
THREE-YEAR STRAIGHT AVERAGE	0.000081	0.000028	0.000002	0.000023	0.000135	
FOUR-YEAR STRAIGHT AVERAGE	0.000082	0.000036	0.000002	0.000019	0.000139	
TWO-YEAR EXPONENTIAL AVG	0.000061	0.000048	0.000002	0.000020	0.000130	*
THREE-YEAR EXPONENTIAL AVG	0.000078	0.000030	0.000002	0.000023	0.000133	
FOUR-YEAR EXPONENTIAL AVG	0.000078	0.000035	0.000002	0.000019	0.000135	

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STATE: OREGON

PREMIUM - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	1	1	2	*
THREE-YEAR STRAIGHT AVERAGE	0	1	0	0	1	
FOUR-YEAR STRAIGHT AVERAGE	0	0	0	0	0	
TWO-YEAR EXPONENTIAL AVG	1	0	0	0	1	
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: OREGON PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE

LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.416	1.173	1.094	1.067	1.056	1.043	1.030
1982	1.433	1.172	1.100	1.065	1.051	1.048	1.034
1983	1.479	1.195	1.108	1.075	1.058	1.045	1.038
1984	1.450	1.171	1.107	1.081	1.063	1.044	1.033
1985	1.571	1.223	1.116	1.077	1.062	1.044	1.032
1986	1.562	1.227	1.126	1.079	1.061	1.050	1.034
1987	1.622	1.263	1.136	1.092	1.066	1.050	1.039
1988	1.663	1.218	1.086	1.053	1.057	1.038	1.039
1989	1.598	1.217	1.115	1.078	1.057	1.059	1.042
POINTS	9	9	9	9	9	9	9
AVERAGE	1.533	1.207	1.110	1.074	1.059	1.047	1.036
SAMPLE VARIANCE	0.008103	0.000979	0.000242	0.000124	0.000020	0.000035	0.000016
SAMPLE COEFF OF VARIANCE	0.059	0.026	0.014	0.010	0.004	0.006	0.004

REGION: WESTERN PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE

LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	1.527	1.205	1.099	1.058	1.042	1.033	1.023
1983	1.574	1.212	1.100	1.060	1.041	1.028	1.025
1984	1.623	1.220	1.110	1.066	1.041	1.033	1.022
1985	1.684	1.257	1.109	1.068	1.043	1.034	1.027
1986	1.675	1.273	1.126	1.065	1.043	1.039	1.024
1987	1.687	1.272	1.126	1.072	1.045	1.031	1.021
1988	1.700	1.265	1.124	1.073	1.049	1.031	1.026
1989	1.697	1.269	1.117	1.065	1.038	1.030	1.019
POINTS	8	8	8	8	8	8	8
AVERAGE	1.646	1.247	1.114	1.066	1.043	1.032	1.023
SAMPLE VARIANCE	0.004194	0.000847	0.000123	0.000027	0.000010	0.000011	0.000007
SAMPLE COEFF OF VARIANCE	0.039	0.023	0.010	0.005	0.003	0.003	0.003

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: OREGON PAID - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: INDEMNITY (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.004819	0.001045	0.000510	0.000257	0.000017	0.000083	0.000013	0.006744	
THREE-YEAR STRAIGHT AVERAGE	0.006566	0.001346	0.000471	0.000215	0.000019	0.000064	0.000017	0.008696	
FOUR-YEAR STRAIGHT AVERAGE	0.009215	0.001427	0.000448	0.000221	0.000023	0.000061	0.000016	0.011411	
TWO-YEAR EXPONENTIAL AVG	0.004769	0.001037	0.000514	0.000263	0.000017	0.000085	0.000013	0.006698	*
THREE-YEAR EXPONENTIAL AVG	0.006289	0.001301	0.000474	0.000222	0.000018	0.000067	0.000016	0.008386	
FOUR-YEAR EXPONENTIAL AVG	0.008491	0.001361	0.000451	0.000225	0.000021	0.000064	0.000016	0.010628	

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STATE: OREGON PAID - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: INDEMNITY ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	1	0	0	0	1	
FOUR-YEAR STRAIGHT AVERAGE	0	0	1	0	0	1	0	2	
TWO-YEAR EXPONENTIAL AVG	1	1	0	0	1	0	1	4	*
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: OREGON PAID + O/S - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	0.918	0.863	0.924	1.008	1.021	1.019	1.009
1982	1.030	0.991	0.980	0.978	0.999	0.999	1.005
1983	1.052	1.029	1.001	1.018	1.016	1.004	1.010
1984	1.117	1.066	1.062	1.057	1.022	1.013	1.011
1985	1.024	0.956	1.005	1.018	1.021	1.000	1.001
1986	1.129	1.121	1.096	1.068	1.027	1.008	1.013
1987	1.144	1.122	1.084	1.077	1.076	1.061	1.037
1988	1.088	1.062	1.064	1.032	1.058	1.031	1.031
1989	1.049	0.992	1.017	1.035	1.037	1.043	1.036
POINTS	9	9	9	9	9	9	9
AVERAGE	1.061	1.022	1.026	1.032	1.031	1.020	1.017
SAMPLE VARIANCE	0.004798	0.006860	0.003084	0.000980	0.000542	0.000453	0.000190
SAMPLE COEFF OF VARIANCE	0.065	0.081	0.054	0.030	0.023	0.021	0.014

REGION: WESTERN PAID + O/S - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	1.066	1.008	0.994	1.005	1.003	0.999	1.006
1983	1.085	1.026	1.013	1.003	1.009	1.005	0.998
1984	1.100	1.025	1.020	1.009	1.005	1.007	1.004
1985	1.149	1.068	1.026	1.015	1.012	1.003	1.007
1986	1.141	1.074	1.039	1.013	1.011	1.007	1.005
1987	1.133	1.055	1.036	1.013	1.008	1.011	1.003
1988	1.127	1.064	1.031	1.009	1.008	0.999	0.998
1989	1.136	1.055	1.019	1.015	1.006	1.000	1.003
POINTS	8	8	8	8	8	8	8
AVERAGE	1.117	1.047	1.022	1.010	1.008	1.004	1.003
SAMPLE VARIANCE	0.000890	0.000576	0.000209	0.000021	0.000009	0.000019	0.000011
SAMPLE COEFF OF VARIANCE	0.027	0.023	0.014	0.004	0.003	0.004	0.003

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: OREGON PAID + O/S - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: INDEMNITY (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.003696	0.008197	0.001931	0.000897	0.000736	0.000669	0.000216	0.016342	
THREE-YEAR STRAIGHT AVERAGE	0.002820	0.006733	0.002098	0.000661	0.000692	0.000621	0.000238	0.013863	
FOUR-YEAR STRAIGHT AVERAGE	0.002380	0.004962	0.002227	0.000920	0.000741	0.000705	0.000276	0.012210	*
TWO-YEAR EXPONENTIAL AVG	0.003692	0.008159	0.001940	0.000896	0.000724	0.000667	0.000212	0.016289	
THREE-YEAR EXPONENTIAL AVG	0.002870	0.006786	0.002064	0.000665	0.000680	0.000617	0.000229	0.013911	
FOUR-YEAR EXPONENTIAL AVG	0.002415	0.005185	0.002133	0.000876	0.000716	0.000684	0.000260	0.012269	

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STATE: OREGON PAID + O/S - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: INDEMNITY ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	1	0	0	0	0	1	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	1	0	0	0	1	
FOUR-YEAR STRAIGHT AVERAGE	1	1	0	0	0	0	0	2	*
TWO-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	1	1	
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	1	1	0	2	*
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: OREGON INCURRED - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	0.956	0.897	0.963	1.038	1.043	1.035	1.017
1982	0.982	0.962	0.970	0.964	0.993	0.996	1.000
1983	0.975	0.979	0.977	0.994	1.004	0.998	1.003
1984	1.027	1.021	1.039	1.038	1.008	1.005	1.001
1985	0.974	0.960	0.999	1.010	1.027	1.013	1.017
1986	1.012	1.040	1.027	1.025	1.005	0.995	1.000
1987	1.031	1.047	1.023	1.005	1.023	1.025	1.006
1988	1.038	1.018	1.032	1.001	1.016	1.008	1.023
1989	0.963	0.961	0.987	1.010	1.014	1.026	1.023
POINTS	9	9	9	9	9	9	9
AVERAGE	0.995	0.987	1.002	1.009	1.015	1.011	1.010
SAMPLE VARIANCE	0.001001	0.002340	0.000842	0.000534	0.000218	0.000212	0.000098
SAMPLE COEFF OF VARIANCE	0.032	0.049	0.029	0.023	0.015	0.014	0.010

REGION: WESTERN INCURRED - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	0.967	0.964	0.977	0.987	1.000	1.000	1.006
1983	0.997	0.984	0.996	0.982	1.002	1.001	0.996
1984	1.017	0.991	1.011	0.994	1.001	1.005	1.003
1985	1.065	1.033	1.016	0.992	1.009	1.002	1.004
1986	1.052	1.034	1.023	0.987	1.004	1.001	0.988
1987	1.038	1.028	1.026	1.004	1.006	1.011	1.003
1988	1.028	1.029	1.018	0.999	1.014	0.996	0.999
1989	1.024	1.020	1.000	1.000	0.999	0.993	1.003
POINTS	8	8	8	8	8	8	8
AVERAGE	1.024	1.010	1.008	0.993	1.004	1.001	1.000
SAMPLE VARIANCE	0.000957	0.000720	0.000270	0.000057	0.000026	0.000030	0.000034
SAMPLE COEFF OF VARIANCE	0.030	0.027	0.016	0.008	0.005	0.005	0.006

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: OREGON INCURRED - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: INDEMNITY (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.001538	0.002404	0.000387	0.000088	0.000136	0.000173	0.000157	0.004882	
THREE-YEAR STRAIGHT AVERAGE	0.001336	0.002135	0.000474	0.000155	0.000161	0.000200	0.000141	0.004602	
FOUR-YEAR STRAIGHT AVERAGE	0.001018	0.001765	0.000489	0.000207	0.000078	0.000166	0.000117	0.003841	*
TWO-YEAR EXPONENTIAL AVG	0.001547	0.002396	0.000398	0.000091	0.000139	0.000180	0.000156	0.004906	
THREE-YEAR EXPONENTIAL AVG	0.001354	0.002138	0.000464	0.000138	0.000159	0.000201	0.000141	0.004595	
FOUR-YEAR EXPONENTIAL AVG	0.001067	0.001791	0.000465	0.000182	0.000086	0.000170	0.000120	0.003882	

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STATE: OREGON INCURRED - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: INDEMNITY ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	1	1	0	0	0	2	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
FOUR-YEAR STRAIGHT AVERAGE	1	1	0	0	1	1	1	5	*
TWO-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: OREGON PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.245	1.107	1.065	1.057	1.047	1.038	1.029
1982	1.256	1.110	1.078	1.053	1.045	1.039	1.037
1983	1.252	1.111	1.077	1.062	1.047	1.038	1.032
1984	1.231	1.086	1.079	1.060	1.049	1.036	1.035
1985	1.293	1.122	1.077	1.060	1.048	1.042	1.032
1986	1.327	1.142	1.085	1.069	1.058	1.043	1.038
1987	1.413	1.174	1.108	1.068	1.067	1.050	1.036
1988	1.351	1.115	1.070	1.050	1.055	1.038	1.033
1989	1.322	1.128	1.079	1.057	1.027	1.016	1.028
POINTS	9	9	9	9	9	9	9
AVERAGE	1.299	1.122	1.080	1.060	1.049	1.038	1.033
SAMPLE VARIANCE	0.003581	0.000622	0.000145	0.000039	0.000119	0.000084	0.000012
SAMPLE COEFF OF VARIANCE	0.046	0.022	0.011	0.006	0.010	0.009	0.003

REGION: WESTERN PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	1.215	1.073	1.042	1.026	1.020	1.017	1.015
1983	1.213	1.077	1.042	1.028	1.021	1.017	1.013
1984	1.233	1.078	1.047	1.029	1.019	1.017	1.016
1985	1.249	1.084	1.041	1.030	1.022	1.015	1.014
1986	1.260	1.086	1.041	1.026	1.022	1.019	1.015
1987	1.278	1.092	1.049	1.028	1.023	1.020	1.012
1988	1.303	1.101	1.052	1.030	1.022	1.021	1.016
1989	1.291	1.102	1.053	1.029	1.022	1.015	1.014
POINTS	8	8	8	8	8	8	8
AVERAGE	1.255	1.087	1.046	1.028	1.021	1.018	1.014
SAMPLE VARIANCE	0.001148	0.000119	0.000025	0.000002	0.000002	0.000005	0.000002
SAMPLE COEFF OF VARIANCE	0.027	0.010	0.005	0.002	0.001	0.002	0.001

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: OREGON PAID - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: MEDICAL (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.004289	0.001176	0.000316	0.000088	0.000300	0.000191	0.000016	0.006377	
THREE-YEAR STRAIGHT AVERAGE	0.005071	0.001230	0.000259	0.000074	0.000286	0.000189	0.000019	0.007130	
FOUR-YEAR STRAIGHT AVERAGE	0.005522	0.001072	0.000241	0.000072	0.000258	0.000181	0.000014	0.007361	
TWO-YEAR EXPONENTIAL AVG	0.004202	0.001164	0.000317	0.000087	0.000295	0.000188	0.000016	0.006269	*
THREE-YEAR EXPONENTIAL AVG	0.004881	0.001205	0.000264	0.000074	0.000284	0.000187	0.000019	0.006913	
FOUR-YEAR EXPONENTIAL AVG	0.005229	0.001062	0.000246	0.000072	0.000259	0.000180	0.000015	0.007064	

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STATE: OREGON PAID - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: MEDICAL ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
FOUR-YEAR STRAIGHT AVERAGE	0	0	1	0	1	0	1	3	*
TWO-YEAR EXPONENTIAL AVG	1	0	0	0	0	0	0	1	
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	1	0	1	0	1	0	3	*

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: OREGON PAID + O/S - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	0.985	1.009	1.034	1.047	1.047	1.044	1.039
1982	1.031	1.042	1.040	1.029	1.023	1.034	1.038
1983	1.058	1.029	1.048	1.043	1.032	1.027	1.029
1984	1.077	1.030	1.061	1.038	1.039	1.031	1.041
1985	1.010	0.942	0.968	1.008	1.003	1.006	1.005
1986	1.071	1.046	1.042	1.011	0.981	0.992	0.991
1987	1.151	1.081	1.033	1.035	1.034	1.006	0.992
1988	1.014	1.035	1.050	1.036	1.042	1.039	1.031
1989	0.997	1.007	1.045	1.062	1.053	1.030	1.035
POINTS	9	9	9	9	9	9	9
AVERAGE	1.044	1.025	1.036	1.034	1.028	1.023	1.022
SAMPLE VARIANCE	0.002672	0.001434	0.000717	0.000286	0.000527	0.000311	0.000419
SAMPLE COEFF OF VARIANCE	0.050	0.037	0.026	0.016	0.022	0.017	0.020

REGION: WESTERN PAID + O/S - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	1.030	1.012	1.002	1.012	1.009	1.014	1.017
1983	1.041	1.014	1.011	1.010	1.012	1.009	1.001
1984	1.056	1.006	1.016	1.001	1.011	1.015	1.008
1985	1.058	1.013	1.009	1.012	1.002	1.004	1.008
1986	1.072	1.026	1.015	1.012	1.005	1.012	1.012
1987	1.075	1.026	1.021	1.008	1.001	1.014	1.009
1988	1.061	1.021	1.010	1.001	1.000	1.003	1.006
1989	1.062	1.023	1.010	1.007	1.008	1.003	1.020
POINTS	8	8	8	8	8	8	8
AVERAGE	1.057	1.018	1.012	1.008	1.006	1.009	1.010
SAMPLE VARIANCE	0.000225	0.000055	0.000032	0.000022	0.000022	0.000027	0.000037
SAMPLE COEFF OF VARIANCE	0.014	0.007	0.006	0.005	0.005	0.005	0.006

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: OREGON PAID + O/S - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: MEDICAL (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.006598	0.004448	0.001838	0.000544	0.001167	0.000587	0.000814	0.015998	
THREE-YEAR STRAIGHT AVERAGE	0.004584	0.003693	0.001661	0.000590	0.001171	0.000643	0.000935	0.013277	
FOUR-YEAR STRAIGHT AVERAGE	0.003814	0.002763	0.001453	0.000630	0.001107	0.000638	0.000895	0.011300	*
TWO-YEAR EXPONENTIAL AVG	0.006521	0.004398	0.001858	0.000535	0.001144	0.000574	0.000796	0.015826	
THREE-YEAR EXPONENTIAL AVG	0.004697	0.003690	0.001677	0.000573	0.001138	0.000620	0.000901	0.013294	
FOUR-YEAR EXPONENTIAL AVG	0.004007	0.002874	0.001484	0.000606	0.001084	0.000615	0.000866	0.011536	

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STATE: OREGON PAID + O/S - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: MEDICAL ('1' INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
FOUR-YEAR STRAIGHT AVERAGE	1	1	1	0	0	0	0	3	*
TWO-YEAR EXPONENTIAL AVG	0	0	0	1	0	1	1	3	*
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	1	0	0	1	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: OREGON INCURRED - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.009	1.028	1.063	1.072	1.068	1.059	1.045
1982	1.008	1.021	1.033	1.020	1.019	1.032	1.035
1983	0.998	0.990	1.024	1.024	1.021	1.022	1.024
1984	1.046	1.025	1.067	1.045	1.045	1.040	1.038
1985	1.002	0.979	0.993	1.022	1.024	1.027	1.027
1986	1.010	1.013	1.017	1.001	0.978	0.987	0.989
1987	1.054	1.026	0.989	0.988	0.995	0.982	0.975
1988	0.960	0.996	1.019	1.005	1.014	1.018	1.013
1989	0.945	0.976	1.008	1.024	1.014	0.988	1.007
POINTS	9	9	9	9	9	9	9
AVERAGE	1.004	1.006	1.024	1.022	1.020	1.017	1.017
SAMPLE VARIANCE	0.001225	0.000438	0.000746	0.000616	0.000676	0.000701	0.000545
SAMPLE COEFF OF VARIANCE	0.035	0.021	0.027	0.024	0.025	0.026	0.023

REGION: WESTERN INCURRED - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	0.972	0.984	0.990	0.999	1.006	1.013	1.017
1983	0.985	0.986	0.997	0.994	1.007	1.006	1.001
1984	1.003	0.985	1.011	0.991	1.009	1.014	1.007
1985	1.007	0.994	1.000	0.996	0.998	1.002	1.006
1986	1.013	1.001	1.003	0.996	1.001	1.008	1.006
1987	1.013	1.008	1.014	1.001	0.999	1.010	1.006
1988	1.009	1.007	1.005	0.996	1.005	1.002	1.009
1989	1.017	1.014	1.003	0.999	1.003	0.998	1.019
POINTS	8	8	8	8	8	8	8
AVERAGE	1.002	0.997	1.003	0.996	1.003	1.007	1.009
SAMPLE VARIANCE	0.000247	0.000138	0.000058	0.000010	0.000015	0.000032	0.000037
SAMPLE COEFF OF VARIANCE	0.016	0.012	0.008	0.003	0.004	0.006	0.006

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: OREGON INCURRED - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: MEDICAL (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.002386	0.000722	0.000691	0.000526	0.000831	0.000814	0.000825	0.006795	
THREE-YEAR STRAIGHT AVERAGE	0.001856	0.000620	0.000835	0.000560	0.000742	0.000714	0.000800	0.006127	
FOUR-YEAR STRAIGHT AVERAGE	0.002039	0.000603	0.000874	0.000551	0.000650	0.000737	0.000777	0.006232	
TWO-YEAR EXPONENTIAL AVG	0.002359	0.000720	0.000713	0.000513	0.000812	0.000805	0.000808	0.006729	
THREE-YEAR EXPONENTIAL AVG	0.001883	0.000626	0.000831	0.000540	0.000724	0.000707	0.000780	0.006091	*
FOUR-YEAR EXPONENTIAL AVG	0.002035	0.000610	0.000857	0.000529	0.000643	0.000721	0.000756	0.006151	

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STATE: OREGON INCURRED - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: MEDICAL ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	1	0	0	0	0	1	
THREE-YEAR STRAIGHT AVERAGE	1	0	0	0	0	0	0	1	
FOUR-YEAR STRAIGHT AVERAGE	0	1	0	0	0	0	0	1	
TWO-YEAR EXPONENTIAL AVG	0	0	0	1	0	0	0	1	
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	1	0	1	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	1	0	1	2	*

NATIONAL COUNCIL ON COMPENSATION INSURANCE
OREGON INDEMNITY COMPARISON OF PROJECTIONS

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	ACTUAL 8TH	AVERAGE	*=LOW AVG
1978 PAID				112,889,493	114,501,738	115,148,509	114,759,944	114,950,834		
1978 PAID + Q/S				128,422,465	130,418,315	133,616,668	131,900,487	132,871,132		
1978 INCURRED				142,088,856	134,928,253	136,895,107	139,434,377	138,173,664		
1978 PAID (1)				1.79%	0.39%	0.17%	0.17%		0.63%	*
1978 PAID + Q/S (1)				3.35%	1.85%	0.56%	0.73%		1.62%	
1978 INCURRED (1)				2.83%	2.35%	0.93%	0.91%		1.76%	
1978 PAID (2)					1.43%	0.56%	0.34%	0.17%	0.62%	*
1978 PAID + Q/S (2)					1.55%	2.45%	1.28%	0.74%	1.51%	
1978 INCURRED (2)					5.04%	1.46%	1.85%	0.90%	2.31%	
1979 PAID			120,858,680	123,238,059	124,913,798	124,668,367	125,445,571	126,138,249		
1979 PAID + Q/S			128,377,162	134,389,472	145,396,862	144,745,853	145,105,667	149,395,458		
1979 INCURRED			147,362,985	139,322,194	149,574,459	154,915,032	152,689,865	152,274,005		
1979 PAID (1)			4.19%	2.30%	0.97%	1.17%	0.55%		1.83%	*
1979 PAID + Q/S (1)			14.07%	10.04%	2.68%	3.11%	2.87%		6.55%	
1979 INCURRED (1)			3.23%	8.51%	1.77%	1.73%	0.27%		3.10%	
1979 PAID (2)				1.97%	1.36%	0.20%	0.62%	0.55%	0.94%	*
1979 PAID + Q/S (2)				4.68%	8.19%	0.45%	0.25%	2.96%	3.31%	
1979 INCURRED (2)				5.46%	7.36%	3.57%	1.44%	0.27%	3.62%	
1980 PAID		118,711,292	122,925,901	124,589,252	124,287,599	124,529,054	125,309,008	125,640,819		
1980 PAID + Q/S		104,263,609	119,885,393	136,502,062	133,402,083	133,920,206	144,052,956	144,963,083		
1980 INCURRED		128,647,094	127,645,810	143,159,326	146,031,789	143,451,909	145,653,698	148,554,800		
1980 PAID (1)		5.52%	2.16%	0.84%	1.08%	0.88%	0.26%		1.79%	*
1980 PAID + Q/S (1)		28.08%	17.30%	5.84%	7.98%	7.62%	0.63%		11.24%	
1980 INCURRED (1)		13.40%	14.07%	3.63%	1.70%	3.44%	1.95%		6.37%	
1980 PAID (2)			3.55%	1.35%	0.24%	0.19%	0.63%	0.26%	1.04%	*
1980 PAID + Q/S (2)			14.98%	13.86%	2.27%	0.39%	7.57%	0.63%	6.62%	
1980 INCURRED (2)			0.78%	12.15%	2.01%	1.77%	1.53%	1.99%	3.37%	
1981 PAID	107,524,378	114,489,165	114,864,629	115,680,387	115,959,741	117,180,689	116,120,886	116,486,292		
1981 PAID + Q/S	85,735,583	104,509,893	121,986,253	118,378,123	121,974,095	134,422,230	135,143,742	135,446,151		
1981 INCURRED	116,117,686	114,920,800	131,548,806	134,833,625	134,032,060	135,021,618	136,299,287	137,375,072		
1981 PAID (1)	7.69%	1.71%	1.39%	0.69%	0.45%	0.60%	0.31%		1.84%	*
1981 PAID + Q/S (1)	36.70%	22.84%	9.94%	12.60%	9.95%	0.76%	0.22%		13.29%	
1981 INCURRED (1)	15.47%	16.35%	4.24%	1.85%	2.43%	1.71%	0.78%		6.12%	
1981 PAID (2)		6.48%	0.33%	0.71%	0.24%	1.05%	0.90%	0.31%	1.43%	*
1981 PAID + Q/S (2)		21.90%	16.72%	2.96%	3.04%	10.21%	0.54%	0.22%	7.94%	
1981 INCURRED (2)		1.03%	14.47%	2.50%	0.59%	0.74%	0.95%	0.79%	3.01%	
1982 PAID	104,567,039	105,548,293	109,448,955	111,041,511	113,401,380	112,334,530	114,113,039			
1982 PAID + Q/S	98,570,993	121,311,477	110,486,884	117,901,685	131,114,857	134,563,154	134,112,335			
1982 INCURRED	111,996,583	131,788,317	132,272,067	131,548,359	129,740,037	132,332,616	134,688,482			
1982 PAID (1)	8.37%	7.51%	4.09%	2.69%	0.62%	1.56%			4.14%	*
1982 PAID + Q/S (1)	26.50%	9.54%	17.62%	12.09%	2.24%	0.34%			11.39%	
1982 INCURRED (1)	16.85%	2.15%	1.79%	2.33%	3.67%	1.75%			4.76%	
1982 PAID (2)		0.94%	3.70%	1.46%	2.13%	0.94%	1.58%		1.79%	*
1982 PAID + Q/S (2)		23.07%	8.92%	6.71%	11.21%	2.63%	0.34%		8.81%	
1982 INCURRED (2)		17.67%	0.37%	0.55%	1.37%	2.00%	1.78%		3.96%	
1983 PAID	130,977,112	142,596,977	147,639,204	151,884,893	146,572,693	146,792,048				
1983 PAID + Q/S	155,356,492	141,286,903	160,232,700	183,104,014	182,361,547	175,624,305				
1983 INCURRED	163,653,732	164,901,751	169,847,995	170,850,075	172,452,547	173,044,376				
1983 PAID (1)	10.77%	2.86%	0.58%	3.47%	0.15%				3.57%	
1983 PAID + Q/S (1)	11.54%	19.55%	8.76%	4.26%	3.84%				9.59%	
1983 INCURRED (1)	5.43%	4.71%	1.85%	1.27%	0.34%				2.72%	*
1983 PAID (2)		8.87%	3.54%	2.88%	3.50%	0.15%			3.79%	
1983 PAID + Q/S (2)		9.06%	13.41%	14.27%	0.41%	3.69%			8.17%	
1983 INCURRED (2)		0.76%	3.00%	0.59%	0.94%	0.34%			1.13%	*
1984 PAID	168,659,290	180,282,458	190,378,496	179,677,017	180,868,714					
1984 PAID + Q/S	165,799,038	183,712,797	228,070,806	226,562,024	216,325,396					
1984 INCURRED	191,168,002	191,505,141	202,083,149	205,781,926	208,134,288					
1984 PAID (1)	6.75%	0.32%	5.26%	0.66%					3.25%	*
1984 PAID + Q/S (1)	23.36%	15.08%	5.43%	4.73%					12.15%	
1984 INCURRED (1)	8.15%	7.99%	2.91%	1.13%					5.04%	
1984 PAID (2)		6.89%	5.60%	5.62%	0.66%				4.69%	
1984 PAID + Q/S (2)		10.80%	24.15%	0.66%	4.52%				10.03%	
1984 INCURRED (2)		0.18%	5.52%	1.83%	1.14%				2.17%	*

NOTES: (1) ABSOLUTE DEVIATION FROM LAST PROJECTION (OR REPORT), RATIODED TO SAME.
(2) ABSOLUTE CHANGE RELATIVE TO PRIOR PROJECTION OR REPORT.
WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.
LOSSES HAVE BEEN RESTATED TO THE LATEST DIAGONAL.

N-4 0.0000
N-3 0.0000
N-2 0.5000
N-1 0.5000
WEIGHTS ASSIGNED TO PRECEDING YEARS:

09:08 AM
03/14/91

NATIONAL COUNCIL ON COMPENSATION INSURANCE
OREGON INDEMNITY COMPARISON OF PROJECTIONS RESTATED TO INCURRED LEVEL

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	RESTATED 8TH	AVERAGE	* <u>IL</u> AVG
1978 PAID				150,446,286	151,109,648	147,558,294	143,649,958	140,375,726		
1978 PAID + Q/S				130,040,174	132,239,627	135,668,527	135,975,242	138,613,156		
1978 INCURRED				142,088,856	134,928,253	136,895,107	139,434,377	138,173,664		
1978 PAID (1)				7.17%	7.65%	5.12%	2.33%		5.57%	
1978 PAID + Q/S (1)				6.18%	4.60%	2.12%	1.90%		3.70%	
1978 INCURRED (1)				2.83%	2.35%	0.93%	0.91%		1.76%	*
1978 PAID (2)					0.44%	2.35%	2.65%	2.28%	1.93%	
1978 PAID + Q/S (2)					1.69%	2.59%	0.23%	1.94%	1.61%	*
1978 INCURRED (2)					5.04%	1.46%	1.85%	0.90%	2.31%	
1979 PAID			161,066,713	162,639,102	160,072,129	156,052,756	153,191,695	151,946,904		
1979 PAID + Q/S			129,994,301	136,266,241	147,629,621	149,217,436	151,376,406	153,800,266		
1979 INCURRED			147,362,985	139,322,194	149,574,459	154,915,032	152,689,865	152,274,005		
1979 PAID (1)			6.00%	7.04%	5.35%	2.70%	0.82%		4.38%	
1979 PAID + Q/S (1)			15.48%	11.40%	4.01%	2.98%	1.58%		7.09%	
1979 INCURRED (1)			3.23%	8.51%	1.77%	1.73%	0.27%		3.10%	*
1979 PAID (2)				0.98%	1.58%	2.51%	1.83%	0.81%	1.54%	*
1979 PAID + Q/S (2)				4.82%	8.34%	1.08%	1.45%	1.60%	3.46%	*
1979 INCURRED (2)				5.46%	7.36%	3.57%	1.44%	0.27%	3.62%	
1980 PAID		158,204,918	162,227,142	159,656,236	155,576,133	152,072,462	150,947,995	150,097,956		
1980 PAID + Q/S		105,576,994	121,559,611	138,598,230	137,523,227	139,707,565	148,300,244	148,154,437		
1980 INCURRED		128,647,094	127,645,810	143,159,326	146,031,789	143,451,909	145,663,698	148,554,800		
1980 PAID (1)		5.40%	8.08%	6.37%	3.65%	1.32%	0.57%		4.23%	*
1980 PAID + Q/S (1)		28.74%	17.95%	6.45%	7.18%	5.70%	0.10%		11.02%	
1980 INCURRED (1)		13.40%	14.07%	3.63%	1.70%	3.44%	1.95%		6.37%	
1980 PAID (2)			2.54%	1.58%	2.56%	2.25%	0.74%	0.56%	1.71%	*
1980 PAID + Q/S (2)			15.14%	14.02%	0.78%	1.59%	6.15%	0.10%	6.29%	
1980 INCURRED (2)			0.78%	12.15%	2.01%	1.77%	1.53%	1.99%	3.37%	
1981 PAID	143,296,271	151,093,056	147,194,513	144,802,116	141,607,784	141,156,572	138,724,881	137,552,656		
1981 PAID + Q/S	86,815,575	105,969,390	123,859,511	122,035,137	127,245,204	138,385,564	138,118,924	138,084,884		
1981 INCURRED	116,117,686	114,920,800	131,548,806	134,833,625	134,032,060	135,021,618	136,299,287	137,375,072		
1981 PAID (1)	4.18%	9.84%	7.01%	5.27%	2.95%	2.62%	0.85%		4.67%	*
1981 PAID + Q/S (1)	37.13%	23.26%	10.30%	11.62%	7.85%	0.22%	0.02%		12.91%	
1981 INCURRED (1)	15.47%	16.35%	4.24%	1.85%	2.43%	1.71%	0.78%		6.12%	
1981 PAID (2)		5.44%	2.58%	1.63%	2.21%	0.32%	1.72%	0.85%	2.11%	*
1981 PAID + Q/S (2)		22.06%	16.88%	1.47%	4.27%	8.76%	0.19%	0.02%	7.67%	
1981 INCURRED (2)		1.03%	14.47%	2.50%	0.59%	0.74%	0.95%	0.79%	3.01%	
1982 PAID	137,998,679	135,255,994	137,001,964	135,601,737	136,603,994	134,201,475	134,750,203			
1982 PAID + Q/S	99,947,552	123,174,373	113,900,117	122,996,805	134,980,675	137,525,555	136,725,083			
1982 INCURRED	111,996,583	131,788,317	132,272,067	131,548,359	129,740,037	132,332,616	134,688,482			
1982 PAID (1)	2.41%	0.38%	1.67%	0.63%	1.38%	0.41%			1.15%	*
1982 PAID + Q/S (1)	26.90%	9.91%	16.69%	10.04%	1.28%	0.59%			10.90%	
1982 INCURRED (1)	16.85%	2.15%	1.79%	2.33%	3.67%	1.75%			4.76%	
1982 PAID (2)		1.99%	1.29%	1.02%	0.74%	1.76%	0.41%		1.20%	*
1982 PAID + Q/S (2)		23.24%	7.53%	7.99%	9.74%	1.89%	0.58%		8.49%	
1982 INCURRED (2)		17.67%	0.37%	0.55%	1.37%	2.00%	1.78%		3.96%	
1983 PAID	167,842,027	178,494,768	180,294,129	182,961,468	175,104,411	173,339,160				
1983 PAID + Q/S	157,742,193	145,651,630	167,157,153	188,502,692	186,376,226	179,045,780				
1983 INCURRED	163,653,732	164,901,751	169,847,995	170,850,075	172,452,547	173,044,376				
1983 PAID (1)	3.17%	2.97%	4.01%	5.55%	1.02%				3.35%	
1983 PAID + Q/S (1)	11.90%	18.65%	6.64%	5.28%	4.09%				9.31%	
1983 INCURRED (1)	5.43%	4.71%	1.85%	1.27%	0.34%				2.72%	*
1983 PAID (2)		6.35%	1.01%	1.48%	4.29%	1.01%			2.83%	
1983 PAID + Q/S (2)		7.66%	14.77%	12.77%	1.13%	3.93%			8.05%	
1983 INCURRED (2)		0.76%	3.00%	0.59%	0.94%	0.34%			1.13%	*
1984 PAID	211,118,087	220,157,437	229,331,097	214,652,795	213,578,538					
1984 PAID + Q/S	170,921,010	191,651,943	234,795,294	231,549,775	220,539,801					
1984 INCURRED	191,168,002	191,505,141	202,083,149	205,781,926	208,134,288					
1984 PAID (1)	1.15%	3.08%	7.38%	0.50%					3.03%	*
1984 PAID + Q/S (1)	22.50%	13.10%	6.46%	4.99%					11.76%	
1984 INCURRED (1)	8.15%	7.99%	2.91%	1.13%					5.04%	
1984 PAID (2)		4.28%	4.17%	6.40%	0.50%				3.84%	
1984 PAID + Q/S (2)		12.13%	22.51%	1.38%	4.75%				10.19%	
1984 INCURRED (2)		0.18%	5.52%	1.83%	1.14%				2.17%	*

NOTES: (1) ABSOLUTE DEVIATION FROM LAST PROJECTION (OR REPORT), RATIOED TO SAME.
(2) ABSOLUTE CHANGE RELATIVE TO PRIOR PROJECTION OR REPORT.
WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.
LOSSES RESTATED TO INCURRED LEVEL OF 8TH REPORT, AND TO LAST DIAGONAL.

WEIGHTS ASSIGNED TO PRECEDING YEARS:
N-4 0.0000
N-3 0.0000
N-2 0.5000
N-1 0.5000

09:08 AM
03/14/91

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 OREGON MEDICAL COMPARISON OF PROJECTIONS

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	ACTUAL 8TH	AVERAGE	*=LOW AVG
1978 PAID				67,608,876	68,156,291	68,187,064	68,515,835	68,824,822		
1978 PAID + Q/S				91,885,932	90,471,937	91,483,938	88,402,133	85,601,813		
1978 INCURRED				100,120,422	93,161,844	95,956,574	95,723,354	91,678,024		
1978 PAID (1)				1.77%	0.97%	0.93%	0.45%		1.03%	*
1978 PAID + Q/S (1)				7.34%	5.69%	6.87%	3.27%		5.79%	
1978 INCURRED (1)				9.21%	1.62%	4.67%	4.41%		4.98%	
1978 PAID (2)					0.81%	0.05%	0.48%	0.45%	0.45%	*
1978 PAID + Q/S (2)					1.54%	1.12%	3.37%	3.17%	2.30%	
1978 INCURRED (2)					6.95%	3.00%	0.24%	4.23%	3.60%	
1979 PAID			75,037,788	75,711,463	75,852,337	75,998,629	76,401,941	76,496,178		
1979 PAID + Q/S			102,494,029	101,302,790	102,287,961	96,929,572	92,100,469	91,519,344		
1979 INCURRED			115,262,782	104,590,953	108,888,045	108,358,515	101,027,636	97,685,992		
1979 PAID (1)			1.91%	1.03%	0.84%	0.65%	0.12%		0.91%	*
1979 PAID + Q/S (1)			11.99%	10.69%	11.77%	5.91%	0.63%		8.20%	
1979 INCURRED (1)			17.99%	7.07%	11.47%	10.93%	3.42%		10.18%	
1979 PAID (2)				0.90%	0.19%	0.19%	0.53%	0.12%	0.39%	*
1979 PAID + Q/S (2)				1.16%	0.97%	5.24%	4.98%	0.63%	2.60%	
1979 INCURRED (2)				9.26%	4.11%	0.49%	6.77%	3.31%	4.79%	
1980 PAID		78,078,659	78,993,963	79,325,883	79,441,848	80,548,407	81,284,661	80,991,567		
1980 PAID + Q/S		102,822,560	101,585,138	104,494,374	97,649,031	89,778,132	89,818,384	93,388,504		
1980 INCURRED		120,583,193	106,198,742	113,548,076	112,775,190	101,417,146	96,348,367	99,380,872		
1980 PAID (1)		3.60%	2.47%	2.06%	1.91%	0.55%	0.36%		1.82%	*
1980 PAID + Q/S (1)		10.10%	8.78%	11.89%	4.56%	3.87%	3.82%		7.17%	
1980 INCURRED (1)		21.33%	6.86%	14.26%	13.48%	2.05%	3.05%		10.17%	
1980 PAID (2)			1.17%	0.42%	0.15%	1.39%	0.91%	0.36%	0.73%	*
1980 PAID + Q/S (2)			1.20%	2.86%	6.55%	8.06%	0.04%		3.78%	
1980 INCURRED (2)			11.93%	6.92%	0.68%	10.07%	5.00%	3.15%	6.29%	
1981 PAID	77,145,983	78,108,808	76,635,431	76,676,269	78,033,867	79,528,127	78,692,006	78,213,783		
1981 PAID + Q/S	97,658,326	101,908,616	103,631,541	90,221,670	82,895,638	85,842,572	91,080,614	93,232,627		
1981 INCURRED	121,311,089	107,382,772	114,682,309	109,399,418	97,528,524	92,333,194	96,641,756	97,894,129		
1981 PAID (1)	1.37%	0.13%	2.02%	1.97%	0.23%	1.68%	0.61%		1.14%	*
1981 PAID + Q/S (1)	4.75%	9.31%	11.15%	3.23%	11.09%	7.93%	2.31%		7.11%	
1981 INCURRED (1)	23.92%	9.69%	17.15%	11.75%	0.37%	5.68%	1.28%		9.98%	
1981 PAID (2)		1.25%	1.89%	0.05%	1.77%	1.91%	1.05%	0.61%	1.22%	*
1981 PAID + Q/S (2)		4.35%	1.69%	12.94%	8.12%	3.55%	6.10%	2.36%	5.59%	
1981 INCURRED (2)		11.48%	6.80%	4.61%	10.85%	5.33%	4.67%	1.30%	6.43%	
1982 PAID	80,556,593	78,480,441	80,276,542	81,882,248	83,371,475	82,386,113	79,866,513			
1982 PAID + Q/S	104,686,327	109,715,352	91,598,329	86,313,594	89,291,226	96,427,842	99,199,799			
1982 INCURRED	111,470,511	122,032,006	117,332,397	104,363,857	95,684,457	101,121,019	101,515,737			
1982 PAID (1)	0.86%	1.74%	0.51%	2.52%	4.39%	3.15%			2.20%	*
1982 PAID + Q/S (1)	5.53%	10.60%	7.66%	12.99%	9.99%	2.79%			8.26%	
1982 INCURRED (1)	9.81%	20.21%	15.58%	2.81%	5.74%	0.39%			9.09%	
1982 PAID (2)		2.58%	2.29%	2.00%	1.82%	1.18%	3.06%		2.15%	*
1982 PAID + Q/S (2)		4.80%	16.51%	5.77%	3.45%	7.99%	2.87%		6.90%	
1982 INCURRED (2)		9.47%	3.85%	11.05%	8.32%	5.68%	0.39%		6.46%	
1983 PAID	93,707,684	98,226,901	103,258,195	107,812,620	105,289,199	99,867,994				
1983 PAID + Q/S	133,119,567	110,063,051	106,117,329	111,528,392	121,504,639	127,357,782				
1983 INCURRED	148,380,894	143,160,773	127,216,384	115,534,687	122,232,219	125,750,474				
1983 PAID (1)	6.17%	1.64%	3.39%	7.96%	5.43%				4.92%	*
1983 PAID + Q/S (1)	4.52%	13.58%	16.68%	12.43%	4.60%				10.36%	
1983 INCURRED (1)	18.00%	13.85%	1.17%	8.12%	2.80%				8.79%	
1983 PAID (2)		4.82%	5.12%	4.41%	2.34%	5.15%			4.37%	*
1983 PAID + Q/S (2)		17.32%	3.58%	5.10%	8.95%	4.82%			7.95%	
1983 INCURRED (2)		3.52%	11.14%	9.18%	5.80%	2.88%			6.50%	
1984 PAID	118,837,144	130,208,154	139,531,993	134,112,674	128,697,954					
1984 PAID + Q/S	132,270,766	124,382,806	142,786,311	157,356,806	168,274,472					
1984 INCURRED	174,738,264	150,583,830	142,869,771	152,264,319	160,969,922					
1984 PAID (1)	7.66%	1.17%	8.42%	4.21%					5.37%	*
1984 PAID + Q/S (1)	21.40%	26.08%	15.15%	6.49%					17.28%	
1984 INCURRED (1)	8.55%	6.45%	11.24%	5.41%					7.91%	
1984 PAID (2)		9.57%	7.16%	3.88%	4.04%				6.16%	*
1984 PAID + Q/S (2)		5.96%	14.80%	10.20%	6.94%				9.48%	
1984 INCURRED (2)		13.82%	5.12%	6.58%	5.72%				7.81%	

NOTES: (1) ABSOLUTE DEVIATION FROM LAST PROJECTION (OR REPORT), RATIOED TO SAME.
 (2) ABSOLUTE CHANGE RELATIVE TO PRIOR PROJECTION OR REPORT.
 WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.
 LOSSES HAVE BEEN RESTATED TO THE LATEST DIAGONAL.

WEIGHTS ASSIGNED TO PRECEDING YEARS: N-4 0.0000
 N-3 0.0000
 N-2 0.5000
 N-1 0.5000
 09:12 AM
 03/14/91

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 OREGON MEDICAL COMPARISON OF PROJECTIONS RESTATED TO INCURRED LEVEL

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	RESTATED 8TH	AVERAGE	*=LOW AVG
1978 PAID				86,404,647	88,867,942	90,763,059	93,205,164	92,805,919		
1978 PAID + Q/S				92,978,844	91,776,864	93,103,363	92,172,623	91,486,162		
1978 INCURRED				100,120,422	93,161,844	95,956,574	95,723,354	91,678,024		
1978 PAID (1)				6.90%	4.24%	2.20%	0.43%		3.44%	
1978 PAID + Q/S (1)				1.63%	0.32%	1.77%	0.75%		1.12%	*
1978 INCURRED (1)				9.21%	1.62%	4.67%	4.41%		4.98%	
1978 PAID (2)					2.85%	2.13%	2.69%	0.43%	2.03%	
1978 PAID + Q/S (2)					1.29%	1.45%	1.00%	0.74%	1.12%	*
1978 INCURRED (2)					6.95%	3.00%	0.24%	4.23%	3.60%	
1979 PAID			95,898,852	98,719,015	100,966,221	103,384,345	103,023,184	99,746,902		
1979 PAID + Q/S			103,713,116	102,763,936	104,098,636	101,063,771	98,431,542	97,850,516		
1979 INCURRED			115,262,782	104,590,953	108,888,045	108,358,515	101,027,636	97,685,992		
1979 PAID (1)			3.86%	1.03%	1.22%	3.65%	3.28%		2.61%	*
1979 PAID + Q/S (1)			5.99%	5.02%	6.39%	3.28%	0.59%		4.26%	
1979 INCURRED (1)			17.99%	7.07%	11.47%	10.93%	3.42%		10.18%	
1979 PAID (2)				2.94%	2.28%	2.39%	0.35%	3.18%	2.23%	
1979 PAID + Q/S (2)				0.92%	1.30%	2.92%	2.60%	0.59%	1.66%	*
1979 INCURRED (2)				9.26%	4.11%	0.49%	6.77%	3.31%	4.79%	
1980 PAID		99,785,108	102,999,016	105,589,819	108,068,310	108,614,432	105,990,826	101,363,395		
1980 PAID + Q/S		104,045,554	103,050,357	106,344,106	101,813,916	95,949,565	96,031,886	99,530,758		
1980 INCURRED		120,583,193	106,198,742	113,548,076	112,775,190	101,417,146	96,348,367	99,380,872		
1980 PAID (1)		1.56%	1.61%	4.17%	6.61%	7.15%	4.57%		4.28%	
1980 PAID + Q/S (1)		4.54%	3.54%	6.85%	2.29%	3.60%	3.52%		4.05%	*
1980 INCURRED (1)		21.33%	6.86%	14.26%	13.48%	2.05%	3.05%		10.17%	
1980 PAID (2)			3.22%	2.52%	2.35%	0.51%	2.42%	4.37%	2.56%	*
1980 PAID + Q/S (2)			0.96%	3.20%	4.26%	5.76%	0.09%	3.64%	2.98%	
1980 INCURRED (2)			11.93%	6.92%	0.68%	10.07%	5.00%	3.15%	6.29%	
1981 PAID	98,593,142	101,844,877	102,008,588	104,306,168	105,223,734	103,700,400	98,485,424	96,923,733		
1981 PAID + Q/S	98,819,896	103,378,501	105,466,000	94,069,766	88,593,961	91,781,033	97,071,076	98,550,135		
1981 INCURRED	121,311,089	107,382,772	114,682,309	109,399,418	97,528,524	92,333,194	96,641,756	97,894,129		
1981 PAID (1)	1.72%	5.08%	5.25%	7.62%	8.56%	6.99%	1.61%		5.26%	
1981 PAID + Q/S (1)	0.27%	4.90%	7.02%	4.55%	10.10%	6.87%	1.50%		5.03%	*
1981 INCURRED (1)	23.92%	9.69%	17.15%	11.75%	0.37%	5.68%	1.28%		9.98%	
1981 PAID (2)		3.30%	0.16%	2.25%	0.88%	1.45%	5.03%	1.59%	2.09%	*
1981 PAID + Q/S (2)		4.61%	2.02%	10.81%	5.82%	3.60%	5.76%	1.52%	4.88%	
1981 INCURRED (2)		11.48%	6.80%	4.61%	10.85%	5.33%	4.67%	1.30%	6.43%	
1982 PAID	105,036,506	104,464,461	109,203,782	110,413,032	108,711,920	103,108,711	98,971,821			
1982 PAID + Q/S	106,196,276	111,657,505	95,505,142	92,246,872	95,468,260	102,769,997	104,857,644			
1982 INCURRED	111,470,511	122,032,006	117,332,397	104,363,857	95,684,457	101,121,019	101,515,737			
1982 PAID (1)	6.13%	5.55%	10.34%	11.56%	9.84%	4.18%			7.93%	
1982 PAID + Q/S (1)	1.28%	6.48%	8.92%	12.03%	8.95%	1.99%			6.61%	*
1982 INCURRED (1)	9.81%	20.21%	15.58%	2.81%	5.74%	0.39%			9.09%	
1982 PAID (2)		0.54%	4.54%	1.11%	1.54%	5.15%	4.01%		2.82%	*
1982 PAID + Q/S (2)		5.14%	14.47%	3.41%	3.49%	7.65%	2.03%		6.03%	
1982 INCURRED (2)		9.47%	3.85%	11.05%	8.32%	5.68%	0.39%		6.46%	
1983 PAID	124,733,279	133,622,461	139,237,145	140,581,858	131,772,616	123,757,967				
1983 PAID + Q/S	135,476,015	114,757,414	113,411,934	119,243,760	129,496,119	134,621,614				
1983 INCURRED	148,380,894	143,160,773	127,216,384	115,534,687	122,232,219	125,750,474				
1983 PAID (1)	0.79%	7.97%	12.51%	13.59%	6.48%				8.27%	*
1983 PAID + Q/S (1)	0.63%	14.76%	15.76%	11.42%	3.81%				9.28%	
1983 INCURRED (1)	18.00%	13.85%	1.17%	8.12%	2.80%				8.79%	
1983 PAID (2)		7.13%	4.20%	0.97%	6.27%	6.08%			4.93%	*
1983 PAID + Q/S (2)		15.29%	1.17%	5.14%	8.60%	3.96%			6.83%	
1983 INCURRED (2)		3.52%	11.14%	9.18%	5.80%	2.88%			6.50%	
1984 PAID	161,659,498	175,577,460	181,942,214	167,846,067	159,484,500					
1984 PAID + Q/S	137,912,323	132,932,997	152,664,055	167,706,319	177,871,980					
1984 INCURRED	174,738,264	150,583,830	142,869,771	152,264,319	160,969,922					
1984 PAID (1)	1.36%	10.09%	14.08%	5.24%					7.69%	*
1984 PAID + Q/S (1)	22.47%	25.26%	14.17%	5.72%					16.90%	
1984 INCURRED (1)	8.55%	6.45%	11.24%	5.41%					7.91%	
1984 PAID (2)		8.61%	3.63%	7.75%	4.98%				6.24%	*
1984 PAID + Q/S (2)		3.61%	14.84%	9.85%	6.06%				8.59%	
1984 INCURRED (2)		13.82%	5.12%	6.58%	5.72%				7.81%	

NOTES: (1) ABSOLUTE DEVIATION FROM LAST PROJECTION (OR REPORT), RATIODE TO SAME.
 (2) ABSOLUTE CHANGE RELATIVE TO PRIOR PROJECTION OR REPORT.
 WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.
 LOSSES RESTATED TO INCURRED LEVEL OF 8TH REPORT, AND TO LAST DIAGONAL.

WEIGHTS ASSIGNED TO PRECEDING YEARS:
 N-4 0.0000
 N-3 0.0000
 N-2 0.5000
 N-1 0.5000

NORTH CAROLINA

NATIONAL COUNCIL ON COMPENSATION INSURANCE
ANALYSIS OF FACTOR SELECTION METHODS AND PROJECTION METHODS
STATE: NORTH CAROLINA

ORDER OF PRESENTATION FOR TESTS AND ANALYSIS

Premium: Development by Diagonal, Showing Variance

Premium: Tests of Minimum Average Squared Deviations

Indemnity: Paid - Development by Diagonal, Showing Variance

Indemnity: Paid - Tests of Minimum Average Squared Deviations

Indemnity: Paid+O/S - Development by Diagonal, Showing Variance

Indemnity: Paid+O/S - Tests of Minimum Average Squared Deviations

Indemnity: Incurred - Development by Diagonal, Showing Variance

Indemnity: Incurred - Tests of Minimum Average Squared Deviations

Medical: Paid - Development by Diagonal, Showing Variance

Medical: Paid - Tests of Minimum Average Squared Deviations

Medical: Paid+O/S - Development by Diagonal, Showing Variance

Medical: Paid+O/S - Tests of Minimum Average Squared Deviations

Medical: Incurred - Development by Diagonal, Showing Variance

Medical: Incurred - Tests of Minimum Average Squared Deviations

Indemnity: Comparison of Projections - Deviations by Loss Statistic Type

Indemnity: Comparison of Restated Projections - Deviations by Loss Statistic Type

Medical: Comparison of Projections - Deviations by Loss Statistic Type

Medical: Comparison of Restated Projections - Deviations by Loss Statistic Type

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: NORTH CAROLINA

PREMIUM - DEVELOPMENT DIAGONALS BY EVALUATION DATE

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH
1981	1.038	1.004	0.999	1.000
1982	1.055	1.006	1.005	1.000
1983	1.036	1.005	1.001	1.000
1984	1.057	1.005	1.000	0.999
1985	1.075	0.994	1.001	0.999
1986	1.056	1.006	1.003	1.001
1987	1.037	0.999	1.004	1.001
1988	1.053	1.002	0.999	0.999
1989	1.050	1.004	0.999	1.000
POINTS	9	9	9	9
AVERAGE	1.051	1.003	1.001	1.000
SAMPLE VARIANCE	0.000156	0.000016	0.000005	0.000001
SAMPLE COEFF OF VARIANCE	0.012	0.004	0.002	0.001

REGION: SOUTHERN

PREMIUM - DEVELOPMENT DIAGONALS BY EVALUATION DATE

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH
1981				
1982	1.051	1.007	1.001	0.999
1983	1.037	1.009	1.005	1.000
1984	1.050	1.004	1.000	0.998
1985	1.048	0.998	1.002	1.000
1986	1.053	1.001	0.999	1.000
1987	1.043	1.004	1.004	1.002
1988	1.036	1.004	0.999	1.001
1989	1.051	1.006	1.000	0.999
POINTS	8	8	8	8
AVERAGE	1.046	1.004	1.001	1.000
SAMPLE VARIANCE	0.000044	0.000012	0.000005	0.000002
SAMPLE COEFF OF VARIANCE	0.006	0.003	0.002	0.001

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: NORTH CAROLINA PREMIUM - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.000358	0.000035	0.000007	0.000002	0.000403	
THREE-YEAR STRAIGHT AVERAGE	0.000266	0.000033	0.000007	0.000001	0.000307	
FOUR-YEAR STRAIGHT AVERAGE	0.000242	0.000032	0.000005	0.000001	0.000281	
TWO-YEAR EXPONENTIAL AVG	0.000349	0.000036	0.000007	0.000002	0.000394	
THREE-YEAR EXPONENTIAL AVG	0.000263	0.000034	0.000007	0.000001	0.000305	
FOUR-YEAR EXPONENTIAL AVG	0.000241	0.000033	0.000005	0.000001	0.000280	*

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STATE: NORTH CAROLINA PREMIUM - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	0	0	
FOUR-YEAR STRAIGHT AVERAGE	0	1	1	1	3	*
TWO-YEAR EXPONENTIAL AVG	0	0	0	0	0	
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	1	0	0	0	1	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: NORTH CAROLINA PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.521	1.158	1.082	1.042	1.024	1.022	1.011
1982	1.503	1.153	1.070	1.044	1.035	1.018	1.012
1983	1.445	1.147	1.064	1.038	1.027	1.018	1.015
1984	1.494	1.135	1.068	1.034	1.028	1.021	1.021
1985	1.531	1.166	1.063	1.039	1.026	1.024	1.016
1986	1.495	1.170	1.078	1.041	1.024	1.018	1.013
1987	1.487	1.168	1.070	1.049	1.028	1.020	1.013
1988	1.546	1.174	1.082	1.041	1.034	1.025	1.015
1989	1.567	1.199	1.091	1.046	1.029	1.028	1.015
POINTS	9	9	9	9	9	9	9
AVERAGE	1.510	1.163	1.074	1.042	1.028	1.022	1.015
SAMPLE VARIANCE	0.001299	0.000333	0.000090	0.000020	0.000015	0.000013	0.000009
SAMPLE COEFF OF VARIANCE	0.024	0.016	0.009	0.004	0.004	0.003	0.003

REGION: SOUTHERN PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	1.517	1.184	1.085	1.046	1.028	1.017	1.011
1983	1.543	1.182	1.081	1.043	1.027	1.017	1.012
1984	1.562	1.184	1.085	1.044	1.028	1.022	1.013
1985	1.628	1.211	1.093	1.053	1.032	1.020	1.014
1986	1.638	1.224	1.092	1.051	1.034	1.027	1.014
1987	1.657	1.235	1.107	1.062	1.039	1.028	1.016
1988	1.686	1.236	1.104	1.058	1.039	1.027	1.018
1989	1.716	1.241	1.108	1.058	1.036	1.025	1.020
POINTS	8	8	8	8	8	8	8
AVERAGE	1.618	1.212	1.094	1.052	1.033	1.023	1.015
SAMPLE VARIANCE	0.005030	0.000651	0.000114	0.000051	0.000024	0.000020	0.000009
SAMPLE COEFF OF VARIANCE	0.044	0.021	0.010	0.007	0.005	0.004	0.003

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: NORTH CAROLINA PAID - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: INDEMNITY (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.002068	0.000363	0.000091	0.000025	0.000018	0.000022	0.000008	0.002595	
THREE-YEAR STRAIGHT AVERAGE	0.001601	0.000366	0.000106	0.000029	0.000019	0.000021	0.000007	0.002148	
FOUR-YEAR STRAIGHT AVERAGE	0.001266	0.000392	0.000134	0.000028	0.000018	0.000016	0.000004	0.001859	*
TWO-YEAR EXPONENTIAL AVG	0.002008	0.000358	0.000091	0.000026	0.000017	0.000021	0.000008	0.002529	
THREE-YEAR EXPONENTIAL AVG	0.001586	0.000359	0.000104	0.000029	0.000018	0.000020	0.000007	0.002122	
FOUR-YEAR EXPONENTIAL AVG	0.001300	0.000379	0.000127	0.000027	0.000018	0.000016	0.000004	0.001872	

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STATE: NORTH CAROLINA PAID - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: INDEMNITY ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	1	0	0	0	1	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
FOUR-YEAR STRAIGHT AVERAGE	1	0	0	0	0	1	0	2	
TWO-YEAR EXPONENTIAL AVG	0	1	1	0	1	0	0	3	*
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	1	1	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: NORTH CAROLINA PAID + O/S - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	0.997	0.979	1.000	1.005	1.007	1.001	1.005
1982	0.972	0.988	0.992	0.997	1.011	0.991	0.992
1983	1.007	0.992	0.986	1.002	1.001	1.003	1.002
1984	1.006	0.996	1.007	1.001	1.002	1.002	0.993
1985	1.037	1.009	1.012	1.001	1.002	0.996	1.009
1986	1.052	1.022	1.018	1.003	0.999	1.000	1.005
1987	1.055	1.038	1.015	1.007	1.001	1.003	1.006
1988	1.091	1.062	1.014	1.012	1.016	1.013	1.002
1989	1.106	1.047	1.010	0.997	1.000	1.007	1.010
POINTS	9	9	9	9	9	9	9
AVERAGE	1.036	1.015	1.006	1.003	1.004	1.002	1.003
SAMPLE VARIANCE	0.001988	0.000845	0.000122	0.000023	0.000033	0.000039	0.000041
SAMPLE COEFF OF VARIANCE	0.043	0.029	0.011	0.005	0.006	0.006	0.006

REGION: SOUTHERN PAID + O/S - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	1.072	1.020	1.004	0.999	1.001	0.995	0.999
1983	1.103	1.021	1.010	1.005	1.001	1.001	1.001
1984	1.089	1.028	1.010	1.000	0.999	1.004	1.002
1985	1.140	1.039	1.019	1.007	1.003	0.999	0.998
1986	1.163	1.075	1.029	1.010	1.009	1.012	1.004
1987	1.165	1.074	1.022	1.015	1.011	1.004	1.002
1988	1.174	1.073	1.031	1.018	1.008	1.008	1.007
1989	1.165	1.059	1.034	1.017	1.009	1.002	1.004
POINTS	8	8	8	8	8	8	8
AVERAGE	1.134	1.049	1.020	1.009	1.005	1.003	1.002
SAMPLE VARIANCE	0.001604	0.000592	0.000123	0.000055	0.000021	0.000028	0.000008
SAMPLE COEFF OF VARIANCE	0.035	0.023	0.011	0.007	0.005	0.005	0.003

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: NORTH CAROLINA PAID + O/S - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: INDEMNITY (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.000893	0.000429	0.000668	0.000047	0.000068	0.000040	0.000039	0.001584	
THREE-YEAR STRAIGHT AVERAGE	0.001401	0.000644	0.000119	0.000042	0.000056	0.000040	0.000052	0.002354	
FOUR-YEAR STRAIGHT AVERAGE	0.001970	0.000895	0.000142	0.000039	0.000056	0.000040	0.000039	0.003180	
TWO-YEAR EXPONENTIAL AVG	0.000869	0.000418	0.000064	0.000047	0.000069	0.000040	0.000040	0.001546	*
THREE-YEAR EXPONENTIAL AVG	0.001320	0.000607	0.000109	0.000042	0.000057	0.000039	0.000051	0.002225	
FOUR-YEAR EXPONENTIAL AVG	0.001801	0.000818	0.000128	0.000039	0.000057	0.000039	0.000039	0.002920	

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STATE: NORTH CAROLINA PAID + O/S - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: INDEMNITY ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	0	1	0	0	1	
FOUR-YEAR STRAIGHT AVERAGE	0	0	0	1	0	0	1	2	
TWO-YEAR EXPONENTIAL AVG	1	1	1	0	0	0	0	3	*
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	1	0	1	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: NORTH CAROLINA INCURRED - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	0.917	0.945	1.000	0.998	1.008	0.999	1.007
1982	0.877	0.951	0.984	0.978	1.008	0.990	0.990
1983	0.910	0.947	0.969	0.982	0.997	1.000	1.001
1984	0.915	0.954	1.001	0.979	0.998	0.999	0.991
1985	0.958	0.972	1.011	0.973	1.000	0.994	1.006
1986	0.971	0.991	1.027	0.970	0.996	0.995	0.998
1987	0.976	1.017	1.004	0.999	0.999	1.002	1.006
1988	0.985	1.027	1.011	1.007	1.036	1.008	1.000
1989	0.994	1.012	0.998	0.985	0.998	0.996	1.011
POINTS	9	9	9	9	9	9	9
AVERAGE	0.945	0.980	1.001	0.986	1.004	0.998	1.001
SAMPLE VARIANCE	0.001667	0.001077	0.000276	0.000163	0.000160	0.000027	0.000052
SAMPLE COEFF OF VARIANCE	0.043	0.034	0.017	0.013	0.013	0.005	0.007

REGION: SOUTHERN INCURRED - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	0.968	0.981	0.994	0.978	0.996	0.992	0.997
1983	1.014	0.978	0.995	0.982	0.995	0.998	1.000
1984	1.020	1.003	1.006	0.986	0.998	1.002	1.002
1985	1.064	1.010	1.015	0.987	1.000	0.996	0.996
1986	1.084	1.047	1.025	0.988	1.005	1.008	0.993
1987	1.081	1.049	1.012	1.006	1.009	1.001	1.002
1988	1.071	1.042	1.021	1.012	1.015	1.005	1.007
1989	1.065	1.032	1.023	1.007	1.005	0.996	1.005
POINTS	8	8	8	8	8	8	8
AVERAGE	1.046	1.018	1.011	0.993	1.003	1.000	1.000
SAMPLE VARIANCE	0.001680	0.000833	0.000147	0.000169	0.000048	0.000028	0.000022
SAMPLE COEFF OF VARIANCE	0.039	0.028	0.012	0.013	0.007	0.005	0.005

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: NORTH CAROLINA INCURRED - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: INDEMNITY (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.000741	0.000627	0.000290	0.000336	0.000376	0.000052	0.000037	0.002459	
THREE-YEAR STRAIGHT AVERAGE	0.001301	0.000939	0.000430	0.000295	0.000316	0.000040	0.000062	0.003383	
FOUR-YEAR STRAIGHT AVERAGE	0.001748	0.001268	0.000404	0.000288	0.000310	0.000032	0.000040	0.004090	
TWO-YEAR EXPONENTIAL AVG	0.000720	0.000608	0.000282	0.000331	0.000382	0.000052	0.000039	0.002414	*
THREE-YEAR EXPONENTIAL AVG	0.001214	0.000883	0.000404	0.000292	0.000324	0.000041	0.000061	0.003218	
FOUR-YEAR EXPONENTIAL AVG	0.001587	0.001157	0.000381	0.000283	0.000316	0.000033	0.000042	0.003799	

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STATE: NORTH CAROLINA INCURRED - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: INDEMNITY ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	1	1	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
FOUR-YEAR STRAIGHT AVERAGE	0	0	0	0	1	1	0	2	
TWO-YEAR EXPONENTIAL AVG	1	1	1	0	0	0	0	3	*
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	1	0	0	0	1	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: NORTH CAROLINA PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.177	1.049	1.021	1.012	1.013	1.012	1.003
1982	1.182	1.055	1.024	1.012	1.011	1.009	1.009
1983	1.177	1.056	1.023	1.012	1.008	1.008	1.008
1984	1.194	1.047	1.034	1.013	1.016	1.009	1.009
1985	1.219	1.060	1.024	1.021	1.009	1.011	1.005
1986	1.207	1.052	1.030	1.013	1.011	1.012	1.011
1987	1.205	1.056	1.020	1.015	1.009	1.010	1.006
1988	1.254	1.072	1.034	1.020	1.014	1.007	1.011
1989	1.263	1.080	1.029	1.027	1.009	1.010	1.005
POINTS	9	9	9	9	9	9	9
AVERAGE	1.209	1.059	1.027	1.016	1.011	1.010	1.007
SAMPLE VARIANCE	0.001008	0.000117	0.000029	0.000029	0.000007	0.000003	0.000008
SAMPLE COEFF OF VARIANCE	0.026	0.010	0.005	0.005	0.003	0.002	0.003

REGION: SOUTHERN PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	1.215	1.079	1.044	1.027	1.015	1.013	1.009
1983	1.216	1.070	1.042	1.021	1.019	1.012	1.010
1984	1.233	1.073	1.039	1.026	1.017	1.014	1.012
1985	1.245	1.073	1.037	1.025	1.017	1.013	1.013
1986	1.267	1.082	1.042	1.022	1.017	1.018	1.012
1987	1.283	1.093	1.043	1.028	1.020	1.016	1.012
1988	1.314	1.101	1.048	1.029	1.021	1.015	1.013
1989	1.340	1.112	1.055	1.033	1.022	1.018	1.013
POINTS	8	8	8	8	8	8	8
AVERAGE	1.264	1.085	1.044	1.026	1.019	1.015	1.012
SAMPLE VARIANCE	0.002096	0.000229	0.000031	0.000015	0.000006	0.000005	0.000002
SAMPLE COEFF OF VARIANCE	0.036	0.014	0.005	0.004	0.002	0.002	0.001

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: NORTH CAROLINA PAID - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: MEDICAL (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.000923	0.000131	0.000031	0.000044	0.000007	0.000006	0.000010	0.001151	
THREE-YEAR STRAIGHT AVERAGE	0.000980	0.000145	0.000039	0.000043	0.000008	0.000006	0.000013	0.001233	
FOUR-YEAR STRAIGHT AVERAGE	0.001117	0.000162	0.000026	0.000039	0.000005	0.000004	0.000008	0.001362	
TWO-YEAR EXPONENTIAL AVG	0.000900	0.000129	0.000033	0.000043	0.000007	0.000006	0.000011	0.001128	*
THREE-YEAR EXPONENTIAL AVG	0.000950	0.000141	0.000039	0.000043	0.000008	0.000006	0.000013	0.001200	
FOUR-YEAR EXPONENTIAL AVG	0.001068	0.000157	0.000028	0.000039	0.000005	0.000004	0.000009	0.001310	

STATE: NORTH CAROLINA PAID - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: MEDICAL ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
FOUR-YEAR STRAIGHT AVERAGE	0	0	1	1	1	1	1	5	*
TWO-YEAR EXPONENTIAL AVG	1	1	0	0	0	0	0	2	
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: NORTH CAROLINA PAID + O/S - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	0.987	1.007	1.017	0.992	1.011	1.006	1.003
1982	0.950	0.996	0.994	0.979	1.020	1.011	1.071
1983	0.993	1.007	0.973	0.993	1.000	0.997	0.998
1984	1.010	1.012	1.011	1.001	1.010	1.010	1.006
1985	1.038	1.004	0.993	1.013	1.004	1.006	1.009
1986	1.035	0.983	1.020	1.002	1.021	1.001	1.014
1987	1.035	1.028	1.018	1.007	0.999	1.011	1.020
1988	1.048	1.027	1.007	0.988	1.004	0.988	0.997
1989	1.069	1.034	0.990	1.011	0.998	1.001	1.006
POINTS	9	9	9	9	9	9	9
AVERAGE	1.018	1.011	1.003	0.998	1.007	1.003	1.014
SAMPLE VARIANCE	0.001344	0.000271	0.000255	0.000128	0.000075	0.000058	0.000513
SAMPLE COEFF OF VARIANCE	0.036	0.016	0.016	0.011	0.009	0.008	0.022

REGION: SOUTHERN PAID + O/S - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	1.042	1.020	1.009	1.006	1.008	1.003	1.013
1983	1.054	1.015	1.023	1.013	1.004	1.005	1.008
1984	1.067	1.020	1.010	1.006	1.008	1.013	1.007
1985	1.072	1.019	1.004	1.011	0.999	1.010	1.006
1986	1.083	1.026	1.018	1.009	1.011	1.011	1.008
1987	1.100	1.043	1.018	1.015	1.013	1.011	1.008
1988	1.101	1.038	1.015	1.012	1.007	1.006	1.010
1989	1.093	1.031	1.022	1.013	1.014	1.011	1.012
POINTS	8	8	8	8	8	8	8
AVERAGE	1.077	1.027	1.015	1.011	1.008	1.009	1.009
SAMPLE VARIANCE	0.000468	0.000100	0.000045	0.000011	0.000024	0.000013	0.000006
SAMPLE COEFF OF VARIANCE	0.020	0.010	0.007	0.003	0.005	0.004	0.002

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: NORTH CAROLINA PAID + D/S - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: MEDICAL (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.000476	0.000470	0.000222	0.000147	0.000085	0.000088	0.000114	0.001602	
THREE-YEAR STRAIGHT AVERAGE	0.000883	0.000470	0.000300	0.000201	0.000116	0.000073	0.000155	0.002198	
FOUR-YEAR STRAIGHT AVERAGE	0.001139	0.000428	0.000304	0.000183	0.000078	0.000088	0.000117	0.002337	
TWO-YEAR EXPONENTIAL AVG	0.000463	0.000466	0.000219	0.000150	0.000088	0.000090	0.000113	0.001589	*
THREE-YEAR EXPONENTIAL AVG	0.000818	0.000461	0.000288	0.000195	0.000114	0.000076	0.000141	0.002094	
FOUR-YEAR EXPONENTIAL AVG	0.001031	0.000426	0.000291	0.000178	0.000082	0.000088	0.000107	0.002204	

2

STATE: NORTH CAROLINA PAID + D/S - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: MEDICAL ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	1	0	0	0	1	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	0	0	1	0	1	
FOUR-YEAR STRAIGHT AVERAGE	0	0	0	0	1	0	0	1	
TWO-YEAR EXPONENTIAL AVG	1	0	1	0	0	0	0	2	*
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	1	0	0	0	0	1	2	*

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: NORTH CAROLINA INCURRED - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	0.944	0.987	1.020	0.990	1.013	1.007	1.005
1982	0.890	0.976	0.990	0.970	1.019	1.010	1.069
1983	0.934	0.979	0.960	0.982	0.998	0.995	0.998
1984	0.952	0.984	1.003	0.988	1.007	1.008	1.005
1985	0.988	0.983	0.989	0.998	1.002	1.004	1.007
1986	0.990	0.969	1.024	0.984	1.019	0.998	1.012
1987	0.990	1.014	1.010	1.003	0.998	1.010	1.019
1988	1.000	1.016	1.012	0.987	1.016	0.985	0.997
1989	1.023	1.027	0.995	1.003	0.998	0.996	1.005
POINTS	9	9	9	9	9	9	9
AVERAGE	0.968	0.993	1.000	0.989	1.008	1.001	1.013
SAMPLE VARIANCE	0.001686	0.000425	0.000384	0.000114	0.000083	0.000073	0.000485
SAMPLE COEFF OF VARIANCE	0.042	0.021	0.020	0.011	0.009	0.009	0.022

REGION: SOUTHERN INCURRED - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	0.981	0.998	1.003	0.995	1.006	1.001	1.011
1983	1.005	0.990	1.013	1.001	1.001	1.003	1.007
1984	1.025	1.003	1.006	0.998	1.007	1.013	1.007
1985	1.030	1.002	1.001	1.000	0.997	1.008	1.005
1986	1.038	1.011	1.017	0.998	1.009	1.009	1.005
1987	1.052	1.029	1.013	1.011	1.011	1.009	1.008
1988	1.049	1.024	1.012	1.009	1.012	1.004	1.010
1989	1.048	1.022	1.020	1.007	1.012	1.008	1.012
POINTS	8	8	8	8	8	8	8
AVERAGE	1.029	1.010	1.011	1.002	1.007	1.007	1.008
SAMPLE VARIANCE	0.000609	0.000194	0.000045	0.000034	0.000030	0.000015	0.000007
SAMPLE COEFF OF VARIANCE	0.024	0.014	0.007	0.006	0.005	0.004	0.003

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: NORTH CAROLINA INCURRED - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: MEDICAL (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.000662	0.000480	0.000227	0.000100	0.000101	0.000103	0.000102	0.001774	
THREE-YEAR STRAIGHT AVERAGE	0.001225	0.000585	0.000415	0.000144	0.000141	0.000085	0.000150	0.002745	
FOUR-YEAR STRAIGHT AVERAGE	0.001540	0.000636	0.000395	0.000121	0.000097	0.000105	0.000119	0.003015	
TWO-YEAR EXPONENTIAL AVG	0.000643	0.000474	0.000226	0.000105	0.000107	0.000105	0.000101	0.001762	*
THREE-YEAR EXPONENTIAL AVG	0.001137	0.000563	0.000393	0.000142	0.000141	0.000088	0.000136	0.002600	
FOUR-YEAR EXPONENTIAL AVG	0.001399	0.000609	0.000374	0.000121	0.000103	0.000105	0.000108	0.002820	

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STATE: NORTH CAROLINA INCURRED - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: MEDICAL ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	1	0	0	0	1	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	0	0	1	0	1	
FOUR-YEAR STRAIGHT AVERAGE	0	0	0	0	1	0	0	1	
TWO-YEAR EXPONENTIAL AVG	1	1	1	0	0	0	1	4	*
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
NORTH CAROLINA INDEMNITY COMPARISON OF PROJECTIONS

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	ACTUAL 8TH	AVERAGE	*=LOW AVG
1978 PAID				57,605,001	57,413,103	57,584,944	57,867,528	57,540,582		
1978 PAID + O/S				61,441,427	61,289,300	61,413,149	61,229,047	61,454,825		
1978 INCURRED				62,219,267	61,350,028	61,381,673	61,197,127	61,167,693		
1978 PAID (1)				0.11%	0.22%	0.08%	0.57%		0.24%	
1978 PAID + O/S (1)				0.02%	0.27%	0.07%	0.37%		0.18%	*
1978 INCURRED (1)				1.72%	0.30%	0.35%	0.05%		0.60%	
1978 PAID (2)					0.33%	0.30%	0.49%	0.56%	0.42%	
1978 PAID + O/S (2)					0.25%	0.20%	0.30%	0.37%	0.28%	*
1978 INCURRED (2)					1.40%	0.05%	0.30%	0.05%	0.45%	
1979 PAID			66,884,553	66,108,818	65,828,786	65,958,492	65,410,309	65,316,194		
1979 PAID + O/S			69,540,851	68,500,860	68,707,990	68,742,653	69,223,921	69,167,835		
1979 INCURRED			71,645,185	68,865,797	68,796,526	68,934,534	69,072,038	69,366,689		
1979 PAID (1)			2.40%	1.21%	0.78%	0.98%	0.14%		1.11%	
1979 PAID + O/S (1)			0.54%	0.96%	0.66%	0.61%	0.08%		0.57%	*
1979 INCURRED (1)			3.28%	0.72%	0.82%	0.62%	0.42%		1.18%	
1979 PAID (2)				1.16%	0.42%	0.20%	0.83%	0.14%	0.55%	
1979 PAID + O/S (2)				1.50%	0.30%	0.05%	0.70%	0.08%	0.53%	*
1979 INCURRED (2)				3.88%	0.10%	0.20%	0.20%	0.43%	0.96%	
1980 PAID		68,971,750	67,861,127	67,767,828	68,164,353	67,599,000	67,432,940	67,535,062		
1980 PAID + O/S		70,046,844	69,807,370	71,328,412	71,328,768	71,469,861	71,720,933	71,475,263		
1980 INCURRED		72,313,538	69,972,324	71,765,541	71,288,098	71,180,005	71,716,807	71,600,446		
1980 PAID (1)		2.13%	0.48%	0.34%	0.93%	0.09%	0.15%		0.69%	*
1980 PAID + O/S (1)		2.00%	2.33%	0.21%	0.20%	0.01%	0.34%		0.85%	
1980 INCURRED (1)		1.00%	2.27%	0.23%	0.44%	0.59%	0.16%		0.78%	
1980 PAID (2)			1.61%	0.14%	0.59%	0.83%	0.25%	0.15%	0.59%	
1980 PAID + O/S (2)			0.34%	2.18%	0.00%	0.20%	0.35%	0.34%	0.57%	*
1980 INCURRED (2)			3.24%	2.56%	0.67%	0.15%	0.75%	0.16%	1.26%	
1981 PAID	69,134,979	65,177,565	64,118,685	64,157,610	63,964,125	63,931,007	64,370,923	64,428,312		
1981 PAID + O/S	64,987,965	66,112,399	67,253,698	68,300,133	68,674,930	68,847,508	69,534,183	69,938,161		
1981 INCURRED	67,390,104	66,293,049	67,257,695	68,785,190	68,395,739	68,739,644	69,462,906	70,026,420		
1981 PAID (1)	7.31%	1.16%	0.48%	0.42%	0.72%	0.77%	0.09%		1.56%	*
1981 PAID + O/S (1)	7.08%	5.47%	3.84%	2.34%	1.81%	1.56%	0.58%		3.24%	
1981 INCURRED (1)	3.76%	5.33%	3.95%	1.77%	2.33%	1.84%	0.80%		2.83%	
1981 PAID (2)		5.72%	1.62%	0.06%	0.30%	0.05%	0.69%	0.09%	1.22%	
1981 PAID + O/S (2)		1.73%	1.73%	1.56%	0.55%	0.25%	1.00%	0.58%	1.06%	*
1981 INCURRED (2)		1.63%	1.46%	2.27%	0.57%	0.50%	1.05%	0.81%	1.18%	
1982 PAID	63,027,328	63,176,894	64,752,260	65,251,595	65,654,215	66,458,944	66,882,319			
1982 PAID + O/S	65,821,747	67,937,864	69,863,101	70,767,324	71,227,951	72,728,624	72,801,207			
1982 INCURRED	65,253,099	67,546,898	70,294,175	71,465,589	73,747,161	77,169,087	76,668,644			
1982 PAID (1)	5.76%	5.54%	3.18%	2.44%	1.84%	0.63%			3.23%	*
1982 PAID + O/S (1)	9.59%	6.68%	4.04%	2.79%	2.16%	0.10%			4.23%	
1982 INCURRED (1)	14.89%	11.90%	8.31%	6.79%	3.81%	0.65%			7.73%	
1982 PAID (2)		0.24%	2.49%	0.77%	0.62%	1.23%	0.64%		1.00%	*
1982 PAID + O/S (2)		3.21%	2.83%	1.29%	0.65%	2.11%	0.10%		1.70%	
1982 INCURRED (2)		3.52%	4.07%	1.67%	3.19%	4.64%	0.65%		2.96%	
1983 PAID	74,012,690	77,982,387	79,359,674	79,507,714	79,941,566	80,177,606				
1983 PAID + O/S	79,102,245	83,268,929	85,733,918	86,120,578	87,893,853	87,499,931				
1983 INCURRED	76,302,694	82,593,613	85,738,367	85,907,939	90,306,657	88,531,677				
1983 PAID (1)	7.69%	2.74%	1.02%	0.84%	0.29%				2.52%	*
1983 PAID + O/S (1)	9.60%	4.84%	2.02%	1.58%	0.45%				3.70%	
1983 INCURRED (1)	13.81%	6.71%	3.16%	2.96%	2.00%				5.73%	
1983 PAID (2)		5.36%	1.77%	0.19%	0.55%	0.30%			1.63%	*
1983 PAID + O/S (2)		5.27%	2.96%	0.45%	2.06%	0.45%			2.24%	
1983 INCURRED (2)		8.24%	3.81%	0.20%	5.12%	1.97%			3.87%	
1984 PAID	94,696,793	95,091,438	95,624,969	97,235,138	97,852,724					
1984 PAID + O/S	99,629,077	104,969,276	107,938,215	109,618,331	108,637,999					
1984 INCURRED	97,748,297	104,199,599	109,421,080	114,059,157	111,901,212					
1984 PAID (1)	3.23%	2.82%	2.28%	0.63%					2.24%	*
1984 PAID + O/S (1)	8.29%	3.38%	0.64%	0.90%					3.30%	
1984 INCURRED (1)	12.65%	6.88%	2.22%	1.93%					5.92%	
1984 PAID (2)		0.42%	0.56%	1.68%	0.64%				0.82%	*
1984 PAID + O/S (2)		5.36%	2.83%	1.56%	0.89%				2.66%	
1984 INCURRED (2)		6.60%	5.01%	4.24%	1.89%				4.44%	

NOTES: (1) ABSOLUTE DEVIATION FROM LAST PROJECTION (OR REPORT), RATIOED TO SAME.

(2) ABSOLUTE CHANGE RELATIVE TO PRIOR PROJECTION OR REPORT.

WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.

LOSSES HAVE BEEN RESTATED TO THE LATEST DIAGONAL.

N-4 0.0000

N-3 0.0000

N-2 0.5000

N-1 0.5000

WEIGHTS ASSIGNED TO

PRECEDING YEARS:

09:00 AM

03/14/91

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 NORTH CAROLINA INDEMNITY COMPARISON OF PROJECTIONS RESTATED TO INCURRED LEVEL

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	RESTATED 8TH	AVERAGE	*=LOW AVG
1978 PAID				60,006,042	60,796,938	61,738,546	62,531,384	61,954,347		
1978 PAID + Q/S				61,829,282	61,644,355	61,807,470	61,557,757	61,439,051		
1978 INCURRED				62,219,267	61,350,028	61,381,673	61,197,127	61,167,693		
1978 PAID (1)				3.14%	1.87%	0.35%	0.93%		1.57%	
1978 PAID + Q/S (1)				0.64%	0.33%	0.60%	0.19%		0.44%	*
1978 INCURRED (1)				1.72%	0.30%	0.35%	0.05%		0.60%	
1978 PAID (2)					1.32%	1.55%	1.28%	0.92%	1.27%	
1978 PAID + Q/S (2)					0.30%	0.26%	0.40%	0.19%	0.29%	*
1978 INCURRED (2)					1.40%	0.05%	0.30%	0.05%	0.45%	
1979 PAID			69,672,376	70,005,164	70,577,016	71,274,443	70,427,736	69,400,052		
1979 PAID + Q/S			69,979,834	68,897,693	69,149,149	69,111,701	69,206,153	69,104,692		
1979 INCURRED			71,645,185	68,865,797	68,796,526	68,934,534	69,072,038	69,366,689		
1979 PAID (1)			0.39%	0.87%	1.70%	2.70%	1.48%		1.43%	
1979 PAID + Q/S (1)			1.27%	0.30%	0.06%	0.01%	0.15%		0.36%	*
1979 INCURRED (1)			3.28%	0.72%	0.82%	0.62%	0.42%		1.18%	
1979 PAID (2)				0.48%	0.82%	0.99%	1.19%	1.46%	0.99%	
1979 PAID + Q/S (2)				1.55%	0.36%	0.05%	0.14%	0.15%	0.45%	*
1979 INCURRED (2)				3.88%	0.10%	0.20%	0.20%	0.43%	0.96%	
1980 PAID		71,846,569	71,860,751	72,655,922	73,658,086	72,784,316	71,649,146	71,661,749		
1980 PAID + Q/S		70,489,021	70,211,772	71,786,396	71,711,699	71,451,516	71,655,459	71,640,576		
1980 INCURRED		72,313,538	69,972,324	71,765,541	71,288,098	71,180,005	71,716,807	71,600,446		
1980 PAID (1)		0.26%	0.28%	1.39%	2.79%	1.57%	0.02%		1.05%	
1980 PAID + Q/S (1)		1.61%	1.99%	0.20%	0.10%	0.26%	0.02%		0.70%	*
1980 INCURRED (1)		1.00%	2.27%	0.23%	0.44%	0.59%	0.16%		0.78%	
1980 PAID (2)			0.02%	1.11%	1.38%	1.19%	1.56%	0.02%	0.88%	
1980 PAID + Q/S (2)			0.39%	2.24%	0.39%	0.10%	0.36%	0.02%	0.57%	*
1980 INCURRED (2)			3.24%	2.56%	0.67%	0.15%	0.75%	0.16%	1.26%	
1981 PAID	72,016,601	69,019,025	68,743,566	69,328,418	68,870,620	67,928,257	68,304,268	69,155,860		
1981 PAID + Q/S	65,398,208	66,495,395	67,685,520	68,666,805	68,657,302	68,784,657	69,695,006	70,043,532		
1981 INCURRED	67,390,104	66,293,049	67,257,695	68,785,190	68,395,739	68,739,644	69,462,906	70,026,420		
1981 PAID (1)	4.14%	0.20%	0.60%	0.25%	0.41%	1.78%	1.23%		1.23%	*
1981 PAID + Q/S (1)	6.63%	5.07%	3.37%	1.97%	1.98%	1.80%	0.50%		3.04%	
1981 INCURRED (1)	3.76%	5.33%	3.95%	1.77%	2.33%	1.84%	0.80%		2.83%	
1981 PAID (2)		4.16%	0.40%	0.85%	0.66%	1.37%	0.55%	1.25%	1.32%	
1981 PAID + Q/S (2)		1.68%	1.79%	1.45%	0.01%	0.19%	1.32%	0.50%	0.99%	*
1981 INCURRED (2)		1.63%	1.46%	2.27%	0.57%	0.50%	1.05%	0.81%	1.18%	
1982 PAID	66,742,056	67,733,843	69,970,994	70,256,849	69,759,207	70,519,875	71,789,934			
1982 PAID + Q/S	66,203,060	68,374,078	70,238,164	70,749,160	71,162,927	72,896,836	72,910,891			
1982 INCURRED	65,253,099	67,546,898	70,294,175	71,465,589	73,747,161	77,169,087	76,668,644			
1982 PAID (1)	7.03%	5.65%	2.53%	2.14%	2.83%	1.77%			3.66%	*
1982 PAID + Q/S (1)	9.20%	6.22%	3.67%	2.96%	2.40%	0.02%			4.08%	
1982 INCURRED (1)	14.89%	11.90%	8.31%	6.79%	3.81%	0.65%			7.73%	
1982 PAID (2)		1.49%	3.30%	0.41%	0.71%	1.09%	1.80%		1.47%	*
1982 PAID + Q/S (2)		3.28%	2.73%	0.73%	0.58%	2.44%	0.02%		1.63%	
1982 INCURRED (2)		3.52%	4.07%	1.67%	3.19%	4.64%	0.65%		2.96%	
1983 PAID	79,351,225	84,267,408	85,447,116	84,478,888	84,826,345	86,060,788				
1983 PAID + Q/S	79,610,144	83,715,961	85,711,912	86,041,958	88,097,140	87,631,761				
1983 INCURRED	78,302,694	82,595,613	85,738,367	85,907,939	90,306,657	88,531,677				
1983 PAID (1)	7.80%	2.08%	0.71%	1.84%	1.43%				2.77%	*
1983 PAID + Q/S (1)	9.15%	4.47%	2.19%	1.81%	0.53%				3.63%	
1983 INCURRED (1)	13.81%	6.71%	3.16%	2.96%	2.00%				5.73%	
1983 PAID (2)		6.20%	1.40%	1.13%	0.41%	1.46%			2.12%	*
1983 PAID + Q/S (2)		5.16%	2.38%	0.39%	2.39%	0.53%			2.17%	
1983 INCURRED (2)		8.24%	3.81%	0.20%	5.12%	1.97%			3.87%	
1984 PAID	102,328,919	102,385,616	101,603,865	103,176,629	105,032,851					
1984 PAID + Q/S	100,163,939	104,942,333	107,839,678	109,871,863	108,801,676					
1984 INCURRED	97,748,297	104,199,599	109,421,080	114,059,157	111,901,212					
1984 PAID (1)	2.57%	2.52%	3.26%	1.77%					2.53%	*
1984 PAID + Q/S (1)	7.94%	3.55%	0.88%	0.98%					3.34%	
1984 INCURRED (1)	12.65%	6.88%	2.22%	1.93%					5.92%	
1984 PAID (2)		0.06%	0.76%	1.55%	1.80%				1.04%	*
1984 PAID + Q/S (2)		4.77%	2.76%	1.88%	0.97%				2.60%	
1984 INCURRED (2)		6.60%	5.01%	4.24%	1.89%				4.44%	

NOTES: (1) ABSOLUTE DEVIATION FROM LAST PROJECTION (OR REPORT), RATIOW TO SAME.
 (2) ABSOLUTE CHANGE RELATIVE TO PRIOR PROJECTION OR REPORT.
 WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.
 LOSSES RESTATED TO INCURRED LEVEL OF 8TH REPORT, AND TO LAST DIAGONAL.

WEIGHTS ASSIGNED TO PRECEDING YEARS:
 N-4 0.0000
 N-3 0.0000
 N-2 0.5000
 N-1 0.5000

NATIONAL COUNCIL ON COMPENSATION INSURANCE
NORTH CAROLINA MEDICAL COMPARISON OF PROJECTIONS

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	ACTUAL 8TH	AVERAGE	*=LOW AVG
1978 PAID				35,352,359	35,282,692	35,509,871	35,544,951	35,673,680		
1978 PAID + Q/S				39,759,668	39,571,851	38,309,568	38,615,814	38,877,856		
1978 INCURRED				40,324,260	39,735,092	38,409,162	38,678,054	38,914,734		
1978 PAID (1)				0.90%	1.10%	0.46%	0.36%		0.70%	*
1978 PAID + Q/S (1)				2.27%	1.79%	1.46%	0.67%		1.55%	
1978 INCURRED (1)				3.62%	2.11%	1.30%	0.61%		1.91%	
1978 PAID (2)					0.20%	0.64%	0.10%	0.36%	0.33%	*
1978 PAID + Q/S (2)					0.47%	3.19%	0.80%	0.68%	1.29%	
1978 INCURRED (2)					1.46%	3.34%	0.70%	0.61%	1.53%	
1979 PAID			41,507,102	41,445,563	41,589,258	41,465,878	41,589,247	41,523,149		
1979 PAID + Q/S			45,714,139	43,717,225	42,753,860	43,138,344	43,008,852	43,385,749		
1979 INCURRED			47,067,119	44,052,052	42,893,509	43,258,253	43,063,555	43,481,453		
1979 PAID (1)			0.04%	0.19%	0.16%	0.14%	0.16%		0.14%	*
1979 PAID + Q/S (1)			5.37%	0.76%	1.46%	0.57%	0.87%		1.81%	
1979 INCURRED (1)			8.25%	1.27%	1.35%	0.51%	0.96%		2.47%	
1979 PAID (2)				0.15%	0.35%	0.30%	0.30%	0.16%	0.25%	*
1979 PAID + Q/S (2)				4.37%	2.20%	0.90%	0.30%	0.88%	1.73%	
1979 INCURRED (2)				6.45%	2.59%	0.85%	0.45%	0.97%	2.26%	
1980 PAID		46,320,945	46,450,825	47,066,818	47,485,291	47,532,516	47,485,570	47,603,485		
1980 PAID + Q/S		51,110,017	49,676,171	49,740,337	51,145,439	51,829,958	52,501,257	51,481,005		
1980 INCURRED		52,756,803	49,998,336	49,952,106	51,169,094	51,829,427	52,606,246	51,630,081		
1980 PAID (1)		2.67%	2.42%	1.13%	0.25%	0.15%	0.25%		1.15%	*
1980 PAID + Q/S (1)		0.72%	3.51%	3.38%	0.65%	0.68%	1.98%		1.82%	
1980 INCURRED (1)		2.18%	3.16%	3.25%	0.89%	0.39%	1.89%		1.96%	
1980 PAID (2)			0.28%	1.33%	0.89%	0.10%	0.10%	0.25%	0.49%	*
1980 PAID + Q/S (2)			2.81%	0.13%	2.82%	1.34%	1.30%	1.94%	1.72%	
1980 INCURRED (2)			5.23%	0.09%	2.44%	1.29%	1.50%	1.86%	2.07%	
1981 PAID	47,262,772	47,272,443	47,260,863	47,286,459	47,100,683	47,054,118	46,867,949	46,709,791		
1981 PAID + Q/S	50,237,287	49,789,684	49,429,938	50,576,160	50,574,004	50,296,002	48,983,225	48,862,327		
1981 INCURRED	52,183,850	50,295,000	49,498,356	50,835,769	50,599,481	50,421,240	49,101,713	48,957,552		
1981 PAID (1)	1.18%	1.20%	1.18%	1.23%	0.84%	0.74%	0.34%		0.96%	*
1981 PAID + Q/S (1)	2.81%	1.90%	1.16%	3.51%	3.50%	2.93%	0.25%		2.30%	
1981 INCURRED (1)	6.59%	2.73%	1.10%	3.84%	3.35%	2.99%	0.29%		2.99%	
1981 PAID (2)		0.02%	0.02%	0.05%	0.39%	0.10%	0.40%	0.34%	0.19%	*
1981 PAID + Q/S (2)		0.89%	0.72%	2.32%	0.00%	0.55%	2.61%	0.25%	1.05%	
1981 INCURRED (2)		3.62%	1.58%	2.70%	0.46%	0.35%	2.62%	0.29%	1.66%	
1982 PAID	51,265,363	52,105,865	52,812,139	52,863,696	52,759,814	52,837,783	52,890,136			
1982 PAID + Q/S	52,251,420	53,796,394	55,240,146	56,538,735	56,818,860	55,647,367	55,344,052			
1982 INCURRED	52,113,685	53,401,697	55,317,168	57,010,622	58,102,642	57,726,268	57,239,188			
1982 PAID (1)	3.07%	1.48%	0.15%	0.05%	0.25%	0.10%			0.85%	*
1982 PAID + Q/S (1)	5.59%	2.80%	0.19%	2.16%	2.66%	0.55%			2.32%	
1982 INCURRED (1)	8.95%	6.70%	3.36%	0.40%	1.51%	0.85%			3.63%	
1982 PAID (2)		1.64%	1.36%	0.10%	0.20%	0.15%	0.10%		0.59%	*
1982 PAID + Q/S (2)		2.96%	2.68%	2.35%	0.50%	2.06%	0.55%		1.85%	
1982 INCURRED (2)		2.47%	3.59%	3.06%	1.92%	0.65%	0.84%		2.09%	
1983 PAID	63,072,147	65,330,440	65,110,911	64,476,453	64,793,675	64,601,488				
1983 PAID + Q/S	65,772,966	70,278,469	69,218,177	70,181,243	67,436,870	66,400,910				
1983 INCURRED	63,970,147	69,462,167	69,327,798	70,229,898	68,704,421	67,143,021				
1983 PAID (1)	2.37%	1.13%	0.79%	0.19%	0.30%				0.96%	*
1983 PAID + Q/S (1)	0.95%	5.84%	4.24%	5.69%	1.56%				3.66%	
1983 INCURRED (1)	4.73%	3.45%	3.25%	4.60%	2.33%				3.67%	
1983 PAID (2)		3.58%	0.34%	0.97%	0.49%	0.30%			1.14%	*
1983 PAID + Q/S (2)		6.85%	1.51%	1.39%	3.91%	1.54%			3.04%	
1983 INCURRED (2)		8.59%	0.19%	1.30%	2.17%	2.27%			2.90%	
1984 PAID	77,331,880	77,397,133	77,018,656	77,885,809	78,574,023					
1984 PAID + Q/S	81,676,059	82,176,452	86,297,841	82,734,668	82,814,416					
1984 INCURRED	79,990,793	82,070,783	86,974,298	85,353,054	84,842,223					
1984 PAID (1)	1.58%	1.50%	1.98%	0.88%					1.48%	*
1984 PAID + Q/S (1)	1.37%	0.77%	4.21%	0.10%					1.61%	
1984 INCURRED (1)	5.72%	3.27%	2.51%	0.60%					3.02%	
1984 PAID (2)		0.08%	0.49%	1.13%	0.88%				0.65%	*
1984 PAID + Q/S (2)		0.61%	5.02%	4.13%	0.10%				2.46%	
1984 INCURRED (2)		2.60%	5.97%	1.86%	0.60%				2.76%	

NOTES: (1) ABSOLUTE DEVIATION FROM LAST PROJECTION (OR REPORT), RATIOED TO SAME.
(2) ABSOLUTE CHANGE RELATIVE TO PRIOR PROJECTION OR REPORT.
WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.
LOSSES HAVE BEEN RESTATED TO THE LATEST DIAGONAL.

N-4 0.0000
N-3 0.0000
N-2 0.5000
N-1 0.5000

WEIGHTS ASSIGNED TO
PRECEDING YEARS:

09:04 AM
03/14/91

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 NORTH CAROLINA MEDICAL COMPARISON OF PROJECTIONS RESTATED TO INCURRED LEVEL

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	RESTATED 8TH	AVERAGE	*=LOW AVG
1978 PAID				38,133,417	39,281,419	38,299,920	38,301,632	38,846,313		
1978 PAID + Q/S				39,935,065	39,714,657	38,491,355	38,791,388	38,967,245		
1978 INCURRED				40,324,260	39,735,092	38,409,162	38,678,054	38,914,734		
1978 PAID (1)				1.84%	1.12%	1.41%	1.40%		1.44%	*
1978 PAID + Q/S (1)				2.48%	1.92%	1.22%	0.45%		1.52%	
1978 INCURRED (1)				3.62%	2.11%	1.30%	0.61%		1.91%	
1978 PAID (2)					3.01%	2.50%	0.00%	1.42%	1.73%	
1978 PAID + Q/S (2)					0.55%	3.08%	0.78%	0.45%	1.22%	*
1978 INCURRED (2)					1.46%	3.34%	0.70%	0.61%	1.53%	
1979 PAID			44,772,334	46,142,753	44,856,970	44,681,755	45,287,981	44,370,012		
1979 PAID + Q/S			45,915,804	43,874,991	42,956,736	43,334,481	43,107,739	43,454,161		
1979 INCURRED			47,067,119	44,032,052	42,893,509	43,258,253	43,063,555	43,481,453		
1979 PAID (1)			0.91%	4.00%	1.10%	0.70%	2.07%		1.75%	*
1979 PAID + Q/S (1)			5.66%	0.97%	1.14%	0.28%	0.80%		1.77%	
1979 INCURRED (1)			8.25%	1.27%	1.35%	0.51%	0.96%		2.47%	
1979 PAID (2)				3.06%	2.79%	0.39%	1.36%	2.03%	1.92%	
1979 PAID + Q/S (2)				4.44%	2.09%	0.88%	0.52%	0.80%	1.75%	*
1979 INCURRED (2)				6.45%	2.59%	0.85%	0.45%	0.97%	2.26%	
1980 PAID		49,964,866	51,715,281	50,764,908	51,168,003	51,759,813	50,741,222	50,723,677		
1980 PAID + Q/S		51,335,486	49,855,441	49,976,365	51,377,982	51,949,127	52,584,043	51,612,317		
1980 INCURRED		52,756,803	49,998,336	49,952,106	51,169,094	51,829,427	52,606,246	51,630,081		
1980 PAID (1)		1.50%	1.95%	0.08%	0.88%	2.04%	0.03%		1.08%	*
1980 PAID + Q/S (1)		0.54%	3.40%	3.17%	0.45%	0.65%	1.88%		1.68%	
1980 INCURRED (1)		2.18%	3.16%	3.25%	0.89%	0.39%	1.89%		1.96%	
1980 PAID (2)			3.50%	1.84%	0.79%	1.16%	1.97%	0.03%	1.55%	*
1980 PAID + Q/S (2)			2.88%	0.24%	2.80%	1.11%	1.22%	1.85%	1.69%	
1980 INCURRED (2)			5.25%	0.09%	2.44%	1.29%	1.50%	1.86%	2.07%	
1981 PAID	50,980,784	52,630,016	50,974,200	50,953,750	51,289,574	50,280,188	49,939,929	49,794,612		
1981 PAID + Q/S	50,458,906	49,969,364	49,664,493	50,806,115	50,690,285	50,375,310	49,108,167	48,980,675		
1981 INCURRED	52,183,850	50,295,000	49,498,356	50,835,769	50,599,481	50,421,240	49,101,713	48,957,552		
1981 PAID (1)	2.38%	5.69%	2.37%	2.33%	3.00%	0.98%	0.29%		2.43%	
1981 PAID + Q/S (1)	3.02%	2.02%	1.40%	3.73%	3.49%	2.85%	0.26%		2.39%	*
1981 INCURRED (1)	6.59%	2.73%	1.10%	3.84%	3.35%	2.99%	0.29%		2.99%	
1981 PAID (2)		3.24%	3.15%	0.04%	0.66%	1.97%	0.68%	0.29%	1.43%	
1981 PAID + Q/S (2)		0.97%	0.61%	2.30%	0.23%	0.62%	2.52%	0.26%	1.07%	*
1981 INCURRED (2)		3.62%	1.58%	2.70%	0.46%	0.35%	2.62%	0.29%	1.66%	
1982 PAID	57,075,469	56,199,879	56,907,974	57,565,121	56,377,072	56,301,058	56,383,121			
1982 PAID + Q/S	52,439,984	54,051,669	55,491,306	56,668,731	56,908,433	55,789,307	55,478,099			
1982 INCURRED	52,113,685	53,401,697	55,317,168	57,010,622	58,102,642	57,726,268	57,239,188			
1982 PAID (1)	1.23%	0.32%	0.93%	2.10%	0.01%	0.15%			0.79%	*
1982 PAID + Q/S (1)	5.48%	2.57%	0.02%	2.15%	2.58%	0.56%			2.23%	
1982 INCURRED (1)	8.95%	6.70%	3.36%	0.40%	1.51%	0.85%			3.63%	
1982 PAID (2)		1.53%	1.26%	1.15%	2.06%	0.13%	0.15%		1.05%	*
1982 PAID + Q/S (2)		3.07%	2.66%	2.12%	0.42%	1.97%	0.56%		1.80%	
1982 INCURRED (2)		2.47%	3.59%	3.06%	1.92%	0.65%	0.84%		2.09%	
1983 PAID	68,027,794	70,397,129	70,901,539	68,897,014	69,040,606	68,867,918				
1983 PAID + Q/S	66,085,072	70,598,005	69,377,326	70,291,907	67,608,881	66,561,738				
1983 INCURRED	63,970,147	69,462,167	69,327,798	70,229,898	68,704,421	67,143,021				
1983 PAID (1)	1.22%	2.22%	2.95%	0.04%	0.25%				1.34%	*
1983 PAID + Q/S (1)	0.72%	6.06%	4.23%	5.60%	1.57%				3.64%	
1983 INCURRED (1)	4.73%	3.45%	3.25%	4.60%	2.33%				3.67%	
1983 PAID (2)		3.48%	0.72%	2.83%	0.21%	0.25%			1.50%	*
1983 PAID + Q/S (2)		6.83%	1.73%	1.32%	3.82%	1.55%			3.05%	
1983 INCURRED (2)		8.59%	0.19%	1.30%	2.17%	2.27%			2.90%	
1984 PAID	83,329,337	84,280,435	82,299,121	82,990,869	83,763,230					
1984 PAID + Q/S	82,047,416	82,365,395	86,433,918	82,945,699	83,014,998					
1984 INCURRED	79,990,793	82,070,783	86,974,298	85,353,054	84,842,223					
1984 PAID (1)	0.52%	0.62%	1.75%	0.92%					0.95%	*
1984 PAID + Q/S (1)	1.17%	0.78%	4.12%	0.08%					1.54%	
1984 INCURRED (1)	5.72%	3.27%	2.51%	0.60%					3.02%	
1984 PAID (2)		1.14%	2.35%	0.84%	0.93%				1.32%	*
1984 PAID + Q/S (2)		0.39%	4.94%	4.04%	0.08%				2.36%	
1984 INCURRED (2)		2.60%	5.97%	1.86%	0.60%				2.76%	

NOTES: (1) ABSOLUTE DEVIATION FROM LAST PROJECTION (OR REPORT), RATIOW TO SAME.
 (2) ABSOLUTE CHANGE RELATIVE TO PRIOR PROJECTION OR REPORT.
 WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.
 LOSSES RESTATED TO INCURRED LEVEL OF 8TH REPORT, AND TO LAST DIAGONAL.

WEIGHTS ASSIGNED TO PRECEDING YEARS:
 N-4 0.0000
 N-3 0.0000
 N-2 0.5000
 N-1 0.5000

UTAH

NATIONAL COUNCIL ON COMPENSATION INSURANCE

ANALYSIS OF FACTOR SELECTION METHODS AND PROJECTION METHODS

STATE: UTAH

ORDER OF PRESENTATION FOR TESTS AND ANALYSIS

Premium: Development by Diagonal, Showing Variance

Premium: Tests of Minimum Average Squared Deviations

Indemnity: Paid - Development by Diagonal, Showing Variance

Indemnity: Paid - Tests of Minimum Average Squared Deviations

Indemnity: Paid+O/S - Development by Diagonal, Showing Variance

Indemnity: Paid+O/S - Tests of Minimum Average Squared Deviations

Indemnity: Incurred - Development by Diagonal, Showing Variance

Indemnity: Incurred - Tests of Minimum Average Squared Deviations

Medical: Paid - Development by Diagonal, Showing Variance

Medical: Paid - Tests of Minimum Average Squared Deviations

Medical: Paid+O/S - Development by Diagonal, Showing Variance

Medical: Paid+O/S - Tests of Minimum Average Squared Deviations

Medical: Incurred - Development by Diagonal, Showing Variance

Medical: Incurred - Tests of Minimum Average Squared Deviations

Indemnity: Comparison of Projections - Deviations by Loss Statistic Type

Indemnity: Comparison of Restated Projections - Deviations by Loss Statistic Type

Medical: Comparison of Projections - Deviations by Loss Statistic Type

Medical: Comparison of Restated Projections - Deviations by Loss Statistic Type

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: UTAH

PREMIUM - DEVELOPMENT DIAGONALS BY EVALUATION DATE

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH
1981	1.055	1.001	1.001	1.000
1982	1.097	1.022	1.004	0.983
1983	1.113	1.000	1.005	1.000
1984	1.065	1.014	0.999	1.000
1985	1.028	0.996	0.997	1.000
1986	1.015	1.019	1.002	1.005
1987	1.012	0.995	1.000	1.001
1988	1.021	0.970	1.001	1.001
1989	1.019	0.983	0.999	1.001
POINTS	9	9	9	9
AVERAGE	1.047	1.000	1.001	0.999
SAMPLE VARIANCE	0.001414	0.000284	0.000006	0.000039
SAMPLE COEFF OF VARIANCE	0.036	0.017	0.003	0.006

REGION: WESTERN

PREMIUM - DEVELOPMENT DIAGONALS BY EVALUATION DATE

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH
1981				
1982	1.043	1.008	1.003	1.002
1983	1.033	1.003	0.999	1.001
1984	1.043	1.007	1.002	0.999
1985	1.048	1.003	1.002	0.999
1986	1.051	1.003	1.000	1.001
1987	1.043	1.006	1.002	1.004
1988	1.042	1.006	0.999	0.999
1989	1.028	1.000	1.000	0.999
POINTS	8	8	8	8
AVERAGE	1.041	1.005	1.001	1.001
SAMPLE VARIANCE	0.000056	0.000007	0.000002	0.000003
SAMPLE COEFF OF VARIANCE	0.007	0.003	0.002	0.002

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: UTAH PREMIUM - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.000973	0.000368	0.000009	0.000006	0.001357	
THREE-YEAR STRAIGHT AVERAGE	0.001505	0.000393	0.000008	0.000012	0.001918	
FOUR-YEAR STRAIGHT AVERAGE	0.001722	0.000377	0.000006	0.000021	0.002127	
TWO-YEAR EXPONENTIAL AVG	0.000929	0.000367	0.000008	0.000006	0.001311	*
THREE-YEAR EXPONENTIAL AVG	0.001398	0.000385	0.000008	0.000011	0.001802	
FOUR-YEAR EXPONENTIAL AVG	0.001575	0.000372	0.000006	0.000018	0.001971	

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STATE: UTAH PREMIUM - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	1	1	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	0	0	
FOUR-YEAR STRAIGHT AVERAGE	0	0	0	0	0	
TWO-YEAR EXPONENTIAL AVG	1	1	0	0	2	*
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	1	0	1	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: UTAH PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.287	1.131	1.064	1.055	1.021	1.010	1.011
1982	1.359	1.184	1.062	1.046	1.035	0.996	1.003
1983	1.376	1.121	1.046	1.040	1.024	1.009	1.006
1984	1.255	1.113	1.062	1.035	1.022	1.005	1.003
1985	1.385	1.136	1.071	1.028	1.030	1.019	1.005
1986	1.340	1.137	1.052	1.055	1.024	1.021	1.002
1987	1.296	1.133	1.084	1.061	1.040	1.018	1.011
1988	1.265	1.118	1.069	1.043	1.027	1.022	1.010
1989	1.279	1.118	1.071	1.032	1.030	1.019	1.026
POINTS	9	9	9	9	9	9	9
AVERAGE	1.316	1.132	1.065	1.044	1.028	1.013	1.009
SAMPLE VARIANCE	0.002465	0.000452	0.000125	0.000129	0.000040	0.000077	0.000055
SAMPLE COEFF OF VARIANCE	0.038	0.019	0.010	0.011	0.006	0.009	0.007

REGION: WESTERN PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	1.527	1.205	1.099	1.058	1.042	1.033	1.023
1983	1.574	1.212	1.100	1.060	1.041	1.028	1.025
1984	1.623	1.220	1.110	1.066	1.041	1.033	1.022
1985	1.684	1.257	1.109	1.068	1.043	1.034	1.027
1986	1.675	1.273	1.126	1.065	1.043	1.039	1.024
1987	1.687	1.272	1.126	1.072	1.045	1.031	1.021
1988	1.700	1.265	1.124	1.073	1.049	1.031	1.026
1989	1.697	1.269	1.117	1.065	1.038	1.030	1.019
POINTS	8	8	8	8	8	8	8
AVERAGE	1.646	1.247	1.114	1.066	1.043	1.032	1.023
SAMPLE VARIANCE	0.004194	0.000847	0.000123	0.000027	0.000010	0.000011	0.000007
SAMPLE COEFF OF VARIANCE	0.039	0.023	0.010	0.005	0.003	0.003	0.003

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: UTAH PAID - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: INDEMNITY (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.002493	0.000175	0.000207	0.000330	0.000052	0.000047	0.000063	0.003366	
THREE-YEAR STRAIGHT AVERAGE	0.002019	0.000129	0.000154	0.000303	0.000049	0.000073	0.000084	0.002811	
FOUR-YEAR STRAIGHT AVERAGE	0.002182	0.000070	0.000184	0.000251	0.000053	0.000089	0.000088	0.002916	
TWO-YEAR EXPONENTIAL AVG	0.002502	0.000172	0.000209	0.000323	0.000053	0.000047	0.000063	0.003369	
THREE-YEAR EXPONENTIAL AVG	0.002028	0.000119	0.000160	0.000297	0.000050	0.000069	0.000082	0.002804	*
FOUR-YEAR EXPONENTIAL AVG	0.002155	0.000067	0.000184	0.000251	0.000053	0.000082	0.000085	0.002877	

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STATE: UTAH PAID - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: INDEMNITY ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	1	1	
THREE-YEAR STRAIGHT AVERAGE	1	0	1	0	1	0	0	3	*
FOUR-YEAR STRAIGHT AVERAGE	0	0	0	1	0	0	0	1	
TWO-YEAR EXPONENTIAL AVG	0	0	0	0	0	1	0	1	
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	1	0	0	0	0	0	1	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: UTAH PAID + O/S - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.040	1.076	1.001	1.012	0.952	1.004	0.963
1982	1.012	0.911	0.998	0.985	1.014	0.965	0.990
1983	1.012	1.015	0.948	0.990	0.969	0.993	1.000
1984	1.015	0.990	0.990	0.987	1.000	0.996	0.989
1985	1.011	0.988	0.994	0.964	1.006	0.986	0.994
1986	1.046	1.005	0.975	0.987	0.998	1.011	0.989
1987	0.918	1.012	1.077	1.003	1.099	0.997	0.970
1988	1.060	1.043	1.006	0.984	0.994	0.994	1.002
1989	1.112	1.022	1.019	0.989	0.982	0.995	0.998
POINTS	9	9	9	9	9	9	9
AVERAGE	1.025	1.007	1.001	0.989	1.002	0.993	0.988
SAMPLE VARIANCE	0.002693	0.002030	0.001224	0.000175	0.001705	0.000163	0.000179
SAMPLE COEFF OF VARIANCE	0.051	0.045	0.035	0.013	0.041	0.013	0.014

REGION: WESTERN PAID + O/S - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	1.066	1.008	0.994	1.005	1.003	0.999	1.006
1983	1.085	1.026	1.013	1.003	1.009	1.005	0.998
1984	1.100	1.025	1.020	1.009	1.005	1.007	1.004
1985	1.149	1.068	1.026	1.015	1.012	1.003	1.007
1986	1.141	1.074	1.039	1.013	1.011	1.007	1.005
1987	1.133	1.055	1.036	1.013	1.008	1.011	1.003
1988	1.127	1.064	1.031	1.009	1.008	0.999	0.998
1989	1.136	1.055	1.019	1.015	1.006	1.000	1.003
POINTS	8	8	8	8	8	8	8
AVERAGE	1.117	1.047	1.022	1.010	1.008	1.004	1.003
SAMPLE VARIANCE	0.000890	0.000576	0.000209	0.000021	0.000009	0.000019	0.000011
SAMPLE COEFF OF VARIANCE	0.027	0.023	0.014	0.004	0.003	0.004	0.003

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: UTAH PAID + O/S - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: INDEMNITY (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.006904	0.000385	0.002075	0.000326	0.003405	0.000115	0.000224	0.013434	
THREE-YEAR STRAIGHT AVERAGE	0.005567	0.000467	0.001710	0.000231	0.002736	0.000085	0.000178	0.010973	*
FOUR-YEAR STRAIGHT AVERAGE	0.005275	0.000631	0.002049	0.000273	0.002894	0.000141	0.000195	0.011459	
TWO-YEAR EXPONENTIAL AVG	0.006872	0.000379	0.002091	0.000323	0.003397	0.000116	0.000223	0.013400	
THREE-YEAR EXPONENTIAL AVG	0.005682	0.000436	0.001746	0.000235	0.002789	0.000086	0.000182	0.011155	
FOUR-YEAR EXPONENTIAL AVG	0.005401	0.000571	0.002016	0.000267	0.002899	0.000133	0.000194	0.011482	

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STATE: UTAH PAID + O/S - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: INDEMNITY ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
THREE-YEAR STRAIGHT AVERAGE	0	0	1	1	1	1	1	5	*
FOUR-YEAR STRAIGHT AVERAGE	1	0	0	0	0	0	0	1	
TWO-YEAR EXPONENTIAL AVG	0	1	0	0	0	0	0	1	
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: UTAH INCURRED - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	0.947	1.003	0.994	1.002	0.950	0.999	0.962
1982	0.927	0.882	0.995	0.968	1.012	0.965	0.989
1983	0.922	0.964	0.935	0.965	0.965	0.993	1.001
1984	0.985	0.983	0.989	0.984	1.000	0.996	0.990
1985	0.956	0.968	0.988	0.955	1.002	0.982	0.992
1986	0.987	0.985	0.969	0.975	0.994	1.007	0.984
1987	0.904	0.993	1.048	0.998	1.093	0.993	0.969
1988	0.949	0.983	0.993	0.992	0.995	0.991	1.001
1989	0.952	0.951	1.000	0.984	0.981	0.992	1.001
POINTS	9	9	9	9	9	9	9
AVERAGE	0.948	0.968	0.990	0.980	0.999	0.991	0.988
SAMPLE VARIANCE	0.000753	0.001286	0.000873	0.000250	0.001617	0.000139	0.000198
SAMPLE COEFF OF VARIANCE	0.029	0.037	0.030	0.016	0.040	0.012	0.014

REGION: WESTERN INCURRED - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	0.967	0.964	0.977	0.987	1.000	1.000	1.006
1983	0.997	0.984	0.996	0.982	1.002	1.001	0.996
1984	1.017	0.991	1.011	0.994	1.001	1.005	1.003
1985	1.065	1.033	1.016	0.992	1.009	1.002	1.004
1986	1.052	1.034	1.023	0.987	1.004	1.001	0.988
1987	1.038	1.028	1.026	1.004	1.006	1.011	1.003
1988	1.028	1.029	1.018	0.999	1.014	0.996	0.999
1989	1.024	1.020	1.000	1.000	0.999	0.993	1.003
POINTS	8	8	8	8	8	8	8
AVERAGE	1.024	1.010	1.008	0.993	1.004	1.001	1.000
SAMPLE VARIANCE	0.000957	0.000720	0.000270	0.000057	0.000026	0.000030	0.000034
SAMPLE COEFF OF VARIANCE	0.030	0.027	0.016	0.008	0.005	0.005	0.006

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: UTAH INCURRED - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: INDEMNITY (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.001099	0.000360	0.001309	0.000330	0.003155	0.000113	0.000256	0.006622	
THREE-YEAR STRAIGHT AVERAGE	0.001282	0.000461	0.000934	0.000267	0.002473	0.000065	0.000227	0.005709	*
FOUR-YEAR STRAIGHT AVERAGE	0.001038	0.000536	0.001246	0.000334	0.002662	0.000117	0.000230	0.006163	
TWO-YEAR EXPONENTIAL AVG	0.001118	0.000356	0.001311	0.000327	0.003144	0.000115	0.000253	0.006624	
THREE-YEAR EXPONENTIAL AVG	0.001265	0.000426	0.000965	0.000267	0.002526	0.000068	0.000227	0.005745	
FOUR-YEAR EXPONENTIAL AVG	0.001046	0.000490	0.001219	0.000321	0.002664	0.000112	0.000227	0.006080	

STATE: UTAH INCURRED - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: INDEMNITY (*1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
THREE-YEAR STRAIGHT AVERAGE	0	0	1	1	1	1	0	4	*
FOUR-YEAR STRAIGHT AVERAGE	1	0	0	0	0	0	0	1	
TWO-YEAR EXPONENTIAL AVG	0	1	0	0	0	0	0	1	
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	1	1	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: UTAH PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.148	1.048	1.028	1.020	1.013	1.000	1.039
1982	1.146	1.055	1.023	1.036	1.019	1.014	1.008
1983	1.184	1.068	1.039	1.015	1.020	1.011	1.012
1984	1.091	1.046	1.026	1.022	1.011	1.010	1.011
1985	1.169	1.056	1.032	1.010	1.019	1.011	1.009
1986	1.150	1.063	1.025	1.008	1.015	1.018	1.010
1987	1.140	1.063	1.030	1.020	1.019	1.023	1.016
1988	1.147	1.015	1.030	1.019	1.020	1.020	1.017
1989	1.137	1.077	1.046	1.025	1.013	1.019	1.020
POINTS	9	9	9	9	9	9	9
AVERAGE	1.146	1.055	1.031	1.019	1.017	1.014	1.016
SAMPLE VARIANCE	0.000642	0.000314	0.000053	0.000069	0.000013	0.000049	0.000092
SAMPLE COEFF OF VARIANCE	0.022	0.017	0.007	0.008	0.003	0.007	0.009

REGION: WESTERN PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	1.215	1.073	1.042	1.026	1.020	1.017	1.015
1983	1.213	1.077	1.042	1.028	1.021	1.017	1.013
1984	1.233	1.078	1.047	1.029	1.019	1.017	1.016
1985	1.249	1.084	1.041	1.030	1.022	1.015	1.014
1986	1.260	1.086	1.041	1.026	1.022	1.019	1.015
1987	1.278	1.092	1.049	1.028	1.023	1.020	1.012
1988	1.303	1.101	1.052	1.030	1.022	1.021	1.016
1989	1.291	1.102	1.053	1.029	1.022	1.015	1.014
POINTS	8	8	8	8	8	8	8
AVERAGE	1.255	1.087	1.046	1.028	1.021	1.018	1.014
SAMPLE VARIANCE	0.001148	0.000119	0.000025	0.000002	0.000002	0.000005	0.000002
SAMPLE COEFF OF VARIANCE	0.027	0.010	0.005	0.002	0.001	0.002	0.001

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: UTAH PAID - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: MEDICAL (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.000364	0.000781	0.000056	0.000062	0.000014	0.000027	0.000015	0.001319	
THREE-YEAR STRAIGHT AVERAGE	0.000190	0.000618	0.000076	0.000087	0.000011	0.000033	0.000020	0.001034	
FOUR-YEAR STRAIGHT AVERAGE	0.000219	0.000521	0.000064	0.000102	0.000013	0.000036	0.000036	0.000991	*
TWO-YEAR EXPONENTIAL AVG	0.000377	0.000799	0.000056	0.000062	0.000014	0.000026	0.000015	0.001349	
THREE-YEAR EXPONENTIAL AVG	0.000209	0.000643	0.000074	0.000083	0.000011	0.000031	0.000019	0.001070	
FOUR-YEAR EXPONENTIAL AVG	0.000228	0.000554	0.000064	0.000095	0.000013	0.000033	0.000032	0.001020	

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STATE: UTAH PAID - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: MEDICAL ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	1	0	0	0	0	1	
THREE-YEAR STRAIGHT AVERAGE	1	0	0	0	1	0	0	2	
FOUR-YEAR STRAIGHT AVERAGE	0	1	0	0	0	0	0	1	
TWO-YEAR EXPONENTIAL AVG	0	0	0	1	0	1	1	3	*
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: UTAH PAID + O/S - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.007	1.037	0.991	1.004	1.006	0.991	0.989
1982	1.051	1.043	0.991	1.015	1.013	0.991	0.997
1983	1.060	0.992	1.009	0.987	1.008	1.002	1.016
1984	1.008	0.986	0.990	0.995	0.987	0.997	0.977
1985	1.057	1.079	1.020	1.014	1.038	1.036	1.027
1986	1.137	1.119	1.010	1.002	1.052	1.143	1.069
1987	0.936	0.972	1.003	0.983	0.963	0.961	0.950
1988	0.940	1.003	1.015	0.997	0.975	0.999	0.998
1989	1.025	1.066	1.014	1.000	0.993	0.974	1.025
POINTS	9	9	9	9	9	9	9
AVERAGE	1.025	1.033	1.005	1.000	1.004	1.010	1.005
SAMPLE VARIANCE	0.003903	0.002403	0.000133	0.000116	0.000812	0.002892	0.001160
SAMPLE COEFF OF VARIANCE	0.061	0.047	0.011	0.011	0.028	0.053	0.034

REGION: WESTERN PAID + O/S - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	1.030	1.012	1.002	1.012	1.009	1.014	1.017
1983	1.041	1.014	1.011	1.010	1.012	1.009	1.001
1984	1.056	1.006	1.016	1.001	1.011	1.015	1.008
1985	1.058	1.013	1.009	1.012	1.002	1.004	1.008
1986	1.072	1.026	1.015	1.012	1.005	1.012	1.012
1987	1.075	1.026	1.021	1.008	1.001	1.014	1.009
1988	1.061	1.021	1.010	1.001	1.000	1.003	1.006
1989	1.062	1.023	1.010	1.007	1.008	1.003	1.020
POINTS	8	8	8	8	8	8	8
AVERAGE	1.057	1.018	1.012	1.008	1.006	1.009	1.010
SAMPLE VARIANCE	0.000225	0.000055	0.000032	0.000022	0.000022	0.000027	0.000037
SAMPLE COEFF OF VARIANCE	0.014	0.007	0.006	0.005	0.005	0.005	0.006

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: UTAH PAID + O/S - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989

LOSS TYPE: MEDICAL (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.010850	0.007936	0.000137	0.000256	0.002311	0.007338	0.003551	0.032381	
THREE-YEAR STRAIGHT AVERAGE	0.007548	0.005449	0.000122	0.000141	0.001738	0.006849	0.002201	0.024049	
FOUR-YEAR STRAIGHT AVERAGE	0.007011	0.003999	0.000155	0.000093	0.001529	0.006440	0.002142	0.021369	*
TWO-YEAR EXPONENTIAL AVG	0.010744	0.007824	0.000139	0.000251	0.002279	0.007341	0.003535	0.032112	
THREE-YEAR EXPONENTIAL AVG	0.007691	0.005532	0.000124	0.000146	0.001744	0.006824	0.002299	0.024358	
FOUR-YEAR EXPONENTIAL AVG	0.007181	0.004246	0.000151	0.000103	0.001555	0.006457	0.002226	0.021919	

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STATE: UTAH PAID + O/S - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS

LOSS TYPE: MEDICAL ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
THREE-YEAR STRAIGHT AVERAGE	0	0	1	0	0	0	0	1	
FOUR-YEAR STRAIGHT AVERAGE	1	1	0	1	1	1	1	6	*
TWO-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: UTAH INCURRED - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	0.960	1.014	0.994	1.005	1.010	0.990	0.992
1982	0.982	1.018	0.988	1.006	1.012	0.990	0.996
1983	1.007	0.966	1.000	0.974	1.005	1.002	1.016
1984	0.990	0.981	0.988	0.994	0.986	0.996	0.977
1985	1.023	1.067	1.015	1.011	1.035	1.033	1.027
1986	1.105	1.111	1.008	0.997	1.051	1.140	1.069
1987	1.021	0.980	0.983	1.027	1.007	0.990	0.948
1988	1.018	0.990	1.044	1.034	1.010	1.044	1.042
1989	0.988	1.035	1.016	1.004	1.009	0.980	1.020
POINTS	9	9	9	9	9	9	9
AVERAGE	1.010	1.018	1.004	1.006	1.014	1.018	1.010
SAMPLE VARIANCE	0.001694	0.002207	0.000369	0.000313	0.000348	0.002540	0.001298
SAMPLE COEFF OF VARIANCE	0.041	0.046	0.019	0.018	0.018	0.049	0.036

REGION: WESTERN INCURRED - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	0.972	0.984	0.990	0.999	1.006	1.013	1.017
1983	0.985	0.986	0.997	0.994	1.007	1.006	1.001
1984	1.003	0.985	1.011	0.991	1.009	1.014	1.007
1985	1.007	0.994	1.000	0.996	0.998	1.002	1.006
1986	1.013	1.001	1.003	0.996	1.001	1.008	1.006
1987	1.013	1.008	1.014	1.001	0.999	1.010	1.006
1988	1.009	1.007	1.005	0.996	1.005	1.002	1.009
1989	1.017	1.014	1.003	0.999	1.003	0.998	1.019
POINTS	8	8	8	8	8	8	8
AVERAGE	1.002	0.997	1.003	0.996	1.003	1.007	1.009
SAMPLE VARIANCE	0.000247	0.000138	0.000058	0.000010	0.000015	0.000032	0.000037
SAMPLE COEFF OF VARIANCE	0.016	0.012	0.008	0.003	0.004	0.006	0.006

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: UTAH INCURRED - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: MEDICAL (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.003034	0.006754	0.000731	0.000495	0.000972	0.005606	0.003433	0.021024	
THREE-YEAR STRAIGHT AVERAGE	0.003102	0.005363	0.000558	0.000366	0.000773	0.005755	0.002280	0.018196	
FOUR-YEAR STRAIGHT AVERAGE	0.003132	0.004092	0.000617	0.000449	0.000651	0.005518	0.002420	0.016878	*
TWO-YEAR EXPONENTIAL AVG	0.003002	0.006633	0.000741	0.000489	0.000956	0.005661	0.003477	0.020960	
THREE-YEAR EXPONENTIAL AVG	0.003036	0.005329	0.000579	0.000369	0.000768	0.005729	0.002411	0.018223	
FOUR-YEAR EXPONENTIAL AVG	0.003059	0.004211	0.000625	0.000436	0.000660	0.005512	0.002504	0.017006	

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STATE: UTAH INCURRED - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: MEDICAL ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
THREE-YEAR STRAIGHT AVERAGE	0	0	1	1	0	0	1	3	*
FOUR-YEAR STRAIGHT AVERAGE	0	1	0	0	1	0	0	2	
TWO-YEAR EXPONENTIAL AVG	1	0	0	0	0	0	0	1	
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	1	0	1	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 UTAH INDEMNITY COMPARISON OF PROJECTIONS RESTATED TO INCURRED LEVEL

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	RESTATED 8TH	AVERAGE	*=LOM AVG
1978 PAID				15,097,018	15,022,871	14,995,621	15,289,644	15,239,630		
1978 PAID + Q/S				15,063,233	15,274,964	15,612,420	15,363,186	15,262,202		
1978 INCURRED				15,105,371	15,163,420	15,590,526	15,324,978	15,222,694		
1978 PAID (1)				0.94%	1.42%	1.60%	0.33%		1.07%	
1978 PAID + Q/S (1)				1.30%	0.08%	2.29%	0.66%		1.09%	
1978 INCURRED (1)				0.77%	0.39%	2.42%	0.67%		1.06%	*
1978 PAID (2)					0.49%	1.96%	1.96%	0.33%	0.74%	*
1978 PAID + Q/S (2)					1.41%	2.21%	1.60%	0.66%	1.47%	
1978 INCURRED (2)					0.38%	2.82%	1.70%	0.67%	1.39%	
1979 PAID			18,701,881	18,365,232	18,209,111	18,564,770	18,689,489	19,130,391		
1979 PAID + Q/S			20,070,479	19,255,162	19,365,691	19,571,452	19,895,176	19,435,664		
1979 INCURRED			19,919,131	18,828,578	19,364,528	19,550,865	19,846,432	19,454,738		
1979 PAID (1)			2.26%	4.00%	4.82%	2.96%	2.30%		3.26%	
1979 PAID + Q/S (1)			3.27%	0.93%	0.36%	0.70%	2.36%		1.52%	*
1979 INCURRED (1)			2.39%	3.22%	0.46%	0.49%	2.01%		1.72%	
1979 PAID (2)				1.80%	0.85%	1.95%	0.67%	2.36%	1.53%	*
1979 PAID + Q/S (2)				4.06%	0.57%	1.06%	1.65%	2.31%	1.93%	
1979 INCURRED (2)				5.47%	2.85%	0.96%	1.51%	1.97%	2.55%	
1980 PAID		21,234,734	20,349,395	20,378,653	20,506,496	20,583,836	20,925,133	21,628,917		
1980 PAID + Q/S		21,456,030	21,584,474	22,121,225	21,737,147	21,714,698	21,385,160	21,909,537		
1980 INCURRED		21,137,740	21,091,966	22,017,205	21,762,518	21,664,727	21,380,260	21,913,973		
1980 PAID (1)		1.82%	5.92%	5.78%	5.19%	4.83%	3.25%		4.47%	
1980 PAID + Q/S (1)		2.07%	1.48%	0.97%	0.79%	0.89%	2.39%		1.43%	*
1980 INCURRED (1)		3.54%	3.75%	0.47%	0.69%	1.14%	2.44%		2.00%	
1980 PAID (2)			4.17%	0.14%	0.63%	0.38%	1.66%	3.36%	1.72%	
1980 PAID + Q/S (2)			0.60%	2.49%	1.74%	0.10%	1.52%	2.45%	1.48%	*
1980 INCURRED (2)			0.22%	4.39%	1.16%	0.45%	1.31%	2.50%	1.67%	
1981 PAID	21,857,500	22,397,476	21,497,768	22,056,385	22,710,303	23,413,546	24,275,477	25,676,553		
1981 PAID + Q/S	23,943,755	22,541,238	23,245,718	23,710,962	24,061,765	26,173,073	26,115,226	26,439,703		
1981 INCURRED	22,706,955	21,346,831	23,083,897	23,789,339	23,912,635	26,027,207	26,017,479	26,429,666		
1981 PAID (1)	14.87%	12.77%	16.27%	14.10%	11.55%	8.81%	5.46%		11.98%	
1981 PAID + Q/S (1)	9.44%	14.74%	12.08%	10.32%	8.99%	1.01%	1.23%		8.26%	*
1981 INCURRED (1)	14.09%	19.23%	12.66%	9.99%	9.52%	1.52%	1.56%		9.80%	
1981 PAID (2)		2.47%	4.02%	2.60%	2.96%	3.10%	3.68%	5.77%	3.51%	
1981 PAID + Q/S (2)		5.86%	3.13%	2.00%	1.48%	8.77%	0.22%	1.24%	3.24%	*
1981 INCURRED (2)		5.99%	8.14%	3.06%	0.52%	8.84%	0.04%	1.58%	4.02%	
1982 PAID	24,084,066	21,291,111	22,122,583	22,181,255	23,117,073	23,805,289	24,965,914			
1982 PAID + Q/S	22,412,017	23,473,662	23,549,675	23,214,872	24,770,680	23,466,582	23,783,606			
1982 INCURRED	20,235,201	23,088,462	23,671,588	23,085,657	24,809,493	23,671,413	24,055,923			
1982 PAID (1)	3.53%	14.72%	11.39%	11.15%	7.41%	4.65%		8.81%		
1982 PAID + Q/S (1)	5.77%	1.30%	0.98%	2.39%	4.15%	1.33%		2.65%	*	
1982 INCURRED (1)	15.88%	4.02%	1.60%	4.03%	3.13%	1.60%		5.04%		
1982 PAID (2)		11.60%	3.91%	0.27%	4.22%	2.98%	4.88%	4.64%		
1982 PAID + Q/S (2)		4.74%	0.32%	1.42%	6.70%	5.26%	1.35%	3.30%	*	
1982 INCURRED (2)		14.10%	2.53%	2.48%	7.47%	4.59%	1.62%	5.46%		
1983 PAID	24,038,488	26,030,632	26,628,104	28,259,635	28,869,937	30,219,371				
1983 PAID + Q/S	26,130,379	26,176,798	26,477,609	30,660,028	30,261,916	28,746,908				
1983 INCURRED	25,561,057	26,478,923	26,330,626	29,957,380	30,157,971	28,783,892				
1983 PAID (1)	20.45%	13.86%	11.88%	6.49%	4.47%			11.43%		
1983 PAID + Q/S (1)	9.10%	8.94%	7.89%	6.66%	5.20%			7.56%		
1983 INCURRED (1)	11.20%	8.01%	8.52%	4.08%	4.77%			7.32%	*	
1983 PAID (2)		8.29%	2.30%	6.13%	2.16%	4.67%		4.71%		
1983 PAID + Q/S (2)		0.18%	1.15%	15.80%	1.36%	4.94%		4.69%		
1983 INCURRED (2)		3.59%	0.56%	13.77%	0.67%	4.56%		4.63%	*	
1984 PAID	32,470,927	33,704,669	35,133,289	36,235,644	37,154,087					
1984 PAID + Q/S	31,844,683	32,978,634	36,945,479	36,076,256	34,346,080					
1984 INCURRED	32,667,549	32,751,791	36,464,421	36,253,702	34,463,527					
1984 PAID (1)	12.60%	9.28%	5.44%	2.47%				7.45%		
1984 PAID + Q/S (1)	7.28%	3.98%	7.57%	5.04%				5.97%		
1984 INCURRED (1)	5.21%	4.97%	5.81%	5.19%				5.29%	*	
1984 PAID (2)		3.80%	4.26%	3.14%	2.53%			3.43%	*	
1984 PAID + Q/S (2)		3.56%	12.03%	2.35%	4.80%			5.68%		
1984 INCURRED (2)		0.26%	11.34%	0.58%	4.94%			4.28%		

NOTES: (1) ABSOLUTE DEVIATION FROM LAST PROJECTION (OR REPORT), RATIOW TO SAME.
 (2) ABSOLUTE CHANGE RELATIVE TO PRIOR PROJECTION OR REPORT.
 WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.
 LOSSES RESTATED TO INCURRED LEVEL OF 8TH REPORT, AND TO LAST DIAGONAL.

WEIGHTS ASSIGNED TO PRECEDING YEARS:
 N-4 0.0000
 N-3 0.0000
 N-2 0.5000
 N-1 0.5000

NATIONAL COUNCIL ON COMPENSATION INSURANCE
UTAH MEDICAL COMPARISON OF PROJECTIONS

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	ACTUAL 8TH	AVERAGE	*=LOW AVG
1978 PAID				14,263,580	14,001,827	13,878,261	13,864,517	13,870,946		
1978 PAID + O/S				15,510,416	15,471,501	15,006,600	15,640,465	16,686,509		
1978 INCURRED				15,783,044	15,528,451	15,083,934	15,683,387	16,726,047		
1978 PAID (1)				2.69%	0.94%	0.05%	0.05%		0.93%	*
1978 PAID + O/S (1)				7.05%	7.28%	10.07%	6.27%		7.67%	
1978 INCURRED (1)				5.64%	7.16%	9.82%	6.23%		7.21%	
1978 PAID (2)					1.70%	0.88%	0.10%	0.05%	0.68%	*
1978 PAID + O/S (2)					0.25%	3.00%	4.22%	6.69%	3.54%	
1978 INCURRED (2)					1.61%	2.86%	3.97%	6.65%	3.77%	
1979 PAID			16,648,152	16,752,556	16,621,675	16,654,229	16,769,532	16,881,107		
1979 PAID + O/S			17,901,133	18,438,431	17,966,297	19,118,685	22,484,872	20,387,545		
1979 INCURRED			18,187,744	18,353,496	18,072,607	19,186,550	22,549,829	20,405,768		
1979 PAID (1)			1.38%	0.76%	1.54%	1.34%	0.66%		1.14%	*
1979 PAID + O/S (1)			12.20%	9.56%	11.88%	6.22%	10.29%		10.03%	
1979 INCURRED (1)			10.87%	10.06%	11.43%	5.97%	10.51%		9.77%	
1979 PAID (2)				0.63%	0.78%	0.20%	0.69%	0.67%	0.59%	*
1979 PAID + O/S (2)				3.00%	2.56%	6.41%	17.61%	9.33%	7.78%	
1979 INCURRED (2)				0.91%	1.53%	6.16%	17.53%	9.51%	7.13%	
1980 PAID		19,255,374	19,528,645	19,216,074	19,018,077	19,083,907	19,310,521	19,393,934		
1980 PAID + O/S		21,705,526	21,134,935	20,305,856	21,566,652	25,119,839	21,343,127	21,094,244		
1980 INCURRED		21,987,415	20,969,300	20,317,264	21,636,815	25,207,569	22,102,991	22,844,620		
1980 PAID (1)		0.71%	0.69%	0.92%	1.94%	1.60%	0.43%		1.05%	*
1980 PAID + O/S (1)		2.90%	0.19%	3.74%	2.24%	19.08%	1.18%		4.89%	
1980 INCURRED (1)		3.75%	8.21%	11.06%	5.29%	10.34%	3.25%		6.98%	
1980 PAID (2)			1.42%	1.60%	1.03%	0.35%	1.19%	0.43%	1.00%	*
1980 PAID + O/S (2)			2.63%	3.92%	6.21%	16.48%	15.03%	1.17%	7.57%	
1980 INCURRED (2)			4.63%	3.11%	6.49%	16.50%	12.32%	3.36%	7.73%	
1981 PAID	21,261,224	22,123,072	21,587,004	21,481,089	21,427,855	21,671,852	21,736,075	21,810,744		
1981 PAID + O/S	23,934,993	24,625,052	23,146,622	24,852,977	28,683,416	24,585,238	22,525,622	23,711,157		
1981 INCURRED	23,704,028	24,075,576	23,208,377	25,025,671	28,775,027	26,205,678	25,345,069	25,975,757		
1981 PAID (1)	2.52%	1.43%	1.03%	1.51%	1.76%	0.64%	0.34%		1.32%	*
1981 PAID + O/S (1)	0.94%	3.85%	2.38%	4.82%	20.97%	3.69%	5.00%		5.95%	
1981 INCURRED (1)	8.75%	7.32%	10.65%	3.66%	10.78%	0.89%	2.43%		6.35%	
1981 PAID (2)		4.05%	2.42%	0.49%	0.25%	1.14%	0.30%	0.34%	1.28%	*
1981 PAID + O/S (2)		2.88%	6.00%	7.37%	15.41%	14.29%	8.38%	5.26%	8.51%	
1981 INCURRED (2)		1.57%	3.60%	7.83%	14.98%	8.93%	3.28%	2.49%	6.10%	
1982 PAID	24,929,898	23,020,226	22,819,078	22,696,539	23,159,689	23,331,102	23,319,794			
1982 PAID + O/S	27,959,234	25,174,301	29,056,229	33,903,132	29,647,981	25,787,999	26,616,899			
1982 INCURRED	26,240,913	24,988,741	29,140,616	33,960,718	32,328,024	29,895,353	29,850,004			
1982 PAID (1)	6.90%	1.28%	2.15%	2.67%	0.69%	0.05%			2.29%	*
1982 PAID + O/S (1)	5.04%	5.42%	9.16%	27.37%	11.39%	3.11%			10.25%	
1982 INCURRED (1)	12.09%	16.29%	2.38%	13.77%	8.30%	0.15%			8.83%	
1982 PAID (2)		7.66%	0.87%	0.54%	2.04%	0.74%	0.05%		1.98%	*
1982 PAID + O/S (2)		9.96%	15.42%	16.68%	12.55%	13.02%	3.21%		11.81%	
1982 INCURRED (2)		4.77%	16.61%	16.54%	4.81%	7.52%	0.15%		8.40%	
1983 PAID	26,148,165	26,511,338	26,761,113	27,186,166	27,508,935	27,333,705				
1983 PAID + O/S	26,450,540	29,863,413	37,951,130	33,112,494	28,753,997	30,803,612				
1983 INCURRED	26,205,811	30,047,965	38,125,247	34,754,629	32,789,269	33,825,338				
1983 PAID (1)	4.34%	3.01%	2.09%	0.54%	0.64%				2.12%	*
1983 PAID + O/S (1)	14.13%	3.05%	23.20%	7.50%	6.65%				10.91%	
1983 INCURRED (1)	22.53%	11.17%	12.71%	2.75%	3.06%				10.44%	
1983 PAID (2)		1.39%	0.94%	1.59%	1.19%	0.64%			1.15%	*
1983 PAID + O/S (2)		12.90%	27.08%	12.75%	13.16%	7.13%			14.61%	
1983 INCURRED (2)		14.66%	26.88%	8.84%	5.65%	3.16%			11.84%	
1984 PAID	30,721,877	31,456,280	31,983,653	32,458,042	32,537,307					
1984 PAID + O/S	35,213,102	48,398,016	37,477,979	32,589,282	34,945,308					
1984 INCURRED	35,659,147	48,689,001	40,449,839	39,886,192	40,108,263					
1984 PAID (1)	5.58%	3.32%	1.70%	0.24%					2.71%	*
1984 PAID + O/S (1)	0.77%	38.50%	7.25%	6.74%					13.31%	
1984 INCURRED (1)	11.09%	21.39%	0.85%	0.55%					8.47%	
1984 PAID (2)		2.39%	1.68%	1.48%	0.24%				1.45%	*
1984 PAID + O/S (2)		37.44%	22.56%	13.04%	7.23%				20.07%	
1984 INCURRED (2)		36.54%	16.92%	1.39%	0.56%				13.85%	

NOTES: (1) ABSOLUTE DEVIATION FROM LAST PROJECTION (OR REPORT), RATIODE TO SAME.
(2) ABSOLUTE CHANGE RELATIVE TO PRIOR PROJECTION OR REPORT.
WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.
LOSSES HAVE BEEN RESTATED TO THE LATEST DIAGONAL.

WEIGHTS ASSIGNED TO PRECEDING YEARS:
N-4 0.0000
N-3 0.0000
N-2 0.5000
N-1 0.5000
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03/14/91

NATIONAL COUNCIL ON COMPENSATION INSURANCE
UTAH MEDICAL COMPARISON OF PROJECTIONS RESTATED TO INCURRED LEVEL

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	RESTATED 8TH	AVERAGE	*=LOW AVG
1978 PAID				15,998,985	16,349,343	15,844,093	15,291,736	16,252,399		
1978 PAID + Q/S				15,650,068	15,576,407	15,088,862	15,698,018	16,734,536		
1978 INCURRED				15,783,044	15,528,451	15,083,934	15,683,387	16,726,047		
1978 PAID (1)				5.25%	0.60%	2.51%	5.91%		3.57%	*
1978 PAID + Q/S (1)				6.48%	6.92%	9.83%	6.19%		7.36%	
1978 INCURRED (1)				5.64%	7.16%	9.82%	6.23%		7.21%	
1978 PAID (2)					6.17%	3.09%	3.49%	6.28%	4.76%	
1978 PAID + Q/S (2)					0.47%	3.13%	4.04%	6.60%	3.56%	*
1978 INCURRED (2)					1.61%	2.86%	3.97%	6.65%	3.77%	
1979 PAID			17,998,610	19,561,252	18,976,134	18,368,622	19,648,633	20,380,753		
1979 PAID + Q/S			18,062,310	18,563,454	18,064,784	19,189,037	22,549,588	20,420,799		
1979 INCURRED			18,187,744	18,353,496	18,072,607	19,186,550	22,549,829	20,405,768		
1979 PAID (1)			11.69%	4.02%	6.89%	9.87%	3.59%		7.21%	*
1979 PAID + Q/S (1)			11.55%	9.10%	11.54%	6.03%	10.42%		9.73%	
1979 INCURRED (1)			10.87%	10.06%	11.43%	5.97%	10.51%		9.77%	
1979 PAID (2)				8.68%	2.99%	3.20%	6.97%	3.73%	5.11%	*
1979 PAID + Q/S (2)				2.77%	2.69%	6.22%	17.51%	9.44%	7.73%	
1979 INCURRED (2)				0.91%	1.53%	6.16%	17.53%	9.51%	7.13%	
1980 PAID		20,817,324	22,802,774	21,938,029	20,975,805	22,360,355	23,313,812	23,140,067		
1980 PAID + Q/S		21,900,957	21,278,242	20,417,168	21,646,011	25,192,138	21,377,939	21,944,756		
1980 INCURRED		21,987,415	20,969,300	20,317,264	21,636,815	25,207,569	22,102,991	22,844,620		
1980 PAID (1)		10.04%	1.46%	5.19%	9.35%	3.37%	0.75%		5.03%	
1980 PAID + Q/S (1)		0.20%	3.04%	6.96%	1.36%	14.80%	2.58%		4.82%	*
1980 INCURRED (1)		3.75%	8.21%	11.06%	5.29%	10.34%	3.25%		6.98%	
1980 PAID (2)			9.54%	3.79%	4.39%	6.60%	4.26%	0.75%	4.89%	*
1980 PAID + Q/S (2)			2.84%	4.05%	6.02%	16.38%	15.14%	2.65%	7.85%	
1980 INCURRED (2)			4.63%	3.11%	6.49%	16.50%	12.32%	3.36%	7.73%	
1981 PAID	22,985,883	25,832,177	24,644,801	23,692,360	25,106,727	26,164,673	25,934,616	25,832,818		
1981 PAID + Q/S	24,150,498	24,792,024	23,273,507	24,944,429	28,765,972	24,625,339	23,433,847	25,826,365		
1981 INCURRED	23,704,028	24,075,576	23,208,377	25,025,671	28,775,027	26,205,678	25,345,069	25,975,757		
1981 PAID (1)	11.02%	0.00%	4.60%	8.29%	2.81%	1.28%	0.39%		4.06%	*
1981 PAID + Q/S (1)	6.49%	4.00%	9.88%	3.41%	11.38%	4.65%	9.26%		7.01%	
1981 INCURRED (1)	8.75%	7.32%	10.65%	3.66%	10.78%	0.89%	2.43%		6.35%	
1981 PAID (2)		12.38%	4.60%	3.86%	5.97%	4.21%	0.88%		4.61%	*
1981 PAID + Q/S (2)		2.66%	6.13%	7.18%	15.32%	14.39%	4.84%	10.21%	8.67%	
1981 INCURRED (2)		1.57%	3.60%	7.83%	14.98%	8.93%	3.28%	2.49%	6.10%	
1982 PAID	29,109,590	26,281,038	25,168,083	26,593,227	27,960,957	27,837,738	27,620,149			
1982 PAID + Q/S	28,148,814	25,312,300	29,163,148	34,000,712	29,696,340	26,827,762	28,991,321			
1982 INCURRED	26,240,913	24,988,741	29,140,616	33,960,718	32,328,024	29,895,353	29,850,004			
1982 PAID (1)	5.39%	4.85%	8.88%	3.72%	1.23%	0.79%			4.14%	*
1982 PAID + Q/S (1)	2.91%	12.69%	0.59%	17.28%	2.43%	7.46%			7.23%	
1982 INCURRED (1)	12.09%	16.29%	2.38%	13.77%	8.30%	0.15%			8.83%	
1982 PAID (2)		9.72%	4.23%	5.66%	5.14%	0.44%	0.78%		4.33%	*
1982 PAID + Q/S (2)		10.08%	15.21%	16.59%	12.66%	9.66%	8.06%		12.04%	
1982 INCURRED (2)		4.77%	16.61%	16.54%	4.81%	7.52%	0.15%		8.40%	
1983 PAID	29,852,050	29,240,425	31,355,633	32,822,168	32,822,562	32,374,256				
1983 PAID + Q/S	26,595,536	29,973,302	38,060,360	33,166,504	29,913,349	33,551,519				
1983 INCURRED	26,205,811	30,047,965	38,125,247	34,754,629	32,789,269	33,825,338				
1983 PAID (1)	7.79%	9.68%	3.15%	1.38%	1.38%				4.68%	*
1983 PAID + Q/S (1)	20.73%	10.66%	13.44%	1.15%	10.84%				11.37%	
1983 INCURRED (1)	22.53%	11.17%	12.71%	2.75%	3.06%				10.44%	
1983 PAID (2)		2.05%	7.23%	4.68%	0.00%	1.37%			3.07%	*
1983 PAID + Q/S (2)		12.70%	26.98%	12.86%	9.81%	12.16%			16.90%	
1983 INCURRED (2)		14.66%	26.88%	8.84%	5.65%	3.16%			11.84%	
1984 PAID	33,884,398	36,856,896	38,614,229	38,727,638	38,537,445					
1984 PAID + Q/S	35,342,676	48,537,315	37,539,109	33,903,271	38,062,684					
1984 INCURRED	35,659,147	48,689,001	40,449,839	39,886,192	40,108,263					
1984 PAID (1)	12.07%	4.36%	0.20%	0.49%					4.28%	*
1984 PAID + Q/S (1)	7.15%	27.52%	1.38%	10.93%					11.74%	
1984 INCURRED (1)	11.09%	21.39%	0.85%	0.55%					8.47%	
1984 PAID (2)		8.77%	4.77%	0.29%	0.49%				3.58%	*
1984 PAID + Q/S (2)		37.33%	22.66%	9.69%	12.27%				20.49%	
1984 INCURRED (2)		36.54%	16.92%	1.39%	0.56%				13.85%	

NOTES: (1) ABSOLUTE DEVIATION FROM LAST PROJECTION (OR REPORT), RATIOED TO SAME.
(2) ABSOLUTE CHANGE RELATIVE TO PRIOR PROJECTION OR REPORT.
WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.
LOSSES RESTATED TO INCURRED LEVEL OF 8TH REPORT, AND TO LAST DIAGONAL.

WEIGHTS ASSIGNED TO PRECEDING YEARS:
N-4 0.0000
N-3 0.0000
N-2 0.5000
N-1 0.5000

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WISCONSIN

NATIONAL COUNCIL ON COMPENSATION INSURANCE
ANALYSIS OF FACTOR SELECTION METHODS AND PROJECTION METHODS
STATE: WISCONSIN

ORDER OF PRESENTATION FOR TESTS AND ANALYSIS

Premium: Development by Diagonal, Showing Variance

Premium: Tests of Minimum Average Squared Deviations

Indemnity: Paid - Development by Diagonal, Showing Variance

Indemnity: Paid - Tests of Minimum Average Squared Deviations

Indemnity: Paid+O/S - Development by Diagonal, Showing Variance

Indemnity: Paid+O/S - Tests of Minimum Average Squared Deviations

Indemnity: Incurred - Development by Diagonal, Showing Variance

Indemnity: Incurred - Tests of Minimum Average Squared Deviations

Medical: Paid - Development by Diagonal, Showing Variance

Medical: Paid - Tests of Minimum Average Squared Deviations

Medical: Paid+O/S - Development by Diagonal, Showing Variance

Medical: Paid+O/S - Tests of Minimum Average Squared Deviations

Medical: Incurred - Development by Diagonal, Showing Variance

Medical: Incurred - Tests of Minimum Average Squared Deviations

Indemnity: Comparison of Projections - Deviations by Loss Statistic Type

Indemnity: Comparison of Restated Projections - Deviations by Loss Statistic Type

Medical: Comparison of Projections - Deviations by Loss Statistic Type

Medical: Comparison of Restated Projections - Deviations by Loss Statistic Type

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: WISCONSIN

PREMIUM - DEVELOPMENT DIAGONALS BY EVALUATION DATE

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH
1981	1.017	1.019	1.000	1.000
1982	0.999	1.003	1.011	1.000
1983	1.031	1.000	0.997	1.001
1984	1.028	1.001	0.999	1.001
1985	1.040	0.999	0.998	0.999
1986	1.020	1.003	1.002	1.001
1987	1.020	0.996	1.000	1.002
1988	1.012	0.997	1.001	1.003
1989	1.044	1.004	1.001	1.001
POINTS	9	9	9	9
AVERAGE	1.023	1.002	1.001	1.001
SAMPLE VARIANCE	0.000196	0.000046	0.000016	0.000001
SAMPLE COEFF OF VARIANCE	0.014	0.007	0.004	0.001

REGION: NORTHERN

PREMIUM - DEVELOPMENT DIAGONALS BY EVALUATION DATE

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH
1981				
1982	1.034	1.001	1.002	1.000
1983	1.027	1.004	1.000	1.001
1984	1.036	1.002	1.002	0.999
1985	1.049	1.000	1.000	0.999
1986	1.047	1.002	1.002	1.001
1987	1.039	0.999	0.999	1.004
1988	1.035	1.001	1.002	1.002
1989	1.043	1.003	1.000	1.000
POINTS	8	8	8	8
AVERAGE	1.039	1.002	1.001	1.001
SAMPLE VARIANCE	0.000053	0.000003	0.000002	0.000003
SAMPLE COEFF OF VARIANCE	0.007	0.002	0.001	0.002

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: WISCONSIN
 PREMIUM - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.000251	0.000020	0.000002	0.000003	0.000276	
THREE-YEAR STRAIGHT AVERAGE	0.000322	0.000015	0.000007	0.000002	0.000346	
FOUR-YEAR STRAIGHT AVERAGE	0.000247	0.000022	0.000004	0.000002	0.000274	
TWO-YEAR EXPONENTIAL AVG	0.000253	0.000020	0.000003	0.000003	0.000278	
THREE-YEAR EXPONENTIAL AVG	0.000314	0.000015	0.000006	0.000002	0.000338	
FOUR-YEAR EXPONENTIAL AVG	0.000247	0.000020	0.000003	0.000002	0.000273	*

STATE: WISCONSIN
 PREMIUM - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	1	0	1	
THREE-YEAR STRAIGHT AVERAGE	0	1	0	0	1	
FOUR-YEAR STRAIGHT AVERAGE	1	0	0	1	2	*
TWO-YEAR EXPONENTIAL AVG	0	0	0	0	0	
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: WISCONSIN PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.330	1.182	1.101	1.062	1.049	1.040	1.026
1982	1.320	1.170	1.111	1.066	1.043	1.051	1.026
1983	1.352	1.155	1.090	1.054	1.038	1.025	1.014
1984	1.387	1.183	1.098	1.057	1.046	1.025	1.017
1985	1.431	1.211	1.111	1.060	1.042	1.024	1.019
1986	1.430	1.210	1.124	1.063	1.039	1.024	1.021
1987	1.453	1.207	1.110	1.069	1.042	1.031	1.022
1988	1.446	1.221	1.121	1.071	1.048	1.029	1.018
1989	1.441	1.226	1.129	1.074	1.047	1.032	1.025
POINTS	9	9	9	9	9	9	9
AVERAGE	1.399	1.196	1.111	1.064	1.044	1.031	1.021
SAMPLE VARIANCE	0.002779	0.000599	0.000163	0.000043	0.000015	0.000082	0.000018
SAMPLE COEFF OF VARIANCE	0.038	0.020	0.011	0.006	0.004	0.009	0.004

REGION: NORTHERN PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	1.600	1.252	1.126	1.078	1.048	1.041	1.029
1983	1.592	1.250	1.126	1.070	1.048	1.031	1.025
1984	1.610	1.261	1.129	1.073	1.044	1.031	1.021
1985	1.660	1.288	1.140	1.079	1.050	1.034	1.028
1986	1.641	1.287	1.146	1.079	1.050	1.036	1.025
1987	1.654	1.301	1.156	1.094	1.062	1.039	1.029
1988	1.669	1.311	1.164	1.100	1.063	1.044	1.030
1989	1.682	1.315	1.160	1.097	1.061	1.048	1.036
POINTS	8	8	8	8	8	8	8
AVERAGE	1.639	1.283	1.143	1.084	1.053	1.038	1.028
SAMPLE VARIANCE	0.001141	0.000672	0.000241	0.000133	0.000056	0.000038	0.000020
SAMPLE COEFF OF VARIANCE	0.021	0.020	0.014	0.011	0.007	0.006	0.004

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: WISCONSIN PAID - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: INDEMNITY (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.000964	0.000449	0.000185	0.000028	0.000018	0.000011	0.000012	0.001667	
THREE-YEAR STRAIGHT AVERAGE	0.001824	0.000562	0.000174	0.000041	0.000015	0.000032	0.000011	0.002661	
FOUR-YEAR STRAIGHT AVERAGE	0.002712	0.000643	0.000173	0.000054	0.000013	0.000051	0.000011	0.003657	
TWO-YEAR EXPONENTIAL AVG	0.000931	0.000432	0.000181	0.000027	0.000017	0.000011	0.000013	0.001611	*
THREE-YEAR EXPONENTIAL AVG	0.001686	0.000530	0.000170	0.000039	0.000015	0.000029	0.000011	0.002479	
FOUR-YEAR EXPONENTIAL AVG	0.002422	0.000597	0.000167	0.000049	0.000013	0.000044	0.000010	0.003302	

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STATE: WISCONSIN PAID - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: INDEMNITY ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
FOUR-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
TWO-YEAR EXPONENTIAL AVG	1	1	0	1	0	1	0	4	*
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	1	0	1	0	1	3	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: WISCONSIN PAID + O/S - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.033	1.035	1.001	0.977	1.015	1.011	1.010
1982	1.055	1.018	1.020	1.004	0.998	0.990	1.003
1983	1.023	0.990	0.988	0.980	0.979	0.991	0.986
1984	1.073	1.030	1.015	1.013	1.011	1.015	1.007
1985	1.092	1.052	1.037	1.003	1.007	1.019	1.011
1986	1.099	1.067	1.047	1.025	1.034	1.013	1.002
1987	1.082	1.027	1.024	1.015	1.019	0.989	1.004
1988	1.094	1.035	1.020	1.010	1.004	1.003	1.007
1989	1.037	1.010	0.999	1.003	1.003	0.985	0.991
POINTS	9	9	9	9	9	9	9
AVERAGE	1.065	1.029	1.017	1.003	1.008	1.002	1.002
SAMPLE VARIANCE	0.000844	0.000507	0.000349	0.000248	0.000230	0.000173	0.000072
SAMPLE COEFF OF VARIANCE	0.027	0.022	0.018	0.016	0.015	0.013	0.008

REGION: NORTHERN PAID + O/S - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	1.109	1.027	1.004	1.001	1.000	1.004	1.004
1983	1.120	1.043	1.014	1.006	1.002	1.002	0.998
1984	1.109	1.055	1.020	1.012	1.004	1.010	1.000
1985	1.132	1.065	1.029	1.007	1.007	1.002	1.002
1986	1.137	1.071	1.040	1.018	1.009	1.002	1.002
1987	1.159	1.083	1.037	1.022	1.009	1.007	1.003
1988	1.143	1.076	1.043	1.017	1.019	1.016	1.009
1989	1.148	1.083	1.037	1.026	1.008	1.003	1.014
POINTS	8	8	8	8	8	8	8
AVERAGE	1.132	1.063	1.028	1.014	1.007	1.006	1.004
SAMPLE VARIANCE	0.000333	0.000400	0.000195	0.000074	0.000034	0.000025	0.000027
SAMPLE COEFF OF VARIANCE	0.016	0.019	0.014	0.008	0.006	0.005	0.005

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: WISCONSIN PAID + O/S - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: INDEMNITY (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.001001	0.000816	0.000559	0.000104	0.000270	0.000225	0.000098	0.003074	
THREE-YEAR STRAIGHT AVERAGE	0.001218	0.001037	0.000663	0.000183	0.000372	0.000288	0.000068	0.003829	
FOUR-YEAR STRAIGHT AVERAGE	0.001348	0.000901	0.000639	0.000186	0.000353	0.000256	0.000065	0.003747	
TWO-YEAR EXPONENTIAL AVG	0.000983	0.000795	0.000541	0.000102	0.000263	0.000222	0.000096	0.003002	*
THREE-YEAR EXPONENTIAL AVG	0.001172	0.000987	0.000631	0.000172	0.000352	0.000275	0.000068	0.003658	
FOUR-YEAR EXPONENTIAL AVG	0.001278	0.000869	0.000611	0.000173	0.000336	0.000247	0.000065	0.003580	

STATE: WISCONSIN PAID + O/S - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: INDEMNITY (*1* INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
FOUR-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	1	1	
TWO-YEAR EXPONENTIAL AVG	1	1	1	1	1	1	0	6	*
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: WISCONSIN INCURRED - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	0.971	1.002	0.998	0.976	1.013	1.010	1.011
1982	0.976	0.984	1.012	0.989	0.994	0.986	1.000
1983	0.947	0.951	0.977	0.964	0.974	0.987	0.985
1984	0.995	0.996	1.010	0.999	1.007	1.012	1.006
1985	1.012	1.027	1.036	0.987	1.005	1.017	1.009
1986	1.007	1.034	1.036	1.001	1.028	1.009	0.996
1987	0.989	1.002	1.010	1.005	1.014	0.985	1.002
1988	1.002	1.009	1.010	1.001	1.006	1.001	1.009
1989	0.945	0.985	0.986	0.992	0.999	0.981	0.992
POINTS	9	9	9	9	9	9	9
AVERAGE	0.983	0.999	1.008	0.990	1.004	0.999	1.001
SAMPLE VARIANCE	0.000611	0.000608	0.000393	0.000179	0.000224	0.000194	0.000077
SAMPLE COEFF OF VARIANCE	0.025	0.025	0.020	0.014	0.015	0.014	0.009

REGION: NORTHERN INCURRED - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: INDEMNITY

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	0.985	0.983	0.992	0.983	0.999	1.003	1.003
1983	1.006	0.994	0.999	0.982	0.997	0.999	0.997
1984	1.010	1.012	1.011	0.994	1.002	1.008	0.999
1985	1.039	1.025	1.021	0.983	1.003	1.000	1.000
1986	1.045	1.038	1.034	0.993	1.005	0.998	0.993
1987	1.040	1.046	1.024	1.012	1.007	1.006	1.004
1988	1.024	1.038	1.030	1.008	1.026	1.014	1.009
1989	1.039	1.050	1.020	1.012	1.004	0.995	1.013
POINTS	8	8	8	8	8	8	8
AVERAGE	1.024	1.023	1.016	0.996	1.005	1.003	1.002
SAMPLE VARIANCE	0.000455	0.000610	0.000216	0.000172	0.000080	0.000038	0.000042
SAMPLE COEFF OF VARIANCE	0.021	0.024	0.014	0.013	0.009	0.006	0.006

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: WISCONSIN INCURRED - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: INDEMNITY (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.000936	0.000936	0.000679	0.000068	0.000209	0.000256	0.000119	0.003204	
THREE-YEAR STRAIGHT AVERAGE	0.001049	0.001131	0.000758	0.000105	0.000326	0.000314	0.000063	0.003745	
FOUR-YEAR STRAIGHT AVERAGE	0.001098	0.001003	0.000731	0.000128	0.000305	0.000273	0.000055	0.003592	
TWO-YEAR EXPONENTIAL AVG	0.000922	0.000905	0.000658	0.000065	0.000202	0.000253	0.000117	0.003122	*
THREE-YEAR EXPONENTIAL AVG	0.001018	0.001073	0.000725	0.000098	0.000305	0.000301	0.000066	0.003585	
FOUR-YEAR EXPONENTIAL AVG	0.001057	0.000961	0.000701	0.000117	0.000287	0.000265	0.000058	0.003445	

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STATE: WISCONSIN INCURRED - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: INDEMNITY ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
FOUR-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	1	1	
TWO-YEAR EXPONENTIAL AVG	1	1	1	1	1	1	0	6	*
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: WISCONSIN PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.175	1.069	1.029	1.018	1.014	1.010	1.011
1982	1.168	1.061	1.040	1.021	1.015	1.014	1.010
1983	1.164	1.068	1.026	1.011	1.015	1.011	1.020
1984	1.181	1.059	1.039	1.014	1.013	1.011	1.012
1985	1.198	1.068	1.031	1.017	1.014	1.018	1.011
1986	1.224	1.064	1.029	1.022	1.015	1.014	1.015
1987	1.233	1.070	1.033	1.017	1.015	1.015	1.009
1988	1.251	1.074	1.040	1.025	1.019	1.013	1.008
1989	1.237	1.070	1.035	1.028	1.016	1.018	1.010
POINTS	9	9	9	9	9	9	9
AVERAGE	1.203	1.067	1.034	1.019	1.015	1.014	1.012
SAMPLE VARIANCE	0.001105	0.000023	0.000028	0.000028	0.000003	0.000008	0.000013
SAMPLE COEFF OF VARIANCE	0.028	0.004	0.005	0.005	0.002	0.003	0.004

REGION: NORTHERN PAID - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	1.224	1.079	1.041	1.027	1.018	1.017	1.017
1983	1.217	1.076	1.041	1.028	1.020	1.016	1.015
1984	1.226	1.078	1.045	1.026	1.020	1.016	1.014
1985	1.235	1.080	1.042	1.025	1.018	1.016	1.013
1986	1.250	1.080	1.039	1.026	1.017	1.016	1.013
1987	1.269	1.086	1.044	1.025	1.020	1.016	1.013
1988	1.285	1.093	1.049	1.030	1.021	1.016	1.012
1989	1.295	1.096	1.047	1.030	1.019	1.018	1.015
POINTS	8	8	8	8	8	8	8
AVERAGE	1.250	1.084	1.043	1.027	1.019	1.016	1.014
SAMPLE VARIANCE	0.000882	0.000055	0.000011	0.000004	0.000002	0.000001	0.000003
SAMPLE COEFF OF VARIANCE	0.024	0.007	0.003	0.002	0.001	0.001	0.002

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: WISCONSIN PAID - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: MEDICAL (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.000571	0.000018	0.000026	0.000030	0.000004	0.000014	0.000014	0.000677	
THREE-YEAR STRAIGHT AVERAGE	0.000934	0.000023	0.000021	0.000030	0.000004	0.000012	0.000007	0.001032	
FOUR-YEAR STRAIGHT AVERAGE	0.001278	0.000024	0.000017	0.000031	0.000005	0.000011	0.000011	0.001377	
TWO-YEAR EXPONENTIAL AVG	0.000553	0.000018	0.000026	0.000029	0.000004	0.000014	0.000014	0.000658	*
THREE-YEAR EXPONENTIAL AVG	0.000874	0.000022	0.000021	0.000030	0.000004	0.000012	0.000008	0.000971	
FOUR-YEAR EXPONENTIAL AVG	0.001161	0.000023	0.000018	0.000030	0.000005	0.000011	0.000010	0.001258	

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STATE: WISCONSIN PAID - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: MEDICAL ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	1	0	0	1	0	0	2	*
THREE-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	1	1	
FOUR-YEAR STRAIGHT AVERAGE	0	0	1	0	0	1	0	2	*
TWO-YEAR EXPONENTIAL AVG	1	0	0	1	0	0	0	2	*
THREE-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: WISCONSIN PAID + O/S - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	1.016	1.001	0.993	0.986	0.995	0.979	1.006
1982	1.027	1.006	1.028	1.005	0.989	0.990	1.005
1983	1.022	1.004	0.974	0.962	0.989	0.997	1.016
1984	1.026	1.009	1.019	1.001	0.971	1.001	1.003
1985	1.031	1.011	1.007	0.983	1.000	1.026	1.005
1986	1.031	1.016	1.003	1.013	1.049	1.009	1.020
1987	1.050	1.009	1.004	1.010	0.999	0.988	1.019
1988	1.046	0.990	1.000	0.999	1.005	0.996	0.997
1989	1.011	0.977	0.998	1.001	0.999	0.997	1.017
POINTS	9	9	9	9	9	9	9
AVERAGE	1.029	1.003	1.003	0.996	1.000	0.998	1.010
SAMPLE VARIANCE	0.000162	0.000145	0.000234	0.000256	0.000442	0.000181	0.000069
SAMPLE COEFF OF VARIANCE	0.012	0.012	0.015	0.016	0.021	0.013	0.008

REGION: NORTHERN PAID + O/S - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	1.039	1.009	0.997	1.004	1.003	1.008	1.012
1983	1.036	0.999	0.996	0.997	1.002	1.009	1.010
1984	1.055	1.011	1.008	1.006	1.000	1.006	1.010
1985	1.044	1.010	1.007	0.998	1.001	1.007	1.003
1986	1.057	1.009	1.002	1.003	1.003	1.007	1.006
1987	1.073	1.020	1.008	1.005	1.002	1.003	1.006
1988	1.066	1.009	1.009	0.996	1.004	1.001	1.003
1989	1.048	1.004	0.997	0.996	1.000	0.999	1.007
POINTS	8	8	8	8	8	8	8
AVERAGE	1.052	1.009	1.003	1.001	1.002	1.005	1.007
SAMPLE VARIANCE	0.000168	0.000036	0.000032	0.000018	0.000002	0.000013	0.000011
SAMPLE COEFF OF VARIANCE	0.012	0.006	0.006	0.004	0.001	0.004	0.003

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: WISCONSIN PAID + O/S - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: MEDICAL (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.000363	0.000218	0.000048	0.000151	0.001090	0.000330	0.000181	0.002362	
THREE-YEAR STRAIGHT AVERAGE	0.000308	0.000273	0.000016	0.000234	0.000941	0.000323	0.000117	0.002211	
FOUR-YEAR STRAIGHT AVERAGE	0.000308	0.000286	0.000027	0.000217	0.000845	0.000355	0.000099	0.002137	
TWO-YEAR EXPONENTIAL AVG	0.000360	0.000212	0.000042	0.000150	0.001079	0.000324	0.000181	0.002348	
THREE-YEAR EXPONENTIAL AVG	0.000311	0.000261	0.000014	0.000224	0.000933	0.000314	0.000121	0.002178	
FOUR-YEAR EXPONENTIAL AVG	0.000308	0.000274	0.000023	0.000208	0.000847	0.000338	0.000105	0.002104	*

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STATE: WISCONSIN PAID + O/S - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: MEDICAL ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
FOUR-YEAR STRAIGHT AVERAGE	1	0	0	0	1	0	1	3	*
TWO-YEAR EXPONENTIAL AVG	0	1	0	1	0	0	0	2	
THREE-YEAR EXPONENTIAL AVG	0	0	1	0	0	1	0	2	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 DEVELOPMENT BY DIAGONAL, SHOWING VARIANCE

STATE: WISCONSIN INCURRED - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981	0.987	0.990	0.995	0.984	0.996	0.979	1.008
1982	0.975	0.988	1.022	0.996	0.986	0.987	1.003
1983	0.976	0.982	0.968	0.954	0.986	0.994	1.016
1984	0.975	0.989	1.015	0.993	0.969	0.999	1.002
1985	0.982	0.998	1.006	0.975	0.999	1.025	1.004
1986	0.973	0.998	0.996	0.999	1.045	1.006	1.017
1987	0.992	0.994	0.996	1.005	0.995	0.985	1.018
1988	0.993	0.978	0.994	0.994	1.007	0.994	0.998
1989	0.963	0.967	0.991	0.994	0.996	0.994	1.016
POINTS	9	9	9	9	9	9	9
AVERAGE	0.980	0.987	0.998	0.988	0.998	0.996	1.009
SAMPLE VARIANCE	0.000096	0.000101	0.000239	0.000239	0.000430	0.000182	0.000059
SAMPLE COEFF OF VARIANCE	0.010	0.010	0.015	0.016	0.021	0.014	0.008

REGION: NORTHERN INCURRED - DEVELOPMENT DIAGONALS BY EVALUATION DATE
 LOSS TYPE: MEDICAL

EVAL DATE	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH
1981							
1982	0.966	0.983	0.990	0.991	1.001	1.007	1.009
1983	0.971	0.968	0.985	0.979	0.997	1.006	1.010
1984	0.988	0.981	1.000	0.991	0.997	1.004	1.010
1985	0.983	0.985	0.999	0.978	0.996	1.004	1.000
1986	0.999	0.991	0.999	0.986	1.002	1.004	1.002
1987	0.999	0.998	1.000	0.999	0.999	1.001	1.005
1988	0.996	0.989	1.005	0.991	1.013	1.000	1.003
1989	0.989	0.990	0.993	0.987	0.997	0.994	1.007
POINTS	8	8	8	8	8	8	8
AVERAGE	0.986	0.986	0.996	0.988	1.000	1.003	1.006
SAMPLE VARIANCE	0.000155	0.000079	0.000042	0.000048	0.000031	0.000017	0.000015
SAMPLE COEFF OF VARIANCE	0.013	0.009	0.007	0.007	0.006	0.004	0.004

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 PREMIUM AND LOSS DEVELOPMENT ANALYSIS
 TESTS OF MINIMUM AVERAGE SQUARED DEVIATIONS

STATE: WISCONSIN INCURRED - SUMMARY OF AVERAGE SQUARED DEVIATIONS BY METHOD, 1985 - 1989
 LOSS TYPE: MEDICAL (ALL METHODS BASED ON STATE DATA ALONE)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR LOW TOTAL
TWO-YEAR STRAIGHT AVERAGE	0.000253	0.000176	0.000093	0.000129	0.001021	0.000360	0.000144	0.002176	
THREE-YEAR STRAIGHT AVERAGE	0.000189	0.000217	0.000032	0.000189	0.000900	0.000351	0.000092	0.001970	
FOUR-YEAR STRAIGHT AVERAGE	0.000182	0.000221	0.000043	0.000208	0.000821	0.000375	0.000078	0.001928	
TWO-YEAR EXPONENTIAL AVG	0.000253	0.000170	0.000084	0.000127	0.001014	0.000354	0.000144	0.002146	
THREE-YEAR EXPONENTIAL AVG	0.000195	0.000207	0.000029	0.000180	0.000894	0.000342	0.000096	0.001944	
FOUR-YEAR EXPONENTIAL AVG	0.000187	0.000211	0.000039	0.000195	0.000822	0.000359	0.000083	0.001896	*

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STATE: WISCONSIN INCURRED - TEST OF MINIMUM AVERAGE SQUARED DEVIATIONS
 LOSS TYPE: MEDICAL ("1" INDICATES THE METHOD HAS THE LOWEST AVERAGE DEVIATION DOWN A COLUMN)

DEVELOPMENT FACTOR METHOD	1ST TO 2ND	2ND TO 3RD	3RD TO 4TH	4TH TO 5TH	5TH TO 6TH	6TH TO 7TH	7TH TO 8TH	TOTAL	* FOR BEST METHOD
TWO-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
THREE-YEAR STRAIGHT AVERAGE	0	0	0	0	0	0	0	0	
FOUR-YEAR STRAIGHT AVERAGE	1	0	0	0	1	0	1	3	*
TWO-YEAR EXPONENTIAL AVG	0	1	0	1	0	0	0	2	
THREE-YEAR EXPONENTIAL AVG	0	0	1	0	0	1	0	2	
FOUR-YEAR EXPONENTIAL AVG	0	0	0	0	0	0	0	0	

NATIONAL COUNCIL ON COMPENSATION INSURANCE
WISCONSIN INDEMNITY COMPARISON OF PROJECTIONS

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	ACTUAL 8TH	AVERAGE	*=LOW AVG
1978 PAID				83,811,878	81,515,666	80,563,265	80,682,787	80,951,745		
1978 PAID + Q/S				87,477,058	83,149,004	86,288,020	88,764,154	88,130,627		
1978 INCURRED				88,674,525	83,240,764	86,569,894	89,147,431	88,115,803		
1978 PAID (1)				3.53%	0.70%	0.48%	0.33%		1.26%	*
1978 PAID + Q/S (1)				0.74%	5.65%	2.09%	0.72%		2.30%	
1978 INCURRED (1)				0.63%	5.53%	1.75%	1.17%		2.27%	
1978 PAID (2)					2.74%	1.17%	0.15%	0.33%	1.10%	*
1978 PAID + Q/S (2)					4.95%	3.78%	2.87%	0.71%	3.08%	
1978 INCURRED (2)					6.13%	4.00%	2.98%	1.16%	3.57%	
1979 PAID			96,046,764	92,588,037	90,898,329	91,077,656	91,212,054	91,417,300		
1979 PAID + Q/S			97,930,136	92,126,690	96,083,456	99,836,395	99,197,333	98,972,958		
1979 INCURRED			99,651,045	92,117,630	96,403,286	100,479,268	99,438,578	99,400,289		
1979 PAID (1)			5.06%	1.28%	0.57%	0.37%	0.22%		1.50%	*
1979 PAID + Q/S (1)			1.05%	6.92%	2.92%	0.87%	0.23%		2.40%	
1979 INCURRED (1)			0.25%	7.33%	3.02%	1.09%	0.04%		2.34%	
1979 PAID (2)				3.60%	1.82%	0.20%	0.15%	0.23%	1.20%	*
1979 PAID + Q/S (2)				5.93%	4.29%	3.91%	0.64%	0.23%	3.00%	
1979 INCURRED (2)				7.56%	4.65%	4.23%	1.04%	0.04%	3.50%	
1980 PAID		94,347,672	90,186,501	88,214,120	88,935,358	88,640,030	89,377,212	89,108,449		
1980 PAID + Q/S		96,767,363	89,217,700	92,536,775	96,970,572	99,029,526	96,062,622	96,492,064		
1980 INCURRED		98,978,340	89,195,421	93,139,316	97,718,420	99,212,933	96,133,816	97,065,854		
1980 PAID (1)		5.88%	1.21%	1.00%	0.19%	0.53%	0.30%		1.52%	*
1980 PAID + Q/S (1)		0.29%	7.54%	4.10%	0.50%	2.63%	0.45%		2.58%	
1980 INCURRED (1)		1.97%	8.11%	4.05%	0.67%	2.21%	0.96%		2.99%	
1980 PAID (2)			4.41%	2.19%	0.82%	0.33%	0.83%	0.30%	1.48%	*
1980 PAID + Q/S (2)			7.80%	3.72%	4.79%	2.12%	3.00%	0.45%	3.65%	
1980 INCURRED (2)			9.88%	4.42%	4.92%	1.53%	3.10%	0.97%	4.14%	
1981 PAID	94,666,724	92,935,039	92,168,564	94,232,543	94,455,072	95,054,130	95,053,112	95,557,729		
1981 PAID + Q/S	100,029,526	91,648,209	96,222,301	104,927,359	107,539,815	105,428,489	105,902,443	104,406,269		
1981 INCURRED	102,329,800	91,261,793	96,501,562	106,218,880	107,496,090	105,169,561	106,278,537	104,819,978		
1981 PAID (1)	0.93%	2.74%	3.55%	1.39%	1.15%	0.53%	0.53%		1.55%	*
1981 PAID + Q/S (1)	4.19%	12.22%	7.84%	0.50%	3.00%	0.98%	1.43%		4.31%	
1981 INCURRED (1)	2.38%	12.93%	7.94%	1.33%	2.55%	0.33%	1.39%		4.12%	
1981 PAID (2)		1.83%	0.82%	2.24%	0.24%	0.63%	0.00%	0.53%	0.90%	*
1981 PAID + Q/S (2)		8.38%	4.99%	9.05%	2.49%	1.96%	0.45%	1.41%	4.10%	
1981 INCURRED (2)		10.82%	5.74%	10.07%	1.20%	2.16%	1.05%	1.37%	4.63%	
1982 PAID	91,739,487	93,338,198	98,278,562	100,108,394	101,309,057	102,137,369	102,486,188			
1982 PAID + Q/S	96,267,717	102,353,042	115,020,890	119,006,499	117,644,664	114,776,611	112,775,225			
1982 INCURRED	95,310,059	101,957,620	116,883,237	118,954,153	118,479,842	117,027,353	115,038,221			
1982 PAID (1)	10.49%	8.93%	4.11%	2.32%	1.15%	0.34%			4.55%	*
1982 PAID + Q/S (1)	14.64%	9.24%	1.99%	5.53%	4.32%	1.77%			6.25%	
1982 INCURRED (1)	17.15%	11.39%	1.60%	3.40%	2.99%	1.73%			6.38%	
1982 PAID (2)		1.74%	5.29%	1.86%	1.20%	0.82%	0.34%		1.88%	*
1982 PAID + Q/S (2)		6.32%	12.38%	3.47%	1.14%	2.44%	1.74%		4.58%	
1982 INCURRED (2)		6.95%	14.66%	1.77%	0.40%	1.23%	1.70%		4.45%	
1983 PAID	100,766,729	109,583,243	112,183,320	112,450,403	113,575,507	114,015,539				
1983 PAID + Q/S	106,307,347	123,178,694	130,006,264	126,920,625	123,528,378	121,454,118				
1983 INCURRED	106,792,391	125,694,066	130,766,593	126,723,790	125,417,346	123,185,941				
1983 PAID (1)	11.62%	3.89%	1.61%	1.37%	0.39%				3.77%	*
1983 PAID + Q/S (1)	12.47%	1.42%	7.04%	4.50%	1.71%				5.43%	
1983 INCURRED (1)	13.31%	2.04%	6.15%	2.87%	1.81%				5.24%	
1983 PAID (2)		8.75%	2.37%	0.24%	1.00%	0.39%			2.55%	*
1983 PAID + Q/S (2)		15.87%	5.54%	2.37%	2.67%	1.68%			5.63%	
1983 INCURRED (2)		17.70%	4.04%	3.09%	1.03%	1.78%			5.53%	
1984 PAID	127,194,429	132,207,684	132,972,580	134,658,108	135,749,964					
1984 PAID + Q/S	152,431,716	162,184,875	155,202,210	149,161,302	145,353,006					
1984 INCURRED	156,098,364	162,412,681	155,008,412	151,763,493	147,945,066					
1984 PAID (1)	6.30%	2.61%	2.05%	0.80%					2.94%	*
1984 PAID + Q/S (1)	4.87%	11.58%	6.78%	2.62%					6.46%	
1984 INCURRED (1)	5.51%	9.78%	4.77%	2.58%					5.66%	
1984 PAID (2)		3.94%	0.58%	1.27%	0.81%				1.65%	*
1984 PAID + Q/S (2)		6.40%	4.31%	3.89%	2.55%				4.29%	
1984 INCURRED (2)		4.05%	4.56%	2.09%	2.52%				3.30%	

NOTES: (1) ABSOLUTE DEVIATION FROM LAST PROJECTION (OR REPORT), RATIOED TO SAME.
(2) ABSOLUTE CHANGE RELATIVE TO PRIOR PROJECTION OR REPORT.
WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.
LOSSES HAVE BEEN RESTATED TO THE LATEST DIAGONAL.

M-4 0.0000
M-3 0.0000
M-2 0.5000
M-1 0.5000
WEIGHTS ASSIGNED TO PRECEDING YEARS:

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 WISCONSIN INDEMNITY COMPARISON OF PROJECTIONS RESTATED TO INCURRED LEVEL

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	RESTATED 8TH	AVERAGE	*=LOW AVG
1978 PAID				96,114,777	91,254,820	87,940,659	87,437,950	88,149,228		
1978 PAID + Q/S				88,136,377	83,683,438	86,876,357	89,328,955	88,388,818		
1978 INCURRED				88,674,525	83,240,764	86,569,894	89,147,431	88,115,803		
1978 PAID (1)				9.04%	3.52%	0.24%	0.81%		3.40%	
1978 PAID + Q/S (1)				0.29%	5.32%	1.71%	1.06%		2.10%	*
1978 INCURRED (1)				0.63%	5.53%	1.75%	1.17%		2.27%	
1978 PAID (2)					5.06%	3.63%	0.57%	0.81%	2.52%	*
1978 PAID + Q/S (2)					5.05%	3.82%	2.82%	1.05%	3.19%	
1978 INCURRED (2)					6.13%	4.00%	2.98%	1.16%	3.57%	
1979 PAID			110,145,645	103,650,071	99,222,156	98,703,129	99,321,788	99,453,884		
1979 PAID + Q/S			98,668,241	92,718,827	96,738,581	100,471,648	99,487,945	99,177,803		
1979 INCURRED			99,651,045	92,117,630	96,403,286	100,479,268	99,438,578	99,400,289		
1979 PAID (1)			10.75%	4.22%	0.23%	0.75%	0.13%		3.22%	
1979 PAID + Q/S (1)			0.51%	6.51%	2.46%	1.30%	0.31%		2.22%	*
1979 INCURRED (1)			0.25%	7.33%	3.02%	1.09%	0.04%		2.34%	
1979 PAID (2)				5.90%	4.27%	0.52%	0.63%	0.13%	2.29%	*
1979 PAID + Q/S (2)				6.03%	4.34%	3.86%	0.98%	0.31%	3.10%	
1979 INCURRED (2)				7.56%	4.65%	4.23%	1.04%	0.04%	3.50%	
1980 PAID		108,197,140	100,961,609	96,292,146	96,381,467	96,521,084	97,234,450	96,977,756		
1980 PAID + Q/S		97,496,704	89,791,140	93,167,718	97,587,590	99,319,647	96,261,443	96,987,205		
1980 INCURRED		98,978,340	89,195,421	93,139,316	97,718,420	99,212,933	96,133,816	97,065,854		
1980 PAID (1)		11.57%	4.11%	0.71%	0.61%	0.47%	0.26%		2.96%	
1980 PAID + Q/S (1)		0.53%	7.42%	3.94%	0.62%	2.40%	0.75%		2.61%	*
1980 INCURRED (1)		1.97%	8.11%	4.05%	0.67%	2.21%	0.96%		2.99%	
1980 PAID (2)			6.69%	4.62%	0.09%	0.14%	0.74%	0.26%	2.09%	*
1980 PAID + Q/S (2)			7.90%	3.76%	4.74%	1.77%	3.08%	0.75%	3.67%	
1980 INCURRED (2)			9.88%	4.42%	4.92%	1.53%	3.10%	0.97%	4.14%	
1981 PAID	108,563,026	104,038,532	100,608,711	102,122,158	102,853,147	103,410,432	103,447,401	104,454,265		
1981 PAID + Q/S	100,783,454	92,237,270	96,878,373	105,595,005	107,854,868	105,646,695	106,445,873	104,923,447		
1981 INCURRED	102,329,800	91,261,793	96,501,562	106,218,880	107,496,090	105,169,561	106,278,537	104,819,978		
1981 PAID (1)	3.95%	0.40%	3.68%	2.23%	1.53%	1.00%	0.96%		1.96%	*
1981 PAID + Q/S (1)	3.95%	12.09%	7.67%	0.64%	2.79%	0.69%	1.45%		4.18%	
1981 INCURRED (1)	2.38%	12.93%	7.94%	1.33%	2.55%	0.33%	1.39%		4.12%	
1981 PAID (2)		4.17%	3.30%	1.50%	0.72%	0.54%	0.04%	0.97%	1.61%	*
1981 PAID + Q/S (2)		8.48%	5.03%	9.00%	2.14%	2.05%	0.76%	1.43%	4.13%	
1981 INCURRED (2)		10.82%	5.74%	10.07%	1.20%	2.16%	1.05%	1.37%	4.63%	
1982 PAID	102,700,141	101,885,452	106,506,930	109,009,110	110,215,236	111,157,281	112,027,751			
1982 PAID + Q/S	96,886,470	103,050,915	115,752,761	119,355,146	117,888,154	115,365,577	113,333,859			
1982 INCURRED	95,310,059	101,957,620	116,883,237	118,954,153	118,479,842	117,027,353	115,038,221			
1982 PAID (1)	8.33%	9.05%	4.93%	2.69%	1.62%	0.78%			4.57%	*
1982 PAID + Q/S (1)	14.51%	9.07%	2.13%	5.31%	4.02%	1.79%			6.14%	
1982 INCURRED (1)	17.15%	11.39%	1.60%	3.40%	2.99%	1.73%			6.38%	
1982 PAID (2)		0.79%	4.54%	2.35%	1.11%	0.85%	0.78%		1.74%	*
1982 PAID + Q/S (2)		6.36%	12.33%	3.11%	1.23%	2.14%	1.76%		4.49%	
1982 INCURRED (2)		6.95%	14.66%	1.77%	0.40%	1.23%	1.70%		4.45%	
1983 PAID	109,994,235	118,758,095	122,157,627	122,336,028	123,605,538	124,630,495				
1983 PAID + Q/S	107,032,182	123,962,473	130,387,136	127,183,313	124,162,254	122,055,743				
1983 INCURRED	106,792,391	125,694,066	130,766,593	126,723,790	125,417,346	123,185,941				
1983 PAID (1)	11.74%	4.71%	1.98%	1.84%	0.82%				4.22%	*
1983 PAID + Q/S (1)	12.31%	1.56%	6.83%	4.20%	1.73%				5.32%	
1983 INCURRED (1)	13.31%	2.04%	6.15%	2.87%	1.81%				5.24%	
1983 PAID (2)		7.97%	2.86%	0.15%	1.04%	0.83%			2.57%	*
1983 PAID + Q/S (2)		15.82%	5.18%	2.46%	2.38%	1.70%			5.51%	
1983 INCURRED (2)		17.70%	4.04%	3.09%	1.03%	1.78%			5.53%	
1984 PAID	137,843,776	143,962,372	144,662,329	146,549,977	148,388,416					
1984 PAID + Q/S	153,401,630	162,660,019	155,523,433	149,926,711	146,073,014					
1984 INCURRED	156,098,364	162,412,681	155,008,412	151,763,493	147,945,066					
1984 PAID (1)	7.11%	2.98%	2.51%	1.24%					3.46%	*
1984 PAID + Q/S (1)	5.02%	11.36%	6.47%	2.64%					6.37%	
1984 INCURRED (1)	5.51%	9.78%	4.77%	2.58%					5.66%	
1984 PAID (2)		4.44%	0.49%	1.30%	1.25%				1.87%	*
1984 PAID + Q/S (2)		6.04%	4.39%	3.60%	2.57%				4.15%	
1984 INCURRED (2)		4.05%	4.56%	2.09%	2.52%				3.30%	

NOTES: (1) ABSOLUTE DEVIATION FROM LAST PROJECTION (OR REPORT), RATIOED TO SAME.
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 WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.
 LOSSES RESTATED TO INCURRED LEVEL OF 8TH REPORT, AND TO LAST DIAGONAL.

WEIGHTS ASSIGNED TO PRECEDING YEARS:
 N-4 0.0000
 N-3 0.0000
 N-2 0.5000
 N-1 0.5000

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 WISCONSIN MEDICAL COMPARISON OF PROJECTIONS

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	ACTUAL 8TH	AVERAGE	*=LOW AVG
1978 PAID				50,473,922	50,325,629	50,201,466	50,325,165	50,481,468		
1978 PAID + O/S				54,996,533	53,735,356	52,996,928	54,132,733	54,981,835		
1978 INCURRED				55,507,245	53,838,298	53,204,192	54,400,411	55,163,402		
1978 PAID (1)				0.01%	0.31%	0.55%	0.31%		0.30%	*
1978 PAID + O/S (1)				0.03%	2.27%	3.61%	1.54%		1.86%	
1978 INCURRED (1)				0.62%	2.40%	3.55%	1.38%		1.99%	
1978 PAID (2)					0.29%	0.25%	0.25%	0.31%	0.27%	*
1978 PAID + O/S (2)					2.29%	1.37%	2.14%	1.57%	1.84%	
1978 INCURRED (2)					3.01%	1.18%	2.25%	1.40%	1.96%	
1979 PAID			58,381,424	58,017,133	57,817,088	57,760,280	57,817,426	57,576,858		
1979 PAID + O/S			60,564,379	58,312,816	59,077,368	60,824,804	61,067,403	61,474,985		
1979 INCURRED			61,418,925	58,438,567	59,332,372	61,214,373	61,306,463	61,772,378		
1979 PAID (1)			1.40%	0.76%	0.42%	0.32%	0.42%		0.66%	*
1979 PAID + O/S (1)			1.48%	5.14%	3.90%	1.06%	0.66%		2.45%	
1979 INCURRED (1)			0.57%	5.40%	3.95%	0.90%	0.75%		2.32%	
1979 PAID (2)				0.62%	0.34%	0.10%	0.10%	0.42%	0.32%	*
1979 PAID + O/S (2)				3.72%	1.31%	2.98%	0.40%	0.67%	1.81%	
1979 INCURRED (2)				4.85%	1.53%	3.17%	0.15%	0.76%	2.09%	
1980 PAID		60,665,872	60,869,625	60,921,821	61,102,316	61,374,106	61,253,171	61,013,550		
1980 PAID + O/S		62,753,060	62,125,961	62,824,143	63,841,928	68,801,330	67,268,472	65,777,698		
1980 INCURRED		64,080,527	62,228,072	63,184,152	64,308,463	69,043,710	67,433,938	66,129,291		
1980 PAID (1)		0.57%	0.24%	0.15%	0.15%	0.59%	0.39%		0.35%	*
1980 PAID + O/S (1)		4.60%	5.55%	4.49%	2.94%	4.60%	2.27%		4.07%	
1980 INCURRED (1)		3.10%	5.90%	4.45%	2.75%	4.41%	1.97%		3.76%	
1980 PAID (2)			0.34%	0.09%	0.30%	0.44%	0.20%	0.39%	0.29%	*
1980 PAID + O/S (2)			1.00%	1.12%	1.62%	7.77%	2.23%	2.22%	2.66%	
1980 INCURRED (2)			2.89%	1.54%	1.78%	7.36%	2.33%	1.93%	2.97%	
1981 PAID	66,419,225	65,998,655	65,302,851	65,304,712	65,982,535	65,852,520	65,527,739	65,598,313		
1981 PAID + O/S	67,042,667	66,471,329	65,995,761	68,392,076	73,507,368	70,825,598	69,851,353	70,444,214		
1981 INCURRED	68,855,845	66,727,774	66,453,092	69,258,153	73,829,834	70,951,816	70,183,456	70,749,377		
1981 PAID (1)	1.25%	0.61%	0.45%	0.45%	0.59%	0.39%	0.11%		0.55%	*
1981 PAID + O/S (1)	4.83%	5.64%	6.31%	2.91%	4.35%	0.54%	0.84%		3.63%	
1981 INCURRED (1)	2.68%	5.68%	6.07%	2.11%	4.35%	0.29%	0.80%		3.14%	
1981 PAID (2)		0.63%	1.05%	0.00%	1.04%	0.20%	0.49%	0.11%	0.50%	*
1981 PAID + O/S (2)		0.85%	0.72%	3.63%	7.48%	3.65%	1.38%	0.85%	2.65%	
1981 INCURRED (2)		3.09%	0.41%	4.22%	6.60%	3.90%	1.08%	0.81%	2.87%	
1982 PAID	69,110,765	69,556,167	70,123,480	70,268,276	69,957,845	69,956,143	70,266,924			
1982 PAID + O/S	71,237,190	70,655,580	73,986,683	77,569,543	77,531,094	74,744,445	75,046,656			
1982 INCURRED	71,287,196	70,706,244	74,959,336	77,814,656	78,058,288	75,883,783	76,153,259			
1982 PAID (1)	1.65%	1.01%	0.20%	0.00%	0.44%	0.44%			0.62%	*
1982 PAID + O/S (1)	5.08%	5.85%	1.41%	3.36%	3.31%	0.40%			3.24%	
1982 INCURRED (1)	6.39%	7.15%	1.57%	2.18%	2.50%	0.35%			3.36%	
1982 PAID (2)		0.64%	0.82%	0.21%	0.44%	0.00%	0.44%		0.43%	*
1982 PAID + O/S (2)		0.82%	4.71%	4.84%	0.05%	3.59%	0.40%		2.40%	
1982 INCURRED (2)		0.81%	6.02%	3.81%	0.31%	2.79%	0.36%		2.35%	
1983 PAID	77,946,214	79,952,685	80,233,341	80,308,474	80,581,290	80,661,112				
1983 PAID + O/S	81,532,787	85,875,308	90,749,334	90,748,673	86,147,872	86,193,972				
1983 INCURRED	81,897,172	87,007,845	91,186,699	90,743,607	86,989,985	86,862,843				
1983 PAID (1)	3.37%	0.88%	0.53%	0.44%	0.10%				1.06%	*
1983 PAID + O/S (1)	5.41%	0.37%	5.29%	5.28%	0.05%				3.28%	
1983 INCURRED (1)	5.72%	0.17%	4.98%	4.47%	0.15%				3.10%	
1983 PAID (2)		2.57%	0.35%	0.09%	0.34%	0.10%			0.69%	*
1983 PAID + O/S (2)		5.33%	5.68%	0.00%	5.07%	0.05%			3.23%	
1983 INCURRED (2)		6.24%	4.80%	0.49%	4.14%	0.15%			3.16%	
1984 PAID	90,407,646	93,531,852	93,788,794	94,558,449	95,441,754					
1984 PAID + O/S	101,404,600	107,156,177	106,626,493	101,423,005	101,427,374					
1984 INCURRED	103,475,484	107,835,699	106,881,599	102,820,478	102,669,065					
1984 PAID (1)	5.27%	2.00%	1.73%	0.95%					2.48%	*
1984 PAID + O/S (1)	0.02%	5.65%	5.13%	0.00%					2.70%	
1984 INCURRED (1)	0.79%	5.03%	4.10%	0.15%					2.52%	
1984 PAID (2)		3.46%	0.27%	0.82%	0.93%				1.37%	*
1984 PAID + O/S (2)		5.67%	0.49%	4.88%	0.00%				2.76%	
1984 INCURRED (2)		4.21%	0.88%	3.80%	0.15%				2.26%	

NOTES: (1) ABSOLUTE DEVIATION FROM LAST PROJECTION (OR REPORT), RATI0ED TO SAME.
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 WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.
 LOSSES HAVE BEEN RESTATED TO THE LATEST DIAGONAL.

N-4 0.0000
 N-3 0.0000
 N-2 0.5000
 N-1 0.5000

WEIGHTS ASSIGNED TO PRECEDING YEARS:

NATIONAL COUNCIL ON COMPENSATION INSURANCE
 WISCONSIN MEDICAL COMPARISON OF PROJECTIONS RESTATED TO INCURRED LEVEL

	1ST TO 8TH	2ND TO 8TH	3RD TO 8TH	4TH TO 8TH	5TH TO 8TH	6TH TO 8TH	7TH TO 8TH	RESTATED 8TH	AVERAGE	*=LOW AVG
1978 PAID				55,282,665	54,509,593	54,104,669	53,503,399	54,207,689		
1978 PAID + Q/S				55,285,352	53,952,168	53,247,958	54,420,136	55,225,307		
1978 INCURRED				55,507,245	53,838,298	53,204,192	54,400,411	55,163,402		
1978 PAID (1)				1.98%	0.56%	0.19%	1.30%		1.01%	*
1978 PAID + Q/S (1)				0.11%	2.31%	3.58%	1.46%		1.86%	
1978 INCURRED (1)				0.62%	2.40%	3.55%	1.38%		1.99%	
1978 PAID (2)					1.40%	0.74%	1.11%	1.32%	1.14%	*
1978 PAID + Q/S (2)					2.41%	1.31%	2.20%	1.48%	1.85%	
1978 INCURRED (2)					3.01%	1.18%	2.25%	1.40%	1.96%	
1979 PAID			63,943,530	62,840,553	62,312,411	61,408,071	62,085,140	62,339,366		
1979 PAID + Q/S			60,882,438	58,548,098	59,357,199	61,147,737	61,337,823	61,725,150		
1979 INCURRED			61,418,925	58,438,567	59,332,372	61,214,373	61,306,463	61,772,378		
1979 PAID (1)			2.57%	0.80%	0.04%	1.49%	0.41%		1.06%	*
1979 PAID + Q/S (1)			1.37%	5.15%	3.84%	0.94%	0.63%		2.38%	
1979 INCURRED (1)			0.57%	5.40%	3.95%	0.90%	0.75%		2.32%	
1979 PAID (2)				1.72%	0.84%	1.45%	1.10%	0.41%	1.11%	*
1979 PAID + Q/S (2)				3.83%	1.38%	3.02%	0.31%	0.63%	1.83%	
1979 INCURRED (2)				4.85%	1.53%	3.17%	0.15%	0.76%	2.09%	
1980 PAID		66,445,620	65,930,194	65,658,540	64,961,170	65,904,352	66,319,768	65,792,689		
1980 PAID + Q/S		63,082,613	62,376,627	63,121,722	64,180,879	69,105,998	67,542,213	66,112,594		
1980 INCURRED		64,080,527	62,228,072	63,184,152	64,308,463	69,043,710	67,433,938	66,129,291		
1980 PAID (1)		0.99%	0.21%	0.20%	1.26%	0.17%	0.80%		0.61%	*
1980 PAID + Q/S (1)		4.58%	5.65%	4.52%	2.92%	4.53%	2.16%		4.06%	
1980 INCURRED (1)		3.10%	5.90%	4.45%	2.75%	4.41%	1.97%		3.76%	
1980 PAID (2)			0.78%	0.41%	1.06%	1.45%	0.63%	0.79%	0.85%	*
1980 PAID + Q/S (2)			1.12%	1.19%	1.68%	7.67%	2.26%	2.12%	2.67%	
1980 INCURRED (2)			2.89%	1.54%	1.78%	7.36%	2.33%	1.93%	2.97%	
1981 PAID	72,747,106	71,485,641	70,380,198	69,428,964	70,852,946	71,299,555	70,660,470	70,923,493		
1981 PAID + Q/S	67,394,747	66,739,529	66,308,363	68,755,185	73,832,876	71,113,814	70,206,989	70,785,046		
1981 INCURRED	68,855,845	66,727,774	66,453,092	69,258,153	73,829,834	70,951,816	70,183,456	70,749,377		
1981 PAID (1)	2.57%	0.79%	0.77%	2.11%	0.10%	0.53%	0.37%		1.03%	*
1981 PAID + Q/S (1)	4.79%	5.72%	6.32%	4.31%	2.87%	0.46%	0.82%		3.61%	
1981 INCURRED (1)	2.68%	5.68%	6.07%	2.11%	4.35%	0.29%	0.80%		3.14%	
1981 PAID (2)		1.73%	1.55%	1.35%	2.05%	0.63%	0.90%	0.37%	1.23%	*
1981 PAID + Q/S (2)		0.97%	0.65%	3.69%	7.39%	3.68%	1.28%	0.82%	2.64%	
1981 INCURRED (2)		3.09%	0.41%	4.22%	6.60%	3.90%	1.08%	0.81%	2.87%	
1982 PAID	74,856,485	74,964,212	74,552,056	75,455,033	75,744,454	75,435,747	75,971,096			
1982 PAID + Q/S	71,524,618	70,990,254	74,379,496	77,913,039	77,846,597	75,124,994	75,409,756			
1982 INCURRED	71,287,196	70,706,244	74,959,336	77,814,656	78,058,288	75,883,783	76,153,259			
1982 PAID (1)	1.47%	1.33%	1.87%	0.68%	0.30%	0.70%			1.06%	*
1982 PAID + Q/S (1)	5.15%	5.86%	1.37%	3.32%	3.23%	0.38%			3.22%	
1982 INCURRED (1)	6.39%	7.15%	1.57%	2.18%	2.50%	0.35%			3.36%	
1982 PAID (2)		0.14%	0.55%	1.21%	0.38%	0.41%	0.71%		0.57%	*
1982 PAID + Q/S (2)		0.75%	4.77%	4.75%	0.09%	3.50%	0.38%		2.37%	
1982 INCURRED (2)		0.81%	6.02%	3.81%	0.31%	2.79%	0.36%		2.35%	
1983 PAID	84,006,593	85,002,015	86,155,656	86,951,243	86,893,153	87,209,069				
1983 PAID + Q/S	81,918,983	86,331,240	91,151,192	91,117,964	86,586,480	86,611,006				
1983 INCURRED	81,897,172	87,007,845	91,186,699	90,743,607	86,989,985	86,862,843				
1983 PAID (1)	3.67%	2.53%	1.21%	0.30%	0.36%				1.61%	*
1983 PAID + Q/S (1)	5.42%	0.32%	5.24%	5.20%	0.03%				3.24%	
1983 INCURRED (1)	5.72%	0.17%	4.98%	4.47%	0.15%				3.10%	
1983 PAID (2)		1.18%	1.36%	0.92%	0.07%	0.36%			0.78%	*
1983 PAID + Q/S (2)		5.39%	5.58%	0.04%	4.97%	0.03%			3.20%	
1983 INCURRED (2)		6.24%	4.80%	0.49%	4.14%	0.15%			3.16%	
1984 PAID	96,117,248	100,435,778	101,546,595	101,965,130	103,189,583					
1984 PAID + Q/S	101,942,981	107,630,689	107,060,397	101,939,383	101,918,112					
1984 INCURRED	103,475,484	107,835,699	106,881,599	102,820,478	102,669,065					
1984 PAID (1)	6.85%	2.67%	1.59%	1.19%					3.08%	
1984 PAID + Q/S (1)	0.02%	5.61%	5.05%	0.02%					2.67%	
1984 INCURRED (1)	0.79%	5.03%	4.10%	0.15%					2.52%	*
1984 PAID (2)		4.49%	1.11%	0.41%	1.20%				1.80%	*
1984 PAID + Q/S (2)		5.58%	0.53%	4.78%	0.02%				2.73%	
1984 INCURRED (2)		4.21%	0.88%	3.80%	0.15%				2.26%	

NOTES: (1) ABSOLUTE DEVIATION FROM LAST PROJECTION (OR REPORT), RATIOED TO SAME.
 (2) ABSOLUTE CHANGE RELATIVE TO PRIOR PROJECTION OR REPORT.
 WEIGHT GIVEN TO REGIONAL EXPERIENCE IS 0.0000.
 LOSSES RESTATED TO INCURRED LEVEL OF 8TH REPORT, AND TO LAST DIAGONAL.

WEIGHTS ASSIGNED TO PRECEDING YEARS:
 N-4 0.0000
 N-3 0.0000
 N-2 0.5000
 N-1 0.5000

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**RATEMAKING PROCEDURES
EVALUATION OF NCCI RATEMAKING METHODOLOGIES**

**NCCI EXAMINATION
VOLUME IV - SECTION IIB - PART 2
EXPENSES**

November 27, 1991

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EXPENSES

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EXPENSES

I. INTRODUCTION

This component of Milliman & Robertson's examination of the ratemaking procedure used by the National Council on Compensation Insurance (NCCI) discusses the methodology NCCI uses to incorporate expenses in the ratemaking process, evaluates the appropriateness of that methodology, and suggests improvements.

A critical consideration in the development of a final rate is the expense factor. Is it appropriate to use an average, a budgeted amount, or a factor that reflects individual company experience? All of these questions have been raised at one time or another by various regulators. As the Request for Proposal (RFP) makes clear, the NCCI treatment of expenses is complicated by many factors. These factors are all, in a sense, interrelated in how they impact the final workers compensation premiums paid by insureds.

Some issues are thought to be of much higher priority than others, especially the extent to which the actual expenses conform to the assumptions contained in the rate, and the cost-benefits of collecting allocated loss adjustment expenses (ALAE) on a unit basis. All of the issues, except for ALAE on a unit basis, rely heavily on the quality and interpretation of the expense data compiled by NCCI. The two-pronged approach called for in the RFP, i.e., independent assessments of both the data quality and ratemaking methodology for expenses, should provide a thorough analysis of these issues. This section of the report analyzes the ratemaking methodology for expenses.

The NCCI expense items are typically divided into the following items:

- General expenses,
- Production expenses (commission, brokerage and other acquisition expenses),
- Taxes, and
- Loss Adjustment Expenses (LAE).

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Loss Adjustment Expenses (LAE) can be further subdivided into two components: ALAE and Unallocated Loss Adjustment Expenses (ULAE). ALAE items are directly traceable (assignable) to a particular claim file. ULAE consist of the overhead classes of expenses resulting from the operation of a claim department and the processing of claim transactions. ULAE items are not directly traceable to a particular claim file. Currently, the definition of ULAE and ALAE will vary from company to company.

NCCI does not currently subdivide LAE into ALAE and ULAE in establishing manual rates or loss plus LAE costs (in loss cost states). NCCI derives a combined ALAE and ULAE loading which is multiplied by loss costs to derive manual rates.

Section II of this report summarizes our conclusions, recommendations and observations. Section III describes the NCCI expense methodology. The remaining Sections (IV through IX) respond to the objectives of the Florida Insurance Department's RFP, which covers the following areas:

Objective 2a: Evaluation of the NCCI Expense Methodology

Objective 2b: Costs and Benefits of Collecting ALAE by Claim

Objective 2c: State Specific Expense Issues

Objective 2d: Budgeted Approach to Acquisition Expenses

Objective 2e: Justification for Dual Expense Discounts

Objective 2f: Equity of Premium Discounts Programs and Expense Constants

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II. SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

The following is a summary of our conclusions and recommendations. These recommendations assume that NCCI continues to prepare manual rate filings (instead of or in addition to loss cost filings) or that NCCI continues to publish expense analyses for consideration by individual insurers in developing their own expense provisions.

Objective 2a: Evaluation of the NCCI Expense Methodology

NCCI expense provisions have overstated the actual amount of expenses incurred by the companies. This observation is apparent in both general and production expenses. The effect of this overstatement on final policyholders costs depends on many factors including the adequacy of loss cost estimates and the effect of individual state regulatory actions.

NCCI expense analysis procedures should be improved so that expense provisions more closely relate to actual expenses. To the extent that verifiable trends are apparent, NCCI should reflect them. In particular, we have the following comments regarding the recent promulgation of expense provisions for general expenses, production expenses, tax provisions, and loss adjustment expenses:

General Expenses

- The current NCCI general expense methodology involves assumptions which tend to produce indications higher than actual average expense amounts incurred. For example, the current negative (downward) general expense trend is not projected to the period when rates will be in effect even though the average discount for general expenses underlying the premium discount plan is trended to the period when rates will be in effect. The general expense variable loading component has decreased from 8.34% in calendar year 1984 to 6.75% in calendar year 1989. We agree with the NCCI adjustment for the average discount underlying the premium discount plan; however, we

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recommend that premium and expenses should also be trended to the period when rates will be in effect (Section IV, Page 21-22).

- NCCI compares general expenses to net earned premium. We recommend that NCCI compare general expenses to direct earned premium (Section IV, Page 22).
- The NCCI Actuarial Committee (Committee) in October, 1990 recommended a general expense provision of 6.7%. Alternative methods, which adjust premium and expenses to the period when rates will be in effect, resulted in indicated direct general expense provisions lower than the NCCI provision of 6.7%. The difference arises for reasons that include the fact that the recent average countrywide rate increases have exceeded the inflationary factors affecting general expenses (Section IV, Page 28-29).
- NCCI should combine the expense experience of stock and mutual companies in establishing general expense indications. Based on recent experience, this is not expected to have a material impact on the selected expense provisions. (Section IV, Page 30).

Production Expenses

- NCCI does not collect data useful to the analysis of the NCCI production expense provision of 15% for the first \$5,000 of standard premium. The expense study by size of risk should incorporate all production expenses (i.e., commission, brokerage and other acquisition expenses) in order to determine the appropriateness of the expense gradations. Previously, the study was limited to a review of other acquisition expenses only (Section IV, Page 30).
- We recommend that NCCI review production expenses annually, as it does for other expenses, in establishing production expense provisions (Section IV, Page 30).

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- The budgeted first \$5,000 production allowance of 15.0% exceeds the actual amount projected to be expended by stock insurers, for combined voluntary and involuntary risks. The amount projected to be expended by stock insurers varied around 14.0% for calendar years 1985 through 1988 and is estimated at 13.0% for 1989. Most, if not all of this difference, may be attributable to the lower commissions incurred on involuntary risks. This analysis assumes that the NCCI production expense gradations are appropriate (Section IV, Pages 30-31).
- The all size of risk analysis, indicates that the production allowance in the rates has exceeded the actual amount expended by stock insurers by 2.0 to 3.0 points of standard premium for calendar years 1986 to 1989. Based on our analysis, it appears that 1.5 to 2.0 points of this difference may be explained by the lower commission levels on involuntary business. The remaining difference is due to: (1) the expense gradations and (2) the fact that some stock carriers use the non-stock premium discount table (Section VII, Pages 65-66).

Tax Provisions

- With regard to premium tax provisions, the proper methodology to incorporate premium tax in the final rate will depend upon the interpretation of the NCCI final rate. If the NCCI rate is intended to be the average rate for the average company, then the tax provision should be based on the average taxes collected. If the NCCI rate is a benchmark for a specified type of insurer then the premium tax provision in the rate should be the tax rate appropriate for that type of insurer (Section IV, Page 31).
- We agree with the NCCI treatment of the other tax provisions (excluding premium tax). However, we recommend that the detailed study of miscellaneous taxes be updated more often than was true in the recent past, once every ten years. NCCI is currently in the process of updating the 1981 detailed study of miscellaneous taxes (Section IV, Page 32).

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Loss Adjustment Expenses

- Historically, NCCI has based their LAE provision on a review of net and direct calendar year experience. Based on the calendar year data, in October, 1990 NCCI recommended that an LAE provision of 12.0% be utilized in rate filings with an average effective date of July 1, 1991 and an average accident date of January 1, 1992 (Section III, Page 18).
- In order to enhance the Committee's ability to analyze LAE, NCCI issued a special call to collect accident year direct paid and outstanding: losses; ALAE; and ULAE. The first call was issued to collect data as of year-end 1988. The NCCI staff reviewed the accident year experience at the February, 1991 meeting and recommended that the 12.0% provision be maintained, although a higher provision was indicated based on the NCCI's analysis, due to the lack of historical experience. The data call was only available at year-end 1988 and 1989. However, the Committee, after reviewing the special call data, voted to increase the LAE provision from 12.0% to 12.5% based on the NCCI projected LAE to loss ratio by accident year (Section IV, Page 32-34).
- We recommend that NCCI rely on the special call data (direct experience) by accident year in establishing the LAE provision. Based on reviewing the special call data, a LAE provision between 12.0% and 12.5% of losses is indicated (Section IV, Page 33-34).

Objective 2b: Cost and Benefit of Collecting ALAE by Claim

We recommend that NCCI collect Allocated Loss Adjustment Expense (ALAE) experience by claim and that ALAE be treated like losses for ratemaking purposes. The rationale for this recommendation includes:

1. ALAE has grown to be a more and more significant element of workers compensation costs, increasing from 4.5% of losses for accident year 1980 to

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5.8% in accident year 1989 based on the individual company's estimates from a NCCI call (Section V, Page 42).

2. Treating ALAE like losses in the ratemaking process will result in more accurate rates by state, industry group, and classification.
3. By collecting ALAE data on retrospective and residual market policies it will be possible to reimburse insurers for actual amounts paid in claim defense, rather than reimbursing the insurers based on an average expense provision.
4. The perceived trend in the LAE ratio will be better understood if ULAE is separate from ALAE.

We worked with NCCI to design a survey to sample small, medium, and large companies to determine the cost of collecting ALAE by claim. The cost estimate, .05% of workers compensation premium for insurers and \$1.4 million for NCCI, is sufficiently low in relation to the benefit that we recommend ALAE be collected by claim effective January 1, 1993. However, a transition program may be appropriate for companies which will incur a high relative cost (Section V, Page 39-41).

The NCCI Actuarial Committee recommended that ALAE be collected by claim and utilized like losses in ratemaking and recommended a January 1, 1993 effective date. The NCCI Board will vote on the ALAE collection issue next year. In addition, a uniform definition of ALAE is required and Exhibit 23 displays the NCCI proposed definition. We concur with the Committee's recommendations.

Collecting ALAE by claim will require changes to the unit statistical reports and the financial calls.

In addition, NCCI will need to develop a procedure to establish a separate ULAE provision. One possibility is to develop a ratio of ULAE to loss plus ALAE by analyzing the special call by accident year. Thus a countrywide ULAE provision could be estimated by accident year and trended if appropriate (Section IV, Page 34).

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The treatment of ALAE and ULAE expenses in loss cost states will need to reflect differences in statute and regulation by state. We recommend that loss costs include ALAE and ULAE when not prohibited by statute or regulation.

Objective 2c: State Specific Expense Issues

The NAIC RFP asked M&R to address the following question - "Should expense loadings for an individual state be tempered when that state experiences a rate increase larger than the countrywide average." While we concluded that tempering is not appropriate, the analysis led to valuable research in the area of state-specific expense levels.

The issue of tempering expense provisions is more correctly viewed as the issue of whether expense ratios should vary by state, (i.e., the expense ratio in a state should be the same whether the state rates rise 40% more than the countrywide average in one step or several steps). NCCI data suggests that there are variations from state to state and we recommend that additional research be performed to determine the appropriateness of varying expense levels by state. To the extent that verifiable differences exist by state, NCCI should reflect state expense levels in the ratemaking process (Section VI, Page 56-57).

Our analysis of tempering for large rate increases is contained in Section VI. The following factors suggest that tempering expenses is not appropriate and that the current NCCI procedure is appropriate.

1. If expenses are reflected correctly on a countrywide basis, any adjustment for large rate increases will result in an inadequate countrywide expense provision.
2. The downward trend in general expense, noted above, is due in part to the level of rate increases implemented in the past.
3. If rates are deficient over a period of time, it is likely that expenses are also deficient.

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4. There are a number of factors to mediate the expense impact of a large rate increase in a state including the fact that more than 40% of the premium is from multi-state risks and the majority of the countrywide premium is generated from risks subject to the premium discount tables.

Objective 2d: Budgeted Approach to Acquisition Expenses

As mentioned previously based on our analysis, the first \$5,000 budgeted provision of 15.0% exceeds the actual amount expended by stock insurers for combined voluntary and involuntary risks. This analysis assumes that the NCCI production expense gradations are appropriate. NCCI should establish a production expense element based on actual experience rather than the budgetary approach by comparing direct production expenses to direct written premium. This will require that NCCI prepare an annual production expense review similar to the current general expense review. However, in order for NCCI to properly perform this review, the production allowances by size of risk need to be verified. Therefore, NCCI should collect all production expenses in the 1991 call for expenses by size of risk (Section VII, Page 66-67).

Objective 2e: Justification for Dual Expense Discounts

The rationale for separate premium discount tables for stock and non-stock insurers is based on the perceived difference in dividend payments between stock and mutual companies. The dividend differential between stock and mutual companies has largely disappeared in the past two years, but this coincided with significant decreases in profitability as presented in the Insurance Expense Exhibit. Stock and mutual company profitability, net of dividends to policyholders, appears similar. Since the profitability net of dividends to policyholders appears similar, the use of separate expense discount tables appears to be justified. However, NCCI should review mutual and stock expense experience by size of risk to confirm if the current tables are justified (Section VIII, Page 74).

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Objective 2f: Equity of Premium Discount Programs and Expense Constants

Based on data from the 1982 Expense Study, we measured the required dollars of general expense by size of risk and compared it to the general expense dollars generated by the discount tables and the expense constant. Based on this analysis, there are no significant biases by size of risk determinable from the 1982 general expense study by size of risk. However, we recommend that the expense study by size of risk be updated more often than every nine years. The most recent study was completed in 1984 based on 1982 expense experience. The NCCI Actuarial Committee has scheduled an update during 1992 based on calendar year 1991 expense experience. Several factors have changed since 1982 which could affect the distribution of expenses by size of risk including: average policy size, cost efficiencies and inflation (Section IX, Page 80-83).

In addition, we recommend that the 1991 commission and brokerage expenses by size of risk also be collected in 1992. This information is necessary to evaluate the production allowances by size of risk which, in turn, determine the premium discount provisions by standard premium division. NCCI is not planning on requesting that data (Section IX, Page 83).

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III. DESCRIPTION OF NCCI EXPENSE METHODOLOGY

A. Overview of NCCI Annual Expense Review

1. Data Utilized

NCCI utilizes the following data sources in establishing expense levels:

- Insurance Expense Exhibits (IEE).
- NCCI 1982 Study of Expenses by Size of Risk.
- NCCI call for ALAE and ULAE by accident year (Data call #19).
- Residual market servicing carrier expense reimbursement amounts and information on how those reimbursements are treated for IEE purposes.
- Distribution of policies by size (Data call #7).
- Company premium on a uniform rate level basis (the Designated Statistical Reporting Level).
- 1984 study of miscellaneous taxes.
- State and local premium tax laws.
- Special call for expenses by state (Data call #14).
- Consumer Price Index.

2. Staff Role

NCCI staff prepares an annual expense review package in October of each year. We have attached Exhibits 1 through 4 and 6 through 10 which are the key exhibits from the 1990 NCCI expense review. Based on the annual expense review, the NCCI staff

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recommends countrywide expense provisions for general expense and loss adjustment expenses. The NCCI Actuarial Committee (Committee) then reviews the staff's recommendations. The expense provisions approved by the Committee are incorporated in subsequent rate filings unless a state requires that state specific expense experience be used.

Production expense provisions are not routinely reviewed by staff or by the Committee. Production expenses are assumed to be a budgetary item and budgetary items are not generally reviewed. NCCI has not altered the budgetary production expense provisions since 1977.

The tax provision is established by NCCI staff without Committee review.

3. Expense Provisions

The NCCI expense program includes three elements: variable expense provisions for each type of expense that do not vary by size of risk, discount provisions by size of risk and an expense constant. The variable element and expense constant in the manual rate are intended to provide a sufficient expense provision for the first \$5,000 of premium. The premium discount by size of risk begins at \$5,000.

The October 1990 NCCI expense review resulted in the following recommended expense provisions to be included in 1991 rate filings.

- a. Variable expense components for the first \$5,000 of premium as follows:

General Expenses	6.7%
Production Expenses	15.0%
Taxes - Varies by State	4.2%*

* average

- b. An LAE provision of 12.0% of losses. The factor is intended to provide a sufficient provision for both ALAE and ULAE. The factor does not vary by size of risk, type of insured, or state.

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c. Premium discount programs as follows:

<u>Standard Premium Size Range</u>	<u>Stock Premium Discounts</u>	<u>Non-Stock Premium Discount</u>
First \$ 5,000	0.0%	0.0%
Next 95,000	10.9	3.5
Next 400,000	12.6	5.0
Over 500,000	14.4	7.0

The premium discount programs are based on reduced general expense and production expense components for the larger policy sizes. The different tables are based on the perceived dividend differential between stock and mutual companies.

d. An expense constant of \$140 consisting of the following elements:

EXPENSE CONSTANT	
<u>Item</u>	<u>Amount</u>
General Expenses	\$ 83.55
Production Expenses	47.35
Taxes	5.70
Profit	<u>3.40</u>
Total	\$140.00

Approximately 11% of the total general and production expense provision is collected through the expense constant.

The following four sections describe the NCCI staff procedure for developing general expense, production expense, LAE and tax provisions.

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B. NCCI Methodology for General Expenses

The components of the general expense provision are an expense constant, the variable provision used for the first \$5,000 of premium and the discounts from that variable provision applicable to higher premium amounts. The first two items are discussed below, and the discounts are discussed in Section IX.

1. Expense Constant

Exhibit 1 displays the calculation of the indicated expense constant from the October, 1990 review. The 1990 indicated expense constant is equal to the portion of the expense constant for general and production expenses from the 1982 study adjusted for inflation. Thus lines 1 and 2 are multiplied by line 3, the NCCI Expense Index (Index). Exhibit 2 displays the mix of expenses utilized in the Index. The inflation adjusted expense constant components are summed and loaded for profit and taxes by dividing the summed amount by one minus the profit and tax provision.

While the indicated expense constant based on the 1990 review is \$152.69, the Actuarial Committee recommended that the current \$140 expense constant be maintained. Exhibit 3 displays the approved expense constants and expense provisions which vary by state.

The expense constant provides approximately 20% of the general expense revenue. The size of the expense constant affects the equity of premium charges for insureds of different sizes, but it does not control the adequacy of the total general expense provision. If the larger expense constant, \$152.69 were recommended, then the variable provision would be reduced. The same total expense dollars would be collected through the rating plan. Section IX presents a further discussion on the equity issue.

2. General Expense - Variable Provision for First \$5,000

Exhibit 4 displays the general expense indications by calendar year for stock companies based on the October, 1990 expense review. The analysis is based on stock companies' IEE for calendar years 1984 through 1989. NCCI receives individual company IEE's and summarizes the IEE's.

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Row 1 of Exhibit 4 is the estimated net standard earned premium. The Committee utilizes Part III of the IEE and an estimate of schedule rating and carrier deviations (about 3% for 1989) to convert reported net earned premium to standard net earned premium at NCCI rate levels. Exhibit 5 displays the calculation of standard net earned premium for stock companies for calendar year 1988.

The standard premium is the premium before the following: retrospective rating adjustments, premium discount (expense graduation), schedule rating, and carrier deviations. Thus, Row 1 of Exhibit 4 is an estimate of the manual premium (i.e., the premium based on manual rates) times the average experience modification plus the expense constant. In states where NCCI files loss costs and not manual rates, company's premium level is converted to a theoretical NCCI manual rate level based on the NCCI standard expense provisions and the NCCI loss costs.

The expense constant offset, Row 2, is utilized to determine the premium dollars generated as a result of the expense constant assuming a \$140 expense constant. Row 3 is an estimate of the standard premium excluding the revenue from the expense constant, and Row 1 minus Row 3 is an estimate of the expense constant revenue assuming the \$140 expense constant.

Row 4 displays the general expenses for stock companies as reported in the IEE (Line 7 - Part II for Workers Compensation). Row 5 is the proportion of the expense constant revenue that is associated with general expenses. The factor to calculate the proportion is calculated in Exhibit 6 which displays the calculation of the expense constant revenue split between general and production expenses. The split is based on the 1982 expense by size of risk study.

Row 6 is the IEE general expenses less the expense constant revenue associated with general expenses. Therefore, Row 6 represents the amount of general expenses which will be loaded into the rates through the variable expense provision.

Some insurers record residual market general expense in ways which would distort the expense analysis. For example, a servicing carrier may record general expenses on residual market business as a direct general expense and the entire servicing carrier allowance as a negative general expense. The servicing carrier allowance, however,

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includes a provision for other acquisition and LAE as well as general expenses. NCCI will adjust for any distortion and this is presented in Row 7. Technical Appendix A discusses the servicing carrier adjustment in more detail.

The NCCI treatment of expenses in this regard aims at determining the appropriate general expense provision for voluntary and residual market insureds combined. NCCI does not attempt to determine the differential, if any, between the two groups of policyholders unless required by a specific state.

The adjustment for the average discount for general expenses underlying the premium discount plan (Line 8) is needed to convert the observed expense provision, which is an average provision for all premium sizes, to a provision for the first \$5,000 of premium. The calculation for the average discount is displayed on Exhibit 7. However, the exhibit fails to display the source of all the underlying inputs. The premium distribution by size of risk and the general expense gradations derived from the 1982 study of expenses by size of risk are used to derive the average discount by year. Insurers publish an average premium discount in the IEE, but NCCI believes its own calculation is more reliable. This average discount is trended to a January 1, 1992 premium distribution level. January 1, 1992 is the midpoint of premium earned for policies effective during 1991.

Some states mandate that state specific expense experience be utilized in establishing expense provisions. In these states, NCCI utilizes the special call for expenses by state. Section VI discusses the issues involved in using varying expense levels by state.

C. NCCI Methodology for Production Expenses

Production expense includes both commission and brokerage expenses and other acquisition expenses.

The first \$5,000 of standard premium incorporates a 15% production expense provision. The percentage provision decreases as the premium size increases. The following table displays the production allowances underlying the stock premium discount table.

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<u>Division of Premium</u>	<u>Stock Production Expense Allowance</u>
First \$ 5,000	15.00%
Next 95,000	7.50
Next 400,000	6.00
Over 500,000	6.00

In addition, \$47.35 per policy of the \$140.00 per policy expense constant is intended to provide for the fixed component of production costs (i.e., other acquisition expenses).

There is no NCCI documentation for the production discount provisions. The only production expense information obtained with the 1982 study of expenses by size of risk related to other acquisition expenses. Commission and brokerage expenses were not incorporated in the study and no other NCCI data call collects commission and brokerage expenses by size of risk.

The Committee selected the above production expense provisions as reasonable without a detailed study. NCCI refers to this as the budgetary basis.

D. NCCI Methodology for Loss Adjustment Expenses

LAE is incorporated into manual rates as a percentage factor applied to losses. As mentioned, NCCI currently utilizes a combined factor to reflect ALAE and ULAE. The Committee's recommended LAE provision is a countrywide factor which does not vary by state, industry group, or classification; however, there are state exceptions which are shown in Exhibit 3. NCCI reviews the relationship between direct LAE and direct losses as reported in the IEE for the most recent 3 and 6 calendar year periods for stock and mutual companies combined. In addition, NCCI reviews a longer term (1964-1989) history of the ratios net of reinsurance.

Exhibits 8 and 9 display the direct and net ratios for the most recent 3 calendar years from the October, 1990 review. Exhibit 10 displays the historical net and direct

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ratios. The average direct ratio for the most recent 3 years is 11.83% and the net ratio is 13.62%. Based on the October, 1990 review NCCI selected a LAE provision of 12.00%.

It appears that NCCI has relied more heavily on the direct ratios in establishing the LAE provision, although NCCI does not state that they rely more on direct or net ratios. Rating organizations generally use direct loss and expense experience for ratemaking calculations for casualty lines of insurance. NCCI stated that the net ratios are higher than direct ratios for reasons that include the following:

- Incomplete data because some reinsurance-only carriers may be excluded.
- Non-proportional expense sharing on some reinsurance agreements.
- Different accounting procedures for different companies.
- Direct incurred but not reported (IBNR) reserves are larger than net IBNR.

In some state rate filings, NCCI will display only the net LAE calendar year ratios (higher ratios).

Historically, NCCI evaluated calendar year (i.e., IEE) LAE ratios to select the LAE expense provision. To enhance the Committee's ability to analyze LAE, NCCI collected accident year direct paid and outstanding losses, ALAE, and ULAE for accident years 1980-1989. Exhibit 11 displays the analysis of this information for the February 20, 1991 Actuarial Committee Meeting. Based on that information NCCI staff recommended that the 12.0% provision be maintained. However, the Committee revised the LAE provision to 12.5% based on a perceived upward trend in the LAE ratio and the experience for recent accident years.

The incurred accident LAE ratios (Exhibit 11, Column 11) are based on individual company assignment of ALAE and ULAE payments and reserves by accident year. NCCI requested that companies utilize a procedure similar to the procedure used for

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allocating ULAE in Schedule P. Chapter IV discusses the issues involved in allocating ULAE to accident year.

Column (13) of Exhibit 11 displays the indicated LAE provision based on a NCCI projection method and Column (11) displays the individual company's estimate of the LAE ratio. Assuming no trend, Column (13) supports the 12.5% LAE provision; however, Column (11) supports the 12.0% provision (assuming the 1989 indication is an outlier). Our trend analysis on the company's estimate (Column (11)) indicates a trended LAE ratio of 12.6% as of January 1, 1992; however, the trended LAE ratio is only 12.1% if the accident year 1989 observation is excluded.

Page 14 of the statutory annual statement will display incurred ALAE and ULAE as of December 31, 1991. NCCI does not plan on utilizing this information in determining rate levels. NCCI stated that the page 14 data has the following limitations:

1. Different companies may use different definitions of ALAE;
2. The accident year ratio of ALAE to incurred loss is more appropriate for ratemaking than the calendar year ratio (page 14 displays calendar year data); and
3. ULAE cannot usually be identified by state.

E. NCCI Methodology for Tax Provisions

The tax provision has two components as follows: state and local insurance taxes, and miscellaneous taxes which include Insurance Department licenses and fees, payroll taxes, and all other taxes - excluding state and local insurance taxes.

The tax provision for state and local insurance premium taxes is based on the statutory provision and is state specific. Some states have different premium tax levels for domestic and foreign (out-of-state) insurers. NCCI selects the foreign insurer tax rate for its premium tax provision. Thus, NCCI does not utilize the actual collected workers compensation taxes in a state. Generally, this is the only state specific element in the NCCI expense provision.

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The treatment of assessments for second injury funds, guaranty funds and other funds in the ratemaking formula varies depending on the nature of the assessment. The assessments that are collected on the basis of premium are treated in a similar manner to premium taxes in the determination of manual rates. In the case where the Compensation Law specifies that, in connection with certain types of injury, a specified amount shall be paid into a special fund (e.g., second injury fund) and that such amounts are in addition to the compensation payable to the injured worker or his dependents, then the combined total amount is reported as incurred indemnity losses. The assessments based on premium writings or total losses are included in manual rates through a flat loading to the classification losses and Financial Data Calls. The assessments are estimated based on the experience in the most recent year available.

The miscellaneous tax allowance is a countrywide value based on a 1981 special call for compensation tax payments. NCCI updated the value in 1984 by considering the effects of changes in the social security tax rates and payroll base.

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IV. OBJECTIVE 2a: EVALUATION OF THE NCCI EXPENSE METHODOLOGY

This section addresses the following objective of the Request for Proposal (RFP):

Objective (2a) Expenses - Does the current NCCI expense Methodology tend to load more or less expenses in the overall rate level than are actually expended by insurers using stock discounts in NCCI states. If there are biases or inaccuracies, what is their source and their effect?

A. General Expenses

1. Stock Company Expense Experience

The NCCI annual general expense review in October of 1990 reviewed stock companies' IEE expenses for calendar years 1984-1989. The expense indications (ratios of general expenses to net earned premium) from this review are incorporated in 1991 rate filings with an average effective date of July 1, 1991 and an average premium earned date of January 1, 1992.

The raw indications from the NCCI October, 1990 expense review are displayed in the following table:

1990 Annual Expense Review
General Expense Indications For Stock Companies
(\$140 Expense Constant)

<u>Calendar Year</u>					
<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>
8.34%	7.43%	7.15%	7.10%	6.87%	6.75%

Based on this expense review, NCCI selected a variable general expense provision of 6.7%. NCCI does not have a specific formula for determining the expense provision. NCCI selects a value based upon reviewing the above table and supporting data.

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The 1984-1989 general expense levels relative to net earned premium display a decreasing trend. NCCI does not project the expense trend to a January 1, 1992 level. In addition, NCCI compares general expenses to net earned premium. We recommend that NCCI compare general expenses to direct earned premium. The following table displays the general expense ratios relative to direct earned premium.

<u>Calendar Year</u>			
<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>
6.54%	6.55%	6.54%	6.34%

The attached Exhibit 12 displays the detailed calculation. The direct indications are not displayed for calendar years 1984 and 1985 as the direct experience is not available in a summarized format for these years. NCCI's use of net instead of direct premium results in a higher general expense indication than the use of direct earned premium. We believe the net experience is not appropriate as NCCI manual rates and loss costs are intended to provide a sufficient expense provision for the direct insurer.

In addition, the general expense trend should be reflected by estimating the general expense levels for the period during which rates will be in effect. This can be accomplished by projecting expenses and premium to the average date on which policies are earned - January 1, 1992.

We utilized three methodologies to adjust expenses and premium to a January 1, 1992 level. All three of these models adjust premium to a current rate level and adjust expenses to a prospective cost level. The primary difference between the models relates to the amount of expense trend assumed. We are not proposing that NCCI adopt a specific model. However, we believe that NCCI should utilize a model or models that reflect trends in the data. The following three models reflect trends in the underlying data to varying degrees and we developed a test to determine how well the models have performed historically. In addition, all of the models are

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sensitive to the number of years analyzed. We believe that NCCI should have discretion in selecting the experience period in order to appropriately reflect trends.

The first model (Model 1) adjusts expenses to a January 1, 1992 level by utilizing the NCCI Expense Index (Index) which is derived on Exhibit 2. Exhibit 13 displays the expense index and trend based on calendar years 1982-1989.

We also adjusted standard earned premium from the NCCI expense review to a projected January 1, 1992 level based on historical rate activity and assuming the average rate change for 1991 is equal to the increase in the Index. We display both the direct and net ratios even though we recommend that NCCI utilize the direct ratios. We recognize that this trend procedure allows a general expense trend equal to the Index trend plus the trend in premium due to payroll increases of policyholders. The following table displays the adjusted expense indications.

Model 1: General Expense Indication for Stock Companies
As a Percentage of Standard Earned Premiums
(\$140 Expense Constant)
Adjusted To A January 1, 1992 Level

	Calendar Year						
	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>Selected</u>
Net Ratios:	6.40%	5.91%	5.92%	6.08%	6.07%	6.28%	6.11%
Direct Ratios:			5.52%	5.69%	5.80%	5.93%	5.74%

As we are adjusting expenses and premium to a prospective cost and rate level, we would not expect the adjusted expense indications by year to display a trend. The adjusted direct general expense indications display an upward trend; therefore, the expense trend may not incorporate all of the factors that affect general expenses. If an exponential trend was applied to the direct ratios shown above for calendar years 1986 - 1989, the projected direct expense ratio as of January 1, 1992 is 6.3%. The selected values shown above are an average of the adjusted calendar year ratios.

The following table compares the rate change trend in NCCI states versus the Index trend.

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COMPARISON OF EXPENSE INDEX CHANGES TO RATE CHANGES

(1)	(2)	(3)	(4)
<u>Calendar Years</u>	<u>Expense Index Relative to 1982</u>	<u>Rate Changes Relative to 1982</u>	<u>Ratio of General Expense Factor to Rate Change Factor</u>
1982	100.0	100.0	1.00
1983	103.8	101.7	1.02
1984	107.7	102.1	1.05
1985	111.8	114.6	.98
1986	116.0	124.8	.93
1987	120.4	136.7	.88
1988	125.0	148.9	.84
1989	129.7	158.0	.82

One reason for the negative trend in general expense ratios is that rate changes are higher than the inflationary factors affecting general expenses. Rates increased 58% since 1982 (in addition to payroll growth). The Index increased only 29.7%. The differential growth rate over the seven year period is -18% (.82 - 1.0).

An alternate test (hindsight test) of the Model 1 trend approach is shown in Appendix B. In that appendix, we apply the procedure to data through 1987 to predict 1989 actual stock insurer expenses as reported in the IEE and data through 1986 to predict the 1988 expenses. We used the net experience for the hindsight analysis as NCCI has relied on net experience to derive a general expense provision. It is not appropriate to compare the NCCI net provision to the direct experience. In addition, the direct experience is not readily available for calendar years 1984 and 1985. Using data through 1987, the results of the trend method for stock company data are 0.26% (of standard premium) short of the actual expenses incurred while the results of the NCCI approach is 0.02% higher than actual. Using the data through 1986, the results of the trend method are 0.03% lower and the results of the NCCI review were 1.07% higher than the actual expenses incurred. The NCCI selection was closer using the 1987 data in part because NCCI at that time made an unusually sharp reduction in the general expense provision from the prior provision. In October 1988, NCCI

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decreased the general expense provision from 7.5% down to 6.7%, partly in response to an increase in the expense constant from \$120 to \$140.

If the inflationary factors that affect general expenses exceeded the historical rate changes then a trended expense indication would exceed untrended indications.

The second model (Model 2) is identical to the first model except that general expenses are not adjusted using the Index and a trend procedure is used to measure the net trend resulting from expense trends and payroll changes. For example, consider the following assumptions:

1. We know that General Expense dollars = 0.05% of nominal payroll;
2. General Expense dollars will increase by 5% per year;
3. Nominal payroll increases by 5% per year and there is no wage limitation;
4. Rates increase by 10% per year; and
5. Initial rate = \$1.00 per \$100 of payroll.

Based on the above assumptions, we can construct 4 sample years of experience and determine how the year 1 experience can be adjusted to estimate the year 4 expense ratio.

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>
Payroll in Year 1 dollars	10,000	10,000	10,000	10,000
Nominal Payroll	10,000	10,500	11,025	11,576
Rates	1.0	1.10	1.21	1.331
Premium	100.0	115.5	133.4	154.1
General Expenses	5.0	5.25	5.5	5.8
General Expense Ratio	5.0%	4.5%	4.1%	3.8%

In order to estimate the Year 4 general expense ratio using calendar year 1 experience, we would adjust premium to a current rate level $100 \times 1.331 = 133.1$

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and divide the actual general expenses in Year 1 by the premium at current rate level for Year 1 $(5/133.1) = 3.8\%$. The above analysis is performed on net (all size of risk data) and an additional adjustment can be made for the premium discount plan by adding the average discount for general expenses to the 3.8%. Thus, a first \$5,000 general expense provision can be computed.

The following table displays the adjusted expense indications from Model 2 on both a direct and net basis for stock companies. We adjusted standard earned premium from the NCCI expense review to a projected January 1, 1992 level based on historical rate activity and assuming the average rate change for 1991 is equal to the increase in the Index.

Model 2: General Expense Indications for Stock Companies
As a Percentage of Standard Earned Premium
(\$140 Expense Constant)
Adjusted to a January 1, 1992 Level

	<u>Calendar Year</u>						
	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>Selected</u>
Net Ratios	5.54%	5.30%	5.40%	5.64%	5.72%	6.06%	6.51%
Direct Ratios			5.06%	5.30%	5.48%	5.73%	6.34%

The adjusted general expense indications display an upward trend for the 1985-1989 time period indicating that general expenses relative to premium are increasing by more than the trend in payrolls. The selected ratios are based on an exponential trend projected to January 1, 1992. Exhibits 14 and 15 display the net and direct calculations.

We also performed a hindsight test for Model 2 (Appendix B) using data through 1987, the Model 2 projected expense provision is lower than actual expenses by 0.60% while the results of the NCCI approach is 0.02% higher than actual. Using the data through 1986, the results of the Model 2 projections are lower than actual expenses by 0.44% and the results of the NCCI review were 1.07% higher.

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The third model is based on the method used by the Workers Compensation Rating and Inspection Bureau of Massachusetts (WCRB). The WCRB analyzes the most recent three calendar years of Massachusetts specific expense experience. A general expense ratio is applied to the Massachusetts standard earned premium for each of the three years. The estimated general expenses are trended (for inflationary factors) and adjusted for the growth in man-weeks to be consistent with the proposed policy period. The three years of estimated general expenses are then averaged to obtain an estimate of Massachusetts general expenses for the proposed policy period. The average general expenses are compared to the middle year (of the three years analyzed) standard earned premium adjusted to a current rate level and (using a payroll trend adjustment factor) to the mid-point of the period when the new rate level will be in effect. This ratio is then divided by one plus the indicated rate change. This procedure treats general expenses as a fixed expense component. Exhibits 16-19 display the Model 3 calculations. This procedure results in the following indicated expense provisions:

Model 3: General Expense Provision

Net	5.81%
Direct	5.57%

The hindsight test (Appendix B) produced an indicated expense provision of 6.22% for calendar year 1989 compared to an actual expense provision of 6.68%. Using data through 1986, the Model 3 expense loading is 6.49% for 1988 compared to the actual loading of 6.43%.

The following table summarizes the results of the three projection methods.

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General Expense Indications
As a Percentage of Standard Earned Premium
Adjusted to a January 1, 1992 Level

	<u>Calendar Year</u>						
	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>Selected</u>
Model 1 (Expense Index Approach)							
Net	6.40%	5.91%	5.92%	6.08%	6.07%	6.28%	6.11%
Direct			5.52%	5.69%	5.80%	5.93%	5.74%
Model 2 (Trend Approach)							
Net	5.54%	5.30%	5.40%	5.64%	5.72%	6.06%	6.51%
Direct			5.06%	5.30%	5.48%	5.73%	6.34%
Model 3 (Massachusetts Approach)							
Net							5.81%
Direct							5.57%

For Model 1, the selected direct general expense loading as of January 1, 1992 is 5.74% which is an average of the 1986-1989 period. For Model 2, the selected general expense loading as of January 1, 1992 is 6.34% which is based on an exponential trend. The Model 3 indicated general expense loading is 5.6%

NCCI should utilize a procedure or procedures which reflects underlying trends in premium and expenses in selecting a general expense provision. Model 1 and Model 3 appear to project the more accurate "hindsight" results.

As we mentioned previously, a methodology which adjusts premium and expenses to a current rate and cost level will produce larger expense indications than the current NCCI methodology if the expense trend exceeds the level of rate changes. An example would be the early 1980's when the underlying expense costs (largely wages)

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were increasing at double digit rates while NCCI rate levels were flat or decreasing. As the attached Exhibit 20 displays, the ratio of general expenses to net earned premium for stock companies steadily increased from 5.5% in calendar year 1977 to 8.0% in calendar year 1983. Since 1983, the ratio has steadily decreased from 8.0% in 1983 to 4.9% in calendar year 1989.

As Exhibit 20 displays, the general expense ratios have exhibited substantial variability and NCCI should utilize procedures which attempts to explicitly reflect the underlying trends in premium and expenses. However, NCCI should not be confined to a specific methodology to establish expense levels as judgment is required with respect to:

1. Future rate changes:
 2. Future expense trends; and
 3. Underlying trends not measured by rate changes and expense trends.
2. Mutual Company Expense Experience

NCCI excludes mutual insurer expense experience from the general expense analysis. The NCCI rationale is twofold. First, the general expense review is intended to produce an expense indication for the first \$5,000 of premium and mutual companies in general write larger policy sizes. Second, the mutual companies have historically paid larger policyholder dividends than stock companies and part of the dividend reflects expense reductions.

However, mutual company expense experience can be adjusted to a first \$5,000 of premium using the mutual company policy size distribution and the same procedures NCCI uses to adjust stock expense data.

Furthermore, there is no significant difference between stock and mutual company general expense experience. Exhibit 21 displays the general expense indications (Page 1-Net, Page 2-Direct) adjusted to a first \$5,000 of premium level for both stock and mutual companies separately and combined utilizing our Model 1 procedure. The mutual company experience is adjusted to a stock basis for the first \$5,000 of

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premium based on the mutual premium distribution by size of policy and the stock expense gradations. This assumes that the average countrywide NCCI rate change is the same for stock and mutual companies.

We recommend that NCCI review the combined experience of mutual and stock companies to more accurately determine a rate for an average insured for the first \$5,000 of premium. Based on the combined experience, the direct expense indication projected to the period when rates will be in effect is 5.69% compared to the stock only indication of 5.74%.

The North Carolina Rate Bureau combines all companies experience (i.e., stock, mutual, reciprocal's and miscellaneous) in establishing general expense levels. NCCI staff reviewed mutual expense experience as part of the October, 1990 expense review and asked the Committee to decide if stock and mutual general expense experience should be combined in determining general expense levels. However, the Committee decided to continue to exclude mutual insurer experience from the calculation.

B. Production Expenses

Part of the expense constant provides for production expenses, (i.e., other acquisition expenses). The annual expense constant review was discussed previously. The variable provision for production expenses is established on a budgeted basis. NCCI incorporates a variable element of 15% for production expenses into manual rates for the first \$5,000 of standard premium. The premium discount plan reflects reduced production expenses for larger policies.

NCCI does not collect data useful to the analysis of the NCCI production expense provision of 15% for the first \$5,000 of standard premium. We recommend that NCCI review production expenses annually, as it does for other expenses, in establishing production expense provisions.

The expense study by size of risk should incorporate all production expenses (i.e., commission, brokerage and other acquisition expenses). Previously, it was limited to a review of other acquisition expenses only (Section VII).

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Based on our analysis, the budgeted first \$5,000 production allowance of 15.0% exceeds the actual amount projected to be expended by stock insurers, for combined voluntary and involuntary risks. The amount projected to be expended by stock insurers varied around 14.0% for calendar years 1985 through 1988 and is estimated at 13.0% for 1989. (Section VII, Page 63). Section VII discusses the use of the budgetary allowance in more detail.

C. Tax Provisions

With regard to premium tax provisions, the proper methodology to incorporate premium tax in the final rate will depend upon the interpretation of the NCCI final rate. If the NCCI rate is intended to be the average rate for the average company, then the tax provision should be based on the average taxes collected. If the NCCI rate is a benchmark for a specified type of insurer then the premium tax provision in the rate should be the tax rate appropriate for that type of insurer.

The current premium tax provision in manual rates (i.e., foreign insurer tax rate) will exceed the collected taxes relative to premium if:

1. The foreign tax rate exceeds the tax rate for domestic insurers;
2. Retaliatory taxes are not significant; and
3. Domestic insurers write a significant volume of business in the state.

The collected taxes in the state relative to premium will exceed the tax provision in manual rates if:

1. The domestic tax rate is similar to the foreign tax rate;
2. Retaliatory taxes are significant; and
3. Domestic insurers do not write a significant volume of business in the state.

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We agree with the NCCI treatment of the other tax provisions (excluding premium tax). However, we recommend that the detailed study of miscellaneous taxes be updated more often than was true in the recent past, once every ten years. NCCI is currently in the process of updating the 1981 detailed study of miscellaneous taxes.

D. Loss Adjustment Expenses

The NCCI Actuarial Committee selected a LAE provision of 12.0% based on the October, 1990 expense review.

The Committee reviewed, in the October 1990 expense review, the relationship between direct loss adjustment expense (LAE) and direct incurred (ultimate) losses as reported in the IEE for the most recent 3 and 6 year periods for both stock and mutual companies in order to establish a LAE provision. The Committee also reviews the net (i.e., of reinsurance) ratios. The following table displays the net and direct ratios for the most recent 3 calendar years.

	<u>Ratio of LAE to Losses</u>			
	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>Average</u>
Direct	12.09%	11.69%	11.71%	11.83%
Net	13.43	13.33	14.09	13.62

Section III outlined the reasons for differences between the net and direct ratios. While it appears that NCCI selected a provision based on the direct experience, NCCI does not explicitly state that direct experience is more appropriate.

We recommend that NCCI rely on direct losses and LAE for establishing a provision for LAE in ratemaking. In some state rate filings, NCCI displays only the net calendar year LAE indications. We recommend that NCCI also display the direct indications in rate filings.

Exhibit 22 displays the ratio of direct LAE to direct loss by accident year utilizing the carrier's estimates of direct ultimate LAE and direct ultimate loss from the NCCI

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accident year data call along with the NCCI's projected ultimate LAE ratio. NCCI projects the ultimate LAE to loss ratio based on the direct paid LAE to paid loss ratio from the special call and the net paid LAE to paid loss development factors from Schedule P aggregate experience for workers compensation.

NCCI first used accident year experience to review LAE in the October, 1989 expense review. When the Committee reviewed the special call accident year experience in February of 1991, it decided to revise the LAE provision to 12.5% largely based on NCCI's projected ultimate LAE ratio. The NCCI's projected ratio, for the most recent five accident years, varied from 12.3% to 13.2% (Exhibit 22).

On one hand, it appears that the ratio of direct LAE to direct loss by accident year is increasing. Based on the year-end 1989 evaluation, the ratio has steadily increased from 11.2% for accident year 1984 to 12.9% for accident year 1989 (based on the company's estimates, Exhibit 22). On the other hand, except for the least mature accident year, 1989, none of the accident years shows LAE in excess of 12.0%. Furthermore, when 1989 experience is excluded and accident years 1980-1988 are analyzed, regression projections through 1991 do not exceed 12.1%.

In addition, we observe that on average, NCCI's estimated ratio of LAE to losses exceeds the company's estimate for accident years 1980 through 1988 by 0.5 points, (Exhibit 22).

We also note that there are possible distortions due to the allocation of the ULAE to accident year. Company to company procedures may vary and within a company, procedures could vary by year. Furthermore, the Schedule P procedure used to assign ULAE by accident year may not be appropriate for ratemaking purposes.

In general, ULAE payments made during the current calendar year are allocated as follows on Schedule P:

1. 45% of the total ULAE payment is allocated to the most recent accident year;
2. 5% of the total ULAE payment is allocated to the next most recent accident year; and

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3. The remaining ULAE payments are distributed to all accident years including the most recent in proportion to the amount of loss payments for each accident year for the current calendar year.

A partial list of the factors effecting actual ULAE expenditures by accident year follow:

1. The complexity of claims (e.g., asbestos claims attributable to older accident years may require more ULAE costs) by accident year;
2. The mix of outside adjusters versus company personnel by accident year; and
3. Any company change in the definition of ALAE versus ULAE costs by calendar year.

We recommend that NCCI continue to review the special call experience and establish the LAE provision based on the special call experience. Based on the NCCI's analysis and the carriers estimates, a LAE provision between 12.0% and 12.5% of losses is indicated.

In the longer term, we recommend that ALAE be collected by claim and utilized similarly to losses in the ratemaking process (this is discussed in detail in Section V). A separate ULAE provision would then replace the current LAE provision, and the expense trend issue may become moot. If ALAE is collected by claim, NCCI will need to develop a procedure to reflect ULAE in the ratemaking formula. One possibility is to develop a countrywide ratio of ULAE to loss plus ALAE by analyzing the special call experience by accident year.

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E. Actual vs. Recommended Expense Provisions

NCCI expense provisions have overstated the actual amount of expenses incurred by the companies. This observation is seen in both general and production expenses.

A summary of our results can be seen on exhibits C-1 through C-3 in the technical appendix section, for calendar years 1986-89. The results of our analysis show that the expense provisions included in NCCI rate filings have exceeded the amounts actually incurred by the companies. A detailed discussion of our methodology used in arriving at this conclusion can be found in Technical Appendix C.

F. Conclusions and Recommendations

Our recommendations regarding possible improvements in the NCCI methodology are as follows:

1. Apparent underlying trends in the expense data should be reflected to the extent appropriate.
2. The general expense and loss adjustment expense provisions should be calculated in a manner that reflects the trends in the ratios. In addition, NCCI should establish expense provisions based on direct experience to the extent available. At this time, this might increase the LAE ratio and would decrease the general expense ratio.
3. The budgeted first \$5,000 production allowance of 15.0% exceeds the actual amount projected to be expended by stock insurers, for combined voluntary and involuntary risks. The amount projected to be expended by stock insurers varied around 14.0% for calendar years 1985 through 1988 and is estimated at 13.0% for 1989. Most, if not all of this difference, may be attributable to the lower commissions incurred on involuntary risks. This analysis assumes that the NCCI production expense gradations are appropriate. Production expenses are discussed in more detail in Section VII.

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4. The all size of risk analysis, indicates that the production allowance in the rates has exceeded the actual amount expended by stock insurers by 2.0 to 3.0 points of standard premium for calendar years 1986 to 1989. Based on our analysis, it appears that 1.5 to 2.0 points of this difference may be explained by the lower commission levels on involuntary business. The remaining difference is due to: (1) the expense gradations and (2) the fact that some stock carriers use the non-stock premium discount table. Production expenses are discussed in more detail in Section VII.
5. The NCCI production expense gradations are not based on data but were selected judgmentally. Therefore, we recommend that NCCI collect all production expenses by size of risk in order to determine the appropriateness of the production gradations. Production expenses are discussed in more detail in Section VII.
6. With regard to premium tax provisions, the proper methodology to incorporate premium tax in the final rate will depend upon the interpretation of the NCCI final rate. If the NCCI rate is intended to be the average rate for the average company, then the tax provision should be based on the average taxes collected. If the NCCI rate is a benchmark for a specified type of insurer then the premium tax provision in the rate should be the tax rate appropriate for that type of insurer.
7. We agree with the NCCI treatment of the other tax provisions (excluding premium tax). However, we recommend that the detailed study of miscellaneous taxes be updated more often than was true in the recent past, once every ten years. NCCI is currently in the process of updating the 1981 detailed study of miscellaneous taxes.
8. General expense calculations should be based on combined stock and mutual insurer expense experience. This is not expected to have a material impact on the selected expense provision.
9. NCCI should further investigate the differences between the calendar year LAE ratios and the accident year LAE ratios, including a review of ULAE reserves by accident year.
10. NCCI should rely on direct losses and LAE expenses for establishing a provision for LAE in ratemaking and should display the direct indications in rate filings.

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11. NCCI should further investigate the difference between the various LAE to loss indications by accident year (carrier's estimate versus NCCI projection method).
12. The NCCI general and production expense ratios are based on (1) premium at NCCI rate levels, in states where NCCI files gross rates, or (2) premium at NCCI loss cost levels and standard NCCI profit and expense levels in states where NCCI files loss costs. With respect to general expenses, NCCI attempt to use a common base for expense analysis purposes is reasonable. However, as more states become loss cost states, NCCI should review the appropriateness of combining loss cost states with states where NCCI publishes rates.

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V. OBJECTIVE 2b: COSTS AND BENEFITS OF COLLECTING ALAE BY CLAIM

This section addresses the following objective of the RFP:

Objective (2b) Expenses - What would be the incremental cost of collecting allocated loss adjustment expenses (ALAE) on a unit basis? Discuss the pros and cons of having this level of statistical detail available versus what is now available. Also, discuss whether it would be more cost efficient to collect this data only as needed, e.g., retrospectively rated risks and residual market risks.

A. Issues Involved in Collecting ALAE by Claim

To collect ALAE by claim, the unit statistical reports and financial call formats need to be modified to include ALAE information. Companies will need to change procedures to collect and report ALAE. NCCI conducted an Impact Analysis to determine the obstacles companies face in collecting ALAE by claim. In addition, we worked with NCCI to develop a Cost/Benefit Analysis Survey and NCCI issued the Survey to 30 companies to determine the costs the companies will incur if incurred ALAE is collected by claim. There were 21 company responses to the Cost Benefit Analysis Survey.

To collect accurate data, NCCI and its members need a definition which distinguishes ALAE from ULAE and losses. The proposed NCCI definition is attached as Exhibit 23. Under this definition ALAE includes the following: attorneys' fees and fees of other authorized representatives when these legal fees can be directly allocated to particular claims, court costs, the costs of alternative dispute resolution procedures, medical cost containment expenses and vocational rehabilitation evaluation costs.

Exhibit 24 displays how 17 companies responded to one or more of the Impact Analysis questions on the manner in which they classify expenses which the NCCI proposal considers ALAE (not all 17 companies responded to every question.) Several items in the proposed NCCI definition of ALAE are currently treated as either ULAE or losses by individual companies. For example, for hospital utilization review expenses (Item 3(b)), 8 of the 17 companies surveyed classified the expense as ALAE,

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whereas 4 companies classified the expense as ULAE, and 5 companies classified the expense as a loss amount. Thus, training of company personnel will be necessary in order to properly classify the proposed items as ALAE.

The Survey asked companies to estimate the cost of collecting incurred ALAE (paid plus case reserve) by claim and reporting ALAE in the same detail as losses to NCCI.

Based on the companies responding to the Survey, the majority of companies reserve for ALAE on a bulk basis and not by individual claim. Based on the comments from the NCCI Impact Analysis, companies stated that establishing reserves by claim will be difficult. Claim systems will require modifications and claim adjusters will need additional training. Of the 21 companies that responded to the Survey only 7 currently establish case reserves for ALAE.

Significant time lags will exist with respect to collecting ALAE by claim. The majority of carriers responding to the Impact Analysis stated that it would take one or more years to identify and capture expenses under the new definition. In addition companies stated that "major" computer system enhancements would be necessary to report the data.

The following table displays the average absolute dollar cost (of collecting and reporting ALAE by claim) and the cost as a percentage of the company's workers compensation premium by size of company.

<u>Company Size</u>	<u>Number of Companies</u>	<u>Average Dollar Cost</u>	<u>Cost as a Percentage of W.C. Premium</u>
Small	5	\$ 28,320	0.49%
Medium	11	103,145	0.11
<u>Large</u>	<u>5</u>	<u>334,496</u>	<u>0.03</u>
Total	21	\$140,413	0.05%

Exhibit 25 displays the dollar cost and cost as a percentage of premium for each of the 21 companies responding to the Survey. The percentage cost is well under 1.0% of workers compensation premium for all but two of the insurers.

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The following table displays the average absolute dollar cost (of collecting and reporting ALAE by claim) and the cost as a percentage of the company's workers compensation premium for companies that currently establish ALAE reserves by claim, and for companies that do not establish ALAE reserves by claim.

<u>Group</u>	<u>Number of Companies</u>	<u>Average Dollar Cost</u>	<u>Cost as a Percentage of W.C. Premium</u>
Companies that do not establish ALAE reserves by claim	14	\$180,514	0.09%
Companies that currently establish ALAE reserves by claim	<u>7</u>	<u>60,211</u>	<u>0.01</u>
All Companies	21	\$140,413	0.05%

As a separate cost component, NCCI estimated that it will cost \$1.4 million in order for NCCI to collect ALAE as a separate item. The cost can be broken down into the following two elements:

NCCI Cost To Collect and Use ALAE
(\$ Millions)

Technical Service Costs	\$1.1
User Department Costs	<u>.3</u>
Total	\$1.4

In addition, if ALAE was collected by claim for only residual market and servicing carrier business the overall costs would not be reduced significantly based on the responses to the survey. Therefore, it is cost effective to collect ALAE by claim for all business.

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B. Rate Accuracy - Trends in ALAE

NCCI requested companies to provide paid and outstanding losses, ALAE and ULAE on a direct basis by accident year. However, carriers do not now define ALAE in a uniform manner; the ALAE in this exhibit (Exhibit 26) is based on each company's own definition. Each company's definition is believed to be consistent over time. The projected ultimate ALAE in Exhibit 26 is based on each company's reserves; no adjustment to IBNR is made by NCCI.

The ratio of ALAE to loss in this Exhibit has increased from 4.5% in accident year 1980 to 5.8% for accident year 1989. The data imply that ALAE as a percentage of losses is increasing by 3.1% per year and implies ALAE for accident year 1991 will equal 6.2 percent of losses. Section IV discussed an upward trend indicated in analyzing total LAE and this appears to be traceable to the trend in ALAE.

If ALAE were collected and analyzed with statewide ratemaking data, trends in ALAE would be more properly included in the overall rate level process than at present.

C. Rate Equity

Treating ALAE like losses in the ratemaking process will result in more accurate rates by state, industry group, and classification. For example, the propensity to incur legal costs varies by state.

If ALAE is included with losses, the ratemaking methodology would reflect the relative susceptibility of various classes to ALAE costs. For example, assume Class A generates LAE costs of 15.0% of losses and Class B generates LAE costs equal to 9.0% of losses. Then, utilizing the current NCCI methodology both classes' rates include a LAE provision of 12.0% of losses. Therefore Class B is subsidizing Class A; a more equitable approach is to base class rates on experience including ALAE.

These issues are more significant as the ratio of ALAE to losses has been increasing. The ratemaking methodology for most casualty lines of insurance combines loss and ALAE. Personal injury protection, the first party coverage for wage loss and medical

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expenses for automobile accidents in no fault states, is probably the coverage most similar to workers compensation. Generally loss and ALAE are combined in the ratemaking methodology for personal injury protection.

D. Retrospectively Rated and Residual Market Policies

For retrospectively rated policies, if the insurance company pays a claim, the insurer can often collect additional retrospective rating premium. However, the insurer defending a claim will not receive additional retrospective rating premium for the ALAE incurred if the claim settles for \$0. This is due to the fact that LAE charges in the retrospective rating formula are included as a factor on losses; actual expended LAE is not reflected. This fact can create the perception that insurers inadequately defend claims under retrospectively rated policies. A similar situation can exist for servicing carriers for assigned risk business. If the insurer pays a claim, the insurer can get reimbursed by the residual market pool. However, currently ALAE expenditures are not directly reimbursed. A provision for total LAE is included in the servicing carrier allowance. By collecting ALAE information in detail, retrospectively rated policies and residual market mechanisms can be designed to directly reimburse carriers for ALAE as well as for loss.

The following factors favor the use of directly reimbursable ALAE costs:

1. Eliminate the perception of an insurer inadequately defending claims.
2. Reduce or eliminate potential for cross-subsidization in that loss and ALAE are tracked to the policyholder involved.
3. May encourage improved claim handling.
4. Increase visibility of the costs of investigating and settling claims.

Thus, both insurers, policyholders and regulators may prefer a system of directly reimbursable ALAE.

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On the other hand, we have the following observations:

1. In practice, it is not practical for a company claim department to have one process for handling residual market and retrospective policy business and a separate method for voluntary, guaranteed cost business.
2. Company claim practices are monitored by audits.
3. Reinsurance agreements regularly require companies to defend claims even when successful defense reduces the reinsurance recoverable.
4. A system which directly reimburses ALAE may not give insurers a sufficient incentive to control ALAE costs.

E. Conclusions and Recommendations

1. The benefits of collecting ALAE information by claim include the following:
 - Increased accuracy in ratemaking.
 - Increased equity in ratemaking.
 - Addressing concerns about the adequacy of insurer defense efforts in situations such as retrospectively rated policies and residual market servicing carrier business where insurers have reduced claim risk but bear the full cost of claim defense.
2. The disadvantage of collecting ALAE information by claim is the additional cost of those efforts, but the overall cost (0.05% of premium) is relatively low. NCCI may want to consider a transition program for companies incurring a relatively higher cost.
3. Generally, loss cost states permit the rating organization to include ALAE as part of loss costs. However, if some states do not permit NCCI to include ALAE in loss costs then the NCCI procedure for collecting and utilizing the data needs to be sufficiently flexible to exclude the information when required.

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4. The NCCI Actuarial Committee recommended that ALAE be collected by claim and recommended a January 1, 1993 effective date for collecting ALAE by claim. We agree with the Committee recommendation that ALAE be collected by claim. The NCCI Board will vote on the collection of ALAE next year.

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VI. OBJECTIVE 2c: STATE SPECIFIC EXPENSE ISSUES

The RFP contained the following objectives.

Objective (2c) Expenses - Should large state rate increases be tempered because of less than proportional increases in expenses?

When a state's premium and rates grow faster than the national average, the question arises of whether expenses are increasing in proportion to the increase in premiums. If not, the question arises of whether larger than average increases should be tempered.

For reasons mentioned later in this section, we do not recommend that standard NCCI procedures include tempering expenses when state rate changes are large. We believe that the tempering issue is more correctly viewed as the issue of whether expenses ratios should vary by state. Sub-section D discusses varying expense ratios by state.

Exhibits 27-31 display the annual rate changes for NCCI states (i.e., states where NCCI publishes rates or loss costs) in various rate change intervals for the 1986-1990 time period. The larger the rate increase/decrease, the greater the effect on expenses. As Exhibit 27 displays for 1990, 5 of the 38 states had a rate change in excess of 17.5%. While the issue may not arise frequently, it is important in those states where it does arise.

For the purpose of this section, we assume that the countrywide expense provisions are appropriate for all states combined.

A. Impact of Rate Increases on Expenses

A rate change due to loss experience or benefit changes alters the amount of premium collected for expenses. As discussed in Section III, the following variable loadings are incorporated into current manual rates.

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<u>Variable Expense</u>	<u>Provision In Manual Rates</u>
General Expenses	6.7%
Production Expenses	15.0
Taxes - Varies by State	4.2*

* average

The expense dollars produced by these provisions increase in proportion to the premium increase. In addition, loss adjustment expenses (LAE) are included in manual rates as 12% of expected losses.

On the other hand, the expense constant of \$140 (depending on state) does not change as a result of a rate increase. The expense constant provides 20% of general expense and 6% of production expense revenue. The premium discount plan will moderate the expense increase resulting from a rate change if an insured's premium is shifted into a higher standard premium division.

The following table displays the combined general, production and tax provisions in a risk's premium before and after a 20% rate change for risks of various premium sizes.

Effect on Expenses with a 20% Rate Increase

<u>Premium Size Before Rate Change</u>	<u>Expenses Before Rate Change</u>	<u>Expenses After Rate Change</u>	<u>Percentage Expense Increase</u>
\$ 4,000	\$ 1,178	\$ 1,385	17.62%
25,000	4,605	5,397	17.20
150,000	23,555	27,797	18.01
750,000	104,395	123,205	18.02

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As expected, the expense increase is less than the premium increase due to the expense constant. Exhibits 32 (Pages 1 through 4) displays the combined general, production and tax provisions before and after various rate changes for various risk sizes. LAE and profit and contingencies were not included in the analysis.

B. Techniques for Tempering - Expense Flattening

As an alternative to the current procedure which treats all expense elements as variable in the development of manual rates, the components could be split between fixed and variable elements (the expense constant is a fixed element, but it is considered separately from the overall rate change in the ratemaking process). The procedure of splitting fixed and variable expenses is utilized for classification ratemaking as well as overall ratemaking for other lines of business.

If the rate change in an individual state was large, the general expense provision might be treated as a fixed element which does not increase with premium.

Expenses other than general expenses are more likely to vary in direct relationship to a rate change. Agent's commissions which represent the majority of the production expense component is typically a flat percentage of premium for smaller risks and is graded by premium size for larger risks. Therefore it will increase as rates increase. In a similar manner, LAE costs are a function of losses, and if losses increase LAE costs will generally increase.

Following is an example of the indicated rate change (based upon experience) under the NCCI current ratemaking methodology and a methodology which flattens expenses based on the NCCI January 22, 1990 filing in Missouri with an effective date of April 1, 1990. From Exhibit II of the Missouri filing, we find the following provisions:

Production Cost	15.0%
General Expense	7.5
Taxes, License and Fees	2.8
Profit and Contingencies	<u>2.5</u>
Total Overhead Provisions	27.8

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Given the Missouri provisions, 72.2% (100% - 27.8%) is considered the permissible loss ratio by NCCI. Based on the NCCI analysis, the projected loss ratio for the experience period is 84.55%. The rate change based on experience is:

$$\frac{\text{Projected Loss Ratio}}{100\% - \text{Total Overhead Provisions}} - 100\% = \frac{84.55}{72.20} - 100\% \text{ or } 17.1\%$$

If a flattening of expense methodology was introduced, the rate change formula is modified as follows:

$$\text{Rate Change} = \frac{\text{Projected Loss Ratio} + \text{Fixed Expense Component}}{100\% - \text{Variable Expense Components}} - 100\%$$

If we assume that all general expenses are fixed expenses while all other expenses are variable, then the fixed expense component is 7.5% and the variable expense component is 20.3% (production, taxes, and profit and contingencies). The indicated rate change under an expense flattening program is:

$$\frac{84.55\% + 7.5\%}{100\% - 20.3\%} - 100\% = \frac{92.05\%}{79.7\%} - 100\% \text{ or } 15.5\%$$

Thus the rate indication is reduced from 17.1% to 15.5% if we assume that general expenses are a fixed component.

Exhibit 33 displays indicated rate changes utilizing the NCCI recommended expense provisions based on the October, 1990 expense review under the NCCI ratemaking methodology and a methodology that flattens expenses. The effect of expense flattening is to reduce a rate change of 20% to a rate change of 18.3%.

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C. Analysis of "Tempering"

The technique described above makes a number of assumptions, including the following:

- The result of the process is an equitable distribution of countrywide general expenses by state.
- The general expense provision in the prior rates was adequate.
- General expense does not vary with premium.
- Production expenses (other than the expense constant) vary directly with premium.

There are a number of issues to be decided before determining whether tempering is proper as a standard procedure.

First, if the expense provision is established correctly on a countrywide basis (considering likely countrywide premium increases) then tempering expenses in one state without offsetting increases in other states leads to an overall expense deficiency.

Second, as mentioned previously, there has been a downward trend in general expenses which may be partly due to the level of rate increases implemented in the past. The selection of a lower countrywide general expense provision may address the tempering issue in a countrywide manner.

Third, there may be no reason to believe that expense levels were adequate prior to the rate increase. If a large increase is required because of continuing rate level inadequacies in the state, then the expense provision is likely to be as deficient as the loss provision. If the increase is due to a law change which results in a relatively high level of benefits, then expense tempering might be more appropriate.

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Fourth, there are several factors that mediate the expense impact of a large rate increase in a state including the fact that more than 40% of the countrywide premium is from multi-state risks and risks which are greatly impacted by premium discount tables. Exhibit 34 displays the premium distribution of intrastate and interstate risks by state. For example, for Alabama, 47.4% of the state's premium is attributable to intrastate risks (i.e., Alabama-only risks) and 52.6% of the premium is attributable to risks with operations in several states.

A more appropriate expense question is whether expenses should vary by state, i.e. are expense ratios lower in some states because of either higher than average loss costs or lower than average state operating costs. This issue is discussed in the next section.

D. Expenses by State

NCCI utilizes state specific expense provisions (if required) based on call #14 which collects direct expenses by state; otherwise, NCCI utilizes countrywide (IEE) expense indications. If a state requires NCCI to establish rates based on only the state's expense experience, the state expense experience is still included in the countrywide experience. The following section analyzes the reasonability of NCCI utilizing a countrywide expense factor versus varying the factor by state.

NCCI data call #14 collects the following direct experience by state:

1. Written Premium
2. Net Earned Premium
3. Standard Earned Premium
4. Commission and Brokerage Expenses
5. Other Acquisition Expenses

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6. Losses (both paid and outstanding)
7. ULAE (both paid and outstanding)
8. ALAE (both paid and outstanding)
9. Board and Bureau Expenses
10. Audit, Inspection and Other General Expenses
11. Taxes, Licenses and Fees

We analyzed state specific general and production expenses to determine if significant expense differences exist by state. We analyzed combined stock and mutual companies experience. The reciprocal exchanges, state funds, and miscellaneous companies were excluded. We believe it is appropriate to exclude these companies, as state funds for example, have different commission schedules and general expense requirements than stock and mutual companies. In addition, we restated the state expense levels to a first \$5,000 basis based on the NCCI expense gradations by size of risk and the state premium distribution by size of risk from the unit statistical report (Exhibit 34). Ideally, the size of risk distribution should include premium generated by the risk in all states in which the risk generates premium; however, this data is not available. This limitation will affect the magnitude of the ratios; however, we believe that the comparison of the relative expense ratios by state is still appropriate.

Exhibit 35 displays direct general expenses as a percentage of direct standard earned premium adjusted to a first \$5,000 basis for calendar years 1987, 1988, 1989 and the combined 1987-1989 time period. We arranged the states from lowest general expense ratio to highest, based on the calendar year 1987 ratios. For 1988 and 1989 and the combined 1987-1989 period, we then determined the respective general expense rankings. For example, Utah had the second lowest general expense ratio in 1987, the eighth lowest in 1988, the fifth lowest in 1989, and for the 1987-1989 period ranked second. The restated first \$5,000 general expense ratios are also displayed next to the rankings. Exhibit 36 is a similar exhibit that displays production expense ratios relative to direct standard written premium.

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We performed two statistical tests to determine if the rankings for a state were correlated across years. The tests measure whether low expense ratios in one year are more likely to be associated with low expense ratios in subsequent years or whether the expense ratios (rankings) vary significantly from year to year.

The two tests utilized are:

1. A chi-squared test based on the coefficient of concordance; and
2. A normal test based on Spearman's rank correlation coefficient.

These tests are described in Technical Appendix D.

Both tests rejected the null hypothesis of no correlation of expense rankings by state across years. Therefore, low rankings in one year are more likely to be associated with low rankings in subsequent years.

The correlations of rankings by state may be a function of several factors. The relative mix of the distribution systems by state may vary. In general, direct writers have lower production expenses than agency companies. Second, in determining the restated expense ratios to a first \$5,000 basis, we utilized the unit statistical reports. This may bias the analysis. Third, states with higher average rate levels would tend to have somewhat lower expense needs as a percentage of premium. Finally, individual company allocation procedures may distort the expense ratios.

In order to determine the distortion due to individual company allocation procedures, we analyzed the procedures that companies use to allocate general and production expenses to state. The state allocation procedures used by the individual companies is also discussed in Part I of the report, the Data Collection Phase. NCCI data call #14 contains the following 7 allocation codes that companies use to allocate expense items to state:

1. Actual Expenses
2. Written Premium

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3. Earned Premium
4. Losses
5. Salaries
6. Time Study
7. Other

Exhibit 37 displays the various allocation procedures that the twenty-five largest countrywide workers compensation companies utilized in allocating general and production expenses to state in NCCI data call #14. For example, for commission and brokerage expenses, 16 of the 24 companies (companies that used two allocation codes for the same expense item are excluded) capture the actual commission and brokerage expenses by state; 6 companies allocate their countrywide commission and brokerage expenses to state based on written premium; and 2 companies utilize some other procedure to allocate commission and brokerage expenses to state.

For general expenses, the majority of the companies use either written or earned premium to allocate countrywide general expenses to state. In order to further investigate the availability and accuracy of the general expense data by state, we worked with NCCI to develop a survey and NCCI issued the survey to 16 companies. The sampled companies included many of the large national writers of workers compensation insurance.

Exhibit 38 summarizes the results of the survey. For other general expenses, only 3 of the 16 companies surveyed allocate branch office--general expenses to the states that the branch offices serve. The other 13 companies combine all general expenses into a countrywide total and then allocate that total to state based on earned or written premium. In fact, only 3 of the companies surveyed stated that general expenses can be identified at the branch office level. Exhibit 39 displays the actual survey form.

On the one hand, it appears that expense levels vary significantly from state to state; however, on the other hand, we would expect that the expense ratios should not vary

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(in particular for general expenses) based on the allocation procedures that companies utilize to allocate expenses to state.

It is our recommendation, given the correlation of expense ratios by state, that additional research be performed. To the extent that verifiable differences exist by state, NCCI should reflect state expense levels in the ratemaking process.

E. Conclusions and Recommendations

1. We do not recommend that standard NCCI procedures include tempering expenses when state rate changes are large.

The rationale for this recommendation includes:

- a. If expenses are reflected correctly on a countrywide basis, adjustment for large rate increases may result in an inadequate countrywide expense provision.
- b. The downward trend in general expense, (as noted in Section IV), is due in part to the level of rate increases implemented in the past, and the countrywide expense provision should consider that trend.
- c. If rates are deficient over a period of time, it is likely that expenses are also deficient.
- d. There are factors to mediate the expense impact of a large rate increase in a state including the fact that more than 40% of the premium is from multi-state risks and risks which are greatly impacted by the premium discount tables.

2. The issue of tempering expense provisions is more correctly viewed as the issue of whether expense ratios should vary by state. NCCI data suggests that there are variations from state to state; however, allocation procedures distort the expense analysis by state. Additional research should be performed to determine the appropriateness of varying expense levels by state. To the extent that verifiable

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differences exist by state, NCCI should reflect state expense levels in the ratemaking process.

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VII. OBJECTIVE 2d: BUDGETED APPROACH TO ACQUISITION EXPENSES

This chapter discusses the following objective of the RFP:

Objective (2d) Expenses - Discuss the advantages and disadvantages of the budgeted approach to acquisition expenses versus basing these factors on actual expense experience.

A. Current Procedure for Selecting Stock Insurer Production Expense Provisions

NCCI defines production expenses to include:

1. Commission and brokerage incurred; and
2. Other acquisition, field supervision and collection expenses incurred.

These items are displayed on line 5 and 6 of Part II of the IEE for workers compensation.

In establishing production provisions it is reasonable to combine commission and brokerage expenses with other acquisition, field supervision, and collection expenses. Agency companies will typically incur larger commission and brokerage expenses than direct writers relative to premium; whereas, direct writers will incur larger other acquisition expenses. If the two provisions were not combined the separate allowances would vary by type of insurer. Independent agents typically perform functions that reduce an insurer's in-house acquisition costs and agents receive reimbursement for this service. The direct writing company agents are employees, and more of the production related expenses are allocated to other acquisition expenses; therefore direct writers incur lower commission related expenses.

NCCI judgmentally selects production expense allowances, and does not support these expense provisions with a specific analysis of expense data. This is described by NCCI as a "budgetary approach".

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NCCI states that a budgetary allowance is appropriate as companies negotiate unique commission schedules with agents and an average of the actual commissions produces an average which is not appropriate for any particular company.

The first \$5,000 of standard premium incorporates a 15% loading for production expenses and the percentage loading decreases as the premium size increases. The following table displays the production allowances for various premium sizes for companies electing the stock premium discount plan.

<u>Division of Premium</u>	<u>Stock Production Expense Allowance</u>
First \$ 5,000	15.00%
Next 95,000	7.50
Next 400,000	6.00
Over 500,000	6.00
Average based on 1987 - 1988 policy size distribution	8.55

These provisions along with the production expense component of the expense constant of \$47.35 are intended to provide an adequate provision for production expenses.

B. Actual Production Expenses Versus Budgeted Expenses

A disadvantage of the budgetary approach of establishing the production expense allowance is that the actual production expenses incurred are not used in determining the expense allowance in the rates. If actual expenses are less (more) than the budgetary allowance then the "average" company will sustain a gain (loss) that is more (less) than that anticipated by the regulator.

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1. Provision in Manual Rates - Stock Insurers

NCCI staff in their 1990 expense review examined the production expense experience for stock companies. The methodology of this review is similar to the general expense review. The NCCI analysis is attached as Exhibit 40. Row 1 of Exhibit 40 displays the net earned premium converted to a standard earned premium basis. The premium is converted to a standard basis to derive a provision for the first \$5,000 of standard premium. The standard premium is the premium before (excluding) any retrospective rating adjustments, premium discount (expense gradation), schedule rating and carrier deviations.

The schedule rating and carrier deviation adjustments represents approximately 2.7% of standard premium for calendar year 1989. After the aforementioned adjustments, Row 1 is an estimate of the manual premium (i.e. the premium based on manual rates) times the average experience modification plus the expense constant. These adjustments, are made to convert individual insurer rates to an NCCI rate level. The budgetary production allowance is intended to be a percentage of NCCI rates. If individual companies utilize downward (negative) deviations then the companies will collect less than the NCCI budgetary production allowance.

The expense constant offset, Row 2, is utilized to determine the amount of standard premium generated from the expense constant of \$140 in total. The expense constant offset is adjusted to a projected January 1, 1992 standard premium level. This adjustment is necessary as the insurers record the expense constant as premium. Row 3 is an estimate of the standard premium excluding the expense constant revenue and Row 1 minus Row 3 is an estimate of the expense constant revenue assuming the \$140 expense constant. As mentioned, \$140 expense constant was recommended by the Actuarial Committee based on the October, 1990 expense review.

Row 4 displays the stock insurer's production expenses from the IEE. Row 5 is the portion of the expense constant revenue that is associated with production expenses. Exhibit 41 displays the calculation of the expense constant revenue that is associated with production expenses. The calculation is based on the production and general expense constant elements from the 1982 study of expenses by size of risk.

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Row 6 is the IEE production expenses less the expense constant revenue associated with production expenses. Therefore, Row 6 represents the amount of production expenses which need to be priced for through the variable expense loading.

To determine the expense allowance which should be incorporated into manual rates (first \$5,000) the Row 6 amount is adjusted for the service carrier allowance and the average premium discount for production expenses.

Row 7 displays an adjustment required for the way servicing carriers record production expenses. This adjustment is discussed in detail in Technical Appendix A.

Row 8 displays the adjustment for the average discount for production expenses underlying the premium discount plan and is needed to convert the expense provision from an average provision to a provision for the first \$5,000 of standard premium. The average discount is projected to a January 1, 1992 distribution of risks by policy size. The detailed calculation is displayed on Exhibit 42.

We would modify the NCCI production review for stock companies by computing the production expense ratio as a percentage of written premium instead of earned premium. Relating production expenses to written premium results in a more accurate matching of expenses and revenue as commission expenses are expensed during the period in which the policy was written even though not all of the premium was earned.

In addition, we believe that direct experience is more appropriate than net (of reinsurance) experience as NCCI rates are intended to be sufficient for the primary carrier.

However, sufficient data is not available at this time to determine the direct indications and several assumptions are required for the direct analysis. Other acquisition, field supervision and collection expenses incurred (other acquisition) are not available from the IEE on a direct basis and the carriers methodology for recording the servicing carrier allowance may bias the net other acquisition expenses incurred. As displayed on Exhibit 40, the 1989 adjustment necessary to eliminate the effect of the servicing carrier allowance from the net production allowance indication is negative 1.7 points of standard premium. NCCI did not collect data sufficient to

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determine the required adjustment separately for commission and brokerage and other acquisition expenses. NCCI is in the process of collecting this information for the October, 1991 expense review.

Several adjustments are also required to convert direct written premium to a standard basis as several data items are not directly available from the IEE on a direct basis. Therefore, we have only adjusted the NCCI indications from a net earned to net written premium basis.

The following table displays the first \$5,000 production expense indications for stock companies based on the NCCI analysis (earned premium) and our modified analysis (written premium):

Production as % of	Stock Production Expenses Indications					
	Calendar Year					
	1984	1985	1986	1987	1988	1989
Earned Premium	15.2	14.4	13.9	14.2	14.1	13.0
Written Premium	15.3	14.3	13.8	13.9	13.9	13.0

The effect of using written premium as the denominator is relatively minor during the 1984-1989 time period. However, the effect is a function of the difference between written and earned premium and could be larger under several scenarios.

Both analyses clearly display a downward production expense trend and the budgeted 15.0% allowance exceeds the actual amount incurred in 1989 of 13.0% by 2.0 points. However, the trend may be partially explained by the growth in the residual market population. In general, the residual market producer fee schedules provide commission levels which vary by state but approximate 5.5% for the first \$5,000 of standard premium. The following table displays the growth in the residual market for the 1984-1990 time period:

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<u>Residual Market Premium Relative to Total Direct Premium</u>						
<u>Countrywide</u>						
<u>Calendar Year</u>						
<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>
5.5%	9.7%	16.3%	19.0%	19.6%	22.0%	24.1%

Technical Appendix E discusses the residual market producer fees in more detail.

2. Provision in Manual Rates - Mutual Insurers

We performed a production analysis for mutual companies. NCCI did not perform an analysis of mutual companies' production expenses. We restated the mutual companies' production expenses to a first \$5,000 basis based on the stock expense gradations underlying the stock premium discount table and the mutuals distribution of risks by size of policy. The ratios are projected to a January 1, 1992 size of risk distribution. Exhibit 43 displays the production expense indication for the first \$5,000 of standard premium for both stock and mutual companies. The following table displays the indicated mutual production expenses by year for the first \$5,000 of standard premium.

<u>Production</u> <u>as % of</u> <u>Written</u> <u>Premium</u>	<u>Mutual Production Expenses Indications</u>					
	<u>Calendar Year</u>					
	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>
	15.0	12.8	12.7	14.3	12.8	11.7

The 15% budgeted production allowance exceeds the 1989 actual net production expenses incurred of 11.7% by 3.3 points.

One major limitation of our analysis is that we have assumed that stock and non-stock production expense follows the NCCI premium discount plan. We cannot analyze the current or historical accuracy of this assumption because the 1982 study of expenses by size of risk did not capture commission and brokerage expenses, and there are no current sources containing this information.

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3. Net Provision - Stock Insurer

An alternative method of analyzing the appropriateness of the production expense provision for stock companies is to compare the actual IEE production expenses incurred to the average production allowance incorporated into the rating plan. Based on the stock production allowances by size of risk and the distribution of risks by premium size, we can estimate the average production allowance incorporated into the rating plan relative to standard premium. As mentioned previously in this section, the average stock production allowance anticipated in the NCCI rating plan for voluntary risks based on the 1987 - 1988 distribution of risks by premium size is 8.55%. To determine the actual production allowance for calendar year 1989 for stock companies we need to adjust for:

- a. the lower filed commission allowances in some states for residual market business;
- b. the premium written by stock companies utilizing the non-stock premium discount table;
- c. the shift in the distribution of policies by size of risk between 1987-1988 and 1989.

Based on these adjustments, the 1989 adjusted production allowance incorporated into the rating plan as a percentage of standard premium is 9.1%. Technical Appendix F displays the detailed calculation for the 1989 adjusted production allowance. The following table displays the actual net IEE production expense ratios relative to standard written premium for stock companies. This table includes stock insurers using the non-stock discount table and excludes non-stock insurers using the stock table.

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Stock IEE Production Percentages
As a Percentage of Standard Written Premium
Excluding Expense Constant Revenue (\$140 Expense Constant)

	<u>Calendar Year</u>					
	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>
Stock %	8.3	7.4	6.8	6.9	6.9	6.0

The production expense allowance in the rating plan, 9.1% in 1989, exceeds the calendar year 1989 actual production expense allowance of 6.0% by 3.1 points of standard premium. Again, we believe that direct expense ratios should be analyzed, but sufficient experience is not available for that analysis.

Possible explanations for the decreasing production expense ratio displayed in the above table are:

1. The growth in the residual market in which producer compensation is lower than in the voluntary market. We previously discussed the growth in the residual market;
2. Negative underwriting results may have reduced the amount of contingent commission paid to agents; and
3. Insurers may have responded to negative underwriting results by offering lower commission rates to agents.

The relatively dramatic decline in commission rates during the last five years may reverse itself if underwriting results improve and the residual market is depopulated.

C. Conclusions and Recommendations

1. The total production expense provision for stock companies - for voluntary and involuntary risks combined - exceeds amounts actually incurred by 2% or more. It appears that the 15% provision in manual rates exceeds the amount incurred of
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13.0% by 2.0 points in 1989; however, sufficient data is not available to evaluate the NCCI production expense gradations. This 2.0 point differential may be explained by the lower commission levels associated with involuntary business.

2. The all size of risk analysis, indicates that the production allowance in the rates has exceeded the actual amount expended by stock insurers by 2.0 to 3.0 points of standard premium for calendar years 1986 to 1989. Based on our analysis, it appears that 1.5 to 2.0 points of this difference may be explained by the lower commission levels on involuntary business. The remaining difference is due to: (1) the expense gradations and (2) the fact that some stock carriers use the non-stock premium discount table.

3. NCCI should perform an annual production expense review based on direct experience similar to the current NCCI general expense review in order to establish production expense provisions. However, in order for NCCI to properly perform this review, the production allowances by size of risk need to be verified. Therefore, NCCI should collect all production expenses in the 1991 call for expenses by size of risk. In October of 1991, NCCI will have the required experience on the servicing carrier allowance to adjust other acquisition expenses to a direct basis.

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VIII. OBJECTIVE 2e: JUSTIFICATION FOR DUAL EXPENSE DISCOUNTS

This section addresses the following objective from the RFP:

Objective (2e) Expenses - Examine whether the original assumptions which supported the existence of dual expense discounts still exist. What is the relationship between the higher rates collected by insurers utilizing non-stock discounts and their level of policyholders' dividends? Are the insurers utilizing non-stock premium discounts realizing lower expenses, and, if so are the "savings" being returned in the form of higher dividends.

A. Dual Expense Program

NCCI publishes two premium discount tables:

1. A stock table; and
2. A non-stock table.

The two tables are reproduced below along with the average implied discount trended to a January 1, 1992 distribution of policies by size of risk.

<u>Standard Premium Division</u>	<u>Stock Premium Discounts</u>	<u>Non-Stock Premium Discounts</u>
First \$ 5,000	0.0%	0.0%
Next \$ 95,000	10.9	3.5
Next \$400,000	12.6	5.0
Next \$500,000	14.4	7.0
Average Discount	10.4%	4.1%

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The stock premium discount table is based on the 1982 study of general and other acquisition expenses by size of risk and an assumed production expense gradation by premium size interval. The non-stock premium discounts were selected judgmentally by the Actuarial Committee in 1984 based on the 1982 study which created the stock table and the perceived dividend differential between stock and non-stock companies. The discounts have not been changed since 1984.

B. Stock Versus Mutual Dividend Ratios

It appears that the difference in dividend ratios between stock and mutual companies is disappearing. Exhibit 44 displays countrywide incurred dividend ratios (incurred dividends divided by net earned premium) for calendar years 1971 to 1989 for stock and mutual companies along with the difference in the dividend ratio.

The following table displays the mutual and stock dividend ratios for the 1971 through 1983 time period and the 1984 through 1989 time period.

<u>Type of Company</u>	<u>Incurred Average Dividend Ratio</u>	
	<u>1971-1983</u>	<u>1984-1989</u>
Mutual	13.3%	9.2%
Stock	5.8	6.9
Dividend Differential	7.5	2.3

The dividend differential between stock and mutual companies is decreasing.

In addition we analyzed countrywide paid dividend ratios for stock versus mutual companies excluding California. California was excluded because:

1. NCCI does not publish rates or loss costs in California; and
2. A high proportion of the countrywide dividends are attributable to California. California has a minimum rate law for workers compensation which precludes

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company deviations and other rating plans that reduce premium. Therefore, price competition in California takes place largely through dividend payments.

The following table displays the countrywide (excluding California) ratio of paid dividends to direct earned premium for mutual versus stock companies for the 1985-1989 time period.

<u>Calendar Year</u>	<u>PAID AVERAGE DIVIDEND RATIOS</u>		<u>Dividend Differential</u>
	<u>Type of Company</u> <u>Mutual</u>	<u>Stock</u>	
1985	8.9%	6.4%	2.5%
1986	7.3	5.3	2.0
1987	5.9	4.6	1.3
1988	5.1	4.3	0.8
1989	4.1	3.9	0.2
1985-1989	5.9	4.8	1.1

It also appears that the differential in the paid dividend ratio between stock and mutual companies is decreasing.

One possible explanation for the decrease in dividend ratios between stock and mutual companies is the decrease in profitability as reported in the IEE. Exhibit 45 displays a summary of the IEE operating ratios and net income ratio for the 1971-1983 and 1984-1989 time periods for stock versus mutual companies for workers compensation. During the 1971-1983 time period mutual companies reported positive underwriting income and mutual companies paid out 129.3% more in dividends than stock companies. During the 1984-1989 time period mutual companies reported negative underwriting income; therefore, mutual companies had less funds to distribute in the form of dividends. The dividend ratio for mutual companies decreased from 13.3% for the 1971-1983 time period to 9.2% for the 1984-1989 time period. Therefore, the decrease in underwriting income may be one factor affecting the decreasing dividend differential between stock and mutual companies.

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Technical Appendix G displays the IEE operating ratios and underwriting income for mutual and stock companies for calendar years 1971-1989.

C. Dividends and Expenses by Type of Insurer

Exhibit 46 displays the production and general expense ratios for the first \$5,000 of premium for stock and mutual companies for calendar years 1984-1989. The average combined expense ratio for mutuals is 17.4% or 1.3 points lower than the stock ratio of 18.7% adjusted to a January 1, 1992 level. In addition to this differential, the non-stock premium discount tables provide less of a discount than the stock tables. The following table compares the expense levels, premium discount provisions and dividend ratios for stock and mutual companies.

	<u>Percent of Standard Premium</u>		
	<u>Stock</u>	<u>Mutual</u>	<u>Differential</u>
Expenses Needed First \$5,000	18.7%	17.4%	1.3%
Premium Discount	10.4	4.1	6.3
1985 - 1989 Paid Dividend Ratio (excluding California)	4.8	5.9	(1.1)

For the first \$5,000 of premium, mutual companies incur 1.3 points less in expenses than stock companies and in addition mutual companies collect 6.3 points more in premium than stock companies due to the premium discount plan differential. Therefore, all other things being equal, mutuals could pay 7.6 points more in standard premium as dividends than stock companies. However, the paid dividend differential is only 1.1 points for the 1985 to 1989 time period. This analysis does not imply that mutual companies are generating a higher net income than stock companies, as the analysis ignores loss ratio and investment income differences. In fact, as Exhibit 45 displays, stock and mutual companies reported a similar net income (underwriting

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income plus investment income) amount relative to earned premium for the 1984 to 1989 time period.

One further limitation of this analysis is that some stock companies use the non-stock table and some non-stock companies use the stock table. The following table displays the magnitude of the crossover of stock and non-stock companies (based on a NCCI special call):

<u>Type of Insurer</u>	<u>Percentage of Premium Premium Discount Table Used</u>		<u>Total</u>
	<u>Stock</u>	<u>Non-Stock</u>	
Stock	74.8%	25.2%	100%
Non-Stock	18.1	81.9	100%

Below we discuss several points related to the regulatory approval process as respects premium discount tables and dividend plans.

First, state insurance departments (Departments) exercise the same regulatory control over the stock and non-stock discount tables as they do over rates and rating plans. In practice, however, Departments approve the two tables and do not monitor the movement of insurers from the stock to non-stock tables.

In addition, even though all of the applicable business written by an individual insurer is rated using either the stock or non-stock table, different insurers in a group may use different discount tables. NCCI issued a special call which required each individual company to state which table it was utilizing. An insurer operating as a group of companies can change an employer from the non-stock to stock discount tables by moving the employer from one company to another. This process is generally outside the control of the regulatory approval process.

Dividend plans are not subject to the same regulatory requirements as rates and rating plans. In most states, dividend plans are not even filed with the state regulatory authority. However, some states restrict the amount of dividend payments which can

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be made in a calendar year (e.g., typically a percentage of surplus or earned surplus). In addition, dividend payments are not guaranteed; typically the board of directors must make a declaration that a certain amount of dividends can be paid in the next quarter. Thus, Departments cannot regulate the extent in which insurers satisfy the policyholder dividend expectations which might be justified by the difference in discount tables.

D. Conclusions and Recommendations

1. The premium discount differential between stock and non-stock discount tables is 6.3% of standard premium (companies utilizing the non-stock table collect 6.3% more in standard premium than companies utilizing the stock table); whereas, the paid dividend differential for the 1985-1989 time period is only 1.1% of premium. Therefore the differential between the stock and non-stock table is not justified solely based on dividend differences; however, stock and mutual company profitability, net of dividends to policyholders, appears similar. NCCI should review mutual and stock expense experience by size of risk in order to determine expense graduations and therefore, a premium discount table for each type of insurer.
2. There appears to be a correlation between the IEE reported underwriting income of mutual companies and their level of policyholder dividends. During periods when underwriting income is positive, mutual companies distribute more funds through policyholder dividends than during periods when their underwriting income is negative.

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IX. OBJECTIVE 2f: EQUITY OF PREMIUM DISCOUNT PROGRAMS AND EXPENSE CONSTANTS

This chapter addresses the following objective of the RFP:

Objective (2f) Expenses - Review premium discounts (stock and non-stock) and expense constants to determine whether the relative expense loadings are equitable for all sizes of risk.

The current NCCI premium discount and expense constant programs are based on the 1982 study of stock company expenses by size of risk (1982 study). This section discusses the nature of the study and the conclusions of the study as they relate to the present NCCI expense program. We will first describe the 1982 study and then we will review the conclusions reached by NCCI. In addition, we will review the mutual companies expenses by size of risk.

A. 1982 NCCI Expense Study by Size of Risk

NCCI issued a special call (1982 call) to obtain expense data by size of risk, function and type for calendar year 1982. The prior call collected 1977 expense data. A call for 1991 expense data by size of risk was recently authorized by the NCCI Actuarial Committee (Committee).

The 1982 call applied to individual insurers and or groups writing \$50 million or more of workers compensation direct earned premium in calendar year 1982. These insurers reported the distribution of salaries and expenses for workers compensation business by size of risk. Premiums and expenses were reported on a direct basis with respect to reinsurance. The following expense items were reported by size of risk:

- Other acquisition
- Payroll Audit
- Inspection

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- Other general
- Boards and Bureaus

Exhibit 47 presents the NCCI data reporting form. The expense elements on the form were reported on an incurred basis with the totals reconcilable to the IEE. NCCI instructed companies to allocate expenses by size of risk using any method which the company believed would provide the most accurate allocation of expenses by size of risk. The method need not be the same method the company used to allocate expenses to line of business.

NCCI analyzed stock company general expense data in order to determine:

1. The general expense component of the expense constant; and
2. The general expense gradations by size of risk.

The general expense gradations are combined with the assumed production expense gradations to derive the premium discount table. Based upon regression analysis of the data, NCCI staff recommended the following general expense program.

Expense Constant - General Expense Element \$62.63

<u>Standard Premium Division</u>	<u>General Expense Provisions</u>
First \$ 5,000	7.5%
Next 20,000	5.5
Next 75,000	4.8
Next 900,000	4.2
Over 1,000,000	3.1

The 1982 study did not incorporate commission and brokerage expenses; only other acquisition expense was captured in the 1982 study. The staff recommended an expense constant attributable to other acquisition expenses of \$35.49 based on

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regression analysis, using data for policies generating less than \$5,000 in standard premium.

The NCCI staff selected the following table of production expense provisions by premium division.

<u>Standard Premium Division</u>	<u>Production Expense Provisions</u>
First \$ 5,000	15.0%
Next 20,000	7.5
Next 75,000	7.5
Next 900,000	6.0
Over 1,000,000	6.0

There is no NCCI documentation for the particular production expense provision by standard premium division, although the divisions are the same as the general expense divisions.

The overall premium discount table is calculated from the above general expense and production expense allowances. The calculation of the premium discount for an interval is the sum of the production and general expense difference between the interval and the first \$5,000 divided by one minus the average tax provision and profit and contingency margin.

The following table displays the indicated premium discount provision for the premium interval \$20,000 excess of \$5,000 assuming a tax provision of 4.24% and a profit and contingency margin of 2.5%.

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PREMIUM DISCOUNT CALCULATION

1. General Expense Provision - First \$5,000	7.5%
2. General Expense Provision - Next \$20,000	<u>5.5</u>
3. General Expense Gradation (1) - (2)	2.0%
4. Assumed Production Expense Provision - First \$5,000	15.0%
5. Assumed Production Expense Provision - Next \$20,000	<u>7.5</u>
6. Production Expense Gradation (4) - (5)	7.5%
7. Production and General Expense Gradation (3) + (6)	9.5%
8. 1.00 - (Tax and Profit Margin)	.933
9. Indicated Premium Discount (7) / (8)	10.2%

Of the 10.2% indicated premium discount, more than 75% (7.5%/9.5%) relates to production expense gradations. This shows the significance of the production expense gradation in determining the premium discount provision. We recommend that NCCI collect all production expense experience (including commission and brokerage) by size of risk in order to determine the appropriateness of the premium discount table.

The NCCI staff recommended the following premium discount table based on the aforementioned gradations and methodology

NCCI Staff Recommended Premium Discount Table

<u>Standard Premium Division</u>	<u>Premium Discount</u>
First \$ 5,000	0.0%
Next 20,000	10.2
Next 75,000	11.0
Next 900,000	13.2
Over 1,000,000	14.4

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The NCCI Actuarial Committee (Committee) concluded that the cost of changing the premium discount division points as a result of the 1982 study was higher than warranted in light of the variability in the underlying data. The Committee decided to retain the then current premium discount division breakpoint at \$5,000, \$100,000, and \$500,000, and selected the following general expense provisions by premium division.

Stock: General Expense Provisions by Premium Division

<u>Standard Premium Division</u>	<u>General Expense Provisions</u>
First \$ 5,000	7.5%
Next 95,000	4.9
Next 400,000	4.7
Over 500,000	3.1

The committee did not alter the recommended general expense constant of \$62.63, the other acquisition expense constant of \$35.49 or the overall expense constant of \$120. The calculation of the \$120 overall expense constant from the general expense and other acquisition expense components is shown on Exhibit 48.

Based on the general expense and production provisions by premium discount division, the premium discounts for stock companies were calculated to be:

Stock: Premium Discount Table

<u>Standard Premium Division</u>	<u>Premium Discount</u>
First \$ 5,000	0.0%
Next 95,000	10.9
Next 400,000	12.6
Over 500,000	14.4

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Based on qualitative consideration of the stock company discounts and the Committee's perception of the relationship between stock and non-stock company dividend plans, the following non-stock discounts were selected judgmentally by the Committee.

Non-Stock: Premium Discount Table

<u>Standard Premium Division</u>	<u>Premium Discount</u>
First \$ 5,000	0.0%
Next 95,000	3.5
Next 400,000	5.0
Over 500,000	7.0

As we discussed in Section VIII, it appears that the dividend differential between stock and non-stock companies is disappearing. Therefore NCCI should analyze stock and non-stock expense experience by size of risk to determine the appropriateness of the current premium discount tables.

B. Evaluation of the Expense Provisions by Size of Risk

To evaluate the Committee's recommended general expense program filed April 1, 1985 as a result of the 1982 study, we compared the general expenses incurred per policy versus the recommended general expense provision in the risk's premium by premium size interval. This analysis considers:

1. the expense constant,
2. the variable loading for the first \$5,000 of premium and the premium discount plan.

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The average incurred general expenses for stock companies completing the 1982 call is displayed in Column (8) of Exhibit 49 by premium size interval. For example, for the premium size interval \$200 to \$299 on average companies incurred \$82.57 in general expenses in calendar year 1982. The NCCI recommended general expense provisions are displayed in Column (9) of Exhibit 49. The recommended general expense provision is \$78.31 for the \$200 to \$299 premium size interval. In other words the risk's premium includes a general expense provision of \$78.31. To measure the overall appropriateness of the general expense program, we divided the general expense difference between the actual expenses incurred and the expense provision in the premium by the average premium size in the interval. Column (10) displays the expense difference and Column (11) displays the difference relative to the average premium in the interval. The following table displays the calculation for the \$200- 299 premium size interval.

ANALYSIS OF GENERAL EXPENSE PROGRAM PREMIUM SIZE INTERVAL (\$200-\$299)

Average Incurred Expenses	\$ 82.57
Expenses Incorporated Into Rates	\$ 78.31
Expense Difference	\$ (4.26)
Average Premium Size	\$ 245.00
Expense Difference Relative to Premium	(1.7)%

For stock companies the NCCI general expense provision (i.e., component of premium) closely approximates the average incurred general expenses by premium size interval except for the smallest premium size interval (\$0 - \$99). The largest percentage difference for any premium size interval (excluding the \$0 - \$99 interval) is 1.7% for the \$200 - \$299 premium size interval. Based on our analysis, for stock insurers, the NCCI general expense program based on calendar year 1982 experience is equitable by size of risk.

We also performed a similar general expense analysis for mutual companies. This analysis will allow us to determine if mutual companies' general expense experience is significantly different than stock companies' general expense experience by size of risk.

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Exhibit 50 is similar to Exhibit 49 but analyzes mutual companies incurred general expenses by premium size interval. As in Exhibit 49, Column (8) displays the average incurred general expenses for mutual companies completing the call. Column (9) of Exhibit 50 displays the general expense provision incorporated into the risk's premium based on the stock general expense gradations. The expense difference, Column (9) minus Column (8) can be utilized to determine if the stock general expense program is appropriate for mutual companies; Column (10) displays the difference. The stock program generates more expense dollars through the rating plan than incurred on average for mutual companies. The largest redundancy relative to premium occurs at the lower premium size intervals. For example, as Column (11) of Exhibit 50 displays, the redundancy relative to premium is 69.3% for the smallest premium size interval and 13.0% for the next largest premium size interval. However, for the larger premium size intervals (above \$5,000) the stock program fits the mutual experience reasonably well with no relative difference greater than 1.0% of premium. The average relative difference excluding premium sizes below \$5,000 is 0.3%.

This analysis indicates that if stock expense levels are utilized for the first \$5,000 of premium then the stock premium discount table reasonably approximates the mutuals general expense experience for the larger premium sizes. However, a lower expense level is indicated for the first \$5,000 of premium for mutuals.

C. Conclusions and Recommendations

1. We recommend that the study by size of risk be updated on a periodic basis. The Committee unanimously approved of issuing the Special Call for expenses by size during 1991. The Committee plans on updating the study during 1992 based on calendar year 1991 expense experience. We concur with the Committee's action and in addition we recommend that the study be updated on a more regular basis than every nine years. Several factors may have altered the expense needs by size of risk including:

- a. Inflation
- b. Distribution of policies by size of risk

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- c. Average policy size
- d. Mechanization - increased automation

2. We recommend that all production expense (commission and brokerage; and other acquisition expenses) data be collected by size of risk. It is not possible to evaluate the appropriateness of the premium discount program without collecting this information.

3. This analysis indicates that the stock general expense provisions for premium sizes above \$5,000 are appropriate for mutual companies; however, the stock provision for the first \$5,000 of premium exceeds the expenses incurred for mutual companies. Presumably mutual companies return the redundant expenses in the form of policyholders dividends. NCCI should review mutual expense experience by size of risk in order to determine the appropriateness of the current non-stock table.

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Size, Calendar Year 1982, for Mutual Companies

NCCI EXPENSESExpense Review - Overview

1) Portion of Expense Constant for general expense (from 1982 Special Call for Expenses by Size of Risk)	\$62.63
2) Portion of Expense Constant for production expense (from 1982 Special Call for Expenses by Size of Risk)	\$35.49
3) Index to adjust expense needs to January 1992	1.455
4) Factor to adjust expense constant for profit and taxes (1 - .042 - .025)	0.935
5) Indicated Expense Constant	\$152.69

As a technical note, line 4 contains a mathematical error and therefore the indicated expense constant should be \$153.08.

1990 EXPENSE REVIEW

Projected Expense Distribution as of September 1, 1989

Type of Expense	Actual Expense	Distribution as of July 1982	Inflation Factor July 82 to Sept. 89	Distribution as of Sept. 89
Salary	\$35,864,716	55.73%	1.370	57.53%
Data Processing Equipment	\$3,795,905	5.90%	1.283	5.70%
Travel	\$2,948,409	4.58%	1.185	4.09%
Postage and Printing	\$3,979,455	6.18%	1.283	5.98%
Other Identifiable Expenses	\$2,903,860	4.51%	1.283	4.36%
Remainder	\$14,868,065	23.10%	1.283	22.34%
Total	\$64,360,410	100.00%	1.327	100.00%

July 1982 - September 1989 = 7 years and 2 months = 86

July 1982 - January 1992 = 9 years and 6 months = 114

Index to adjust expense needs to January 1992 :
 $1.327^{(114/86)} = 1.455$

1990 EXPENSE REVIEW

STATE	EFFECTIVE DATE	ACQUISITION, FIELD SUPERVISION AND COMMISSION EXPENSE	GENERAL EXPENSE	LOSS ADJUSTMENT EXPENSE	EXPENSE CONSTANT
-----	-----	-----	-----	-----	-----
AL	03/01/90	15.00%	6.90%	12.00%	\$120
AK	01/01/90	15.00%	6.90%	12.00%	\$120
AZ	10/01/89	15.00%	7.30%	12.00%	\$60
AR	01/01/90	15.00%	6.90%	12.00%	\$120
CO	06/01/90	15.00%	6.70%	12.00%	\$140
CT	01/01/90	15.00%	5.70%	12.00%	\$140
DE	02/01/88	15.00%	7.00%	12.00%	\$100
DC	05/15/90	15.00%	6.70%	12.00%	\$140
FL	01/01/90	15.00%	5.15%	12.00%	\$140
GA	07/01/90	15.00%	6.70%	12.00%	\$140
HI	10/01/89	15.00%	6.90%	12.00%	\$120
ID	01/01/90	15.00%	6.70%	12.00%	\$140
IL	01/01/90	15.00%	6.70%	12.00%	\$60
IN	01/01/90	15.00%	6.70%	12.00%	\$140
IA	04/01/90	15.00%	6.70%	12.00%	\$140
KS	05/01/90	15.00%	6.70%	12.00%	\$140
LA	02/01/89	15.00%	7.50%	12.50%	\$120
ME	04/17/90	14.00%	7.50%	9.80%	\$90
MA	01/01/89	15.00%	5.30%	11.00%	\$150
MI	01/01/90	15.00%	6.10%	12.00%	\$85
MS	06/01/90	15.00%	6.70%	12.00%	\$140
MO	09/01/90	15.00%	6.80%	12.00%	\$125
MT	07/01/90	15.00%	6.70%	12.00%	\$140
NE	10/01/90	15.00%	6.70%	12.00%	\$140
NH	07/01/90	15.00%	7.10%	12.00%	\$85
NJ	01/01/90	15.00%	5.06%	12.00%	\$60
NM	06/01/89	10.00%	5.00%	11.90%	\$120
NC	01/01/90	15.00%	6.70%	12.00%	\$140
OK	07/01/89	15.00%	7.50%	12.00%	\$120
OR	01/01/90	15.00%	6.70%	12.00%	\$140
PA	01/01/90	13.00%	5.70%	11.50%	\$120
RI	06/22/89	15.00%	6.90%	9.70%	\$100
SC	07/01/90	13.18%	6.00%	10.91%	\$140
SD	06/01/90	15.00%	6.70%	12.00%	\$140
TN	01/01/90	15.00%	6.70%	12.00%	\$140
TX	01/01/90	15.00%	5.02%	10.80%	\$85
UT	01/01/90	15.00%	6.70%	12.00%	\$140
VT	07/01/90	15.00%	6.70%	12.00%	\$140
VA	11/01/88	15.00%	5.90%	9.90%	\$120
WI	07/01/90	15.00%	6.70%	12.00%	\$140

GENERAL EXPENSE INDICATION
FOR STOCK COMPANIES

	1984	1985	1986	1987	1988	1989+
(1) Net Earned Premium (STD Basis) including Expense Constant Revenue*	13,073,981	14,311,170	15,484,013	17,552,847	20,498,049	21,938,253
(2) Expense Constant Offset**	0.985	0.985	0.985	0.985	0.985	0.985
(3) Standard Earned Premium excluding Expense Constant Revenue (1) * (2)	12,877,871	14,096,502	15,251,753	17,289,554	20,190,578	21,609,179
(4) Reported General Expenses	852,181	766,010	795,797	887,031	1,010,897	965,614
(5) Estimated Revenue generated by Expense Constant for General Expense ((1)-(3))*0.595	116,685	127,727	138,195	156,659	182,945	195,799
(6) Reported General Expense excluding Expense Constant Revenue (4) - (5)	735,496	638,283	657,602	730,372	827,952	769,815
(7) Adjustment for Allocation of Servicing Carrier Allowance	-0.06%	0.21%	0.15%	0.19%	0.08%	0.50%
(8) Average Discount for General Expense underlying Premium Discount Plan	2.69%	2.69%	2.69%	2.69%	2.69%	2.69%
(9) Provision for General Expense combined with a \$140 Expense Constant: ((6)/(3))+ (7)+(8)	8.34%	7.43%	7.15%	7.10%	6.87%	6.75%
(10) Three Year Average						6.91%
(11) Six Year Average						7.27%

* Preliminary

* Premium adjusted for schedule rating and carrier deviations.

** Expense Constant Offset based on \$140 Expense Constant projected to 1/1/92

Source: Insurance Expense Exhibit

NCCI Prepared

CALCULATION OF STANDARD EARNED PREMIUM
(\$000's)

For Stock Companies

Calendar Year 1988

1) Net Earned Premium (Line 1, Part III IEE)	\$ 18,813,074
2) Adjustment for Retrospective Rating (Part III IEE)	9,427
3) Adjustment for Expense Graduation (Line 12, Part III IEE)	1,066,808
4) Effect of Schedule Rating (NCCI Calculation)	.007
5) Effect of Carrier Deviations (NCCI Calculation)	.023
6) Standard Earned Premium Excluding War Projects $((1)+(2)+(3)) \times (1+(4)+(5))$	20,485,988
7) Net Earned Premium War Projects (Line 4, Part III IEE)	12,061
8) Net Earned Premium (Standard Basis) (6)+(7)	20,498,049

M&R Prepared

✓
Portion of Expense Constant Allocated to General Expense
FOR STOCK COMPANIES

1. Portion of expense constant for general expenses (1982 Special Call for Expenses by Size of Risk)	\$62.63
2. Portion of expense constant for other acquisition (1982 Special Call for Expenses by Size of Risk)	\$35.49
3. Total expense constant (1) + (2)	\$98.12
4. Profit and contingency	2.50%
5. Countrywide weighted average Premium Taxes (Including premium based Miscellaneous Taxes)	4.24%
6. Factor to adjust expense constant for profit & taxes 1 - (4) - (5)	0.9326
7. Expense Constant reflecting profit and taxes (3)/(6)	\$105.21
8. Factor to estimate revenue generated by expense constant for general expense (1)/(7)	0.595

1990 ANNUAL EXPENSE REVIEW

Calculation of Average Discount for General Expenses
Underlying Premium Discount Plan

FOR STOCK COMPANIES

Midpoint of Data	Premium Discount	Regression Output:	
		Constant	-0.028269795
01-Nov-83	0.0219	Std Err of Y Est	0.0002770983
01-Nov-84	0.0229	R Squared	0.9398566549
01-Nov-85	0.0233	No. of Observations	5
01-Nov-86	0.0235	Degrees of Freedom	3
01-Nov-87	0.0246		
		X Coefficient(s)	0.000001642
Projected 01-Jan-92	0.0269	Std Err of Coef.	0.000000239

ASSUMPTIONS:

- (1) Average policy effective date for policies written in 1991 is 1/1/92.
- (2) Data source for discounts is Premium by Size of Policy Call.
Carriers have optional reporting periods: 1/1/87 - 12/31/87
or 7/1/87 - 6/30/88

A survey of the top 10 carriers reporting this Call (representing 58% of premium) revealed that 64.9% of premium was based on a 7/1/87 - 6/30/88 reporting period. A weighted average of the above midpoints (7/1/87 and 1/1/88, respectively) yielded an average midpoint of approximately 11/1/87. The distribution was assumed to be the same for prior years.

1990 ANNUAL EXPENSE REVIEW

INCURRED LOSS AND LOSS ADJUSTMENT EXPENSE
FOR STOCK AND MUTUAL COMPANIES COMBINED
DIRECT (PRIOR TO REINSURANCE)

(Numbers in thousands)

	1987	1988	1989+
	<hr/>	<hr/>	<hr/>
(1) Direct Losses Incurred	-20,355,399	22,665,528	25,179,638
(2) Direct Loss Adjustment Expense Incurred	2,460,015	2,648,654	2,949,326
(3) Average Provision for Loss Adjustment = (2)/(1)	12.09%	11.69%	11.71%
(4) Three Year Unweighted Average			11.83%

+ Preliminary

Source: Compilations of the Insurance Expense Exhibit

1990 ANNUAL EXPENSE REVIEW

INCURRED LOSS AND LOSS ADJUSTMENT EXPENSE
FOR STOCK AND MUTUAL COMPANIES COMBINED
NET (AFTER REINSURANCE)

	1987	1988	1989*
(1) Net Losses Incurred	18,324,178	20,509,988	21,670,126
(2) Net Loss Adjustment Expense Incurred	2,424,156	2,669,918	2,980,346
(3) Adjustment for allocation of reinsurance pool servicing carrier allowance	0.20%	0.31%	0.34%
(4) Average Provision for Loss Adjustment Expense = (2)/(1)+(3)	13.43%	13.33%	14.09%
(5) Three Year Unweighted Average			13.62%

* Preliminary

1990 ANNUAL EXPENSE REVIEW

Loss Adjustment Expense Indications and Averages
 Stock and Mutual Companies
 1964 - 1989

Year	Net LAE	Three Year Average	Six Year Average	Direct LAE	Three Year Average	Six Year Average
1989+	14.09%	13.62%	12.77%	11.71%	11.83%	11.40%
1988	13.33%	12.91%	12.58%	11.69%	11.73%	11.47%
1987	13.43%	12.37%	12.70%	12.09%	11.33%	11.65%
1986	11.97%	11.91%	12.64%	11.42%	10.96%	
1985	11.72%	12.24%	12.71%	10.49%	11.21%	
1984	12.05%	13.02%	12.95%	10.98%	11.97%	
1983	12.96%	13.36%	12.92%	12.15%		
1982	14.06%	13.18%	12.68%	12.78%		
1981	13.05%	12.87%	12.12%			
1980	12.44%	12.48%	11.80%			
1979	13.11%	12.17%	11.75%			
1978	11.90%	11.38%	11.62%			
1977	11.50%	11.12%	11.74%			
1976	10.73%	11.32%	11.92%			
1975	11.13%	11.86%	12.34%			
1974	12.11%	12.35%	12.69%			
1973	12.34%	12.51%	12.84%			
1972	12.61%	12.82%	13.01%			
1971	12.58%	13.03%	13.15%			
1970	13.28%	13.17%	13.37%			
1969	13.22%	13.20%	13.51%			
1968	13.01%	13.27%				
1967	13.37%	13.58%				
1966	13.43%	13.82%				
1965	13.93%					
1964	14.10%					

CALL FOR LOSS ADJUSTMENT EXPENSES
COUNTRYWIDE DIRECT WORKERS COMPENSATION BUSINESS AS OF 12/31/89

EXHIBIT 11

SUMMARY FOR ALL CARRIERS

ACC. YEAR	LOSSES			LOSS ADJUSTMENT EXPENSES			TOTAL			TOTAL			LAE AS % OF LOSSES		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)		
	PAID	OUTSTANDING	ALLOCATED PAID	ALLOCATED OUTSTANDING	UNALLOCATED PAID	UNALLOCATED OUTSTANDING	TOTAL PAID	TOTAL OUTSTANDING	Paid Alloc.	Paid Total	Inc. Total	Paid* Alloc.	Paid* Devel.		
1980	6,215,179,901	785,452,041	276,887,950	37,497,229	458,165,480	19,912,570	735,053,430	57,409,799	4.5	11.8	11.3	4.5	11.6		
1981	6,705,898,781	892,005,523	286,127,118	58,786,700	518,673,124	23,265,876	804,800,242	82,052,576	4.3	12.0	11.7	4.3	12.1		
1982	7,364,724,951	1,264,354,901	348,591,988	64,190,875	543,454,236	35,183,154	892,046,224	99,374,029	4.7	12.1	17.5	4.8	12.2		
1983	8,036,268,296	1,332,301,759	377,262,645	77,002,971	567,174,973	38,876,083	944,437,618	115,879,054	4.7	11.8	11.3	4.9	11.9		
1984	10,502,898,218	2,196,311,988	509,787,554	140,411,516	709,805,775	64,543,199	1,219,593,329	204,954,715	4.9	11.6	11.2	5.2	11.5		
1985	11,324,248,019	3,041,122,556	559,660,333	210,681,603	810,081,091	98,977,878	1,369,741,424	309,659,481	4.9	12.1	11.7	5.5	12.3		
1986	12,501,922,096	4,703,102,507	654,124,977	330,916,055	906,523,314	153,915,685	1,560,648,291	484,831,740	5.2	12.5	11.9	6.2	12.6		
1987	12,392,776,427	6,798,485,933	612,782,581	448,498,830	971,822,378	231,168,509	1,584,604,959	679,667,339	4.9	12.8	11.8	6.6	13.2		
1988	11,589,297,291	10,897,156,821	446,550,403	808,329,905	1,039,415,795	412,052,202	1,485,966,198	1,220,382,107	3.9	12.8	12.0	6.5	12.7		
1989	5,921,827,863	18,079,627,496	118,344,374	1,270,671,732	894,538,844	811,731,699	1,012,883,218	2,082,403,431	2.0	17.1	12.9	4.5	12.3		

* The ratio in column (12) is the ratio from column (9) developed to an ultimate report.

* The ratio in column (13) is the ratio from column (10) developed to an ultimate report.

NCCI Prepared

NCCI EXPENSE PROVISION ANALYSIS

 General Expense Indication
 FOR STOCK COMPANIES
 Basis: Direct Earned Premium

	Calendar Year			
	1986	1987	1988	1989
	-----	-----	-----	-----
(1) Adjusted Direct Earned Premium (Std Basis) including Expense Constant Revenue*	17,545,256	19,684,139	21,985,469	24,889,611
(2) Expense Constant Offset**	0.985	0.985	0.985	0.985
(3) Standard Earned Premium excluding Expense Constant Revenue (1) * (2)	17,282,077	19,388,877	21,655,687	24,516,267
(4) Reported General Expenses	795,797	887,031	1,010,897	993,480
(5) Estimated Revenue generated by Expense Constant for General Expense ((1)-(3))*0.595	156,592	175,681	196,220	222,140
(6) Reported General Expenses excluding Expense Constant Revenue (4) - (5)	639,205	711,350	814,677	771,340
(7) Adjustment for Allocation of Servicing Carrier Allowance	0.15%	0.19%	0.08%	0.50%
(8) Average Discount for General Expense underlying Premium Discount Plan	2.69%	2.69%	2.69%	2.69%
(9) Provision for General Expense combined with a \$140 Expense Constant: ((6)/(3))+ (7)+(8)	6.54%	6.55%	6.54%	6.34%
(10) Three Year Average				6.48%

* Premium adjusted for schedule rating and carrier deviations.

** Expense Constant Offset based on \$140 Expense Constant projected to 1/1/92.

Source: Insurance Expense Exhibit

M&R Prepared

Exhibit 13

MCCI EXPENSE PROVISION ANALYSIS

Appropriate Index to Trend Expense Constant

Year	MCCI INDEX *	CPS Avg Weekly Wage **	CPS Avg Weekly Wage †
1982	195.0		
1983	202.4	313	
1984	210.1		
1985	218.0	343	335.68
1986	226.2		347.53
1987	234.8	373	360.63
1988	243.7	385	373.80
1989	252.9		387.72
Implicit Trend	3.8X	4.3X	2.80X

- * Source: U.S. Bureau of Labor Statistics (Monthly Labor Review) Indices provided by the MCCI.
- ** Source: U.S. Bureau of Labor Statistics Based on Current Population Survey. In current dollars of usual weekly earnings for all workers.
- † 1990 Annual Expense Review

NCCI EXPENSE PROVISION ANALYSIS

General Expense Provision at Current Rate Level Trended to 1991
Restated to a First \$5,000 Basis
Stock Companies Only
Model II - Net

Calendar Year	(1) Statewide Premium Level Changes	(2) Cumulative Statewide Premium Level Changes	Portion of column (2) earned in:				Selected	
			1984	1985	1986	1987		1988	1989
1982	Base	1.000						
1983	1.001	1.001	0.056					
1984	1.019	1.020	0.722					
1985	1.131	1.154	0.222	0.056				
1986	1.099	1.268	0.222	0.722	0.056			0.056
1987	1.102	1.397		0.222	0.722			0.722
1988	1.108	1.548			0.222			0.222
1989	1.098	1.700						
1990	1.120	1.904						
Average Earned Rate Level Index			1.005	1.049	1.172	1.290	1.424	1.573
(1) Factor to 1991 Rate Level +			1.966	1.884	1.687	1.532	1.388	1.256
(2) Net Earned Premium (STD Basis)			12,877,871	14,096,502	15,251,753	17,289,554	20,190,578	22,017,558
(3) Net Earned Premium at 1991 Rate Level (STD Basis)			25,316,974	26,563,532	25,724,606	26,480,078	28,028,034	27,652,741
(4) General Expenses *			735,496	638,283	657,602	730,372	827,952	793,981
(5) Factor to obtain General Expense Level to 1991			1.000	1.000	1.000	1.000	1.000	1.000
(6) Trended General Expenses at 1991 Level			735,496	638,283	657,602	730,372	827,952	793,981
(7) General Expense Provision Restated to 1991 at 1991 Rate Level			2.91%	2.40%	2.56%	2.76%	2.95%	2.87%
(8) Effect of Premium Discount			2.69%	2.69%	2.69%	2.69%	2.69%	2.69%
(9) Servicing Carrier Allowance			-0.06%	0.21%	0.15%	0.19%	0.08%	0.50%
(10) General Expense Provision re-stated to a first \$5,000 basis at 1991 rate level			5.54%	5.30%	5.40%	5.64%	5.72%	6.06%

+ 1991 rate level projected using NCCI Index
* includes Expense Constant Revenue

MCCI EXPENSE PROVISION ANALYSIS

General Expense Provision at Current Rate Level Trended to 1991
 Restated to a First \$5,000 Basis
 Stock Companies Only
 Model II - Direct

Calendar Year	(1) Statewide Premium Level Changes	(2) Cumulative Statewide Premium Level Changes	Portion of column (2) earned in:				Selected	
			1984	1985	1986	1987		1988	1989
1982	Base	1.000	0.056					
1983	1.001	1.001	0.722					
1984	1.019	1.020	0.056					
1985	1.131	1.154	0.722	0.056				
1986	1.099	1.268	0.222	0.722	0.056			0.056
1987	1.102	1.397		0.222	0.722			0.722
1988	1.108	1.548						0.222
1989	1.098	1.700						0.222
1990	1.120	1.904						
Average Earned Rate Level Index			1.005	1.049	1.172	1.290	1.424	1.573
(1)	Factor to 1991 Rate Level +		1.966	1.884	1.687	1.532	1.388	1.256
(2)	Direct Earned Premium ++ (STD Basis)				17,545,256	19,684,139	21,985,469	24,889,611
(3)	Direct Earned Premium at 1991 Rate Level (STD Basis)				29,592,978	30,147,540	30,519,655	31,259,868
(4)	General Expenses *		657,602	730,372	827,952	793,981		
(5)	Factor to obtain General Expense Level to 1991		1.000	1.000	1.000	1.000	1.000	1.000
(6)	Trended General Expenses at 1991 Level		657,602	730,372	827,952	793,981		
(7)	General Expense Provision Restated to 1991 at 1991 Rate Level		2.22%	2.62%	2.71%	2.54%		
(8)	Effect of Premium Discount		0.15%	0.19%	0.08%	0.69%		
(9)	Servicing Carrier Allowance							
(10)	General Expense Provision re- stated to a first \$5,000 basis at 1991 rate level		5.06%	5.30%	5.48%	5.73%		6.34%

+ 1991 rate level projected using MCCI Index
 ++ Direct Earned Premium is estimated based on the Relationship between Net Standard Earned Premium and Net Earned Premium
 * Excludes Expense Constant Revenue

EXHIBIT 16

NCCI EXPENSE PROVISION ANALYSIS

 General Expense Indication Calculated by Massachusetts's Method
 (000 excluded)
 FOR STOCK COMPANIES

	Calendar Year	
	1987	1988
	-----	-----
(1) Net Standard Earned Premium including Expense Constant Revenue	17,552,847	20,498,049
(2) Expense Constant Offset	0.985	0.985
(3) Standard Earned Premium exclusive of Expense Constant Revenue; (1) x (2)	17,289,554	20,190,578
(4) General Expense Percentage	0.0505	0.0493
(5) General Expenses; (4) x (1)	887,031	1,010,897
(6) General Expense Portion of Expense Constant	0.595	0.595
(7) Estimated Revenue General Expenses Generated by Expense Constant [(1) - (3)] x (6)	156,659	182,945
(8) General Expenses exclusive of Expense Constant Revenue; (5) - (7)	730,372	827,952
(9) Percentage General Expense exclusive of Expense Constant; (8)/(3)	4.22%	4.10%
		3.61%

MCCI EXPENSE PROVISION ANALYSIS

General Expense Indication Calculated by Massachusetts' Method
(000 excluded)
FOR STOCK COMPANIES

	Calendar Year	
	1987	1988
(1) Net Standard Earned Premium excluding Expense Constant Revenue	17,289,554	20,190,578
(2) Adjusted Average X for General Expense Collectible	4.22X	4.10X
(3) Estimated General Expense; (1) x (2)	730,372	827,952
(4) General Expense Trend Factor to Policy Year 1991 *	1.183	1.139
(5) Exposure Growth Index	1.114	1.089
(6) General Expenses for Policy effective Period; (3) x (4) x (5)	962,315	1,027,363
(7) Three Year Average General Expenses:	971,762	925,610

* Trended by MCCI Index of 3.8X

MCCI EXPENSE PROVISION ANALYSIS

General Expense Provision at Current Rate Level Trended to 1991
 Restated to a First \$5,000 Basis
 Stock Companies Only
 Model III - Net

Calendar Year	(1) Statewide Premium Level Changes	(2) Cumulative Statewide Premium Level Changes	Portion of column (2) earned in:					
			1984	1985	1986	1987		
1982		Base 1.000						
1983	1.001	1.001	0.056					
1984	1.019	1.020	0.722					
1985	1.131	1.154	0.056	0.056				
1986	1.099	1.268	0.722	0.722	0.056			
1987	1.102	1.397	0.222	0.722	0.722	0.056		
1988	1.108	1.548				0.722		
1989	1.098	1.700				0.222		
1990	1.120	1.904				0.222		
Average Earned Rate Level Index			1.005	1.049	1.172	1.290	1.424	1.573

(1) Factor to 1991 Rate Level +	1.966	1.884	1.687	1.532	1.388	1.256
(2) Payroll Trend Factor to 1/1/92						
(3) Net Earned Premium (STD Basis)					20,190,578	31,936,210
(4) Rate Level (STD Basis)						
(5) Fixed Expenses (Net of Premium Discount) *					971,762	
(6) General Expense Provision Restated to 1991 at 1991 Rate Level						
(7) Effect of Premium Discount					3.04%	
(8) Servicing Carrier Allowance					2.69%	
(9) General Expense Provision re-stated to a first \$5,000 basis at 1991 rate level					0.08%	
						5.81%

* 1991 rate level projected using MCCI Index
 * Calculated by method used in Workers' Compensation Insurance Filing of the Workers' Compensation Rating and Inspection Bureau of Massachusetts

MCCI EXPENSE PROVISION ANALYSIS

General Expense Provision at Current Rate Level Trended to 1991
 Restated to a First \$5,000 Basis
 Stock Companies Only
 Model III - Direct

Calendar Year	(1) Statewide Premium Level Changes	(2) Cumulative Statewide Premium Level Changes	Portion of column (2) earned in:					
			1984	1985	1986	1987	1988	1989
1982	Base	1.000	0.056					
1983	1.001	1.001	0.722	0.056				
1984	1.019	1.020	0.222	0.722	0.056			
1985	1.131	1.154		0.222	0.722	0.056		
1986	1.099	1.268			0.222	0.722	0.056	
1987	1.102	1.397				0.722	0.722	0.056
1988	1.108	1.548					0.222	0.722
1989	1.098	1.700						0.222
1990	1.120	1.904						
Average Earned Rate Level Index			1.005	1.049	1.172	1.290	1.424	1.573
(1)	Factor to 1991 Rate Level +		1.966	1.884	1.687	1.532	1.388	1.256
(2)	Payroll Trend Factor to 1/1/92						1.139	
(3)	Direct Earned Premium ++ (STD Basis)						21,985,469	
(4)	Direct Earned Premium at 1991 Rate Level (STD Basis)						34,761,887	
(5)	Fixed Expenses (Net of Premium Discount) *						971,762	
(6)	General Expense Provision Restated to 1991 at 1991 Rate Level						2.80%	
(7)	Effect of Premium Discount						2.69%	
(8)	Servicing Carrier Allowance						0.08%	
(9)	General Expense Provision re- stated to a first \$5,000 basis at 1991 rate level						5.57%	

+ 1991 rate level projected using MCCI Index
 ++ Direct Earned Premium is estimated based on the Relationship between Net Standard Earned Premium and Net Earned Premium
 * Calculated by method used in Workers' Compensation Insurance Filing of the Worker's Compensation Rating Inspection Bureau of Massachusetts

EXHIBIT 20

MCCI EXPENSE PROVISION ANALYSIS

Ratio of General Expense to Net Earned Premium
Comparison of Actual vs. Recommended
STOCK COMPANIES (Includes Participating & Non-Participating)

Year	General Expense Ratio
1971	6.3%
1972	6.5%
1973	6.4%
1974	6.4%
1975	6.2%
1976	5.6%
1977	5.5%
1978	5.7%
1979	6.1%
1980	6.0%
1981	6.8%
1982	7.7%
1983	8.0%
1984	7.4%
1985	6.1%
1986	5.7%
1987	5.5%
1988	5.4%
1989	4.9%

2

MCCI EXPENSE PROVISION ANALYSIS

General Expense Provision at Current Rate Level Trended to 1991
Restated to a First \$5,000 Basis
Model I - Net

	Calendar Year						
	1984	1985	1986	1987	1988	1989	Average
Stock Companies Only							
(1) General Expense Provision Restated to 1991 at 1991 Rate Level	3.77%	3.01%	3.08%	3.20%	3.30%	3.09%	3.24%
(2) Effect of Premium Discount +	2.69%	2.69%	2.69%	2.69%	2.69%	2.69%	2.69%
(3) Servicing Carrier Allowance ++	-0.06%	0.21%	0.15%	0.19%	0.08%	0.50%	0.18%
(4) General Expense Provision re-stated to a first \$5,000 basis at 1991 rate level	6.40%	5.91%	5.92%	6.08%	6.07%	6.28%	6.11%

	Calendar Year						
	1984	1985	1986	1987	1988	1989	Average
Mutual Companies Only							
(1) General Expense Provision Restated to 1991 at 1991 Rate Level	3.27%	2.85%	2.85%	2.41%	2.77%	3.13%	2.88%
(2) Effect of Premium Discount +	3.07%	3.07%	3.07%	3.07%	3.07%	3.07%	3.07%
(3) Servicing Carrier Allowance ++	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%
(4) General Expense Provision re-stated to a first \$5,000 basis at 1991 rate level	6.34%	5.92%	5.93%	5.48%	5.84%	6.20%	5.95%

	Calendar Year						
	1984	1985	1986	1987	1988	1989	Average
Stock and Mutual Combined							
(1) General Expense Provision Restated to 1991 at 1991 Rate Level	3.66%	2.97%	3.02%	2.97%	3.18%	3.10%	3.15%
(2) Effect of Premium Discount +	2.78%	2.78%	2.78%	2.78%	2.78%	2.78%	2.78%
(3) Servicing Carrier Allowance ++	-0.05%	0.16%	0.11%	0.14%	0.06%	0.38%	0.13%
(4) General Expense Provision re-stated to a first \$5,000 basis at 1991 rate level	6.39%	5.90%	5.91%	5.89%	6.02%	6.26%	6.06%

+ Based on 1989 distribution of Stock and Mutual Premium
++ Based on distribution of Stock and Mutual Premium

MCCI EXPENSE PROVISION ANALYSIS

General Expense Provision at Current Rate Level Trended to 1991
Restated to a First \$5,000 Basis
Model 1 - Direct

	Calendar Year			Average
	1986	1987	1988		1989
Stock Companies Only				
(1) General Expense Provision Restated to 1991 at 1991 Rate Level	2.68X	2.81X	3.03X	2.74X
(2) Effect of Premium Discount +	2.69X	2.69X	2.69X	2.69X
(3) Servicing Carrier Allowance ++	0.15X	0.19X	0.08X	0.50X
(4) General Expense Provision re-stated to a first \$5,000 basis at 1991 rate level	5.52X	5.69X	5.80X	5.93X

	Calendar Year			Average
	1986	1987	1988		1989
Mutual Companies Only				
(1) General Expense Provision Restated to 1991 at 1991 Rate Level	2.63X	2.32X	2.44X	2.66X
(2) Effect of Premium Discount +	3.07X	3.07X	3.07X	3.07X
(3) Servicing Carrier Allowance ++	0.01X	0.00X	0.00X	0.00X
(4) General Expense Provision re-stated to a first \$5,000 basis at 1991 rate level	5.71X	5.39X	5.51X	5.73X

	Calendar Year			Average
	1986	1987	1988		1989
Stock and Mutual Combined				
(1) General Expense Provision Restated to 1991 at 1991 Rate Level	2.66X	2.68X	2.89X	2.72X
(2) Effect of Premium Discount +	2.78X	2.78X	2.78X	2.78X
(3) Servicing Carrier Allowance ++	0.11X	0.14X	0.06X	0.38X
(4) General Expense Provision re-stated to a first \$5,000 basis at 1991 rate level	5.56X	5.60X	5.73X	5.88X

+ Based on 1989 distribution of Stock and Mutual Premium
++ Based on distribution of Stock and Mutual Premium

NCCI EXPENSE PROVISION ANALYSIS

 Ratio of LAE to Loss by Year
 Stock and Mutual Companies

Accident Year	Direct Basis	
	NCCI Estimate	Estimate Based on Companies' Ultimates
1980	11.8%	11.3%
1981	12.1%	11.7%
1982	12.2%	11.5%
1983	11.9%	11.3%
1984	11.8%	11.2%
1985	12.3%	11.7%
1986	12.8%	11.9%
1987	13.2%	11.8%
1988	12.7%	12.0%
1989	12.3%	12.9%
Weighted Average	12.4%	11.9%

* Based on call.

Definition of Allocated Loss Adjustment Expenses
Composed by Joint Actuarial/Claims Committees
As of July 31, 1991

Allocated Loss Adjustment Expenses encompass the following costs of a carrier which can be directly allocated to a particular claim:

- (1) Fees of attorneys or authorized representatives where permitted for legal services, whether by outside counsel or staff representative.
- (2) Court, Alternate Dispute Resolution and other specific items of expense such as:
 - Medical examinations of a claimant to determine the extent of the carrier's liability, degree of permanency or length of disability;
 - Expert medical or other testimony;
 - Autopsy;
 - Witnesses and summonses;
 - Copies of documents such as birth and death certificates, medical treatment records;
 - Impartial examinations ordered by Industrial Board;
 - Arbitration fees;
 - Surveillance;
 - Appeal bond costs and appeal filing fees.
- (3) Medical cost containment expenses incurred, whether by an outside vendor or done internally by an employee for the purpose of controlling medical losses, to ensure that only reasonable and necessary costs of services are paid. The expenses include:

- Bill auditing expenses for any medical or vocational services rendered, including hospital bills (inpatient or outpatient), nursing home bills, physician bills, chiropractic bills, medical equipment charges, pharmacy charges, physical therapy bills, medical or vocational rehabilitation vendor bills.
- Hospital and other Treatment Utilization Reviews, including pre-certification/pre-admission, concurrent or retrospective reviews.
- Preferred Provider Organization expenses.
- Medical Fee Review Panel expenses.

(4) Vocational Rehabilitation Evaluation Expense.

(Note: vocational rehabilitation education expenses and income maintenance shall be reported as part of the loss. Actuarial Committee will consider further.)

The following shall not be included as allocated loss adjustment expense:

- (1) Salaries, overhead and traveling expenses of carrier employees, except for employees while doing activities previously listed as allocated expenses.
- (2) Fees paid to independent claims professionals or attorneys, for developing and investigating a claim so that a determination can be made of the cause, extent or responsibility for the injury or disease, including evaluation and settlement of covered claims.
- (3) Expenses which are defined as either an indemnity or medical loss.

Distribution of LAE by Carrier

	Number of carriers that classify expenses as	
	ALAE	ULAE
(1) Attorneys Fees for Legal Services		
(a) Staff Counsel	11	6
(b) Outside Counsel	14	2
(2) Court Expenses		
(a) Medical Exams	12	2
(b) Expert Testimony	15	2
(c) Autopsy	14	2
(d) Witness & Summonses	15	2
(e) Copies of Documents	14	3
(f) Impartial Examinations	12	4
(g) Arbitration Fees	15	2
(h) Surveillance	14	3
(i) Appeal Expense	13	4
(3) Medical Cost Containment		
(a) Bill Auditing	9	5
(b) Hospital Utilization Review	8	4
(c) PPO Expenses	8	3
(d) Medical Fee Review	11	3
(4) Vocational Rehab Evaluation Expense		
(a) Carrier	7	4
(b) Outside Services	6	2

NCCI EXPENSE PROVISION ANALYSIS

 Cost of collecting ALAE By Claim

Company Size/Group	1989		Estimated Cost	Cost Related To Premium
	Direct Written W.C. Premium			
Small				
A	1,091,000		0	0.0000X
B	8,699,000		71,000	0.8162X
C	18,065,000		0	0.0000X
D	786,000		70,000	8.9059X
E *	417,000		600	0.1439X
Total Small	29,058,000		141,600	0.4873X
Medium				
A	21,206,000		6,000	0.0283X
B	70,928,000		55,000	0.0775X
C	132,100,000		300,300	0.2273X
D	179,937,000		6,000	0.0033X
E	184,374,000		81,000	0.0439X
F	98,905,000		18,000	0.0182X
G	162,356,000		77,000	0.0474X
H	33,790,000		385,000	1.1394X
I	126,801,000		195,000	0.1538X
J	25,152,000		3,300	0.0131X
K **	28,864,000		8,000	0.0277X
Total Medium	1,064,413,000		1,134,600	0.1066X
Large				
A	530,645,000		25,480	0.0048X
B	1,686,339,000		319,000	0.0189X
C	1,108,200,000		265,000	0.0239X
D	879,646,000		63,000	0.0072X
E	789,651,000		1,000,000	0.1266X
Total Large	4,994,481,000		1,672,480	0.0335X
Grand Total	6,087,952,000		2,948,680	0.0484X

* If 1989 Direct Written Premium unavailable, 1988 Direct Written Premium was used.
 ** When Direct Written Premium unavailable for all years, 1989 Net Earned Premium was used.

NCCI EXPENSE PROVISION ANALYSIS

Trend in ALAE based on Special Call *
All Carriers Combined

Accident Year	Direct Ultimate Loss (000's)	Direct Ultimate ALAE (000's)	ALAE to Loss
1980	7,000,632	314,385	4.5%
1981	7,597,904	344,914	4.5%
1982	8,629,080	412,783	4.8%
1983	9,368,570	454,266	4.8%
1984	12,699,210	650,199	5.1%
1985	14,365,371	770,342	5.4%
1986	17,205,025	985,041	5.7%
1987	19,191,262	1,061,281	5.5%
1988	22,486,454	1,254,880	5.6%
1989	24,001,455	1,389,016	5.8%
1991 +			6.2%

* Trended forward from 1989 using exponential curvefit based on 1985 through 1989
* Based on Call for Loss Adjustment Expenses as of 12/31/89

NCCI EXPENSE PROVISION ANALYSIS

1990 Statewide Premium Level Changes

Size of Premium Change	Number of States	% of Premium Used for Weights	Amount of Change				Overall
			Experience	Benefit	Misc. *		
-17.5% and greater	0	0.0%	0.0	0.0	0	0.0	
-12.5% to -17.4%	0	0.0%	0.0	0.0	0	0.0	
-7.5% to -12.4%	1	2.7%	-9.7	1.4	0	-8.4	
-2.5% to -7.4%	2	1.2%	-1.3	-1.0	-1.8	-4.0	
-.1% to -2.4%	1	3.9%	-1.1	1.7	-0.8	-0.2	
No Change	4	5.2%	0.0	0.0	0	0.0	
+ .1% to +2.4%	1	1.3%	1.7	0.0	0	1.7	
+2.5% to +7.4%	9	20.7%	17.5	-9.3	-2.8	3.6	
+7.5% to +12.4%	9	25.8%	16.2	1.8	-7.3	9.6	
+12.5% to +17.4%	6	8.6%	23.8	0.4	-8	14.4	
+17.5% and greater	5	30.7%	24.7	-0.8	1.4	25.4	
Average or Total	38	100.0%	17.1	-1.6	-2.8	12.0	

Miscellaneous changes include changes in expense, tax, assessment, and profit & contingency provisions as well as any commissioner's decisions to limit change.

EXHIBIT 28

NCCI EXPENSE PROVISION ANALYSIS

1989 Statewide Premium Level Changes

Size of Premium Change	Number of States	% of Premium Used for Weights	Amount of Change			
			Experience	Benefit	Misc. *	Overall
-17.5% and greater	0	0.0%	0.0	0.0	0	0.0
-12.5% to -17.4%	0	0.0%	0.0	0.0	0	0.0
-7.5% to -12.4%	0	0.0%	0.0	0.0	0	0.0
-2.5% to -7.4%	4	9.2%	-6.0	1.0	-0.5	-5.5
-.1% to -2.4%	0	0.0%	0.0	0.0	0	0.0
No Change	10	18.2%	0.0	0.0	0	0.0
+.1% to +2.4%	2	2.6%	11.7	0.0	-8.8	1.9
+2.5% to +7.4%	6	20.1%	11.0	0.4	-5.4	5.4
+7.5% to +12.4%	5	12.7%	14.2	0.8	-4.5	9.9
+12.5% to +17.4%	7	7.3%	22.6	1.4	-7.6	14.9
+17.5% and greater	4	30.0%	29.1	-1.1	-3.9	22.7
Average or Total	38	100.0%	14.1	0.1	-3.9	9.8

* Miscellaneous changes include changes in expense, tax, assessment, and profit & contingency provisions as well as any commissioner's decisions to limit change.

EXHIBIT 22

NCCI EXPENSE PROVISION ANALYSIS

1988 Statewide Premium Level Changes

Size of Premium Change	Number of States	% of Premium Used for Weights	Amount of Change			Overall
			Experience	Benefit	Misc. *	
-17.5% and greater	0	0.0%	0.0	0.0	0.0	0.0
-12.5% to -17.4%	0	0.0%	0.0	0.0	0.0	0.0
-7.5% to -12.4%	1	5.7%	-5.4	0.2	-2.4	-7.5
-2.5% to -7.4%	3	4.9%	-5.7	3.0	-1.2	-4.0
-.1% to -2.4%	0	0.0%	0.0	0.0	0.0	0.0
No Change	6	12.9%	1.3	-0.2	-1.0	0.0
+.1% to +2.4%	1	2.8%	0.0	2.3	0.0	2.3
+2.5% to +7.4%	6	14.2%	5.3	1.6	-1.1	5.8
+7.5% to +12.4%	6	15.6%	19.3	0.5	-9.3	8.8
+12.5% to +17.4%	5	12.9%	14.9	0.6	-1.4	14.0
+17.5% and greater	10	31.1%	34.6	-0.7	-7.5	23.7
Average or Total	38	100.0%	16.0	0.4	-4.9	10.8

* Miscellaneous changes include changes in expense, tax, assessment, and profit & contingency provisions as well as any commissioner's decisions to limit change.

EXHIBIT 30

MCCI EXPENSE PROVISION ANALYSIS

 1987 Statewide Premium Level Changes

Size of Premium Change	Number of States	% of Premium Used for Weights	Amount of Change			Overall
			Experience	Benefit	Misc. *	
-17.5% and greater	1	1.5%	-17.1	2.2	-4.3	-18.9
-12.5% to -17.4%	0	0.0%	0.0	0.0	0.0	0.0
-7.5% to -12.4%	2	3.8%	-4.3	-0.6	-4.5	-9.2
-2.5% to -7.4%	0	0.0%	0.0	0.0	0.0	0.0
-.1% to -2.4%	1	0.8%	2.5	0.0	-2.9	-0.5
No Change	6	11.0%	2.7	0.2	-2.8	0.0
+.1% to +2.4%	1	1.5%	0.0	0.0	0.2	0.2
+2.5% to +7.4%	7	20.6%	4.6	-0.7	0.0	3.9
+7.5% to +12.4%	8	16.8%	9.1	0.5	1.0	10.7
+12.5% to +17.4%	6	13.8%	17.2	2.5	-4.5	14.7
+17.5% and greater	6	30.2%	41.3	1.0	-15.6	20.5
Average or Total	38	100.0%	17.2	0.6	-6.5	10.2

* Miscellaneous changes include changes in expense, tax, assessment, and profit & contingency provisions as well as any commissioner's decisions to limit change.

EXHIBIT 31

NCCI EXPENSE PROVISION ANALYSIS

 1986 Statewide Premium Level Changes

Size of Premium Change	Number of States	% of Premium Used for Weights	Amount of Change			
			Experience	Benefit	Misc. *	Overall
-17.5% and greater	0	0.0%	0.0	0.0	0.0	0.0
-12.5% to -17.4%	1	1.7%	-11.7	1.1	-1.9	-12.4
-7.5% to -12.4%	0	0.0%	0.0	0.0	0.0	0.0
-2.5% to -7.4%	0	0.0%	0.0	0.0	0.0	0.0
-.1% to -2.4%	1	3.5%	-0.9	0.5	-2.0	-2.4
No Change	6	22.8%	0.0	0.0	0.0	0.0
+.1% to +2.4%	0	0.0%	0.0	0.0	0.0	0.0
+2.5% to +7.4%	5	8.7%	4.0	0.9	1.0	6.0
+7.5% to +12.4%	10	25.2%	11.8	1.3	-3.0	9.8
+12.5% to +17.4%	6	16.2%	15.6	2.2	-3.0	14.6
+17.5% and greater	9	22.0%	17.3	2.6	1.3	21.9
Average or Total	38	100.0%	9.4	1.4	-0.9	9.9

* Miscellaneous changes include changes in expense, tax, assessment, and profit & contingency provisions as well as any commissioner's decisions to limit change.

NCCI EXPENSE PROVISION ANALYSIS

Rate Change Effect on Expense Loads by Premium Size
Assumes a 20% Rate Increase

BEFORE RATE CHANGE

Premium Size *	Expense Constant	General	Production	Net Taxes +	Total
\$4,000	140	268	600	170	1,178
\$25,000	140	1,155	2,250	1,060	4,605
\$150,000	140	6,180	10,875	6,360	23,555
\$750,000	140	25,580	46,875	31,800	104,395

AFTER RATE CHANGE

Premium Size *	Expense Constant	General	Production	Net Taxes +	Total	Total Expense Increase
\$4,800	140	322	720	204	1,385	17.62%
\$30,000	140	1,360	2,625	1,272	5,397	17.20%
\$180,000	140	7,350	12,675	7,632	27,797	18.01%
\$900,000	140	29,030	55,875	38,160	123,205	18.02%

Note: Assumes Stock Table in effect

* Before application of the Expense Constant.

+ Based on Net Tax assumption of 4.24%.

NCCI EXPENSE PROVISION ANALYSIS

Rate Change Effect on Expense Loads by Premium Size
Assumes a 20% Rate Decrease

BEFORE RATE CHANGE

Premium Size *	Expense Constant	General	Production	Net Taxes +	Total
\$4,000	140	268	600	170	1,178
\$25,000	140	1,155	2,250	1,060	4,605
\$150,000	140	6,180	10,875	6,360	23,555
\$750,000	140	25,580	46,875	31,800	104,395

AFTER RATE CHANGE

Premium Size *	Expense Constant	General	Production	Net Taxes +	Total	Total Expense Decrease
\$3,200	140	214	480	136	970	-17.62%
\$20,000	140	950	1,875	848	3,813	-17.20%
\$120,000	140	5,010	9,075	5,088	19,313	-18.01%
\$600,000	140	22,130	37,875	25,440	85,585	-18.02%

Note: Assumes Stock Table in effect

* Before application of the Expense Constant.

+ Based on Net Tax assumption of 4.24%.

NCCI EXPENSE PROVISION ANALYSIS

Rate Change Effect on Expense Loads by Premium Size
Assumes a 10% Rate Increase

BEFORE RATE CHANGE

Premium Size *	Expense Constant	General	Production	Net Taxes +	Total
\$4,000	140	268	600	170	1,178
\$25,000	140	1,155	2,250	1,060	4,605
\$150,000	140	6,180	10,875	6,360	23,555
\$750,000	140	25,580	46,875	31,800	104,395

AFTER RATE CHANGE

Premium Size *	Expense Constant	General	Production	Net Taxes +	Total	Expense Increase
\$4,400	140	295	660	187	1,281	8.81%
\$27,500	140	1,258	2,438	1,166	5,001	8.60%
\$165,000	140	6,765	11,775	6,996	25,676	9.00%
\$825,000	140	27,305	51,375	34,980	113,800	9.01%

Note: Assumes Stock Table in effect

* Before application of the Expense Constant.

+ Based on Net Tax assumption of 4.24%.

NCCI EXPENSE PROVISION ANALYSIS

Rate Change Effect on Expense Loads by Premium Size
Assumes a 10% Rate Decrease

BEFORE RATE CHANGE

Premium Size *	Expense Constant	General	Production	Net Taxes +	Total
\$4,000	140	268	600	170	1,178
\$25,000	140	1,155	2,250	1,060	4,605
\$150,000	140	6,180	10,875	6,360	23,555
\$750,000	140	25,580	46,875	31,800	104,395

AFTER RATE CHANGE

Premium Size *	Expense Constant	General	Production	Net Taxes +	Total	Total Expense Decrease
\$3,600	140	241	540	153	1,074	-8.81%
\$22,500	140	1,053	2,063	954	4,209	-8.60%
\$135,000	140	5,595	9,975	5,724	21,434	-9.00%
\$675,000	140	23,855	42,375	28,620	94,990	-9.01%

Note: Assumes Stock Table in effect

* Before application of the Expense Constant.

+ Based on Net Tax assumption of 4.24%.

NCCI EXPENSE PROVISION ANALYSIS

RATE LEVEL IMPACT DUE TO EXPENSE FLATTENING
ASSUMING GENERAL EXPENSES ARE A FIXED EXPENSE

Indicated Rate Level Change	Indicated Rate Level Change
Current Procedure -----	Flattening Expenses -----
-30.0%	-27.4%
-20.0%	-18.3%
-10.0%	-9.1%
0.0%	0.0%
10.0%	9.1%
20.0%	18.3%
30.0%	27.4%

NATIONAL COUNCIL ON COMPENSATION INSURANCE

EXHIBIT 34

% OF DISTRIBUTION BASED
ON STATE'S STANDARD PREMIUM

STATE	% OF DISTRIBUTION BASED ON STATE'S STANDARD PREMIUM				INTERSTATE		INTRASTATE		STATE'S % OF COUNTRYWIDE PREMIUM
	FIRST \$5,000	NEXT \$95,000	NEXT \$400,000	OVER \$500,000	# OF RISKS	% OF PREMIUM	# OF RISKS	% OF PREMIUM	
AL	24.47%	48.76%	19.68%	7.09%	6,149	52.61%	33,804	47.39%	2.29%
AZ	24.52%	50.31%	18.42%	6.74%	5,390	33.83%	53,376	66.17%	3.24%
AR	26.52%	48.03%	20.60%	4.85%	4,189	51.02%	24,444	48.98%	1.41%
CO	25.60%	47.75%	17.65%	8.99%	6,653	32.57%	64,961	67.43%	3.42%
CT	21.83%	45.23%	20.43%	12.51%	4,807	37.24%	53,991	62.76%	3.49%
DC	23.81%	47.64%	19.37%	9.18%	4,199	62.59%	13,335	37.41%	0.91%
FL	26.03%	40.25%	19.80%	13.92%	12,040	45.54%	165,112	54.46%	7.41%
GA	24.57%	47.86%	18.54%	9.03%	12,322	52.50%	67,369	47.50%	4.80%
ID	28.72%	49.71%	18.03%	3.54%	1,923	26.64%	20,318	73.36%	0.84%
IL	22.05%	46.02%	20.31%	11.62%	14,523	41.22%	159,086	58.78%	9.90%
IN	35.08%	46.51%	14.93%	3.48%	7,598	41.71%	82,006	58.29%	1.93%
IA	30.28%	44.12%	17.24%	8.37%	4,824	46.91%	54,956	53.09%	1.59%
KS	31.97%	44.65%	13.06%	10.31%	6,087	49.52%	40,969	50.48%	1.50%
KY	25.41%	42.89%	19.86%	11.85%	5,437	49.04%	46,026	50.96%	2.00%
LA	21.42%	45.60%	21.94%	11.03%	5,994	45.18%	47,756	54.82%	2.98%
ME	22.02%	43.29%	20.22%	14.48%	2,369	36.24%	26,683	63.76%	1.54%
MD	23.00%	44.60%	19.60%	12.80%	8,442	56.30%	57,660	43.70%	3.36%
MI	25.41%	45.08%	19.06%	10.45%	2,105	9.42%	143,804	90.58%	6.42%
MS	25.66%	52.35%	19.42%	2.58%	4,197	46.17%	20,838	53.83%	1.33%
MO	13.91%	23.25%	8.66%	54.18%	8,740	24.58%	58,218	75.42%	6.20%
MT	29.35%	43.77%	14.58%	12.29%	1,277	26.69%	26,960	73.31%	0.89%
NE	35.80%	43.52%	15.63%	5.06%	3,563	48.69%	31,185	51.31%	0.80%
NH	26.99%	47.04%	18.93%	7.04%	3,817	47.03%	26,632	52.97%	1.41%
NM	25.58%	52.15%	19.24%	3.03%	3,101	44.98%	15,880	55.02%	1.09%
NC	16.11%	23.03%	9.37%	51.49%	7,237	22.66%	69,703	77.34%	5.04%
OK	24.93%	45.59%	20.63%	8.85%	5,674	44.07%	40,937	55.93%	2.24%
OR	19.66%	46.65%	23.12%	10.57%	3,557	24.59%	59,257	75.41%	4.46%
RI	21.76%	51.91%	21.26%	5.07%	2,682	43.78%	12,178	56.22%	1.10%
SC	25.19%	47.25%	20.49%	7.07%	5,990	55.60%	29,834	44.40%	1.99%
SD	42.58%	44.24%	11.39%	1.79%	1,813	41.07%	12,861	58.93%	0.32%
TN	25.08%	46.31%	19.55%	9.06%	8,139	54.71%	49,124	45.29%	2.89%
UT	34.85%	44.92%	15.25%	4.98%	2,673	36.96%	25,968	63.04%	0.70%
VT	36.45%	45.44%	15.04%	3.07%	1,599	35.69%	15,504	64.31%	0.47%
VA	29.58%	46.42%	15.53%	8.46%	9,933	47.84%	75,957	52.16%	3.28%
WI	23.90%	42.88%	21.54%	11.68%	5,071	37.97%	89,625	62.03%	4.07%
HI	19.13%	43.25%	22.84%	14.78%	1,334	21.42%	20,560	78.58%	1.65%
AK	16.08%	42.68%	24.99%	16.25%	914	25.96%	10,112	74.04%	1.04%

NCCI EXPENSE PROVISION ANALYSIS

SUMMARY CALL FOR EXPENSES BY STATE

Restated First \$5000 General Expenses by State

	1987 Adjusted General Expenses as a Percentage of Earned Premium		1988 Adjusted General Expenses as a Percentage of Earned Premium		1989 Adjusted General Expenses as a Percentage of Earned Premium		Average Adjusted General Expenses as a Percentage of Earned Premium	
	Ratio	Rank	Ratio	Rank	Ratio	Rank	Ratio	Rank
HI	6.0%	1	5.7%	1	6.1%	1	5.9%	1
UT	6.1%	2	6.4%	8	6.3%	5	6.3%	2
AZ	6.4%	3	6.2%	5	6.2%	3	6.3%	3
RI	6.6%	4	6.6%	11	6.4%	8	6.5%	7
MD	6.7%	5	7.1%	25	8.8%	36	7.5%	30
MS	6.7%	6	6.5%	10	6.5%	10	6.6%	8
VA	6.7%	7	6.8%	14	6.9%	14	6.8%	14
CO	6.7%	8	6.4%	7	7.1%	22	6.7%	12
GA	6.7%	9	6.4%	9	6.4%	7	6.5%	6
VT	6.7%	10	6.2%	4	6.3%	6	6.4%	5
NH	6.8%	11	7.1%	23	6.1%	2	6.7%	9
IN	6.8%	12	6.8%	17	6.6%	11	6.7%	13
ID	6.8%	13	6.1%	3	6.2%	4	6.4%	4
AL	6.9%	14	6.3%	6	6.9%	17	6.7%	11
CT	6.9%	15	6.9%	20	7.0%	20	6.9%	18
AR	6.9%	16	6.8%	15	7.0%	19	6.9%	16
FL	6.9%	17	6.9%	21	7.3%	27	7.0%	19
NH	6.9%	18	6.7%	13	6.4%	9	6.7%	10
SC	7.0%	19	6.6%	12	6.9%	16	6.8%	15
MT	7.0%	20	7.2%	28	6.9%	18	7.0%	21
NE	7.0%	21	6.9%	19	7.2%	24	7.0%	20
IL	7.1%	22	6.8%	16	6.9%	15	6.9%	17
DC	7.1%	23	6.9%	22	7.2%	25	7.1%	22
MI	7.3%	24	7.6%	32	7.4%	29	7.4%	26
TN	7.3%	25	7.1%	26	7.2%	23	7.2%	24
OK	7.3%	26	7.2%	27	6.8%	12	7.1%	23
IA	7.5%	27	7.4%	30	7.4%	30	7.4%	27
LA	7.7%	28	7.1%	24	8.0%	33	7.6%	31
WI	7.8%	29	7.6%	33	7.0%	21	7.5%	29
SD	7.8%	30	6.9%	18	7.2%	26	7.3%	25
AK	8.0%	31	7.6%	31	6.8%	13	7.5%	28
KY	8.1%	32	8.6%	37	9.0%	37	8.6%	37
ME	8.1%	33	8.4%	36	7.9%	32	8.2%	34
MO	8.3%	34	8.2%	35	8.3%	35	8.3%	35
NC	8.5%	35	7.7%	34	8.2%	34	8.1%	33
KS	8.8%	36	7.3%	29	7.4%	28	7.8%	32
OR	11.7%	37	6.0%	2	7.7%	31	8.5%	36
Weighted Average	7.3%		7.0%		7.2%		7.2%	

Adjustment for First \$5000 Basis but not for Carrier Service Allowance

The expense ratios for Oregon appear suspect. We discussed this with the NCCI and the NCCI is investigating this.

NCCI EXPENSE PROVISION ANALYSIS

SUMMARY CALL FOR EXPENSES BY STATE

Restated First \$5000 Production Expenses by State

	1987 Adjusted Production Expenses as a Percentage of Written Premium		1988 Adjusted Production Expenses as a Percentage of Written Premium		1989 Adjusted Production Expenses as a Percentage of Written Premium		Average Adjusted Production Expenses as a Percentage of Written Premium	
	Ratio	Rank	Ratio	Rank	Ratio	Rank	Ratio	Rank
UT	10.5%	1	11.7%	2	11.0%	2	11.1%	2
NM	11.5%	2	11.0%	1	10.6%	1	11.0%	1
AZ	11.7%	3	12.7%	6	12.3%	6	12.2%	5
CO	11.7%	4	13.3%	13	13.1%	12	12.7%	6
MT	12.0%	5	12.5%	5	11.5%	4	12.0%	3
RI	12.8%	6	12.3%	4	11.4%	3	12.2%	4
ID	12.8%	7	12.7%	7	12.7%	7	12.7%	7
AR	13.0%	8	12.8%	8	13.1%	14	13.0%	9
VT	13.2%	9	13.6%	18	12.8%	9	13.2%	11
VA	13.2%	10	13.3%	12	13.1%	13	13.2%	12
GA	13.2%	11	12.9%	10	12.3%	5	12.8%	8
MD	13.3%	12	14.7%	31	15.8%	37	14.6%	30
MS	13.5%	13	13.6%	21	13.0%	11	13.3%	14
IA	13.5%	14	13.7%	24	13.6%	21	13.6%	18
SC	13.5%	15	13.4%	14	13.4%	18	13.4%	16
DC	13.6%	16	13.8%	25	13.5%	19	13.6%	19
FL	13.6%	17	13.7%	23	13.6%	20	13.6%	20
KS	13.6%	18	13.7%	22	13.7%	23	13.6%	21
NH	13.6%	19	13.5%	17	12.7%	8	13.3%	13
LA	13.7%	20	13.6%	20	14.3%	29	13.9%	24
TN	13.7%	21	12.1%	3	13.3%	15	13.0%	10
ME	13.7%	22	14.1%	27	14.4%	31	14.1%	26
AL	13.8%	23	13.5%	16	12.8%	10	13.4%	15
CT	13.9%	24	13.9%	26	13.3%	16	13.7%	23
IL	13.9%	25	13.5%	15	13.7%	22	13.7%	22
AK	13.9%	26	13.0%	11	13.8%	24	13.6%	17
WI	13.9%	27	14.5%	30	14.0%	26	14.2%	29
MI	14.0%	28	14.1%	28	14.2%	27	14.1%	28
NE	14.1%	29	14.2%	29	13.9%	25	14.1%	27
HI	14.4%	30	14.9%	33	15.2%	35	14.9%	35
IN	14.7%	31	15.1%	34	14.3%	30	14.7%	32
MO	14.7%	32	14.9%	32	14.9%	33	14.8%	34
SD	14.9%	33	13.6%	19	13.3%	17	13.9%	25
OK	14.9%	34	15.1%	35	14.2%	28	14.7%	33
KY	15.3%	35	15.2%	36	15.3%	36	15.3%	36
NC	15.3%	36	15.4%	37	15.1%	34	15.3%	37
OR	16.7%	37	12.8%	9	14.4%	32	14.6%	31
Weighted Average	13.8%		13.7%		13.7%		13.7%	
Adjustment for First \$5000 Basis but not for Carrier Service Allowance								

The expense ratios for Oregon appear suspect. We discussed this with the NCCI and the NCCI is investigating this.

STATE ALLOCATION METHODOLOGY

Expenses to State

In Call #14 - Calendar Years Expense

DATA BY STATE

Number of Companies
Allocation Method

<u>Expense Category</u>	<u>Actual</u>	<u>Written Premiums</u>	<u>Earned Premiums</u>	<u>Other</u>	<u>Total</u>
<u>Production</u>					
- Commission and Brokerage	16	6	0	2	24
- Other Acquisition - Branch Office	2	14	4	3	23
- Other Acquisition - Home Office	1	16	3	4	24
<u>General Expenses</u>					
- Boards and Bureau	4	10	8	2	24
- Other General	0	12	9	4	25

Note: 25 largest countrywide writers of workers' compensation based on direct written premium from A.M. Best - 1990. Some companies had multiple allocation coded for one expense item and their responses are excluded.

STATE ALLOCATION METHODOLOGY
METHOD THAT COMPANIES UTILIZE TO ALLOCATE

Branch Office General Expenses

Number of Companies

<u>General Expense</u> <u>Category</u>	<u>Branch Office Expenses</u> <u>Allocated to One of a Few States</u>	<u>Branch Office Expenses Combined</u> <u>Into a Countrywide</u>	<u>Total</u>
Boards and Bureaus	2	14	16
Other General Expenses	3	13	16

Note: Based on a special survey



National
Council on
Compensation
Insurance

750 Park of Commerce Drive
Boca Raton, Florida 33487
Tel. (407) 997-1000

EXHIBIT 39

DATA CALL #14
ALLOCATION METHODOLOGY SURVEY

For Companies that Allocate Items (8A) and 8B)
Based on Written Premium or Earned Premium

We are interested in a more detailed explanation of the procedures that companies use to allocate items (8A) and (8B) on the Calendar Year Expense Data Call (#14). Item (8A) is Boards and Bureau Expenses and item (8B) is Audit, Inspection and Other General Expenses. Please respond to the following two questions concerning the allocation procedure your company uses by August 15, 1991.

- 1) If your company has branch office in a state and the branch office services one or a few states, are the (8A) and (8B) related expenses for that branch office only allocated to the states serviced? The other possibility is that all the (8A) and (8B) related expenses are combined into a countrywide total and the countrywide total allocated based on earned premium or written premium by state.

Please check the appropriate box below and insert any comments you feel are appropriate.

ALLOCATION METHOD

- a) Branch office (8A) and (8B) expenses only allocated to one or a few states
_____.
- b) Branch office (8A) and (8B) expenses combined into a countrywide total which is then allocated to state based on earned premium or written premium
_____.

COMMENTS:

- 2) If you checked Box (b) above, is it possible for your company to identify the (8A) and (8B) expenses at the branch office level?

Yes _____ NO _____

Name of person completing form: _____

Company Name: _____

Phone Number: _____

Please return to Judy Gillam, NCCI. (FAX)407-997-4233

1990 ANNUAL EXPENSE REVIEW

PRODUCTION EXPENSE INDICATION
FOR STOCK COMPANIES

	1984	1985	1986	1987	1988	1989
(1) Net Earned Premium (STD Basis) including Expense Constant Revenue*	13,073,981	14,311,170	15,484,013	17,552,847	20,498,049	22,352,851
(2) Expense Constant Offset**	0.985	0.985	0.985	0.985	0.985	0.985
(3) Standard Earned Premium excluding Expense Constant Revenue (1) * (2)	12,877,871	14,096,502	15,251,753	17,289,554	20,190,578	22,017,558
(4) Reported Production Expenses	1,182,815	1,154,615	1,251,655	1,461,508	1,772,247	1,814,597
(5) Estimated Revenue generated by Expense Constant for Production Expense ((1)-(3))*0.337	66,089	72,343	78,272	88,730	103,618	112,994
(6) Reported Production Expense excluding Expense Constant Revenue (4) - (5)	1,116,726	1,082,272	1,173,383	1,372,778	1,668,629	1,701,603
(7) Adjustment for Allocation of Servicing Carrier Allowance	-0.46%	-0.29%	-0.77%	-0.77%	-1.16%	-1.70%
(8) Average Discount for Production Expense underlying Premium Discount Plan	6.98%	6.98%	6.98%	6.98%	6.98%	6.98%
(9) Provision for Production Exp combined with a \$140 Expense Constant: ((6)/(3))+ (7)+(8)	15.19%	14.37%	13.90%	14.15%	14.08%	13.01%
(10) Three Year Average						13.75%
(11) Six Year Average						14.12%

Premium adjusted for schedule rating and carrier deviations.

* Expense Constant Offset based on \$140 Expense Constant projected to 1/1/92

Source: Insurance Expense Exhibit

NCCI Prepared

1990 ANNUAL EXPENSE REVIEW

Portion of Expense Constant Allocated to Production Expense

FOR STOCK COMPANIES

1. Portion of expense constant for general expenses (1982 Special Call for Expenses by Size of Risk)	\$62.63
2. Portion of expense constant for other acquisition (1982 Special Call for Expenses by Size of Risk)	\$35.49
3. Total expense constant (1) + (2)	\$98.12
4. Profit and contingency	2.50%
5. Countrywide weighted average Premium Taxes (Including premium based Miscellaneous Taxes)	4.23%
6. Factor to adjust expense constant for profit & taxes 1 - (4) - (5)	0.9327
7. Expense Constant reflecting profit and taxes (3)/(6)	\$105.20
8. Factor to estimate revenue generated by expense constant for Production Expense (2)/(7)	0.337

1990 ANNUAL EXPENSE REVIEW

Calculation of Average Discount for Production Expenses
Underlying Premium Discount Plan

FOR STOCK COMPANIES

Midpoint of Data	Premium Discount	Regression Output:	
		Constant	-0.052581498
01-Nov-83	0.0588	Std Err of Y Est	0.0003872921
01-Nov-84	0.0605	R Squared	0.9751937389
01-Nov-85	0.0618	No. of Observations	5
01-Nov-86	0.0624	Degrees of Freedom	3
01-Nov-87	0.0645		
		X Coefficient(s)	0.000003641
Projected 01-Jan-92	0.0698	Std Err of Coef.	0.000000335

ASSUMPTIONS:

- (1) Average policy effective date for policies written in 1991 is 1/1/92.
- (2) Data source for discounts is Premium by Size of Policy Call.
Carriers have optional reporting periods: 1/1/87 - 12/31/87
or 7/1/87 - 6/30/88

A survey of the top 10 carriers reporting this Call (representing 58% of premium) revealed that 64.9% of premium was based on a 7/1/87 - 6/30/88 reporting period. A weighted average of the above midpoints (7/1/87 and 1/1/88, respectively) yielded an average midpoint of approximately 11/1/87. The distribution was assumed to be the same for prior years.

NCCI EXPENSE PROVISION ANALYSIS

Production Expense Provisions -- Restated to First \$5,000 Basis
 Stock Companies versus Mutual Companies

	Stock Companies					
	1984	1985	1986	1987	1988	1989
IEE Production Expense Indication *	8.76%	7.65%	7.55%	7.65%	8.04%	7.72%
Effect of Premium Discount	6.98%	6.98%	6.98%	6.98%	6.98%	6.98%
Service Carrier Allowance	-0.46%	-0.29%	-0.77%	-0.77%	-1.16%	-1.70%
Restated Production Expense Indication	15.28%	14.34%	13.76%	13.86%	13.86%	13.00%

	Mutual Companies					
	1984	1985	1986	1987	1988	1989
IEE Production Expense Indication *	5.64%	3.58%	3.73%	5.27%	3.51%	2.87%
Effect of Premium Discount	9.44%	9.44%	9.44%	9.44%	9.44%	9.44%
Service Carrier Allowance	-0.07%	-0.22%	-0.43%	-0.43%	-0.12%	-0.57%
Restated Production Expense Indication	15.01%	12.80%	12.74%	14.28%	12.83%	11.74%

* Excludes Expense Constant Revenue
 Source: IEE's and 1990 Annual Expense Review

NCCI EXPENSE PROVISION ANALYSIS

 Incurred Dividend Ratios (Based On Countrywide IEE's)
 (All Numbers in Thousands)

Calendar Year	Mutual	Stock	Dividend Differential
1971	13.8X	5.6X	8.2X
1972	13.4X	5.3X	8.1X
1973	13.7X	5.1X	8.6X
1974	13.8X	5.1X	8.7X
1975	11.7X	4.6X	7.1X
1976	10.2X	3.9X	6.3X
1977	9.2X	3.7X	5.5X
1978	10.0X	4.2X	5.8X
1979	11.5X	4.9X	6.6X
1980	15.3X	5.5X	9.7X
1981	14.7X	6.6X	8.1X
1982	16.3X	7.8X	8.5X
1983	16.4X	8.8X	7.6X
1984	13.4X	8.8X	4.7X
1985	11.0X	9.0X	2.0X
1986	9.2X	7.3X	1.9X
1987	7.4X	6.5X	0.9X
1988	9.7X	5.6X	4.2X
1989	7.3X	5.8X	1.5X

EXHIBIT 45

NCCI EXPENSE PROVISION ANALYSIS
Expense Indications (Based On Countrywide IEE's)
(All Numbers in Thousands)

	Calendar Years 1971-1983		Calendar Years 1984 - 1989		Calendar Years 1971 - 1989	
	Stock	Mutual	Stock	Mutual	Stock	Mutual
(1) Net Written Premium	87,556,274	28,475,008	94,551,016	30,336,904	182,107,290	58,811,912
(2) Net Earned Premium	85,271,058	28,414,495	93,198,739	30,260,608	178,469,797	58,675,103
(3) Losses Incurred Ratio - (3)/(2)	60,633,762 (71.1%)	19,345,314 (68.1%)	76,777,069 (82.4%)	25,230,162 (83.4%)	137,410,831 (77.0%)	44,575,476 (76.0%)
(4) Loss Adjustment Expense Incurred Ratio - (4)/(2)	7,636,753 (9.0%)	2,422,009 (8.5%)	10,144,306 (10.9%)	2,845,969 (9.4%)	17,781,059 (10.0%)	5,267,978 (9.0%)
(5) Commission & Brokerage Incurred Ratio - (5)/(1)	6,119,308 (7.0%)	412,959 (1.5%)	5,655,674 (6.0%)	332,736 (1.1%)	11,774,982 (6.5%)	745,695 (1.3%)
(6) Other Acquisition Expense Incurred Ratio - (6)/(1)	2,274,650 (2.6%)	1,149,796 (4.0%)	2,981,763 (3.2%)	1,154,649 (3.8%)	5,256,413 (2.9%)	2,304,445 (3.9%)
(7) Total Commission, Brokerage & Other Acquisition Expense Ratio - (7)/(1)	8,393,958 (9.6%)	1,562,755 (5.5%)	8,637,437 (9.1%)	1,487,385 (4.9%)	17,031,395 (9.4%)	3,050,140 (5.2%)
(8) General Expenses Ratio - (8)/(2)	5,576,430 (6.5%)	1,592,644 (5.6%)	5,305,422 (5.7%)	1,509,098 (5.0%)	10,881,852 (6.1%)	3,101,742 (5.3%)
(9) Taxes, Licenses & Fees Ratio - (9)/(2)	3,370,662 (4.0%)	1,108,826 (3.9%)	4,386,971 (4.7%)	1,382,505 (4.6%)	7,757,633 (4.3%)	2,491,331 (4.2%)
(10) Total Expenses, (Excluding LAE) Ratio - (7)/(1) + [(8)+(9)]/(2)	17,341,050 (20.1%) (340,507) (-0.4%)	4,264,225 (15.0%) 2,382,947 (8.4%)	18,329,830 (19.5%) (12,052,466) (-12.9%)	4,378,988 (14.5%) (2,194,511) (-7.3%)	35,670,880 (19.8%) (12,392,973) (-6.9%)	8,643,213 (14.7%) 188,436 (0.3%)
(11) Gain from Underwriting Ratio - (11)/(2)	4,979,402 (5.8%)	3,783,113 (13.3%)	6,432,331 (6.9%)	2,791,701 (9.2%)	11,411,733 (6.4%)	6,574,814 (11.2%)
(12) Dividends to Policyholders Ratio - (12)/(2)	8,801,545 (10.3%)	2,753,896 (9.7%)	13,309,919 (14.3%)	3,269,704 (10.8%)	22,111,464 (12.4%)	6,023,600 (10.3%)
(13) Net Investment Gain or Loss Ratio - (13)/(2)	3,481,638 (4.1%)	1,353,729 (4.8%)	(5,174,852) (-5.6%)	(1,716,510) (-5.7%)	(1,693,214) (-0.9%)	(362,781) (-0.6%)
(14) Net Income Before Federal & Foreign Income Taxes Ratio - (14)/(2)						

EXHIBIT 46

NCCI EXPENSE PROVISION ANALYSIS

General & Production Expenses Incurred (as % of STD Premium)
Restated to First \$5,000 of Premium

Year	STOCK COMPANIES			MUTUAL COMPANIES		
	General Expenses +	Production Expenses +	Total Expenses +	General Expenses +	Production Expenses +	Total Expenses +
1984	8.34%	15.28%	23.62%	8.03%	15.01%	23.04%
1985	7.43%	14.34%	21.77%	7.36%	12.80%	20.16%
1986	7.15%	13.76%	20.91%	7.07%	12.74%	19.81%
1987	7.10%	13.86%	20.96%	6.25%	14.28%	20.53%
1988	6.87%	13.86%	20.73%	6.50%	12.83%	19.33%
1989	6.80%	13.00%	19.80%	6.72%	11.74%	18.46%
1991 **	5.69%	13.00%	18.69%	5.69%	11.74%	17.43%
Provision in Rates	6.70%	15.00%	21.70%	6.70%	15.00%	21.70%

* Based upon premium discount table. Amount of discount assumes an additive relationship. Includes adjustments for Expense Constant revenue applicable to the respective expenses as well as the assumed allocation of Service Carrier Allowance used by NCCI.

** General Expenses based on provision adjusted to current rate levels and restated to \$5,000 Basis. Calendar years 1984-1989 display expenses relative to net earned premium. The selected 1991 provision for general expenses is relative to direct earned premium.

ANALYSIS OF WORKERS' COMPENSATION EXPENSES BY POLICY SIZE, CALENDAR YEAR 1982

EXHIBIT 47

Carrier Code No. Insurance Carrier(s) _____

Method of Production: Agency Direct Writing Participating Non-participating
 Mixed Mixed

(a) Annual Premium Size	(b) No. of Policies	(c) Direct Standard Earned Premium	(d) Other Acquisition	(e) Payroll Audit	(f) Inspection	(g) Other General	(h) Boards and Bureaus Incurred
0 - 99							XX
100 - 199							XX
200 - 299							XX
300 - 499							XX
500 - 999							XX
1,000 - 2,999							XX
3,000 - 4,999							XX
5,000 - 9,999							XX
10,000 - 24,999							XX
25,000 - 49,999							XX
50,000 - 99,999							XX
100,000 - 249,999							XX
250,000 - 499,999							XX
500,000 - 999,999							XX
1,000,000 - 2,499,999							XX
2,500,000 & Over							XX
SUBTOTAL							XX
Three year fixed rate							
TOTAL (Direct)							XX

NOTES AND REFERENCES

Column (c) Premiums are prior to premium discounts and retrospective adjustments and should balance to total for National Council calendar year for 1982 (F class, coal mine, and annual calls)

Column (d) See Instructions

Column (e), (f) & (g) Total for three columns combined should reconcile to line (9) in Part II of Insurance Expense Exhibit

Column (h) Total should reconcile to line (8) in Part II of Insurance Expense Exhibit

CALCULATION OF REVISED EXPENSE CONSTANT

1. Portion of expense constant for general expense - 1982	\$62.63
2. Portion of expense constant for other acquisition expense - 1982	\$35.49
3. Index to adjust Expense needs to April 1985.	1.146
4. Factor to adjust Expense Constant for profit and tax: (1-.042-.025)	.933
5. Indicated Expense Constant $((1)+(2)) \times (3) \div (4)$	\$120.52

EXHIBIT 49

MOCI EXPENSE PROVISION ANALYSIS

Analysis of Workers Compensation Expenses by Policy Size, Calendar Year 1982
Expense Ratios for all Stock Companies

Annual Premium Size	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Average Policy Size	Other Acquisition	Payroll Audit	Inspection	Other General	Boards & Bureaus Incurred	Total General (3)+(4)+(5)+(6)	Per Policy (7)*(1)	General Expense Provided in Rates *	Difference (9)-(8)	Ratio of Difference to Average Policy Size
\$0 -- \$99	40	0.677	0.127	0.022	0.988	0.008	1.145	45.80	62.95	17.13	0.428
\$100 -- \$199	146	0.265	0.066	0.012	0.399	0.008	0.475	69.35	70.88	1.53	0.010
\$200 -- \$299	245	0.183	0.052	0.012	0.265	0.008	0.337	82.57	78.31	(4.26)	-0.017
\$300 -- \$499	390	0.121	0.039	0.010	0.178	0.008	0.285	91.65	89.18	(2.47)	-0.006
\$500 -- \$999	713	0.065	0.029	0.011	0.121	0.008	0.169	120.50	113.41	(7.09)	-0.010
\$1,000 -- \$2,999	1,766	0.050	0.020	0.011	0.074	0.008	0.113	199.56	192.38	(7.18)	-0.004
\$3,000 -- \$4,999	3,894	0.038	0.016	0.010	0.057	0.008	0.091	354.35	351.98	(2.37)	-0.001
\$5,000 -- \$9,999	7,085	0.032	0.014	0.010	0.047	0.008	0.079	599.72	537.37	(62.35)	-0.008
\$10,000 -- \$24,999	15,712	0.025	0.009	0.010	0.039	0.008	0.066	1,056.99	960.46	(96.53)	-0.005
\$25,000 -- \$49,999	35,187	0.021	0.007	0.009	0.034	0.008	0.058	2,040.85	1,914.90	(125.95)	-0.004
\$50,000 -- \$99,999	71,100	0.019	0.005	0.009	0.032	0.008	0.054	3,839.40	3,674.70	(164.70)	-0.002
\$100,000 -- \$249,999	155,482	0.018	0.004	0.008	0.030	0.008	0.050	7,774.10	7,698.52	(75.58)	-0.001
\$250,000 -- \$499,999	348,814	0.016	0.003	0.006	0.029	0.008	0.046	16,045.44	16,785.16	739.72	0.002
\$500,000 -- \$999,999	713,642	0.015	0.002	0.006	0.029	0.008	0.045	32,113.89	30,514.00	(1,599.89)	-0.002
\$1,000,000 -- \$2,499,999	1,530,674	0.012	0.001	0.005	0.025	0.008	0.039	59,696.29	55,842.21	(3,854.08)	-0.005
\$2,500,000 and over	6,057,451	0.009	0.001	0.003	0.022	0.008	0.034	205,953.33	196,172.45	(9,780.88)	-0.002
Subtotal	5,484	0.025	0.008	0.008	0.041	0.008	0.065	356.46	318.69	(37.77)	Average of all Policies: 0.024
Three year fixed rate	393	0.067	0.025	0.002	0.138	0.008	0.173	67.99	89.41	21.42	Average of \$100+ Premium Policies: -0.003
TOTAL (Direct)	5,365	0.025	0.008	0.008	0.042	0.008	0.066	354.09	313.09	(41.00)	

Note: Data based on 1982 Special Call for distribution of Expenses by Size of Risk for Stock Companies

* Predicted Expenses based on the following formula:
 (Avg Policy Size - Avg Expense Constant in 1982) x (General Expense Indication used in 1982) + (Portion of Proposed Expense Constant for General Expense)
 where: Avg Expense Constant in 1982 = 36.00
 General Expense Provision = 7.5%, 4.9%, 4.7%, and 3.1%
 Expense Constant Portion for General Expense = 62.63

Exhibit 50

MOI EXPENSE PROVISION ANALYSIS

**Analysis of Workers Compensation Expenses by Policy Size, Calendar Year 1982
Expense Ratios for all Mutual Companies**

(1) Annual Premium Size	(2) Average Policy Size	(3) Other Acquisition	(4) Payroll Audit	(5) Inspection	(6) Other General	(7) Boards & Bureaus Incurred	(8) Total General (3)+(4)+(5)+(6)	(9) Per Policy Provided in (7)*(1)	(10) Difference (9)-(8)	(11) Ratio of Difference to Average Policy Size	
90 -- 999	42	0.685	0.188	0.052	0.563	0.006	0.809	33.98	63.08	29.10	0.693
\$100 -- \$199	146	0.311	0.074	0.019	0.256	0.006	0.355	51.83	70.88	19.05	0.130
\$200 -- \$299	245	0.198	0.044	0.013	0.190	0.006	0.253	61.99	78.31	16.32	0.067
\$300 -- \$499	386	0.143	0.033	0.011	0.141	0.006	0.191	73.73	88.88	15.15	0.059
\$500 -- \$999	697	0.094	0.026	0.007	0.095	0.006	0.134	95.40	112.21	18.80	0.027
\$1,000 -- \$2,999	1,713	0.060	0.019	0.007	0.064	0.006	0.096	164.45	188.41	23.96	0.014
\$3,000 -- \$4,999	3,803	0.042	0.015	0.009	0.050	0.006	0.080	304.24	345.16	40.91	0.011
\$5,000 -- \$9,999	6,921	0.033	0.012	0.013	0.041	0.006	0.072	490.31	529.32	31.01	0.004
\$10,000 -- \$24,999	15,364	0.026	0.009	0.016	0.034	0.006	0.065	998.66	943.40	(55.26)	-0.004
\$25,000 -- \$49,999	34,440	0.020	0.006	0.013	0.028	0.006	0.053	1,825.32	1,878.29	52.97	0.002
\$50,000 -- \$99,999	69,471	0.016	0.004	0.011	0.024	0.006	0.045	3,126.20	3,594.88	468.68	0.007
\$100,000 -- \$249,999	150,017	0.013	0.004	0.010	0.021	0.006	0.041	6,150.70	7,441.66	1,290.96	0.009
\$250,000 -- \$499,999	343,265	0.011	0.003	0.011	0.020	0.006	0.040	13,731.40	16,525.30	2,793.90	0.008
\$500,000 -- \$999,999	735,812	0.008	0.002	0.012	0.019	0.006	0.039	28,698.67	31,201.28	2,504.61	0.003
\$1,000,000 -- \$2,499,999	1,488,571	0.008	0.002	0.011	0.017	0.006	0.036	53,588.56	54,537.01	948.45	0.001
\$2,500,000 and over	5,535,012	0.008	0.002	0.012	0.017	0.006	0.037	204,795.44	179,976.85	(24,818.61)	-0.004
Subtotal	5,425	0.024	0.007	0.012	0.052	0.006	0.057	309.23	455.83	146.60	Average of all Policies:
Three year fixed rate	199	0.209	0.060	0.025	0.502	0.006	0.593	118.01	74.86	(43.16)	0.063
TOTAL (Direct)	5,306	0.025	0.007	0.012	0.052	0.006	0.057	302.44	449.98	147.54	Average of \$5,000+ Premium Policies:

Note: Data based on 1982 Special Call for distribution of Expenses by Size of Risk for Mutual Companies

* Predicted Expenses based on the following formula:

(Avg Policy Size - Avg Expense Constant in 1982) x (General Expense Indication used in 1982) + (Portion of Proposed Expense Constant for General Expense)

where: Avg Expense Constant in 1982 = 36.00

General Expense Provision = 7.5%, 4.9%, 4.7%, and 3.1%

Expense Constant Portion for General Expense = 62.63

Formulas based on Stock Company's Premium Discount Table.

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TECHNICAL APPENDICES

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TECHNICAL APPENDIX A
Servicing Carrier Adjustment

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**EXPENSES:
TECHNICAL APPENDIX A**

NCCI, in their October, 1990 general expense review, included a provision for the "allocation of servicing carrier allowance" in determining the indicated general expense levels. This provision is displayed on row (7) of Exhibit 4 for general expenses. In addition, a similar adjustment is made for production expenses and is displayed on row (7) of Exhibit 39. These adjustments are made in order to restate the IEE expense indications to a direct basis. This adjustment is necessary as companies book the service carrier allowance differently on an assumed and ceded basis.

The servicing carriers for the National Workers' Compensation Reinsurance Pool receive an allowance from the Pool to offset the following expenses associated with issuing residual market policies:

1. general expenses;
2. other acquisition expenses;
3. loss adjustment expenses;
4. profit and contingencies;
5. premium based taxes; and
6. loss based taxes.

Commission expenses are not part of the allowance as the Pool directly reimburses the servicing carriers for commission expenses incurred.

In order to compute the servicing carrier allowance adjustment, NCCI staff requested all servicing carriers and a number of other large companies to report to NCCI the booking of the servicing carriers allowance by major expense category on both an assumed and ceded basis. Exhibit A-1 displays the stock company data collected by NCCI along with the NCCI staff's calculation of the servicing carrier allowance for stock companies.

The top part of the exhibit displays the servicing carriers booking by major expense category of the servicing carrier allowance (Column A). The servicing carriers receive the allowance as a fee to offset their expenses and therefore book the allowance as a negative expense. As NCCI collected data from all stock servicing carriers the ceded expense transactions constitute all ceded adjustments related to the servicing carrier allowance. As a technical note, GE represents general expenses; PE represents production expenses; and LAE represents loss adjustment expenses. As

EXPENSES:
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the servicing carriers constitute the entirety of the ceded transactions, Column (B) displays the standard earned premiums and losses for all stock companies. Column (C) displays the ceded transactions relative to premium (or losses for LAE) by major expense category.

The middle portion of Exhibit A-1 displays the assumed servicing carrier adjustment. Column (D) displays the sampled companies booking for the assumed share of the servicing carrier allowance by major expense category. Column (E) displays the corresponding standard earned premium and losses for the sampled companies. Column (F) displays the assumed transactions relative to premium (or loss for LAE) by major expense category.

Column (F) less Column (C) is an estimate of the overstatement by major expense category as a result of the companies recording the servicing carrier allowance differently on an assumed and ceded basis. For example, for calendar year 1989 the ceded service carrier allowance associated with production expenses accounted for 1.48% of total market premium; whereas, the assumed servicing carrier allowance for production expenses accounted for 3.18% of the sampled carriers premium. To restate the IEE expenses to a direct basis, the assumed transactions must equal the ceded transactions; therefore, an adjustment (subtraction) of 1.7% of premium to the IEE production expense indication is necessary. For general expenses for calendar year 1989, the ceded service carrier allowance adjustment (1.69%) exceeds the assumed servicing carriers allowances adjustment (1.22%); therefore, to restate general expenses to a direct basis 0.47% of premium is added to the IEE general expense indications.

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TECHNICAL APPENDIX A

EXHIBITS

Exhibit #

Exhibits

Exhibit A-1

NCCI Calculation for the Adjustment Due to the Allocation of Servicing Carrier Allowance

EXPENSES

NCCI CALCULATION
FOR THE ADJUSTMENT DUE TO THE ALLOCATION OF
SERVICING CARRIER ALLOWANCE
STOCK COMPANIES

I. STOCK COMPANIES: CEDED BUSINESS

	(A)			(B)		(C)		
	PORTION BOOKED AS:			COUNTRYWIDE		SCA ADJUSTMENTS		
	GE	PE	LAE	PREMIUM	LOSSES	GE	PE	LAE
	(FROM ACTUAL SURVEY)			(PAGE 2)	(IEE)	(A)/(B)		
1984	23,177,142	58,555,291	12,226,066	12,222,791	11,820,686	0.19%	-0.48%	0.10%
1985	72,923,706	54,247,889	23,628,153	13,058,838	13,281,948	0.56%	0.42%	0.18%
1986	167,549,226	198,569,002	59,540,086	15,220,785	16,108,747	1.10%	1.30%	0.37%
1987	219,196,231	286,202,917	81,445,831	16,797,540	18,113,342	1.30%	1.70%	0.45%
1988	272,412,551	278,908,722	118,485,404	20,875,947	20,509,988	1.30%	1.34%	0.58%
1989	372,448,499	326,227,949	143,783,450	22,026,674	21,961,684	1.69%	1.48%	0.65%

II. STOCK COMPANIES: ASSUMED BUSINESS

	(D)			(E)		(F)		
	PORTION BOOKED AS:			SAMPLE		SCA ADJUSTMENTS		
	GE	PE	LAE	PREMIUM	LOSSES	GE	PE	LAE
	(FROM ACTUAL SURVEY)			(PAGE 2)	(IEE BY CARRIER)	(D)/(E)		
1984	12,355,606	46,566,724	3,730,810	4,935,705	5,529,439	0.25%	0.94%	0.07%
1985	29,513,161	59,601,926	4,904,217	8,432,305	6,748,776	0.35%	0.71%	0.07%
1986	69,484,820	151,534,482	20,303,997	7,336,841	7,178,891	0.95%	2.07%	0.28%
1987	95,931,410	214,769,312	25,297,224	8,679,635	10,061,569	1.11%	2.47%	0.25%
1988	129,920,006	267,436,982	31,465,786	10,680,218	11,819,714	1.22%	2.50%	0.27%
1989	143,564,549	375,326,238	38,418,570	11,803,957	11,871,196	1.22%	3.18%	0.32%

III. STOCK COMPANIES: FINAL SCA ADJUSTMENTS (C)-(F)

	GE	PE	LAE
1984	-0.06%	-0.46%	0.03%
1985	0.21%	-0.29%	0.11%
1986	0.15%	-0.77%	0.09%
1987	0.19%	-0.77%	0.20%
1988	0.08%	-1.16%	0.31%
1989	0.47%	-1.70%	0.33%

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TECHNICAL APPENDIX B
Test of Proposed General Expense Methodologies

EXPENSES

**EXPENSES:
TECHNICAL APPENDIX B**

In this Appendix, we compare the projected general expense loading using the three models discussed in Section IV and the current NCCI methodology versus the actual general expenses incurred as reported in the IEE (adjusted to a first \$5,000 basis). The projected general expenses are compared to the IEE expenses for calendar years 1989 and 1988.

A. Insight 1989 Indications

This analysis is based on net experience.

It was necessary to adjust the row labelled "Effect of Premium Discount" to be an estimate of the premium discount in effect at 1/1/90 (the average accident date for policies written in 1989). For stock companies, this calculation utilized the NCCI regression equation. The result for 1989 was a premium discount of 2.57%, or .12% lower than the discount assumed for 1991.

Model 1 - Stock Company Results

Using countrywide premium level changes through 1988 and the assumption that premiums and general expenses will both increase 3.8% during 1989, we have recalculated the indicated general expense provision restated to a first \$5,000 basis at the 1989 rate level (Exhibit B-1). The indicated general expense provision is an average of the 1984-1987 adjusted general expense ratios.

The indicated general expense provision based on this procedure restated to a first \$5,000 basis is 6.42%. This is the result of averaging the four years shown on Exhibit B-1. This indication is compared to the actual 1989 IEE results:

Reported IEE General Expenses excluding Expense Constant Revenue	\$ 793,981
Standard Earned Premium excluding Expense Constant Revenue	<u>22,017,558</u>
General Expense Provision net of Carrier Allowance and Premium Discount Plan	3.61%
Average Discount underlying Premium Discount Plan	2.57
Adjustment for Allocation of Servicing Carrier Allowance	<u>.50</u>
Provision for General Expenses, first \$5,000 basis	<u>6.68%</u>

EXPENSES:
TECHNICAL APPENDIX B

The general expense provision based on trending expenses and adjusting premium to current rate level yielded an expense provision of 6.42%, a result which proved to be deficient by .26%. By comparison, NCCI recommended general expense provision for 1989 (1988 expense review) was 6.7%, a redundancy of .02%.

Model 2 - Stock Company Results

Using countrywide premium level changes through 1988 and the assumption that premiums will increase 3.8% during 1989 (estimated payroll growth), we have recalculated the general expense provision restated to a first \$5,000 basis at the 1989 rate level (Exhibit B-2). Adjusting premiums to current rate level while not trending general expenses implies that the general expense trend is equal to the payroll trend

This model yielded an expense provision of 6.08%, a result which proved to be deficient by .60%.

Model 3 - Stock Company Results

This model is based on the method used by the Workers' Compensation Rating and Inspection Bureau of Massachusetts to establish general expense levels. The indicated general expense provision restated to a first \$5,000 basis at a 1989 rate level is 6.22%, a result which proved to be deficient by .46% (Exhibit B-3).

B. Hindsight 1988 Indications

Note that it was necessary to adjust the row labelled "Effect of Premium Discount" to be an estimate of the premium discount in effect at 1/1/89 (the average accident date of policies written in 1988). For stock companies, this calculation utilizes a regression procedure similar to that used by NCCI to estimate the 1991 discount. The result for 1988 was a premium discount of 2.48%, or .21% lower than the discount assumed for 1991.

**EXPENSES:
TECHNICAL APPENDIX B**

Model 1 - Stock Company Results

The assumption that premiums and general expenses will both increase 3.8% during 1988, was used. The Model 1 indicated general expense provision restated to a first \$5,000 basis is 6.40%. This is the result of averaging the three years shown on Exhibit B-4. This indication is compared to the actual 1988 IEE results (restated to a first \$5,000 basis):

Reported IEE General Expenses excluding Expense Constant Revenue*	\$ 779,167
Standard Earned Premium excluding Expense Constant Revenue*	<u>20,108,586</u>
General Expense Provision net of Carrier Allowance and Premium Discount Plan	3.87%
Average Discount underlying Premium Discount Plan	2.48
Adjustment for Allocation of Servicing Carrier Allowance	<u>.08</u>
Provision for General Expenses, first \$5,000 basis	<u>6.43%</u>

*Adjusted to account for a \$120 expense constant
+Based upon actual 87-88 premium distribution

Our recommended general expense provision based on trending expenses and adjusting premium to current rate level yielded an expense provision of 6.40% - a result which provided to be deficient by .03% (Exhibit B-4). By comparison, NCCI recommended general expense provision for 1988 (1987 expense review) was 7.5% - a redundancy of 1.07%.

Model 2 - Stock Company Results

The assumption that premiums will increase 3.8% during 1988 was used. The indicated Model 2 general expense provision restated to a first \$5,000 basis is 5.99% (Exhibit B-5). This is the result of averaging the three years shown on Exhibit B-5.

The general expense provision of 5.99% proved to be deficient by .44%. By comparison, NCCI recommended general expense provision for 1988 was 7.5% - a redundancy of 1.07%.

EXPENSES:
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Model 3 - Stock Company Results

This model is based on the method used by the Workers' Compensation Rating and Inspection Bureau of Massachusetts. The indicated general expense provision restated to a first \$5,000 basis at 1988 rate level is 6.49% (Exhibit B-6). The general expense provision proved to be redundant by .06%.

The following table summarizes the hindsight analysis.

	Recommended General Expense Provision				Actual General Expense Provision
	NCCI	Model 1	Model 2	Model 3	
1989	6.70%	6.42%	6.08%	6.22%	6.68%
1988	7.50%	6.40%	5.99%	6.49%	6.43%

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TECHNICAL APPENDIX B

EXHIBITS

<u>Exhibit #</u>	<u>Exhibits</u>
Exhibit B-1	General Expense Provision at Current Rate Level Trended to 1989 - Hindsight - Model I
Exhibit B-2	General Expense Provision at Current Rate Level Trended to 1989 - Hindsight - Model II
Exhibit B-3	General Expense Provision at Current Rate Level Trended to 1989 - Hindsight - Model III
Exhibit B-4	General Expense Provision at Current Rate Level Trended to 1988 - Hindsight - Model I
Exhibit B-5	General Expense Provision at Current Rate Level Trended to 1988 - Hindsight - Model II
Exhibit B-6	General Expense Provision at Current Rate Level Trended to 1988 - Hindsight - Model III

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MCCI EXPENSE PROVISION ANALYSIS

General Expense Provision at Current Rate Level Trended to 1989
 Restated to a First \$5,000 Basis
 Stock Companies Only
 Hindsight - Model I

Calendar Year	(1) Statewide Premium Level Changes		(2) Cumulative Statewide Premium Level Changes		Portion of column (2) earned in:			
	Base	1989	1982	1988	1984	1985	1986	1987
1982	1.000		0.056		0.056			
1983	1.001		0.722		0.722			
1984	1.019		0.222		0.222			
1985	1.131			0.056		0.056		
1986	1.099			0.722		0.722		
1987	1.102			0.222		0.222		
1988	1.108						0.222	

Average Earned Rate Level Index

1.005	1.049	1.172	1.290
-------	-------	-------	-------

(1) Factor to 1989 Rate Level +

1.599	1.532	1.372	1.245
-------	-------	-------	-------

(2) Net Earned Premium (STD Basis)

12,877,871	14,096,502	15,251,753	17,289,554
------------	------------	------------	------------

(3) Net Earned Premium at 1989 Rate Level (STD Basis)

20,586,923	21,600,583	20,918,395	21,532,720
------------	------------	------------	------------

(4) General Expenses +

735,496	638,283	657,602	730,372
---------	---------	---------	---------

(5) General Expense Index **

1.000	1.038	1.077	1.118
-------	-------	-------	-------

(6) Factor to obtain General Expense Level to 1989

1.205	1.161	1.118	1.077
-------	-------	-------	-------

(7) Trended General Expenses at 1989 Level

886,272	740,974	735,453	786,935
---------	---------	---------	---------

(8) General Expense Provision Restated to 1989 at 1989 Rate Level

4.31%	3.43%	3.52%	3.65%
-------	-------	-------	-------

(9) Effect of Premium Discount

2.57%	2.57%	2.57%	2.57%
-------	-------	-------	-------

(10) Servicing Carrier Allowance

-0.06%	0.21%	0.15%	0.19%
--------	-------	-------	-------

(11) General Expense Provision re-stated to a first \$5,000 basis at 1989 rate level

6.82%	6.21%	6.24%	6.41%
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+ 1989 rate level projected using MCCI Index

* Excludes Expense Constant Revenue

** Based on CPI Trend

MCCI EXPENSE PROVISION ANALYSIS

General Expense Provision at Current Rate Level Trended to 1989
 Restated to a First \$5,000 Basis
 Stock Companies Only
 Hindsight - Model II

Calendar Year	(1) Statewide Premium Level Changes		(2) Cumulative Statewide Premium Level Changes		Portion of column (2) earned in:		
	1984	1985	1986	1987	1984	1985	1986
1982			0.056				
1983			0.722				
1984			0.222				
1985				0.056			
1986				0.722			0.056
1987				0.222			0.722
1988							0.222
Average Earned Rate Level Index							
			1.005	1.049	1.172		1.290
(1) Factor to 1989 Rate Level +							
(2) Net Earned Premium (STD Basis)							
			1.599	1.532	1.372		1.245
(3) Net Earned Premium at 1989 Rate Level (STD Basis)							
			12,877,871	14,096,502	15,251,753		17,289,554
(4) General Expenses *							
(5) Factor to obtain General Expense Level to 1989							
			735,496	638,283	657,602		730,372
(6) Trended General Expenses at 1989 Level							
			1,000	1,000	1,000		1,000
(7) General Expense Provision Restated to 1989 at 1989 Rate Level							
			3.57%	2.95%	3.14%		3.39%
(8) Effect of Premium Discount							
			2.57%	2.57%	2.57%		2.57%
(9) Servicing Carrier Allowance							
			-0.06%	0.21%	0.15%		0.19%
(10) General Expense Provision re-stated to a first \$5,000 basis at 1989 rate level							
			6.08%	5.73%	5.86%		6.15%

+ 1989 rate level projected using MCCI Index
 * Excludes Expense Constant Revenue

MCCI EXPENSE PROVISION ANALYSIS

General Expense Provision at Current Rate Level Trended to 1989
 Restated to a First \$5,000 Basis
 Stock Companies Only
 Hindsight - Model III

Calendar Year	(1) Statewide Premium Level Changes		(2) Cumulative Statewide Premium Level Changes		Portion of column (2) earned in:		
	Base	1989	1984	1985	1986	1987	1988
1982	1.000		0.056				
1983	1.001		0.722	0.056	0.056		
1984	1.019	1.020	0.222	0.722	0.722		
1985	1.131	1.154		0.222	0.222	0.056	
1986	1.099	1.268				0.722	
1987	1.102	1.397				0.222	
1988	1.108	1.548					
Average Earned Rate Level Index			1.005	1.049	1.172	1.290	

(1) Factor to 1989 Rate Level +
 (2) Payroll Trend Factor to 1/1/90
 (3) Net Earned Premium (STD Basis)

(4) Rate Level (STD Basis)

(5) Fixed Expenses (Net of Premium Discount) *

(6) General Expense Provision Restated to 1989 at 1989

(7) Rate Level Effect of Premium Discount

(8) Servicing Carrier Allowance

(9) General Expense Provision re-stated to a first \$5,000 basis at 1989 rate level

* 1989 rate level projected using MCCI Index
 * Calculated by method used in Workers' Compensation Insurance Filing of the Workers' Compensation Rating and Inspection Bureau of Massachusetts

MCCI EXPENSE PROVISION ANALYSIS

General Expense Provision at Current Rate Level Trended to 1988
 Restated to a First \$5,000 Basis
 Stock Companies Only
 Hindsight - Model I

Calendar Year	(1)		(2)		Portion of column (2) earned in:	
	Statewide Premium Level Changes	Cumulative Statewide Premium Level Changes	1984	1985	1985	1986
1982	Base	1.000	0.056			
1983	1.001	1.001	0.722	0.056		
1984	1.019	1.020	0.722	0.722	0.056	
1985	1.131	1.154	0.222	0.222	0.722	
1986	1.099	1.268			0.722	
1987	1.102	1.397			0.222	

Average Earned Rate Level Index

1.005	1.049	1.172
1.443	1.383	1.238
12,825,575	14,039,258	15,189,817
18,504,802	19,415,944	18,802,750

(1) Factor to 1988 Rate Level +
 (2) Net Earned Premium (STD Basis)

(3) Net Earned Premium at 1988 Rate Level (STD Basis)

(4) General Expenses +
 (5) General Expense Index **
 (6) Factor to obtain General Expense Level to 1988

704,379	604,222	620,750
1.000	1.038	1.077
1.161	1.118	1.077
817,703	675,754	668,823

(7) Trended General Expenses at 1988 Level

(8) General Expense Provision Restated to 1988 at 1988 Rate Level

(9) Effect of Premium Discount
 (10) Servicing Carrier Allowance

4.42%	3.48%	3.56%
2.48%	2.48%	2.48%
-0.06%	0.21%	0.15%

(11) General Expense Provision re-stated to a first \$5,000 basis at 1988 rate level

6.84%	6.17%	6.19%
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+ 1988 rate level projected using MCCI Index
 * Excludes Expense Constant Revenue (\$120)
 ** Based on CPI Trend

MCCI EXPENSE PROVISION ANALYSIS

General Expense Provision at Current Rate Level Trended to 1988
 Restated to a First \$5,000 Basis
 Stock Companies Only
 Hindsight - Model II

Calendar Year	(1)	(2)	Portion of column (2) earned in:	
	Statewide Premium Level Changes	Cumulative Statewide Premium Level Changes	1984	1985
1982	Base	1.000	0.056	
1983	1.001	1.001	0.722	0.056
1984	1.019	1.020	0.222	0.722
1985	1.131	1.154		0.222
1986	1.099	1.268		0.722
1987	1.102	1.397		0.222
Average Earned Rate Level Index			1.005	1.049
				1.172

(1)	Factor to 1988 Rate Level +	1.443	1.383	1.238
(2)	Net Earned Premium (STD Basis)	12,825,575	14,039,258	15,189,817
(3)	Net Earned Premium at 1988 Rate Level (STD Basis)	18,504,802	19,415,944	18,802,750
(4)	General Expenses *	704,379	604,222	620,750
(5)	Factor to obtain General Expense Level to 1988	1.000	1.000	1.000
(6)	Trended General Expenses at 1988 Level	704,379	604,222	620,750
(7)	General Expense Provision Restated to 1988 at 1988 Rate Level	3.81%	3.11%	3.30%
(8)	Effect of Premium Discount	2.48%	2.48%	2.48%
(9)	Servicing Carrier Allowance	-0.06%	0.21%	0.15%
(10)	General Expense Provision re-stated to a first \$5,000 basis at 1988 rate level	6.23%	5.80%	5.93%

+ 1988 rate level projected using NCCI Index
 * Excludes Expense Constant Revenue

MCCI EXPENSE PROVISION ANALYSIS

General Expense Provision at Current Rate Level Trended to 1988
 Restated to a First \$5,000 Basis
 Stock Companies Only
 Hindsight - Model III

Calendar Year	(1)	(2)	Portion of column (2) earned in:	
	Statewide Premium Level Changes	Cumulative Statewide Premium Level Changes	1984	1985
1982	Base	1.000	0.056	
1983	1.001	1.001	0.722	0.056
1984	1.019	1.020	0.722	0.722
1985	1.131	1.154	0.222	0.722
1986	1.099	1.268		0.222
1987	1.102	1.397		
Average Earned Rate Level Index			1.005	1.049

(1) Factor to 1988 Rate Level +

(2) Payroll Trend Factor to 1/1/89

(3) Net Earned Premium (STD Basis)

(4) Rate Level (STD Basis)

(5) Fixed Expenses (Net of Premium Discount) *

(6) General Expense Provision Restated to 1988 at 1988 Rate Level

(7) Effect of Premium Discount

(8) Servicing Carrier Allowance

(9) General Expense Provision re-stated to a first \$5,000 basis at 1988 rate level

1.383
 1.139
 14,039,258
 22,123,266

841,068

3.80X
 2.48X
 0.21X

6.49X

* 1988 rate level projected using MCCI Index
 * Calculated by method used in Workers' Compensation Insurance Filing of the Workers' Compensation Rating and Inspection Bureau of Massachusetts

EXPENSES

TECHNICAL APPENDIX C
Collected Versus Actual Production and General Expenses

EXPENSES

**EXPENSES:
TECHNICAL APPENDIX C**

To test the adequacy of NCCI's allowance for production and general expenses in the rating plan, we have compared the historical NCCI recommendations for expense provisions versus the amount that the carriers actually incurred as reported in the IEE.

To obtain the recommended provisions, we calculated:

- a. the portion of the overall provision attributable to the expense constant; and
- b. the average variable provision for all policy sizes.

This comparison was done for both general and production expenses using stock company data only. The following sections develop our comparisons for calendar year 1986. Exhibit C-1 summarizes our results for all years in which the available data allowed for a comparison for general and production expenses combined.

EXPENSES:
TECHNICAL APPENDIX C

I. GENERAL EXPENSES

1. Recommended Provision

- a. The expense constant provision was calculated by multiplying the number of policies in a year by the NCCI recommended expense constant. This product was then adjusted to reflect the portion of the total expense constant dollars which can be attributed to general expenses. Note that on Exhibit C-2 we have shown two different expense constant calculations. The first one utilizes a \$120 expense constant which was recommended by the Actuarial Committee in the NCCI annual expense review (Method 1). The second method utilizes a weighted average of the expense constants actually in effect for each state for the year (Method 2). The following calculations derive these provisions:

**EXPENSES:
TECHNICAL APPENDIX C**

	Method 1	Method 2
1986 Number of Policies	2,058,050	2,058,050
Expense Constant	120	88.3
Expense Constant Revenue (ECR)	246,966,000	181,725,815
Portion of ECR Attributable to General Expense (GE)	.595	.595
ECR Attributable to GE	146,944,770	108,126,860
1986 Direct Earned Premium (000's)	17,545,256	17,545,256
Provision for Expense Constant Portion of General Expenses	0.84%	.62%

- b. The average variable provision for all policy sizes is derived directly from the stock premium discount table and policy size distribution:

Premium Size	Percentage of Premium	Gradation of General Expense Provisions
0-5,000	24.06%	7.5%
5,001-100,000	39.98	4.9
100,001-500,000	16.99	4.7
500,000 & Over	18.97	3.1
		5.15%

- c. Combining the two portions above gives us the NCCI recommended general expense provision:

EXPENSES:
TECHNICAL APPENDIX C

	Method 1	Method 2
Provision for Expense Constant (EC)	.84%	.62%
Average Provision net of EC	5.15	5.15
NCCI Recommended General Expense Provision	5.99%	5.77%

This analysis does not reflect the premium written by stock companies utilizing the non-stock premium discount table.

2. Actual Company Expenses Incurred

As previously mentioned, this calculation is taken directly from the countrywide IEE's. The following calculation derives the amount of general expense actually incurred (including revenue generated from the expense constant):

1986 General Expenses Incurred (000's)	795,797
1986 Direct Earned Premium (000's)	17,545,256
Actual 1986 General Expense Provision	4.54%

**EXPENSES:
TECHNICAL APPENDIX C**

II. PRODUCTION EXPENSES

1. Recommended Provision

- a. As was done for General Expense, the expense constant provision was calculated by taking the number of policies in a given year and multiplying by the NCCI recommended expense constant. This product was then adjusted to reflect the portion of the total expense constant dollars which can be attributed to production expenses.

	Method 1	Method 2
1986 Number of Policies	2,058,050	2,058,050
Expense Constant	120	88.3
Portion of ECR Attributable to General Expense (GE)	.337	.337
ECR Attributable to GE	83,227,542	61,241,600
1986 Direct Written Premium (000's)	17,853,256	17,853,256
	.47%	.34%

- b. The average variable provision for all policy sizes is derived directly from the stock premium discount tables and policy size distribution.

**EXPENSES:
TECHNICAL APPENDIX C**

Premium Size	Percentage of Premium	Gradation of Production Expense Provisions
0-5,000	24.06%	15.0%
5,001-100,000	39.98	7.5
100,001-500,000	16.99	6.0
500,000 & Over	18.97	6.0
		8.76

- c. Combining the two provisions above gives us the NCCI recommended production expense provision:

	Method 1	Method 2
Provision for Expense Constant (EC)	.47%	.34%
Average Provision Net of EC	8.76	8.76
NCCI Recommended General Expense Provision	9.23%	9.10%

2. Actual Company Expense Incurred

As with the case for general expenses, this calculation is taken directly from the countrywide IEE's. The following calculation derives the amount of production expense actually incurred (including revenue generated from the expense constant):

1986 Production Expenses Incurred (000's)	\$ 1,494,991
1986 Direct Written Premium (000's)	17,853,256
Actual 1986 Production Expense Provision	8.37%

**EXPENSES:
TECHNICAL APPENDIX C**

III. CONCLUSIONS

The summary of our results can be seen on Exhibits C-2 (for general expense) and C-3 (for production expense) for calendar years 1986 through 1989. Both exhibits display that the rating plan premium collected for expenses as recommended by NCCI exceed the amount actually incurred by the companies.

For production expenses, this analysis does not reflect:

1. the premium written by stock companies utilizing the non-stock premium discount table; and
2. the filed assigned risk expense provision where NCCI prepares a separate assigned risk filing.
3. The distortion due to the way the carriers book the servicing carrier allowance (Appendix A).

As we discuss in Technical Appendix G, the net effect of the above two factors is to increase the stock collected expense provision.

EXPENSES

TECHNICAL APPENDIX C

EXHIBITS

<u>Exhibit #</u>	<u>Exhibits</u>
Exhibit C-1	Production and General Expense Ratios - Comparison of Actual vs. Recommended
Exhibit C-2	General Expense Ratios - Comparison of Actual vs. Recommended
Exhibit C-3	Production Expense Ratios - Comparison of Actual vs. Recommended

EXPENSES

Exhibit C-1

NCCI EXPENSE PROVISION ANALYSIS
 Production and General Expense Ratios
 Comparison of Actual vs. Recommended

	Actual Expense Constant	NCCI Proposed Expense Constant
1986	14.87%	12.91%
1987	14.40%	12.56%
1988	13.38%	12.91%
1989	13.12%	12.26%

	Stock Companies		Stock Companies	
	Rating Plan +	Actual IEE	Rating Plan *	Actual IEE
1986	14.87%	12.91%	15.22%	12.91%
1987	14.40%	12.56%	14.64%	12.56%
1988	13.38%	12.91%	13.72%	12.91%
1989	13.12%	12.26%	13.38%	12.26%

Source: Insurance Expense Exhibit

- + Uses [(# of policies x Average Expense Constant x 59.5%)/Direct Earned Premium] + Average Net General Expense Provision plus [(# of policies x Average Expense Constant x 33.7%)/Direct Written Premium] + Average Net Production Expense Provision
 - * Uses [(# of policies x EC x 59.5%)/Direct Earned Premium] + Average Net General Expense Provision plus [(# of policies x EC x 33.7%)/Direct Written Premium] + Average Net Production Expense Provision
- where EC = Recommended Expense Constant in effect

MCCI EXPENSE PROVISION ANALYSIS

General Expense Ratios
Comparison of Actual vs. Recommended

	Actual Expense Constant	MCCI Proposed Expense Constant
	Stock Companies	
	Rating Plan + Actual IEE	Rating Plan * Actual IEE
1986	5.77%	5.99%
1987	5.56%	5.72%
1988	4.67%	4.89%
1989	4.56%	4.73%

Source: Insurance Expense Exhibit

+ Uses [(# of policies x Average Expense Constant x 59.5%)/Direct Earned Premium] + Average Net General Expense Provision

* Uses [(# of policies x EC x 59.5%)/Direct Earned Premium] + Average Net General Expense Provision
where EC = Recommended Expense Constant in effect

NCCI EXPENSE PROVISION ANALYSIS

Production Expense Ratios
 Comparison of Actual vs. Recommended

	Actual Expense Constant	NCCI Proposed Expense Constant
	Stock Companies	
	Rating Plan + Actual IEE	Rating Plan * Actual IEE
1986	9.10%	8.37%
1987	8.84%	8.05%
1988	8.71%	8.31%
1989	8.56%	8.27%

Source: Insurance Expense Exhibit

+ Uses [(# of policies x Average Expense Constant x 33.7%)/Direct Written Premium] + Average Net Production Expense Provision

* Uses [(# of policies x EC x 33.7%)/Direct Written Premium] + Average Net Production Expense Provision
 Where EC = Recommended Expense Constant in effect

EXPENSES

TECHNICAL APPENDIX D
Correlation Test of State Expense Ratios

EXPENSES

**EXPENSES:
TECHNICAL APPENDIX D**

This Appendix presents an explanation of the statistical correlation tests which were performed to measure the relationship of state expense ratios.

The two statistical tests mentioned below measure the correlation of expense ratio rankings across years within a state. Both the production and general expense ratios were computed on a direct basis and are restated to a first \$5,000 basis. General expenses and production expenses were tested separately for each correlation statistic. The two statistical tests of correlation utilized are:

1. A chi-squared test based on the coefficient of concordance; and
2. A normal test based on Spearman's rank correlation coefficient.

The coefficient of concordance W ranges in value from 0 to 1. The variable permits a simultaneous test across a multiple number of years m of the degree of correlation in the rankings of n objects.

The execution of the test is best described by the use of an example. Exhibit D-1 provides the calculation of the coefficient of concordance for production expenses. The first step is to take the rank for production expenses for each state in each of the three years 1987 through 1989 and sum across the years. For example, the sum of Utah's ranks across the three years is 5. With $m = 3$ years and $n = 37$ states, the average three-year sum of the ranks is $m(n+1)/2 = 3(37+1)/2 = 57$; in the next step, this average is subtracted from each state's own three-year summed rank to determine each's state's deviation. Again focusing on Utah, the deviation is $5-57 = -52$. Then, the deviations are squared and the squares are summed across the states; this gives the sum of the squared deviations $S = 31,878$ that is shown on Exhibit D-1. This sum includes the squared deviation for Utah of $(-52)(-52) = 2,704$.

We now define M as the square of m and $N = n(n+1)(n-1)$; The coefficient of concordance can now be calculated from the equation $W=12S/MN$. In this case, $M = 9$ and $N = 37(37+1)(37-1) = 37(38)(36) = 50,616$; it follows that the value of the test statistic is $12(31,878)/9(50,616) = .839734$; this result is also displayed on Exhibit D-1.

EXPENSES:
TECHNICAL APPENDIX D

Although tables of the distribution of W are available, it is useful to exploit the relationship of W to the chi-squared distribution in hypothesis testing. The transformation of W based on $f(W) = m(n-1)W$ produces a variable that is approximately a chi-squared variable, with $n-1$ degrees of freedom. For our rankings of $n = 37$ states in each of $m = 3$ years, the test value $f(W)$ produced is $3(37-1)(.839734) = 90.6913$.

The coefficient of concordance tests the null hypothesis that there is no consensus in the rankings year to year (no community of order). Based on the transformation to chi-squared, the critical test value with $n-1 = 37-1 = 36$ degrees of freedom is 61.5 at a .005 level of significance. Thus, for the production expenses, the null hypothesis is rejected in favor of the alternative hypothesis: the state rankings for production expenses are correlated year to year for the entire three-year period 1987 to 1989.

Exhibit D-2 repeats the coefficient of concordance test for general expenses. The key values resulting from this test are: $S = 29,828$, $W = .785733$, and $f(W) = 84.8592$. At the .005 level of significance, the determination is again to reject the null hypothesis in favor of the alternative hypothesis: the state rankings for general expenses are correlated for the entire three-year period 1987 to 1989.

Our second set of tests involved the calculation of Spearman's rank correlation coefficient $r(s)$. These tests are based on the more familiar concept of correlation being a statistical measure applied to exactly two sets of observations. That is, whereas the coefficient of concordance W permits a test of a multiple number of years, Spearman's rank correlation coefficient tests one year against another. As a correlation coefficient, the range of values for $r(s)$ is -1 to 1.

As before, the calculation of Spearman's $r(s)$ statistic can best be explained through use of an example. Exhibit D-3 presents the calculation of $r(s)$ for each of the three possible year against year combinations (i.e., 1987 versus 1988, 1988 versus 1989, 1987 versus 1989) for the rankings of state production expense ratios. The first step in calculating $r(s)$ is to calculate the difference in each state's rankings across the two years being compared, then to square these differences; for example, Utah ranks in 1987 and 1988 are 1 and 2, respectively, resulting in a squared difference of 1. The squared differences are then summed across states; for the comparison between 1987 and 1988, it is seen on Exhibit D-3 that the squared differences sum

**EXPENSES:
TECHNICAL APPENDIX D**

to $D = 2,582$. Spearman's $r(s)$ is then calculated from the equation $r(s) = 1 - (6D/N)$, where N is again defined to be $N = n(n+1)(n-1)$, and n is again the number of states being ranked. In the case of 1987 versus 1988 production expense rankings, $r(s) = 1 - [(6)(2,582)/50,616] = .6939$, again as displayed on Exhibit D-3.

Although tables of the distribution of $r(s)$ are available, it is useful to exploit the relationship of $r(s)$ to the standard normal distribution in hypothesis testing. The transformation of $r(s)$ based on $g(r(s)) = .5\{\ln[(1+r(s))/(1-r(s))]\}$ produces a variable that is approximately normal, with variance $1/(n-3)$. In this case, the variance is $1/(37-3) = .0294$, which implies a standard deviation of $.1715$; this can be used to further transform the normal variable $g(r(s))$ to a standard normal variable Z .

For the case of 1987 versus 1988 production expense rankings, $g(r(s)) = 0.8554$. This corresponds to the standard normal variate of $Z = 0.8554/.1715 = 4.9878$ that is displayed on Exhibit D-3. The test of the null hypothesis that there is zero correlation in the rankings then reduces to a comparison of this value against a critical standard normal Z value. At a $.005$ level of significance, the critical value of Z is 2.57 for a one-sided test; hence, the test is significant. Thus, for the correlation of production expenses between 1987 and 1988, the null hypothesis is rejected in favor of the alternative hypothesis: the rankings are positively correlated.

Exhibit D-3 also displays tests of 1988 versus 1989 and 1987 versus 1989 for production expenses. Additionally, Exhibit D-4 displays tests of all three possible year against year tests for the general expense ratio rankings. In all of these remaining cases, the test results are significant; at the $.005$ level of significance, the determination is always made to reject the null hypothesis in favor of the alternative hypothesis that the state rankings are positively correlated year to year.

EXPENSES

TECHNICAL APPENDIX D

EXHIBITS

<u>Exhibit #</u>	<u>Exhibits</u>
Exhibit D-1	Test of Coefficient of Concordance for Production Expenses
Exhibit D-2	Test of Coefficient of Concordance for General Expenses
Exhibit D-3	Test of Spearman's Rank Correlation Coefficient for Production Expenses
Exhibit D-4	Test of Spearman's Rank Correlation Coefficient for General Expenses

EXPENSES

NCCI EXPENSE PROVISION ANALYSIS
ADJUSTED PRODUCTION EXPENSES
TEST OF COEFFICIENT OF CONCORDANCE

State	(1) Ranking for 1987	(2) Ranking for 1988	(3) Ranking for 1989	(4) Sum of Rankings	(5) Deviation from Avg 3-Yr Ranking	(6) Deviation Squared
UT	1	2	2	5	-52	2,704
NM	2	1	1	4	-53	2,809
AZ	3	6	6	15	-42	1,764
CO	4	13	12	29	-28	784
MT	5	5	4	14	-43	1,849
RI	6	4	3	13	-44	1,936
ID	7	7	7	21	-36	1,296
AR	8	8	14	30	-27	729
VT	9	18	9	36	-21	441
VA	10	12	13	35	-22	484
GA	11	10	5	26	-31	961
MD	12	31	37	80	23	529
MS	13	21	11	45	-12	144
IA	14	24	21	59	2	4
SC	15	14	18	47	-10	100
DC	16	25	19	60	3	9
FL	17	23	20	60	3	9
KS	18	22	23	63	6	36
NH	19	17	8	44	-13	169
LA	20	20	29	69	12	144
TN	21	3	15	39	-18	324
ME	22	27	31	80	23	529
AL	23	16	10	49	-8	64
CT	24	26	16	66	9	81
IL	25	15	22	62	5	25
AK	26	11	24	61	4	16
WI	27	30	26	83	26	676
MI	28	28	27	83	26	676
NE	29	29	25	83	26	676
HI	30	33	35	98	41	1,681
IN	31	34	30	95	38	1,444
MO	32	32	33	97	40	1,600
SD	33	19	17	69	12	144
OK	34	35	28	97	40	1,600
KY	35	36	36	107	50	2,500
NC	36	37	34	107	50	2,500
OR	37	9	32	78	21	441
Total	703	703	703	2,109	0	31,878
Average	19	19	19	57	0	862

Quantities in the test:

m =	3	(i.e., number of years)
M =	9	(i.e., m squared)
n =	37	(i.e., number of states)
N =	50,616	(i.e., n(n+1)(n-1))
S =	31,878	(i.e., sum of Column (6))
W =	0.839734	(i.e., 12S/MN)
f(W) =	90.6913	(i.e., m(n-1)W)

Test for f(W): the transformed variable is distributed approximately as chi-squared with n-1 = 36 degrees of freedom. A critical value for the test is 61.5 at the 0.005 level of significance. The test is significant.

NCCI EXPENSE PROVISION ANALYSIS

ADJUSTED GENERAL EXPENSES

TEST OF COEFFICIENT OF CONCORDANCE

	(1)	(2)	(3)	(4)	(5)	(6)
State	Ranking for 1987	Ranking for 1988	Ranking for 1989	Sum of Rankings	Deviation from Avg 3-Yr Ranking	Deviation Squared
HI	1	1	1	3	-54	2,916
UT	2	8	5	15	-42	1,764
AZ	3	5	3	11	-46	2,116
RI	4	11	8	23	-34	1,156
MD	5	25	36	66	9	81
MS	6	10	10	26	-31	961
VA	7	14	14	35	-22	484
CO	8	7	22	37	-20	400
GA	9	9	7	25	-32	1,024
VT	10	4	6	20	-37	1,369
NM	11	23	2	36	-21	441
IN	12	17	11	40	-17	289
ID	13	3	4	20	-37	1,369
AL	14	6	17	37	-20	400
CT	15	20	20	55	-2	4
AR	16	15	19	50	-7	49
FL	17	21	27	65	8	64
NH	18	13	9	40	-17	289
SC	19	12	16	47	-10	100
MT	20	28	18	66	9	81
NE	21	19	24	64	7	49
IL	22	16	15	53	-4	16
DC	23	22	25	70	13	169
MI	24	32	29	85	28	784
TN	25	26	23	74	17	289
OK	26	27	12	65	8	64
IA	27	30	30	87	30	900
LA	28	24	33	85	28	784
WI	29	33	21	83	26	676
SD	30	18	26	74	17	289
AK	31	31	13	75	18	324
KY	32	37	37	106	49	2,401
ME	33	36	32	101	44	1,936
MO	34	35	35	104	47	2,209
NC	35	34	34	103	46	2,116
KS	36	29	28	93	36	1,296
OR	37	2	31	70	13	169
Total	703	703	703	2,109	0	29,828
Average	19	19	19	57	0	806

Quantities in the test:

m =	3	(i.e., number of years)
M =	9	(i.e., m squared)
n =	37	(i.e., number of states)
N =	50,616	(i.e., n(n+1)(n-1))
S =	29,828	(i.e., sum of Column (6))
W =	0.785733	(i.e., 12S/MN)
f(W) =	84.8592	(i.e., m(n-1)W)

Test for f(W): the transformed variable is distributed approximately as chi-squared with n-1 = 36 degrees of freedom. A critical value for the test is 61.5 at the 0.005 level of significance. The test is significant.

ADJUSTED PRODUCTION EXPENSES

TEST OF SPEARMAN'S RANK CORRELATION COEFFICIENT

State	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Rankings			1987 vs 1988		1988 vs 1989		1987 vs 1989	
	1987	1988	1989	Diff	Squared	Diff	Squared	Diff	Squared
UT	1	2	2	-1	1	0	0	-1	1
NM	2	1	1	1	1	0	0	1	1
AZ	3	6	6	-3	9	0	0	-3	9
CO	4	13	12	-9	81	1	1	-8	64
MT	5	5	4	0	0	1	1	1	1
RI	6	4	3	2	4	1	1	3	9
ID	7	7	7	0	0	0	0	0	0
AR	8	8	14	0	0	-6	36	-6	36
VT	9	18	9	-9	81	9	81	0	0
VA	10	12	13	-2	4	-1	1	-3	9
GA	11	10	5	1	1	5	25	6	36
MD	12	31	37	-19	361	-6	36	-25	625
MS	13	21	11	-8	64	10	100	2	4
IA	14	24	21	-10	100	3	9	-7	49
SC	15	14	18	1	1	-4	16	-3	9
DC	16	25	19	-9	81	6	36	-3	9
FL	17	23	20	-6	36	3	9	-3	9
KS	18	22	23	-4	16	-1	1	-5	25
NH	19	17	8	2	4	9	81	11	121
LA	20	20	29	0	0	-9	81	-9	81
TN	21	3	15	18	324	-12	144	6	36
ME	22	27	31	-5	25	-4	16	-9	81
AL	23	16	10	7	49	6	36	13	169
CT	24	26	16	-2	4	10	100	8	64
IL	25	15	22	10	100	-7	49	3	9
AK	26	11	24	15	225	-13	169	2	4
WI	27	30	26	-3	9	4	16	1	1
MI	28	28	27	0	0	1	1	1	1
NE	29	29	25	0	0	4	16	4	16
HI	30	33	35	-3	9	-2	4	-5	25
IN	31	34	30	-3	9	4	16	1	1
MO	32	32	33	0	0	-1	1	-1	1
SD	33	19	17	14	196	2	4	16	256
OK	34	35	28	-1	1	7	49	6	36
KY	35	36	36	-1	1	0	0	-1	1
NC	36	37	34	-1	1	3	9	2	4
OR	37	9	32	28	784	-23	529	5	25
Total					2,582		1,674		1,828

Quantities for the tests:

Column Sums D =	2,582	1,674	1,828
Number of States n =	37	37	37
$N = n(n+1)(n-1) =$	50,616	50,616	50,616
$r(s) = 1-(6D/N) =$	0.6939	0.8016	0.7833
Normal Variable $g(r(s)) =$	0.8554	1.1031	1.0539
Standard Deviation for $g(r(s)) =$	0.1715	0.1715	0.1715
Standard Normal Z =	4.9878	6.4321	6.1452
Critical Z at .005 =	2.57	2.57	2.57

All tests of correlation are significant.

NCCI EXPENSE PROVISION ANALYSIS

ADJUSTED GENERAL EXPENSES

TEST OF SPEARMAN'S RANK CORRELATION COEFFICIENT

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Rankings			1987 vs 1988		1988 vs 1989		1987 vs 1989	
State	1987	1988	1989	Diff	Squared	Diff	Squared	Diff	Squared
HI	1	1	1	0	0	0	0	0	0
UT	2	8	5	-6	36	3	9	-3	9
AZ	3	5	3	-2	4	2	4	0	0
RI	4	11	8	-7	49	3	9	-4	16
MD	5	25	36	-20	400	-11	121	-31	961
MS	6	10	10	-4	16	0	0	-4	16
VA	7	14	14	-7	49	0	0	-7	49
CO	8	7	22	1	1	-15	225	-14	196
GA	9	9	7	0	0	2	4	2	4
VT	10	4	6	6	36	-2	4	4	16
NM	11	23	2	-12	144	21	441	9	81
IN	12	17	11	-5	25	6	36	1	1
ID	13	3	4	10	100	-1	1	9	81
AL	14	6	17	8	64	-11	121	-3	9
CT	15	20	20	-5	25	0	0	-5	25
AR	16	15	19	1	1	-4	16	-3	9
FL	17	21	27	-4	16	-6	36	-10	100
NH	18	13	9	5	25	4	16	9	81
SC	19	12	16	7	49	-4	16	3	9
MT	20	28	18	-8	64	10	100	2	4
NE	21	19	24	2	4	-5	25	-3	9
IL	22	16	15	6	36	1	1	7	49
DC	23	22	25	1	1	-3	9	-2	4
MI	24	32	29	-8	64	3	9	-5	25
TN	25	26	23	-1	1	3	9	2	4
OK	26	27	12	-1	1	15	225	14	196
IA	27	30	30	-3	9	0	0	-3	9
LA	28	24	33	4	16	-9	81	-5	25
WI	29	33	21	-4	16	12	144	8	64
SD	30	18	26	12	144	-8	64	4	16
AK	31	31	13	0	0	18	324	18	324
KY	32	37	37	-5	25	0	0	-5	25
ME	33	36	32	-3	9	4	16	1	1
MO	34	35	35	-1	1	0	0	-1	1
NC	35	34	34	1	1	0	0	1	1
KS	36	29	28	7	49	1	1	8	64
OR	37	2	31	35	1225	-29	841	6	36
Total					2,706		2,908		2,520

Quantities for the tests:

Column Sums D =	2,706	2,908	2,520
Number of States n =	37	37	37
$N = n(n+1)(n-1) =$	50,616	50,616	50,616
$r(s) = 1 - (6D/N) =$	0.6792	0.6553	0.7013
Normal Variable $g(r(s)) =$	0.8276	0.7845	0.8699
Standard Deviation for $g(r(s)) =$	0.1715	0.1715	0.1715
Standard Normal Z =	4.8257	4.5743	5.0723
Critical Z at .005 =	2.57	2.57	2.57

All tests of correlation are significant.

M&R Prepared

EXPENSES

TECHNICAL APPENDIX E
Residual Market Producer Fees

EXPENSES

**EXPENSES:
TECHNICAL APPENDIX E**

NCCI publishes producer fee tables by state for non-coal and coal exposures for residual market business. Exhibit E-1 displays the tables utilized by state. NCCI publishes 12 different tables for non-coal exposures and 1 table for coal mine exposures. The attached Exhibits E-2 through E-13 display the various tables.

The tables provide for lower producer fees than would be incurred in the voluntary market. Based on our analysis of stock companies, we estimated that companies incurred 13.0% of standard premium (excluding expense constant revenue) for total production expenses (including other acquisition expenses) for the first \$5,000 of standard premium. Based on our analysis, we estimate that 4.5% of the 13.0% is for other acquisition expenses and 8.5% is due to commission related expenses.

All of the residual market producer fee tables provide for producer fees less than 8.5% for the first \$5,000 of standard premium. For example, Table A (Exhibit E-2) contains the following graduated producer fee schedule:

Residual Market Producer Fee

Table A

<u>Standard Premium Division</u>		<u>Producer Fee Provision</u>
First	\$1,000	8.0%
Next	\$4,000	5.0
Next	\$95,000	3.0
Over	\$100,000	2.0

The above table provides for a 5.6% producer fee allowance for the first \$5,000 of standard premium.

EXPENSES

TECHNICAL APPENDIX E

EXHIBITS

<u>Exhibit #</u>	<u>Exhibits</u>
Exhibit E-1	Handbook for Plans and Pools - Exhibit E - Table of Contents
Exhibit E-2	Handbook for Plans and Pools - Exhibit E - Table A
Exhibit E-3	Handbook for Plans and Pools - Exhibit E - Table B
Exhibit E-4	Handbook for Plans and Pools - Exhibit E - Table C
Exhibit E-5	Handbook for Plans and Pools - Exhibit E - Table D
Exhibit E-6	Handbook for Plans and Pools - Exhibit E - Table E
Exhibit E-7	Handbook for Plans and Pools - Exhibit E - Table F
Exhibit E-8	Handbook for Plans and Pools - Exhibit E - Table G
Exhibit E-9	Handbook for Plans and Pools - Exhibit E - Table H
Exhibit E-10	Handbook for Plans and Pools - Exhibit E - Table I
Exhibit E-11	Handbook for Plans and Pools - Exhibit E - Table J
Exhibit E-12	Handbook for Plans and Pools - Exhibit E - Table K
Exhibit E-13	Handbook for Plans and Pools - Exhibit E - Table L
Exhibit E-14	Handbook for Plans and Pools - Exhibit E - Table M

EXPENSES

Effective October 1, 1984

PRODUCER FEE PERCENTAGE SCALES

Exhibit E-1

The tables found in this exhibit show average rates that may be used by the servicing carrier in determining both coal and non-coal producer fees and are advisory in nature. The states are grouped under the applicable tables as follows:

<u>State</u>	<u>Table(s)</u>		<u>State</u>	<u>Table(s)</u>	
	<u>Non-Coal</u>	<u>Coal</u>		<u>Non-Coal</u>	<u>Coal</u>
Alabama	A	K	Montana	None	K
Alaska	H	K	★ Nebraska	A	None
Arizona	J	K	Nevada	None	None
Arkansas	A	K	New Hampshire	A	None
California	None	None	New Jersey	F	None
Colorado	None	K	New Mexico	A	K
Connecticut	A	None	New York	None	None
Delaware	J	None	North Carolina	J	K
District of Columbia	A	None	North Dakota	None	None
Florida	A	None	Ohio	None	None
★ Georgia	A	K	Oklahoma	None	K
Hawaii	B	None	Oregon	G	None
Idaho	None	None	Pennsylvania	None	K(OD) G(Traumatic)
Illinois	C	K	Rhode Island	A	None
Indiana	A	K	South Carolina	A	None
★ Iowa	A	K	★ South Dakota	A	K
Kansas	A	K	Tennessee	A	K
Kentucky	A	K	Texas	L	None
Louisiana	I	None	Utah	None	K
Maine	A	None	Vermont	A	None
Maryland	None	K	Virginia	A	K
Massachusetts	D	None	Washington	None	K
Michigan	M	None	West Virginia	None	None
Minnesota	E	None	Wisconsin	E	None
Mississippi	A	None	Wyoming	None	K
Missouri	A	K			

HANDBOOK FOR PLANS AND POOLS

3rd Reprint

PART SEVEN

TABLE A—EXHIBIT E

Par

Effective October 1, 1984

<u>GRADUATED A SCALE</u>			<u>Applicable States</u>	<u>Exhibit E-2</u>	
First	\$ 1,000	8%	Alabama	★ Iowa	New Mexico
Next	4,000	5%	Arkansas	Kansas	Rhode Island
Next	95,000	3%	Connecticut	Kentucky	South Carolina
Over	100,000	2%	Delaware	Maine	★ South Dakota
			District of Columbia	Mississippi	Tennessee
			Florida	Missouri	Vermont
			★ Georgia	★ Nebraska	Virginia
			Indiana	New Hampshire	

<u>Standard Premium Interval</u>	<u>Producer Fee Percentage</u>	<u>Standard Premium Interval</u>	<u>Producer Fee Percentage</u>
0-1,017	8.0%	6,342- 6,667	5.0%
1,018-1,053	7.9	6,668- 7,027	4.9
1,054-1,091	7.8	7,028- 7,429	4.8
1,092-1,132	7.7	7,430- 7,879	4.7
1,133-1,176	7.6	7,880- 8,387	4.6
1,177-1,224	7.5	8,388- 8,966	4.5
1,225-1,277	7.4	8,967- 9,630	4.4
1,278-1,333	7.3	9,631- 10,400	4.3
1,334-1,395	7.2	10,401- 11,304	4.2
1,396-1,463	7.1	11,305- 12,381	4.1
1,464-1,538	7.0	12,382- 13,684	4.0
1,539-1,622	6.9	13,685- 15,294	3.9
1,623-1,714	6.8	15,295- 17,333	3.8
1,715-1,818	6.7	17,334- 20,000	3.7
1,819-1,935	6.6	20,001- 23,636	3.6
1,936-2,069	6.5	23,637- 28,889	3.5
2,070-2,222	6.4	28,890- 37,143	3.4
2,223-2,400	6.3	37,144- 52,000	3.3
2,401-2,609	6.2	52,001- 86,667	3.2
2,610-2,857	6.1	86,668- 107,619	3.1
2,858-3,158	6.0	107,620- 118,947	3.0
3,159-3,529	5.9	118,948- 132,941	2.9
3,530-4,000	5.8	132,942- 150,667	2.8
4,001-4,615	5.7	150,668- 173,846	2.7
4,615-5,098	5.6	173,847- 205,455	2.6
5,099-5,306	5.5	205,456- 251,111	2.5
5,307-5,532	5.4	251,112- 322,857	2.4
5,533-5,778	5.3	322,858- 452,000	2.3
5,779-6,047	5.2	452,001- 753,333	2.2
6,048-6,341	5.1	753,334- 2,260,000	2.1
		2,260,001 and over	2.0

Effective January 1, 1982

Exhibit E-3

GRADUATED B SCALE

First	\$ 5,000	5%
Next	95,000	3%
Next	100,000	2%

Applicable State
 Hawaii

<u>Standard Premium Interval</u>	<u>Producer Fee Percentage</u>	<u>Standard Premium Interval</u>	<u>Producer Fee Percentage</u>
0- 5,128	5.0%	18,183- 22,222	3.5%
5,129- 5,405	4.9	22,223- 28,571	3.4
5,406- 5,714	4.8	28,572- 40,000	3.3
5,715- 6,061	4.7	40,001- 66,667	3.2
6,062- 6,452	4.6	66,668- 104,762	3.1
6,453- 6,897	4.5	104,763- 115,789	3.0
6,898- 7,407	4.4	115,790- 129,412	2.9
7,408- 8,000	4.3	129,413- 146,667	2.8
8,001- 8,697	4.2	146,668- 169,231	2.7
8,697- 9,524	4.1	169,232- 200,000	2.6
9,525-10,526	4.0	200,001- 244,444	2.5
10,527-11,765	3.9	244,445- 314,286	2.4
11,766-13,333	3.8	314,287- 440,000	2.3
13,334-15,385	3.7	440,001- 733,333	2.2
15,386-18,182	3.6	733,334-2,200,000	2.1
		2,200,001 and over	2.0

HANDBOOK FOR PLANS AND POOLS

Original Printing

Effective January 1, 1982

GRADUATED C SCALE

Exhibit E-4

First	\$ 1,000	8%
Next	4,000	4%
Next	95,000	2%
Over	100,000	1%

Applicable State

Illinois

<u>Final Annual Premium Interval</u>	<u>Producer Fee Percentage</u>	<u>Final Annual Premium Interval</u>	<u>Producer Fee Percentage</u>
0-1,013	8.0%	5,491- 5,714	4.5%
1,014-1,039	7.9	5,715- 5,957	4.4
1,040-1,067	7.8	5,958- 6,222	4.3
1,068-1,096	7.7	6,223- 6,512	4.2
1,097-1,127	7.6	6,513- 6,829	4.1
1,128-1,159	7.5	6,830- 7,179	4.0
1,160-1,194	7.4	7,180- 7,568	3.9
1,195-1,231	7.3	7,569- 8,000	3.8
1,232-1,270	7.2	8,001- 8,485	3.7
1,271-1,311	7.1	8,486- 9,032	3.6
1,312-1,356	7.0	9,033- 9,655	3.5
1,357-1,404	6.9	9,656- 10,370	3.4
1,405-1,455	6.8	10,371- 11,200	3.3
1,456-1,509	6.7	11,201- 12,174	3.2
1,510-1,569	6.6	12,175- 13,333	3.1
1,570-1,633	6.5	13,334- 14,737	3.0
1,634-1,702	6.4	14,738- 16,471	2.9
1,703-1,778	6.3	16,472- 18,667	2.8
1,779-1,860	6.2	18,668- 21,538	2.7
1,861-1,951	6.1	21,539- 25,455	2.6
1,952-2,051	6.0	25,456- 31,111	2.5
2,052-2,162	5.9	31,112- 40,000	2.4
2,163-2,286	5.8	40,001- 56,000	2.3
2,287-2,424	5.7	56,001- 93,333	2.2
2,425-2,581	5.6	93,334- 113,333	2.1
2,582-2,759	5.5	113,334- 125,263	2.0
2,760-2,963	5.4	125,264- 140,000	1.9
2,964-3,200	5.3	140,001- 158,667	1.8
3,201-3,478	5.2	158,668- 183,077	1.7
3,479-3,810	5.1	183,078- 216,364	1.6
3,811-4,211	5.0	216,365- 264,444	1.5
4,212-4,706	4.9	264,445- 340,000	1.4
4,707-5,091	4.8	340,001- 476,000	1.3
5,092-5,283	4.7	476,001- 793,333	1.2
5,284-5,490	4.6	793,334-2,380,001	1.1
		2,380,001 and over	1.0

Effective January 1, 1982

Exhibit E-5

GRADUATED D SCALE

First	\$ 1,000	9%
Next	4,000	5%
Next	95,000	4%
Over	100,000	3%

Applicable State

Massachusetts

<u>Standard Premium Interval</u>	<u>Producer Fee Percentage</u>	<u>Standard Premium Interval</u>	<u>Producer Fee Percentage</u>
0-1,012	9.0%	3,810- 4,210	6.0%
1,018-1,038	8.9	4,211- 4,705	5.9
1,039-1,066	8.8	4,706- 5,142	5.8
1,067-1,095	8.7	5,143- 5,454	5.7
1,096-1,126	8.6	5,455- 5,806	5.6
1,127-1,159	8.5	5,807- 6,206	5.5
1,160-1,194	8.4	6,207- 6,666	5.4
1,195-1,230	8.3	6,667- 7,200	5.3
1,231-1,269	8.2	7,201- 7,826	5.2
1,270-1,311	8.1	7,827- 8,571	5.1
1,312-1,355	8.0	8,572- 9,473	5.0
1,356-1,403	7.9	9,474- 10,588	4.9
1,404-1,454	7.8	10,589- 12,000	4.8
1,455-1,509	7.7	12,001- 13,846	4.7
1,510-1,568	7.6	13,847- 16,363	4.6
1,569-1,632	7.5	16,364- 20,000	4.5
1,633-1,702	7.4	20,001- 25,714	4.4
1,703-1,777	7.3	25,715- 36,000	4.3
1,778-1,860	7.2	36,001- 60,000	4.2
1,861-1,951	7.1	60,001- 103,809	4.1
1,952-2,051	7.0	103,810- 114,736	4.0
2,052-2,162	6.9	114,737- 128,235	3.9
2,163-2,285	6.8	128,236- 145,333	3.8
2,286-2,424	6.7	145,334- 167,692	3.7
2,425-2,580	6.6	167,693- 198,181	3.6
2,581-2,758	6.5	198,182- 242,222	3.5
2,759-2,962	6.4	242,223- 311,428	3.4
2,963-3,200	6.3	311,429- 436,000	3.3
3,201-3,478	6.2	436,001- 726,666	3.2
3,479-3,809	6.1	726,667-2,180,000	3.1
		2,180,001 and over	3.0

<u>GRADUATED E SCALE</u>			<u>Applicable States</u>	<u>Exhibit E-6</u>
First	\$ 1,000	5%	Minnesota	
Next	4,000	4%	Texas	
Next	5,000	3%	Wisconsin	
Over	10,000	1%		

<u>Standard Premium Interval</u>	<u>Producer Fee Percentage</u>	<u>Standard Premium Interval</u>	<u>Producer Fee Percentage</u>
0- 1,052	5.0%	12,684- 13,333	3.0%
1,053- 1,176	4.9	13,334- 14,054	2.9
1,177- 1,333	4.8	14,055- 14,857	2.8
1,134- 1,538	4.7	14,858- 15,758	2.7
1,539- 1,818	4.6	15,759- 16,774	2.6
1,819- 2,222	4.5	16,775- 17,931	2.5
2,223- 2,857	4.4	17,932- 19,259	2.4
2,858- 4,000	4.3	19,260- 20,800	2.3
4,001- 5,217	4.2	20,801- 22,609	2.2
5,218- 5,714	4.1	22,610- 24,762	2.1
5,715- 6,316	4.0	24,763- 27,368	2.0
6,317- 7,059	3.9	27,369- 30,588	1.9
7,060- 8,000	3.8	30,589- 34,667	1.8
8,001- 9,231	3.7	34,668- 40,000	1.7
9,232-10,196	3.6	40,001- 47,273	1.6
10,197-10,612	3.5	47,274- 57,778	1.5
10,613-11,064	3.4	57,779- 74,286	1.4
11,065-11,556	3.3	74,287-104,000	1.3
11,557-12,093	3.2	104,001-173,333	1.2
12,094-12,683	3.1	173,334-520,000	1.1
		520,001 and over	1.0

NATIONAL COUNCIL ON COMPENSATION INSURANCE

Effective January 1, 1989

Graduated F Scale		
First	\$ 1,000	8.0%
Next	4,000	6.0
Next	95,000	4.0
Over	100,000	2.0

Applicable State
New Jersey

Exhibit E-7

Standard Premium Interval			Producer Fee Percentage	Standard Premium Interval			Producer Fee Percentage	Standard Premium Interval			Producer Fee Percentage
\$ 0—	1,025		8.0%	5,854—	6,153		6.0%	103,415—	108,717		4.0%
1,026—	1,081		7.9	6,154—	6,486		5.9	108,718—	114,594		3.9
1,082—	1,142		7.8	6,487—	6,857		5.8	114,595—	121,142		3.8
1,143—	1,212		7.7	6,858—	7,272		5.7	121,143—	128,484		3.7
1,213—	1,290		7.6	7,273—	7,741		5.6	128,485—	136,774		3.6
1,291—	1,379		7.5	7,742—	8,275		5.5	136,775—	146,206		3.5
1,380—	1,481		7.4	8,276—	8,888		5.4	146,207—	157,037		3.4
1,482—	1,600		7.3	8,889—	9,600		5.3	157,038—	169,600		3.3
1,601—	1,739		7.2	9,601—	10,434		5.2	169,601—	184,347		3.2
1,740—	1,904		7.1	10,435—	11,428		5.1	184,348—	201,904		3.1
1,905—	2,105		7.0	11,429—	12,631		5.0	201,905—	223,157		3.0
2,106—	2,352		6.9	12,632—	14,117		4.9	223,158—	249,411		2.9
2,353—	2,666		6.8	14,118—	16,000		4.8	249,412—	282,666		2.8
2,667—	3,076		6.7	16,001—	18,461		4.7	282,667—	326,153		2.7
3,077—	3,636		6.6	18,462—	21,818		4.6	326,154—	385,454		2.6
3,637—	4,444		6.5	21,819—	26,666		4.5	385,455—	471,111		2.5
4,445—	5,106		6.4	26,667—	34,285		4.4	471,112—	605,714		2.4
5,107—	5,333		6.3	34,286—	48,000		4.3	605,715—	848,000		2.3
5,334—	5,581		6.2	48,001—	80,000		4.2	848,001—	1,413,333		2.2
5,582—	5,853		6.1	80,001—	103,414		4.1	1,413,334—	4,240,000		2.1
								4,240,001—	OVER		2.0

Exhibit E-8

GRADUATED G SCALE

First	\$ 1,000	5%
Next	4,000	3%
Next	95,000	2%
Over	100,000	1%

Applicable State
Oregon
Pennsylvania (Coal-Traumatic Only)

<u>Standard Premium Interval</u>	<u>Producer Fee Percentage</u>	<u>Standard Premium Interval</u>	<u>Producer Fee Percentage</u>
0-1,026	5.0%	6,668- 7,368	3.0%
1,027-1,081	4.9	7,369- 8,235	2.9
1,082-1,143	4.8	8,236- 9,333	2.8
1,144-1,212	4.7	9,334- 10,769	2.7
1,213-1,290	4.6	10,770- 12,727	2.6
1,291-1,379	4.5	12,728- 15,556	2.5
1,380-1,481	4.4	15,557- 20,000	2.4
1,482-1,600	4.3	20,001- 28,000	2.3
1,601-1,739	4.2	28,001- 46,667	2.2
1,740-1,905	4.1	46,668- 101,905	2.1
1,906-2,105	4.0	101,906- 112,632	2.0
2,106-2,353	3.9	112,633- 125,882	1.9
2,354-2,667	3.8	125,883- 142,667	1.8
2,668-3,077	3.7	142,668- 164,615	1.7
3,078-3,636	3.6	164,616- 194,545	1.6
3,637-4,444	3.5	194,546- 237,778	1.5
4,445-5,185	3.4	237,779- 305,714	1.4
5,186-5,600	3.3	305,715- 428,000	1.3
5,601-6,087	3.2	428,001- 713,333	1.2
6,088-6,667	3.1	713,334-2,140,000	1.1
		2,140,001 and over	1.0

GRADUATED H SCALE (NON-AIRCRAFT)			Applicable State	GRADUATED H SCALE (AIRCRAFT)		
First	\$ 5,000	5 %	Alaska	First	\$ 5,000	4.7%
Next	95,000	3 %		Next	95,000	2.8%
Over	100,000	1½ %		Over	100,000	1.4%
Standard Premium Interval		Producer Fee Percentage		Standard Premium Interval		Producer Fee Percentage
0-	5,000	5.0%		0-	5,000	4.7%
5,001-	5,128	5.0		5,001-	5,135	4.7
5,129-	5,405	4.9		5,136-	5,428	4.6
5,406-	5,714	4.8		5,429-	5,757	4.5
5,715-	6,060	4.7		5,758-	6,129	4.4
6,061-	6,451	4.6		6,130-	6,551	4.3
6,452-	6,896	4.5		6,552-	7,037	4.2
6,897-	7,407	4.4		7,038-	7,600	4.1
7,408-	8,000	4.3		7,601-	8,260	4.0
8,001-	8,695	4.2		8,261-	9,047	3.9
8,696-	9,523	4.1		9,048-	10,000	3.8
9,524-	10,526	4.0		10,001-	11,176	3.7
10,527-	11,764	3.9		11,177-	12,666	3.6
11,765-	13,333	3.8		12,667-	14,615	3.5
13,334-	15,384	3.7		14,616-	17,272	3.4
15,385-	18,181	3.6		17,273-	21,111	3.3
18,182-	22,222	3.5		21,112-	27,142	3.2
22,223-	28,571	3.4		27,143-	38,000	3.1
28,572-	40,000	3.3		38,001-	63,333	3.0
40,001-	66,666	3.2		63,334-	103,103	2.9
66,667-	103,225	3.1		103,104-	110,740	2.8
103,226-	110,344	3.0		110,741-	119,600	2.7
110,345-	118,518	2.9		119,601-	130,000	2.6
118,519-	128,000	2.8		130,001-	142,380	2.5
128,001-	139,130	2.7		142,381-	157,368	2.4
139,131-	152,380	2.6		157,369-	175,882	2.3
152,381-	168,421	2.5		175,883-	199,333	2.2
168,422-	188,235	2.4		119,334-	230,000	2.1
188,236-	213,333	2.3		230,001-	271,818	2.0
213,334-	246,153	2.2		271,819-	332,222	1.9
246,154-	290,909	2.1		332,223-	427,142	1.8
290,910-	355,555	2.0		427,143-	598,000	1.7
355,556-	457,142	1.9		598,001-	996,666	1.6
457,143-	640,000	1.8		996,667-	2,990,000	1.5
640,001-	1,066,666	1.7		2,990,001 and over		1.4
1,066,667-	3,200,000	1.6				
3,200,001 and over		1.5				

★ GRADUATED I SCALE

Exhibit E-10

			Applicable State
First	\$ 1,000	8.0%	Louisiana
Next	2,000	5.0%	
Next	116,400	4.2%	
Over	119,400	2.5%	

★	Standard Premium Interval	Producer Fee Percentage	Standard Premium Interval	Producer Fee Percentage
	0-1,016	8.0%	4,001- 4,320	5.5%
	1,017-1,052	7.9	4,321- 4,695	5.4
	1,053-1,090	7.8	4,696- 5,142	5.3
	1,091-1,132	7.7	5,143- 5,684	5.2
	1,133-1,176	7.6	5,685- 6,352	5.1
	1,177-1,224	7.5	6,353- 7,200	5.0
	1,225-1,276	7.4	7,201- 8,307	4.9
	1,277-1,333	7.3	8,308- 9,818	4.8
	1,334-1,395	7.2	9,819- 12,000	4.7
	1,396-1,463	7.1	12,001- 15,428	4.6
	1,464-1,538	7.0	15,429- 21,600	4.5
	1,539-1,621	6.9	21,601- 36,000	4.4
	1,622-1,714	6.8	36,001- 108,000	4.3
	1,715-1,818	6.7	108,001- 126,290	4.2
	1,819-1,935	6.6	126,291- 134,438	4.1
	1,936-2,068	6.5	134,439- 143,710	4.0
	2,069-2,222	6.4	143,711- 154,355	3.9
	2,223-2,400	6.3	154,356- 166,704	3.8
	2,401-2,608	6.2	166,705- 181,200	3.7
	2,609-2,857	6.1	181,201- 198,457	3.6
	2,858-3,085	6.0	198,458- 219,347	3.5
	3,086-3,272	5.9	219,348- 245,152	3.4
	3,273-3,483	5.8	245,153- 277,840	3.3
	3,484-3,724	5.7	277,841- 320,584	3.2
	3,725-4,000	5.6	320,585- 378,872	3.1
			378,873- 463,066	3.0
			463,067- 595,371	2.9
			595,372- 833,520	2.8
			833,521-1,389,200	2.7
			1,389,201-4,167,600	2.6
			4,167,601 and over	2.5

Please note: The percentages given take into account the current Louisiana rule against paying producer fee on the surcharged portion of the premium, and therefore should be applied against the state standard premium as per the usual procedure.

Effective October 1, 1984

Exhibit E-11

5% FLAT

A flat producer fee of 5% of the total charged and collected premium is used in the states of:

Arizona
North Carolina

1% FLAT

A flat producer fee of 1% is applied to the total charged and collected premium for the **occupational disease coverage** under policies subject to the Federal Coal Mine Health and Safety Act in the states of:

Alabama	Missouri
Alaska	Montana
Arizona	New Mexico
Arkansas	North Carolina
Colorado	Oklahoma
Georgia	Pennsylvania
Illinois	South Dakota
Indiana	Tennessee
Iowa	Utah
Kansas	Virginia
Kentucky	Washington
Maryland	Wyoming

The producer fee tables applicable to the **surface and auger traumatic coverage** and **underground traumatic coverage** under policies subject to the Federal Coal Mine Health and Safety Act in the above states are the same as the non-coal tables. Refer to Part Seven, Exhibit E, Page 1 for the appropriate Non-Coal table.

Effective May 1, 1982

Exhibit E-13

GRADUATED J SCALE

First	\$ 3,000	5%
Next	12,000	4%
Next	15,000	3%
Over	30,000	2%

Applicable State

Texas

<u>Standard Premium Interval</u>	<u>Producer Fee Percentage</u>	<u>Standard Premium Interval</u>	<u>Producer Fee Percentage</u>
0- 3,000	5.0	38,049- 40,000	3.0
3,001- 3,157	5.0	40,001- 42,162	2.9
3,158- 3,529	4.9	42,163- 44,571	2.8
3,530- 4,000	4.8	44,572- 47,272	2.7
4,001- 4,615	4.7	47,273- 50,322	2.6
4,616- 5,454	4.6	50,323- 53,793	2.5
5,455- 6,666	4.5	53,794- 57,777	2.4
6,667- 8,571	4.4	57,778- 62,400	2.3
8,572- 12,000	4.3	62,401- 67,826	2.2
12,001- 15,652	4.2	67,827- 74,285	2.1
15,653- 17,142	4.1	74,286- 82,105	2.0
17,143- 18,947	4.0	82,106- 91,764	1.9
18,948- 21,176	3.9	91,765- 104,000	1.8
21,177- 24,000	3.8	104,001- 120,000	1.7
24,001- 27,692	3.7	120,001- 141,818	1.6
27,693- 30,588	3.6	141,819- 173,333	1.5
30,589- 31,836	3.5	173,334- 222,857	1.4
31,837- 33,191	3.4	222,858- 312,000	1.3
33,192- 34,666	3.3	312,001- 520,000	1.2
34,667- 36,279	3.2	520,001- 1,560,000	1.1
36,280- 38,048	3.1	1,560,001 and over	

Effective October 1, 1983

Exhibit E-14

GRADUATED K SCALE

First	\$ 5,000	5%
Next	95,000	4%
Next	400,000	3%
Over	500,000	2%

Applicable State

Michigan

<u>Standard Premium Interval</u>		<u>Producer Fee Percentage</u>
0-	5,000	5.0%
5,001-	5,263	5.0
5,264-	5,882	4.9
5,883-	6,666	4.8
6,667-	7,692	4.7
7,693-	9,090	4.6
9,091-	11,111	4.5
11,112-	14,285	4.4
14,286-	20,000	4.3
20,001-	33,333	4.2
33,334-	100,000	4.1
100,001-	110,526	4.0
110,527-	123,529	3.9
123,530-	140,000	3.8
140,001-	161,538	3.7
161,539-	190,909	3.6
190,910-	233,333	3.5
233,334-	300,000	3.4
300,001-	420,000	3.3
420,001-	526,086	3.2
526,087-	576,190	3.1
576,191-	636,842	3.0
636,843-	711,764	2.9
711,765-	806,666	2.8
806,667-	930,769	2.7
930,770-	1,100,000	2.6
1,100,001-	1,344,444	2.5
1,344,445-	1,728,571	2.4
1,728,572-	2,420,000	2.3
2,420,001-	4,033,333	2.2
4,033,334-	12,100,000	2.1
12,100,001 and Over		2.0

This schedule is applicable on policies written effective January 1, 1983 and subsequent in Rating Plans A, B, and C.

EXPENSES

TECHNICAL APPENDIX F

Net Production Allowance in the Rating Plan - Calendar Year 1989

EXPENSES

**EXPENSES:
TECHNICAL APPENDIX F**

NCCI manual rates incorporate a 15% loading for production expenses for the first \$5,000 of standard premium and the percentage loading decreases, as the premium size increases. The following table displays the production allowances for various premium sizes for companies electing the stock premium discount table.

Division of Premium	Stock Production Expense Allowances
First \$5,000	15.00%
Next 95,000	7.50
Next 400,000	6.00
Next 500,000	6.00

These provisions, along with the production expense component of the expense constant of \$47.35 provide for the production allowance in the rating plan.

Based on the distribution of policies by size (from data call #7) and the above table, we can derive the average variable production expense allowance which is provided for in the rating plan. Exhibit F-1 displays the premium discount associated with production expenses based on data call #7 for five time periods along with NCCI projected discount to January 1, 1992. Using a similar method to NCCI, we computed an average discount of 6.65% as of July 1, 1989. July 1, 1989 is the mid-point for calendar year 1989. Thus the variable expense element in the rating plan for stock companies is 15.00% minus 6.65% or 8.35% for calendar year 1989.

In order to estimate the variable percentage collected by stock companies through the rating plan in calendar year 1989 two additional adjustments are necessary:

1. to reflect the premium written by stock companies utilizing the non-stock table; and
2. to reflect the lower filed commission allowances in manual rates for residual market business in some states.

EXPENSES:
TECHNICAL APPENDIX F

A stock company is not restricted to utilizing the stock table. Based on a special data call by NCCI, 74.8% of the stock companies utilize the stock table and 25.2% of the stock companies utilize the non-stock table. The stock companies utilizing the non-stock table will collect more for production expenses than stock companies utilizing the stock table. For the states in which NCCI manages the residual market pool, the residual market premium represents 22.0% of the calendar year 1989 total market premium and the average production allowance for the first \$5,000 of standard premium is 14.25% (Exhibit F-2). Exhibit F-3 displays the filed production expense allowance for residual market business in states where NCCI submits a separate filing for residual market business. As discussed in Technical Appendix E, in general the producer fees for residual market business are lower than the voluntary commission and brokerage expenses incurred by companies.

Based on the above information, we can estimate the average variable production allowance (excluding expense constant revenue) for the total market based on the Actuarial Committee's recommended expense program for policies effective in 1989 and the residual market information above. The following table displays the calculation.

**EXPENSES:
TECHNICAL APPENDIX F**

Estimated Collected Variable Production Allowance Calendar Year 1989		
Stock Companies		
Type of Business	Percentage of Premium Related to Total Market	Average Production Allowance Adjusted to 1989 Distribution
Voluntary		
Stock Using Stock Table	58.3%	8.35%
Stock Using Non-Stock Table	19.7	11.65
Sub Total	78	9.18
Residual Market	22	8.72
Total	100	9.08

Based on the above analysis, the average collected production expense allowance of 9.08% exceeds the incurred production expense allowance of 6.03% by 3.05 points of standard premium. The incurred production expense allowance is directly from the IEE (less expense constant revenue associated with production expenses).

EXPENSES

TECHNICAL APPENDIX F

EXHIBITS

<u>Exhibit #</u>	<u>Exhibits</u>
Exhibit F-1	Calculation of Average Discount for Production Expenses Underlying Premium Discount Plan
Exhibit F-2	Production Expense Ratios by State
Exhibit F-3	States where NCCI Submits a Separate Filing for Assigned Risk Business

EXPENSES

1990 ANNUAL EXPENSE REVIEW

Calculation of Average Discount for Production Expenses
Underlying Premium Discount Plan

FOR STOCK COMPANIES

Midpoint of Data	Premium Discount	Regression Output:	
		Constant	-0.052581498
01-Nov-83	0.0588	Std Err of Y Est	0.0003872921
01-Nov-84	0.0605	R Squared	0.9751937389
01-Nov-85	0.0618	No. of Observations	5
01-Nov-86	0.0624	Degrees of Freedom	3
01-Nov-87	0.0645		
Projected 01-Jan-92	0.0698	X Coefficient(s)	0.000003641
		Std Err of Coef.	0.000000335

ASSUMPTIONS:

- (1) Average policy effective date for policies written in 1991 is 1/1/92.
- (2) Data source for discounts is Premium by Size of Policy Call.
Carriers have optional reporting periods: 1/1/87 - 12/31/87
or 7/1/87 - 6/30/88

A survey of the top 10 carriers reporting this Call (representing 58% of premium) revealed that 64.9% of premium was based on a 7/1/87 - 6/30/88 reporting period. A weighted average of the above midpoints (7/1/87 and 1/1/88, respectively) yielded an average midpoint of approximately 11/1/87. The distribution was assumed to be the same for prior years.

Exhibit F-2

NCCI EXPENSE PROVISION ANALYSIS

 PRODUCTION EXPENSE RATIOS BY STATE

	(1)	(2)	(3)
STATES	1989 POOLS REINSURANCE PREMIUMS WRITTEN	PRODUCTION EXPENSE	PRODUCTION EXPENSE WEIGHTED BY (1)
AL	95,453,501	15.00%	0.39%
AR	76,445,407	15.00%	0.32%
CT	108,570,347	15.00%	0.45%
DC	14,863,623	15.00%	0.06%
GA	160,121,581	15.00%	0.66%
HI	24,817,124	15.00%	0.10%
IL	272,171,404	12.00%	0.90%
IN	88,717,541	15.00%	0.37%
LA	254,703,926	10.00%	0.70%
MI	106,726,827	15.00%	0.44%
NH	68,663,874	15.00%	0.28%
NM	64,221,606	10.00%	0.18%
OR	28,803,271	15.00%	0.12%
RI	144,425,791	15.00%	0.60%
SC	82,177,422	11.00%	0.25%
VT	28,148,844	15.00%	0.12%
VA	86,974,060	15.00%	0.36%
ALL OTHER	1,933,425,786	15.00%	7.97%
TOTALS:	3,639,431,935		14.25%

STATES WHERE NCCI SUBMITS A SEPARATE FILING
FOR ASSIGNED RISK BUSINESS

Assigned Risk

State	Latest Effective Date	Production Expense
Alabama	01-Apr-91	15%
Arkansas	01-Mar-91	15%
Connecticut	01-Jan-91	15%
Dist. of Col.	01-Apr-91	15%
Georgia	01-Mar-91	15%
Hawaii	01-Oct-89	15%
Illinois	01-Apr-91	12%
Indiana	01-Jan-91	15%
Louisiana	01-May-91	10%
Michigan	01-May-91	15%
New Hampshire	01-Jul-91	15%
New Mexico	01-Jan-91	10%
Oregon	01-Jan-91	15%
Rhode Island	22-Jun-89	15%
South Carolina	01-July-91	11%
Virginia	01-Nov-90	15%
Vermont	01-Jul-90	15%

EXPENSES

TECHNICAL APPENDIX G

Insurance Expense Exhibit Operating Ratios

EXPENSES

EXPENSES

TECHNICAL APPENDIX G

EXHIBITS

<u>Exhibit #</u>	<u>Exhibits</u>
Exhibit G-1 & G-2	Expense Indications for Stock Companies (1971 - 1989)
Exhibit G-3 & G-4	Expense Indications for Mutual Companies (1971 - 1989)

NCCI EXPENSE PROVISION ANALYSIS

Expense Indications (Based On Countrywide IEE's)
STOCK COMPANIES (Includes Participating & Non-Participating)
(All Numbers in Thousands)

	Calendar Year									
	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
(1) Net Written Premium	2,529,008	2,883,808	3,370,959	3,844,760	4,354,468	5,157,965	6,561,053	7,729,670	9,334,840	10,339,159
(2) Net Earned Premium	2,454,414	2,762,224	3,246,873	3,741,318	4,196,331	4,959,571	6,322,191	7,346,313	8,926,651	10,085,927
(3) Losses Incurred Ratio - (3)/(2)	1,942,246 (68.3%)	1,942,881 (70.3%)	2,256,832 (69.5%)	2,738,037 (73.2%)	3,193,950 (76.1%)	3,995,401 (80.6%)	5,018,125 (79.4%)	5,607,891 (76.3%)	6,391,313 (71.6%)	6,927,395 (68.7%)
(4) Loss Adjustment Expense Incurred Ratio - (4)/(2)	207,827 (8.5%)	240,369 (8.7%)	274,729 (8.5%)	324,511 (8.7%)	346,172 (8.2%)	421,420 (8.5%)	586,253 (9.3%)	666,989 (9.1%)	832,961 (9.3%)	853,845 (8.5%)
(5) Commission & Brokerage Incurred Ratio - (5)/(1)	211,248 (8.4%)	243,079 (8.4%)	278,952 (8.3%)	308,781 (8.0%)	335,469 (7.7%)	369,941 (7.2%)	448,272 (6.8%)	493,438 (6.4%)	611,987 (6.6%)	706,699 (6.8%)
(6) Other Acquisition Expense Incurred Ratio - (6)/(1)	61,970 (2.5%)	69,891 (2.4%)	83,675 (2.5%)	95,290 (2.5%)	101,312 (2.3%)	114,306 (2.2%)	136,524 (2.1%)	145,659 (1.9%)	189,564 (2.0%)	260,082 (2.5%)
(7) Total Commission, Brokerage & Other Acquisition Expense Ratio - (7)/(1)	273,218 (10.8%)	312,970 (10.9%)	362,627 (10.8%)	404,071 (10.5%)	436,781 (10.0%)	484,247 (9.4%)	584,796 (8.9%)	639,097 (8.3%)	801,551 (8.6%)	966,781 (9.4%)
(8) General Expenses Ratio - (8)/(2)	154,834 (6.3%)	178,347 (6.5%)	209,302 (6.4%)	239,084 (6.4%)	258,636 (6.2%)	278,289 (5.6%)	350,066 (5.5%)	417,640 (5.7%)	548,601 (6.1%)	606,565 (6.0%)
(9) Taxes, Licenses & Fees Ratio - (9)/(2)	91,992 (3.7%)	111,164 (4.0%)	129,619 (4.0%)	150,273 (4.0%)	170,869 (4.1%)	198,136 (4.0%)	241,062 (3.8%)	285,283 (3.9%)	351,361 (3.9%)	370,253 (3.7%)
(10) Total Expenses, (Excluding LAE) Ratio - (7)/(1) + (8)+(9)/(2)	520,044 (20.9%)	602,481 (21.3%)	701,548 (21.2%)	793,428 (20.9%)	866,286 (20.3%)	960,672 (19.0%)	1,175,924 (18.3%)	1,342,020 (17.8%)	1,701,513 (18.7%)	1,943,599 (19.0%)
(11) Gain from Underwriting Ratio - (11)/(2)	51,297 (2.1%)	(23,507) (-0.9%)	13,764 (0.4%)	(114,658) (-3.1%)	(210,077) (-5.0%)	(417,922) (-8.4%)	(458,111) (-7.2%)	(270,587) (-3.7%)	864 (0.0%)	361,088 (3.6%)
(12) Dividends to Policyholders Ratio - (12)/(2)	137,647 (5.6%)	147,223 (5.3%)	165,872 (5.1%)	190,430 (5.1%)	192,668 (4.6%)	193,530 (3.9%)	235,781 (3.7%)	308,836 (4.2%)	434,658 (4.9%)	558,928 (5.5%)
(13) Net Investment Gain or Loss Ratio - (13)/(2)	116,952 (4.8%)	130,928 (4.7%)	159,626 (4.9%)	205,749 (5.5%)	288,358 (6.9%)	358,490 (7.2%)	496,459 (7.9%)	606,348 (8.3%)	860,190 (9.6%)	1,079,844 (10.7%)
(14) Net Income Before Federal & Foreign Income Taxes Ratio - (14)/(2)	30,604 (1.2%)	(39,805) (-1.4%)	7,518 (0.2%)	(99,339) (-2.7%)	(114,387) (-2.7%)	(252,962) (-5.1%)	(197,431) (-3.1%)	26,925 (0.4%)	426,397 (4.8%)	882,004 (8.7%)

Exhibit G-2

NCCI EXPENSE PROVISION ANALYSIS
 Expense Indications (Based On Countrywide IEE's)
 STOCK COMPANIES (Includes Participating & Non-Participating)
 (All Numbers in Thousands)

	Calendar Year								
	1981	1982	1983	1984	1985	1986	1987	1988	1989
(1) Net Written Premium	10,659,362	10,293,845	10,497,377	11,411,039	12,516,464	14,290,885	16,658,846	19,354,205	20,319,577
(2) Net Earned Premium	10,488,700	10,262,628	10,477,917	11,524,287	12,471,808	14,023,434	16,049,092	18,825,135	20,304,983
(3) Losses Incurred Ratio - (3)/(2)	6,982,458 (66.8%)	6,597,691 (64.3%)	7,306,542 (69.7%)	9,299,846 (80.7%)	10,090,264 (80.9%)	12,013,590 (85.7%)	13,049,351 (81.3%)	15,572,918 (82.7%)	16,751,100 (82.5%)
(4) Loss Adjustment Expense Incurred Ratio - (4)/(2)	960,969 (9.2%)	940,567 (9.2%)	980,141 (9.4%)	1,134,997 (9.8%)	1,214,822 (9.7%)	1,480,689 (10.6%)	1,832,640 (11.4%)	2,088,809 (11.1%)	2,392,349 (11.8%)
(5) Commission & Brokerage Incurred Ratio - (5)/(1)	690,425 (6.5%)	660,379 (6.4%)	760,638 (7.2%)	779,609 (6.8%)	741,796 (5.9%)	807,930 (5.7%)	983,049 (5.9%)	1,183,776 (6.1%)	1,159,514 (5.7%)
(6) Other Acquisition Expense Incurred Ratio - (6)/(1)	306,210 (2.9%)	347,227 (3.4%)	362,940 (3.5%)	403,206 (3.5%)	412,819 (3.3%)	443,725 (3.1%)	478,459 (2.9%)	588,471 (3.0%)	655,083 (3.2%)
(7) Total Commission, Brokerage & Other Acquisition Expense Ratio - (7)/(1)	996,635 (9.3%)	1,007,606 (9.8%)	1,123,578 (10.7%)	1,182,815 (10.4%)	1,154,615 (9.2%)	1,251,655 (8.8%)	1,461,508 (8.8%)	1,772,247 (9.2%)	1,814,597 (8.9%)
(8) General Expenses Ratio - (8)/(2)	710,003 (6.8%)	786,698 (7.7%)	838,365 (8.0%)	852,181 (7.4%)	766,010 (6.1%)	795,797 (5.7%)	887,031 (5.5%)	1,010,923 (5.4%)	993,480 (4.9%)
(9) Taxes, Licenses & Fees Ratio - (9)/(2)	414,404 (4.0%)	412,280 (4.0%)	443,966 (4.2%)	495,016 (4.3%)	576,653 (4.6%)	689,238 (4.9%)	786,900 (4.9%)	896,932 (4.8%)	942,232 (4.6%)
(10) Total Expenses, Incurred (Excluding LAE) Ratio - (7)/(1) + [(8)+(9)]/(2)	2,121,042 (20.1%)	2,206,584 (21.5%)	2,405,909 (22.9%)	2,530,012 (22.1%)	2,497,278 (20.0%)	2,736,690 (19.3%)	3,135,439 (19.2%)	3,680,102 (19.3%)	3,750,309 (18.5%)
(11) Gain from Underwriting Ratio - (11)/(2)	424,231 (4.0%)	517,786 (5.0%)	(214,675) (-2.0%)	(1,440,568) (-12.5%)	(1,330,556) (-10.7%)	(2,207,535) (-15.7%)	(1,968,338) (-12.3%)	(2,516,694) (-13.4%)	(2,588,775) (-12.7%)
(12) Dividends to Policyholders Ratio - (12)/(2)	692,214 (6.6%)	803,927 (7.8%)	917,688 (8.8%)	1,009,653 (8.8%)	1,119,760 (9.0%)	1,030,060 (7.3%)	1,039,389 (6.5%)	1,046,792 (5.6%)	1,186,677 (5.8%)
(13) Net Investment Gain or Loss Ratio - (13)/(2)	1,357,185 (12.9%)	1,521,536 (14.8%)	1,619,880 (15.5%)	1,867,455 (16.2%)	1,896,933 (15.2%)	2,010,395 (14.3%)	2,225,165 (13.9%)	2,510,735 (13.3%)	2,799,236 (13.8%)
(14) Net Income Before Federal & Foreign Income Taxes Ratio - (14)/(2)	1,089,202 (10.4%)	1,235,395 (12.0%)	487,517 (4.7%)	(582,766) (-5.1%)	(553,383) (-4.4%)	(1,227,200) (-8.8%)	(782,562) (-4.9%)	(1,052,725) (-5.6%)	(976,216) (-4.8%)

NCCI EXPENSE PROVISION ANALYSIS
Expense Indications (Based On Countrywide IEE's)
MUTUAL COMPANIES
(All Numbers in Thousands)

	Calendar Year									
	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
(1) Net Written Premium	987,436	1,046,881	1,177,261	1,330,127	1,434,326	1,743,840	2,291,314	2,494,235	3,231,856	3,380,108
(2) Net Earned Premium	976,915	1,029,662	1,170,571	1,293,301	1,395,218	1,714,867	2,262,580	2,700,828	3,154,631	3,323,955
(3) Losses Incurred Ratio - (3)/(2)	660,577 (67.6%)	699,005 (67.9%)	785,338 (67.1%)	886,932 (68.6%)	963,634 (69.1%)	1,235,732 (72.1%)	1,678,476 (74.2%)	1,922,687 (71.2%)	2,120,470 (67.2%)	2,130,775 (64.1%)
(4) Loss Adjustment Expense Incurred Ratio - (4)/(2)	86,049 (8.8%)	92,733 (9.0%)	100,817 (8.6%)	114,420 (8.8%)	116,460 (8.3%)	139,964 (8.2%)	183,690 (8.1%)	229,358 (8.5%)	282,602 (9.0%)	273,236 (8.2%)
(5) Commission & Brokerage Incurred Ratio - (5)/(1)	17,244 (1.7%)	24,155 (2.3%)	23,146 (2.0%)	29,296 (2.2%)	29,532 (2.1%)	23,302 (1.3%)	26,275 (1.1%)	16,474 (0.7%)	29,026 (0.9%)	30,905 (0.9%)
(6) Other Acquisition Expense Incurred Ratio - (6)/(1)	44,614 (4.5%)	47,278 (4.5%)	52,605 (4.5%)	58,232 (4.4%)	61,282 (4.3%)	66,680 (3.8%)	77,102 (3.4%)	90,353 (3.6%)	108,327 (3.4%)	120,955 (3.6%)
(7) Total Commission, Brokerage & Other Acquisition Expense Ratio - (7)/(1)	61,858 (6.3%)	71,433 (6.8%)	75,751 (6.4%)	87,528 (6.8%)	90,814 (6.3%)	89,982 (5.2%)	103,377 (4.5%)	106,827 (4.3%)	137,353 (4.2%)	151,860 (4.5%)
(8) General Expenses Ratio - (8)/(2)	62,930 (6.4%)	65,764 (6.4%)	70,371 (6.0%)	76,604 (5.9%)	79,478 (5.7%)	87,656 (5.1%)	99,257 (4.4%)	121,852 (4.5%)	144,617 (4.6%)	175,221 (5.3%)
(9) Taxes, Licenses & Fees Ratio - (9)/(2)	39,055 (4.0%)	43,869 (4.3%)	48,251 (4.1%)	49,025 (3.8%)	56,885 (4.1%)	66,569 (3.9%)	82,694 (3.7%)	102,646 (3.8%)	117,029 (3.7%)	115,668 (3.5%)
(10) Total Expenses (Excluding LAE) Ratio - (7)/(1) + [(8)+(9)]/(2)	163,843 (16.7%)	181,066 (17.5%)	194,373 (16.6%)	213,157 (16.3%)	227,177 (16.1%)	244,207 (14.2%)	285,328 (12.6%)	331,325 (12.6%)	398,999 (12.5%)	442,749 (13.2%)
(11) Gain from Underwriting Ratio - (11)/(2)	66,446 (6.8%)	56,858 (5.5%)	90,043 (7.7%)	78,792 (6.1%)	87,947 (6.3%)	94,964 (5.5%)	115,086 (5.1%)	217,458 (8.1%)	352,560 (11.2%)	477,195 (14.4%)
(12) Dividends to Policyholders Ratio - (12)/(2)	135,213 (13.8%)	138,459 (13.4%)	160,853 (13.7%)	178,959 (13.8%)	163,663 (11.7%)	175,628 (10.2%)	209,268 (9.2%)	270,775 (10.0%)	362,986 (11.5%)	507,704 (15.3%)
(13) Net Investment Gain or Loss Ratio - (13)/(2)	57,747 (5.9%)	66,374 (6.4%)	72,159 (6.2%)	79,067 (6.1%)	93,074 (6.7%)	107,168 (6.2%)	146,602 (6.5%)	191,924 (7.1%)	261,232 (8.3%)	355,149 (10.7%)
(14) Net Income Before Federal & Foreign Income Taxes Ratio - (14)/(2)	(11,021) (-1.1%)	(15,226) (-1.5%)	1,349 (0.1%)	(21,101) (-1.6%)	17,358 (1.2%)	26,505 (1.5%)	52,420 (2.3%)	138,606 (5.1%)	250,806 (8.0%)	324,640 (9.8%)

Exhibit G-4

NCCI EXPENSE PROVISION ANALYSIS
Expense Indications (Based On Countrywide IEE's)
MUTUAL COMPANIES
(All Numbers in Thousands)

	Calendar Year								
	1981	1982	1983	1984	1985	1986	1987	1988	1989
(1) Net Written Premium	3,337,740	3,108,183	2,911,701	3,234,541	4,095,105	5,116,466	5,975,240	5,681,668	6,233,884
(2) Net Earned Premium	3,313,687	3,083,811	2,994,469	3,163,633	3,900,482	4,912,673	6,256,489	5,892,754	6,134,577
(3) Losses Incurred Ratio - (3)/(2)	2,182,501 (65.9%)	1,984,021 (64.3%)	2,095,166 (70.0%)	2,520,840 (79.7%)	3,191,684 (81.8%)	4,095,157 (83.4%)	5,274,827 (84.3%)	4,937,070 (83.8%)	5,210,584 (84.9%)
(4) Loss Adjustment Expense Incurred Ratio - (4)/(2)	280,010 (8.5%)	271,775 (8.8%)	250,895 (8.4%)	286,351 (9.1%)	327,160 (8.4%)	432,394 (8.8%)	591,516 (9.5%)	581,109 (9.9%)	627,439 (10.2%)
(5) Commission & Brokerage Incurred Ratio - (5)/(1)	46,706 (1.4%)	59,180 (1.9%)	57,718 (1.9%)	71,465 (2.3%)	15,270 (0.4%)	53,124 (1.1%)	171,117 (2.7%)	30,359 (0.5%)	8,599 (-0.1%)
(6) Other Acquisition Expense Incurred Ratio - (6)/(1)	131,964 (4.0%)	141,134 (4.6%)	149,270 (5.0%)	155,916 (4.9%)	176,848 (4.5%)	181,002 (3.7%)	203,882 (3.3%)	206,315 (3.5%)	230,686 (3.8%)
(7) Total Commission, Brokerage & Other Acquisition Expense Ratio - (7)/(1)	178,670 (5.4%)	200,314 (6.5%)	206,988 (6.9%)	227,381 (7.2%)	192,118 (4.9%)	234,126 (4.8%)	374,999 (6.0%)	236,674 (4.0%)	222,087 (3.6%)
(8) General Expenses Ratio - (8)/(2)	206,298 (6.2%)	201,932 (6.5%)	200,664 (6.7%)	208,195 (6.6%)	230,046 (5.9%)	255,470 (5.2%)	266,309 (4.3%)	257,918 (4.4%)	291,160 (4.7%)
(9) Taxes, Licenses & Fees Ratio - (9)/(2)	125,344 (3.8%)	129,957 (4.2%)	131,834 (4.4%)	138,095 (4.4%)	194,702 (5.0%)	244,225 (5.0%)	266,151 (4.3%)	262,118 (4.4%)	277,214 (4.5%)
(10) Total Expenses, Incurred (Excluding LAE) Ratio - (7)/(1) + [(8)+(9)]/(2)	510,312 (15.4%)	532,203 (17.2%)	539,486 (18.2%)	573,671 (18.0%)	616,866 (15.6%)	733,821 (14.7%)	907,459 (14.8%)	756,710 (13.0%)	790,461 (12.8%)
(11) Gain from Underwriting Ratio - (11)/(2)	340,864 (10.3%)	295,812 (9.6%)	108,922 (3.6%)	(217,229) (-6.9%)	(235,228) (-6.0%)	(348,699) (-7.1%)	(517,313) (-8.3%)	(382,135) (-6.5%)	(493,907) (-8.1%)
(12) Dividends to Policyholders Ratio - (12)/(2)	486,497 (14.7%)	503,133 (16.3%)	489,975 (16.4%)	425,234 (13.4%)	427,364 (11.0%)	452,266 (9.2%)	462,872 (7.4%)	573,152 (9.7%)	450,813 (7.3%)
(13) Net Investment Gain or Loss Ratio - (13)/(2)	405,246 (12.2%)	442,135 (14.3%)	476,019 (15.9%)	465,250 (14.7%)	531,199 (13.6%)	502,453 (10.2%)	553,907 (8.9%)	579,747 (9.8%)	637,148 (10.4%)
(14) Net Income Before Federal & Foreign Income Taxes Ratio - (14)/(2)	259,613 (7.8%)	234,814 (7.6%)	94,966 (3.2%)	(177,213) (-5.6%)	(131,393) (-3.4%)	(298,512) (-6.1%)	(426,278) (-6.8%)	(375,542) (-6.4%)	(307,572) (-5.0%)

NAIC

Examination of NCCI

Section II: Ratemaking Procedures
Evaluation of NCCI Ratemaking Methodologies

Volumes V through VI

Book 3

**RATEMAKING PROCEDURES
EVALUATION OF RATEMAKING METHODOLOGIES**

**NCCI EXAMINATION
VOLUME V - SECTION IIB - PART 3
TREND**

November 22, 1991

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TREND

I. INTRODUCTION

This component of Milliman & Robertson's examination of the ratemaking procedures used by National Council on Compensation Insurance (NCCI) focuses on trend. This analysis was prepared in response to a request from the National Association of Insurance Commissioners (NAIC). The questions asked by the NAIC are included in italics at the beginning of each section.

In ratemaking, historical experience is used to project the loss ratios expected for the period during which rates will be in effect (the rate effective period). Due to the time necessary to compile the historical experience, prepare rate filings, and, where necessary, gain regulatory approval, two to three years can elapse between the historical experience period and the rate effective period. During that time, many factors can influence loss ratios, including:

- differences between medical and wage inflation,
- changes in the utilization of medical services,
- changes in claim frequency, and
- shifts in frequency between types of injuries.

The purpose of trend is to measure these changes and to include a provision in the rate level for anticipated changes between the experience period and the rate effective period.



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II. SUMMARY AND CONCLUSIONS

Most of our analysis focused on a review of the experience in eight sample states: Connecticut, Florida, Illinois, Louisiana, Michigan, North Carolina, Oregon and Wisconsin. The experience for Oregon was provided separately for private companies and the state fund. While we have drawn inferences from the experience in these states, conclusions regarding appropriate methods should be validated through an analysis of the experience in all states. The evaluation of the linear and exponential models included one test based on all NCCI states excluding Georgia. It should also be noted that variations in some aspects of the trend procedure may be appropriate for a particular state to reflect the specific circumstances in that state.

A. Evaluation of NCCI Procedure (Section 3a)

"Are there any expected biases or errors present in the NCCI's general trending procedures? If so, discuss their impact."

We have evaluated each aspect of the NCCI trend procedure. Based on our review of trend indications in the sample states, there appear to be several aspects that may produce inaccuracies in the rate level indication. These are:

- the use of the midpoints of the experience and rate effective periods as approximations for their respective average accident dates,
- the use of credibilities that do not consider the appropriateness of the credibility complement, and
- the split between effective and ineffective medical fee schedules based on observed trend indications.

Two other potential biases related to the benefit on level factor derivation were identified by the NAIC. These are discussed in detail in Sections VII and IX of this report.

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1. Midpoint versus Average Accident Date (Page 34)

In most states, the midpoints of the rate effective period and the experience period used for ratemaking are reasonable approximations of the average accident date in each period. In some states, however, presence of a state fund with a highly skewed distribution of premium writings by month can cause errors in the loss ratio projected for the rate effective period of up to 2%, using a 7% annual trend rate. These errors can lead to either over- or understatement of the projected loss ratios. We recommend that adjustments be made to the lengths of the trend periods to reflect distributions of premium writings by month.

2. Introduction of Exponential Curve (Page 54)

Based on the results of tests of projection accuracy, we conclude that for medical losses the exponential model was more accurate than the linear model for the relatively recent economic environment (using Policy Years 1981 through 1986 to project Policy Years 1987 and 1988). For indemnity losses, the corresponding results were inconclusive, but tended to favor the exponential model. Our limited tests using different time periods, reflecting a range of economic conditions, were inconclusive for both medical and indemnity losses. We believe that it is important that, before a model is adopted for long-term use, it be shown to perform better under a range of conditions, not only those that have existed recently. We therefore recommend that NCCI perform tests similar to those contained herein periodically (every two years), which will reflect the then most recent economic environment. We also recommend that NCCI perform tests of projection accuracy over a longer time frame (i.e., five policy years of data predicting two and three years ahead, but differing five-year periods).

3. Appropriateness of the Credibility Complement (Page 56)

In the classical credibility technique employed by NCCI, a weighted average between state trend indications and a credibility complement (based on experience from state groups) is used to determine trend. The weights (i.e. credibilities) are calculated based on the goodness-of-fit of state indications without considering the accuracy of the credibility complement. The resulting weights may be far from optimal.

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We used "empirical Bayesian credibility" methods to test the appropriateness of the credibility complements used by NCCI. These tests indicated that the NCCI procedure has overstated the weight that should be applied to the credibility complement (i.e., understated the state credibility). We also performed tests of prediction errors related to the credibility complement, with inconclusive results. These tests are discussed further on Page 7.

4. Effective versus Ineffective Medical Fee Schedules (Page 71)

NCCI splits states with medical fee schedules between those that are deemed effective and those that are deemed ineffective based on the trend rates indicated after the fee schedule has been implemented. Trend indications from those states with ineffective fee schedules are combined with those from states with no fee schedule in determining the credibility complements.

It is more appropriate to identify the characteristics of fee schedules that are likely to affect trends and to validate these based on the actual data. If such characteristics cannot be identified, we recommend that all states with fee schedules be grouped together for purposes of determining the credibility complement.

B. Changes to NCCI Procedure (Section 3b)

"Would more accurate trending be likely with a different model or with revisions to the current model?"

1. Evaluation Criteria (Page 48)

In evaluating NCCI's procedure, we primarily reviewed the effect of each aspect of the procedure on projection accuracy. This differs from NCCI analyses in that they base their evaluations on the resulting goodness-of-fit. That is, to the extent that a trend line produces a better fit to the data in the experience period used for trend, it is considered superior by NCCI. It is our opinion that it is more appropriate to measure the effect on projection accuracy, rather than historical goodness-of-fit, because the purpose of trend is to project losses two to three years after the experience period used for trend, not to measure the ability of the trend line to fit the historical experience. If a method fits the historical experience well, it will often

TREND

be a good predictor. There are many situations, however, in which a good fit does not imply high projection accuracy.

2. Data Underlying Calculation (Page 39)

In many lines of casualty insurance, trends are estimated for claim frequency and severity (average claim size), separately, as compared to the analysis of loss ratios performed by NCCI. We have identified advantages and disadvantages of the separate projection of frequency and severity. At present, insufficient historical audited claim counts are available from Financial Calls to make projections of ultimate claim counts and, hence, claim frequencies and severities. We recommend that, when sufficient claim count data are available, NCCI perform tests of the projection accuracy of frequency and severity trends and re-evaluate the choice of data underlying the trend calculations.

3. Statistical Approach (Page 46)

NCCI currently uses a statistical method known as least squares regression to estimate trend. Our tests indicate that projection accuracy may be improved through the use of double exponential smoothing or its equivalent, least squares regression with exponential weights.¹ These techniques rely on weighted averages of the underlying data to estimate trend with more weight given to recent data. As a result, these approaches react more quickly to changes in trend rates.

Our analysis indicates that most methods of projecting trend are reasonably accurate in situations in which the trend rate is relatively stable over time. There are many factors that can change the rate of trend or the level of the losses. Methods that respond quickly to such changes without overreacting to outliers (points far from the trend line) will tend to be better predictors of future loss experience.

Another technique that we found promising for longer term study, particularly for medical, is econometric modeling. While the projection accuracy of the simple models tested was not quite as good as that of exponential smoothing, we believe that, with further study, more complex models can be derived that will improve

1 D. A. D'Esopo, "A Note on Forecasting by the Exponential Smoothing Operator," Operations Research, Vol. 9, (1961), pp. 686-687.

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projection accuracy. One of the key advantages of econometric models is their ability to identify and respond to changes in the level of losses and/or the trend rate.

Our conclusion with regard to the number of years used to estimate the trend rate is that the current NCCI practice of using five years is generally reasonable for the linear model. If, however, the exponential model is used, we recommend that NCCI consider extending the experience period to seven or eight years. We also recommend that NCCI periodically (every three to five years) review the projection accuracy of trends based on experience periods of different lengths. It should be noted that the choice of experience period length has less effect if a weighted least squares approach (with exponential weights) is used.

4. Credibility and the Credibility Complement (Page 56)

NCCI's procedure for determining the credibility of an indicated trend rate in each state is based on "classical" credibility theory. In classical credibility, the credibility of an indication is based on its statistical significance. A flaw in this approach is that it does not take into account the ability of the credibility complement (the alternative estimate to which 100% minus the credibility is applied) to estimate the trend rate for a particular state. That is, regardless of the appropriateness of the credibility complement, classical credibility will give the same credibility to a particular indication.

We concluded that a Bayesian credibility approach is theoretically preferable to the classical approach. The important distinction is that, in a Bayesian approach, credibility is assigned based on the relative predictive value of the state indication and the credibility complement. We recommend that NCCI move toward the adoption of a Bayesian credibility approach unless subsequent investigation reveals an unanticipated problem.

We used two approaches to measuring the relative predictive value of the state indication and the credibility complement. First, we tested several empirical Bayesian credibility techniques analogous to those documented in the actuarial literature. These tests indicated that the predictive value of the credibility complements was relatively poor and, therefore, that the state credibilities assigned by NCCI's formula are too low. Second, we performed direct tests of prediction errors based on the state trend indications as compared to those based on the credibility complements. The tests of prediction errors, limited to an eight-state

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sample, did not support the above indication regarding the poor predictive ability of the credibility complements. However, the tests of prediction errors were far from conclusive due to the limited sample size. In Section V and Appendix B, we describe an approach whereby Bayesian credibilities could be calculated based on a comparison of actual historical prediction errors between state indications and the credibility complements (given adequate data availability).

We recommend that the Bayesian approach based on prediction errors be pursued, as well as additional testing and consideration of other empirical Bayesian credibility techniques, such as those tested in our analysis.

NCCI assigns credibility based on the quality of the line fit in each state. This approach leads to credibilities which are more unstable than more common volume-based credibility measures. We found no evidence supporting the quality of fit approach over more stable measures. We tested two approaches to volume-based credibility and found the approach described herein as "volume plus a constant" to be preferable.

We recommend that credibility be based on a measure of volume, preferably using the "volume plus a constant" approach. This change could be implemented as part of a Bayesian credibility procedure or as part of a classical credibility framework if, after investigation, NCCI does not implement a Bayesian credibility procedure.

C. Economic and Benefit Changes (Section 3c)

"Are adequate adjustments made to projections by the NCCI's trend model when significant legal or economic changes occur on a state or national level?"

As noted above, many factors can influence the level of losses and the trend rate. High on the list of such factors are economic changes, such as recessions or shifts in the key industries in a region, and benefit changes, such as the introduction of medical fee schedules and changes in compensation formulas. Our analyses included a review of the procedures used by NCCI to evaluate the impact of such changes on the trend procedure.

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1. Economic Changes (Page 75)

It is our understanding that NCCI has not made adjustments to the trend procedure to address economic changes in specific states or regions. This is not unusual in actuarial analyses. Not only is the impact of economic changes on trend difficult to measure, but the timing and magnitude of the changes themselves are not subject to precise measurement or prediction. Until further research by actuaries and econometricians improves the prediction of economic changes and their impact on trend, it is unlikely that accurate prospective adjustments can be made. The most promising approach for performing such research is through econometric analysis. We recommend that NCCI perform extensive analysis of econometric models. Such models can be valuable not only in states with significant economic changes, but have the potential to improve projection accuracy in more stable situations as well.

Economic changes that occurred during the experience period used to derive the trend rate should be carefully evaluated. For example, a trend rate based on a period of economic recession would not necessarily be appropriate for a period of recovery. Review of long-term trends and econometric analysis can provide guidance regarding adjustments to the trend rate for the impact of such changes during the experience period.

2. Benefit Changes (Page 80)

The impacts of benefit changes on trend are reflected primarily through the adjustment of losses to the current benefit level. For each benefit change, a law amendment factor is calculated to estimate the impact of the benefit change on losses at the time that the change is implemented. These factors are combined to derive factors to adjust losses from the experience period to the current benefit level before the trend estimates are derived.

NCCI has developed a procedure to evaluate the impact of a medical fee schedule on trend, the bent-line procedure. This procedure could be improved through certain refinements. In particular, an assumption implicit in the procedure is that all newly introduced medical fee schedules will be effective (as currently defined by NCCI) in reducing losses and trends. Historically, only about two-thirds of such fee schedules implemented more than five to seven years ago have been effective (as defined by NCCI) in reducing medical trends. Therefore, the NCCI procedure will

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tend, on average, to understate trend in states in which a medical fee schedule has been recently introduced.

In recent years, a few judgmental adjustments have been made by NCCI to the indicated trend rates in states with significant benefit changes. In general, such adjustments are appropriate. We recommend further analysis of historical experience to evaluate which benefit changes have tended to have a predictable impact on trend. Such analyses may prove valuable in estimating the impact of similar changes on the trend indications in other states.

D. Adjustments for Automatic Benefit Changes (Section 3d)

"Contrast the current model, which puts all losses to a current benefit level, to a model which puts all past losses to the same "relative" value of prospective benefits."

As noted above, losses are adjusted to reflect the current benefit level through the use of law amendment factors. These factors are calculated for all benefit changes, including increases in benefits due to automatic increases in minimum and maximum indemnity benefits. The NAIC, in its request for proposal, outlined an alternative approach in which losses are adjusted to the same relative benefit level. As such, the impact of automatic benefit changes would be estimated through the trend rate itself, rather than through specific adjustment factors.

Our conclusion is that the alternative approach is likely to increase projection accuracy to a small degree by removing potential distortions in the loss ratios used in the trend calculation. Also, the alternative approach is strongly preferable for purposes of econometric analysis. We recommend that the alternative approach be adopted at least with regard to benefit changes that occur automatically as a function of the state average weekly wage or a similar index. However, it should be recognized that the impact of this change will be small in most situations and could be in either direction for a particular filing, although increases in indicated rate changes appear likely to be more common than decreases. In addition, work will be required to change the NCCI systems and to educate those involved in the rate filing and review process regarding the change. We do not consider this to be a high priority recommendation to implement (Page 92).

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A method for implementing this alternative approach for other types of benefit changes is provided later in this report. This approach also will eliminate the distortion evaluated in Section 3f. We recommend that NCCI evaluate the practicality of implementing this method for all benefit changes.

E. Distortions in Premium On Level Factors (Section 3e)

"Estimate the likely magnitude of distortions due to changes in the mix of business by class and discuss whether an improved procedure would be warranted."

Changes in the mix of business by classification can cause distortions in premium on level factors. In the limited sample of states that we studied, we found some degree of misestimation of on level premiums. While the trend rates were not significantly distorted, it is possible that they would be in other cases. It would be necessary to use Statistical Plan data to completely avoid the distortion. We recommend that Financial Call data continue to be used for trend calculation, but that Statistical Plan data be used to test for this distortion on a regular basis (Page 98).

For the purposes of calculating premium on level factors for the overall ratemaking procedure, we recommend that the effects of applicable rate changes be re-estimated using the exposure distribution from the year of Statistical Plan data that is closest (or equal) to the experience year.

F. Distortions in Benefit On Level Factors (Section 3f)

"The NCCI brings past losses to a current benefit level by multiplying the various law change factors estimated at about the time the law changes went into effect. Is this an accurate method?"

The NCCI's multiplicative combination of separate estimates of the effects of a series of benefit changes at different times causes a distortion in benefit on level factors. Our analysis indicates that this distortion is likely to cause a downward bias in trend indications. The extent of that bias might be quite small; however, we did not


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estimate the amount of bias in our analysis. We recommend that additional study be performed to estimate the magnitude of the bias (Page 106).

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III. CURRENT NCCI APPROACH

A. Overview

NCCI's approach for estimating trend is a least squares line fit. This technique is also known as linear regression. (The NCCI's Actuarial Committee has recently approved the use of an exponential curve fit as the primary model. A straight line will be used in states in which it is clearly statistically superior.) Indications based on both individual state experience and "countrywide" data (that of groups of states, actually) are derived. These indications are weighted based on the credibility of the trend indication from the state being reviewed.

B. Trend Period

The experience underlying the rate level projections is comprised of the most recent policy year and the most recent calendar-accident year. Generally, 12 to 18 months elapse between the midpoint of the experience period and the date that the rate filing is prepared. Additionally, 15 to 21 months elapse between the time when the calculations are made and the midpoint of the period during which policies written at the projected rate levels will be in effect, known as the Midpoint of the Rate Effective Period. Thus, the experience is commonly trended for 27 to 39 months.

C. Data Underlying Calculation

NCCI uses five policy years of data to determine the trend rate. Trends are calculated using loss ratios adjusted to current rate and benefit levels for indemnity and medical, separately. Premiums and losses adjusted to the current rate and benefit levels are referred to as being "on level." Excerpts from an Arkansas rate filing will be used to illustrate these calculations and are included as our Exhibit 1.

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ARKANSAS
APPENDIX A-V

Exhibit 1
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CALCULATION OF POLICY YEAR TREND FACTOR (CONTD.)

SECTION D - DATA FOR INDEMNITY TREND FACTOR

(1) Policy Year	(2) Time Index	(3) Premium On Level (See App. A-V Sect. A)	(4) Ind. Losses On Level (See App. A-V Sect. B)	(5) Ind. Loss Ratio (4)/(3)	(6) (2)x(2)	(7) (2)x(5)	(8) Ind. Loss Ratio On Line ((9)x(2))+ (10)
1983	1	164,653,357	58,640,831	.356	1	.356	.337
1984	2	190,809,165	63,081,716	.331	4	.662	.340
1985	3	216,016,819	71,754,661	.332	9	.996	.343
1986	4	225,856,734	72,225,546	.320	16	1.280	.346
1987	5	230,512,885	86,811,243	.377	25	1.885	.349
Total	15	xxx	xxx	1.716	55	5.179	xxx

SECTION E - DATA FOR MEDICAL TREND FACTOR

(1) Policy Year	(2) Time Index	(3) Premium On Level (See App. A-V Sect. A)	(4) Med. Losses On Level (See App. A-V Sect. C)	(5) Med. Loss Ratio (4)/(3)	(6) (2)x(2)	(7) (2)x(5)	(8) Med. Loss Ratio On Line ((9)x(2))+ (10)
1983	1	164,653,357	49,547,112	.301	1	.301	.277
1984	2	190,809,165	52,090,488	.273	4	.546	.283
1985	3	216,016,819	57,770,516	.267	9	.801	.289
1986	4	225,856,734	62,618,487	.277	16	1.108	.295
1987	5	230,512,885	75,700,785	.328	25	1.640	.301
Total	15	xxx	xxx	1.446	55	4.396	xxx

SECTIONS D AND E, CONTD. - CALCULATION OF INDEMNITY AND MEDICAL TREND FACTORS

	INDEMNITY (See Section D)	MEDICAL (See Section E)
(9) Annual Increment in Loss Ratio: $(n \text{ Sum}(7) - \text{Sum}(2)\text{Sum}(5)) / (n \text{ Sum}(6) - \text{Sum}(2)\text{Sum}(2))$	.003	.006
(10) Loss Ratio at Base: $(\text{Sum}(5) - (9)\text{Sum}(2)) / n$	.334	.271
(11) Midpoint of Experience in Filing is 04-01-88. Time Index for 04-01-88 is:	5.250	5.250
(12) Midpoint of Period during which Proposed Rates Effective is 06-01-91. Time Index for 06-01-91 is:	8.417	8.417
(13) Trend Factor prior to Credibility: $((10) + (9)x(12)) / ((10) + (9)x(11))$	1.026	1.063
(14) E = Sum of Squares of ((5)-(8))	.002023	.002213
(15) Credibility (Limited to 100%): $(.0011 / ((14) / ((10)+(9)X3.00)**2))**.5$	.252	.202
(16) Annual Expected Trend	.050	.070
(17) Credibility Weighted Trend Factor: $(1.000 - (15)) \times (1.000 + (16)x((12) - (11))) + ((13)x(15))$	1.126	1.191

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1. Earned Premium Adjustments

Standard earned premiums are developed to fifth report and adjusted to reflect the current rate level. As shown in Section A of Appendix A-V (our Exhibit 1, Page 8), standard earned premiums [Column (1)] are multiplied by development factors [Column (2)] and on level factors [Column (3)] to derive the Adjusted Standard Earned Premiums in Column (4).

To the extent that the derivation of the rate level adjustment factors is accurate, Adjusted Standard Earned Premiums are proportional to unlimited payroll adjusted to reflect the relative exposure to loss by class. It is therefore essentially a measure of exposure and should not be affected by changes in the adequacy of rate levels.

2. Adjustments to Losses

Losses are developed to ultimate using the same type of data (e.g., paid, incurred including IBNR, or incurred excluding IBNR) as are used to project the policy year losses in the experience period to ultimate. Losses are then adjusted for the effect of any benefit level changes. These calculations are shown in Sections B and C of Appendix A-V of the Arkansas filing (our Exhibit 1, Page 8) for indemnity and medical losses, respectively.

3. Loss Ratios

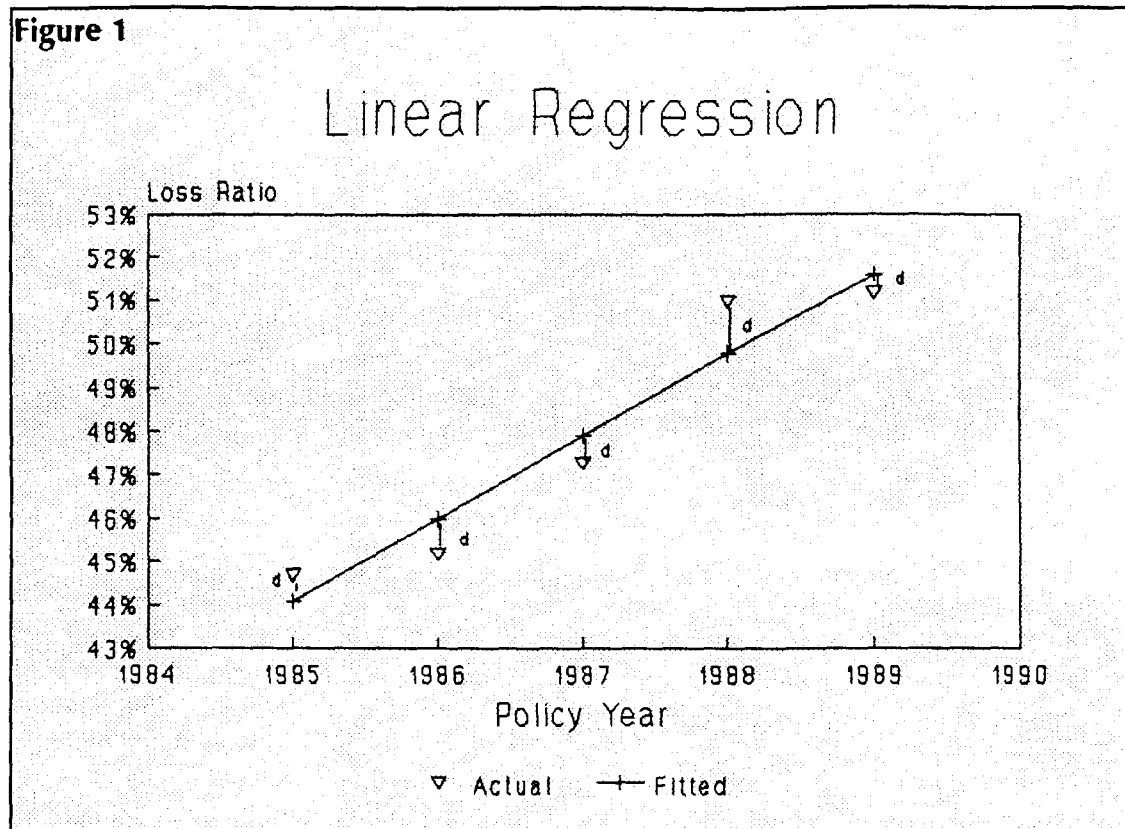
The loss ratios used in the trend calculation are ratios of developed, on-benefit-level losses to developed, on level earned premiums, as shown for indemnity and medical in Columns (3) through (5) of Sections D and E (see Page 14), respectively. These loss ratios can be thought of as pure premiums derived using Adjusted Standard Earned Premiums as an exposure base.

D. Statistical Approach

Linear regression is then applied to the adjusted loss ratios for the most recent five policy years. In linear regression, a line is estimated so that the sum of the squares of the differences between the fitted line and the actual data is minimized.

Figure 1, on the next page, illustrates this concept. The line shown is the one that minimizes the squares of the distances between the actual points, represented by

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the triangles, and the fitted line. These distances are denoted by the letter "d" in the figure.

The two parameters of the fitted line are often referred to as the location parameter and the slope parameter. In the context of least squares regression, the location parameter is more commonly referred to as the intercept. It is the slope parameter that is of greater interest as it measures the annual change in loss ratios. The formula for the line is:

$$\text{Loss ratio} = \alpha + \beta (\text{time index}) + e,$$

where the time indices correspond to policy years and e is an error term. For the five-year experience period, the time indices are 1 through 5, as shown in Column (2) of Sections D and E. For projection purposes, estimates of α and β ,

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referred to herein as $\hat{\alpha}$ and $\hat{\beta}$, are derived. The projected value of e is set equal to 0 which is its expected value if the linear model is appropriate.

In the linear regression model, the loss ratio for each policy year is assumed to be a single observation from a range of possible results. Several key assumptions underlie the linear regression method:

- (1) The expected value of the error for each policy year is zero;
- (2) The probability distributions of the error terms for each of the policy years have the same variance, independent of the policy year; and
- (3) The errors observed for different policy years are statistically independent.

Furthermore, it is frequently assumed that the error terms are distributed with a Normal distribution. This assumption is used in making confidence interval projections, such as those used in the NCCI credibility procedure.

The formula for $\hat{\beta}$ is:

$$\hat{\beta} = \frac{n \sum_i x_i t_i - \sum_i t_i \sum_i x_i}{n \sum_i t_i^2 - (\sum_i t_i)^2},$$

where $i = 1, \dots, n$, n is 5 (years), the t_i 's are values of the time index and the x_i 's are observed loss ratios.

The Annual Increment in Loss Ratio, Line (9), corresponds to the slope parameter of the linear regression. Column (6) of Sections D and E shows the squares of the time indices and Column (7) shows the products of the time indices and the loss ratios. Table 1, on the next page, shows the terms in the formula in Line (9) that correspond to the formula for $\hat{\beta}$. Also shown are the values for indemnity and medical from the Arkansas filing.

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<u>Line (9) Formula</u>	<u>β Formula</u>	<u>Indemnity</u>	<u>Medical</u>
n Sum (7)	$n \sum x_i t_i$	25.90	21.98
Sum (2) Sum (5)	$\sum t_i \sum x_i$	25.74	21.69
n Sum (6)	$n \sum t_i^2$	275	275
Sum (2) Sum (2)	$(\sum t_i)^2$	225	225

The formula for $\hat{\alpha}$ is:

$$\hat{\alpha} = \frac{\sum_i x_i - \hat{\beta} \sum_i t_i}{n}$$

This is shown in Line (10). The points on the fitted lines for each policy year in the experience period are shown in Column (8).

Underlying linear regression is the assumption that the differences in the trended amount are constant on a year to year basis. By comparison, the assumption underlying exponential regression is one of constant percentage changes. Quantities such as inflation are commonly modeled using exponential models.

E. Trend Factor Based on State Data

Trend factors for each of indemnity loss ratio and medical loss ratio are desired from the midpoint of the experience period to the midpoint of the rate effective period. The time indices for these dates are shown in Lines (11) and (12).

The experience period in this example is comprised of Policy Year 1987, with an exposure period midpoint of January 1, 1988, and Calendar-Accident Year 1988,

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with a midpoint of July 1, 1988, giving an overall midpoint of April 1, 1988. The index for the midpoint of each policy year corresponds to January 1 of the subsequent year. Thus, April 1, 1988 is 0.25 years after the midpoint of Policy Year 1987, giving a time index of 5.25.

The filed rates are assumed to remain in effect for one year. Hence, the midpoint of the rate effective period is assumed to be 12 months after the effective date of the filing. The sample filing for Arkansas was originally filed with a June 1, 1990 effective date. The trend calculation was not revised when the filing was resubmitted. Thus, the midpoint of the rate effective period is assumed to be 12 months after June 1, 1990, that is, June 1, 1991. This midpoint is 38 months or 3.167 years after April 1, 1988, giving a time index of 8.417.

The Trend Factors prior to Credibility represent the trend indications based solely on the state's experience. They are calculated as the fitted loss ratios at the midpoint of the rate effective period ($\hat{\alpha} + 8.417 \hat{\beta}$) divided by the fitted loss ratios at the midpoint of the experience period ($\hat{\alpha} + 5.25 \hat{\beta}$). These ratios are shown in Line (13).

F. Credibility

Credibility is "a measure of the credence that the actuary believes should be attached to a particular body of experience for ratemaking purposes."² To estimate the credibility of the trend estimates for indemnity loss ratio and medical loss ratio in each state, NCCI relies on classical credibility theory. Under this theory, assumptions are made regarding the probability distribution of the estimate. From these assumptions, a full credibility standard is determined. If the full credibility standard is met, 100% credibility is assigned to the estimate. Otherwise, partial credibility is determined using the square root rule.

NCCI has based its full credibility standard on the ratio of the sum of squared residuals calculated from the curve fit to the square of the fitted loss ratio at the

2 L. H. Longley-Cook, An Introduction to Credibility Theory, Casualty Actuarial Society, New York, 1962, p. 3.

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midpoint of the experience period used for trend. The sums of squared residuals are calculated as the sums of the squares of the differences of the values shown in Columns (5) and (8) of Appendix A-V, Sections D and E (See Page 14). These sums are shown in Line (14).

The full credibility standard was selected so that there is 90% confidence that the estimate of the loss ratio at the midpoint of the experience period used for trend will be within $\pm 5\%$ of its theoretical mean, assuming that the error terms are Normally distributed. The value of the full credibility standard is 0.0011. Partial credibility is determined as:

$$\left[\frac{0.0011}{\left(\frac{SSR}{MID^2} \right)} \right]^{\frac{1}{2}}$$

where SSR is the observed sum of squared residuals and MID is the projected loss ratio at the midpoint of the experience period used for trend. The above formula is subject to a maximum of 1.00. The values of MID are calculated as the location parameters [Line (10)] plus 3 times the trend parameters [Line (9)]. The credibility of each trend estimate is shown in Line (15).

G. Annual Expected Trend

To the extent that the indemnity and/or medical trend indications, based on an individual state's experience, are not fully credible, the indicated trends are weighted with the respective annual expected trend (the credibility complements). The annual expected trends are shown in Line (16) of Appendix A-V of the Arkansas filing (See Page 14). These are expressed as annual increases in loss ratios as a percentage of the loss ratio at the midpoint of the experience period used to derive the rate level (e.g. corresponding to the time index in Line (11)). Comparable quantities on a state basis would be calculated as Line (13) minus 1 divided by the trend period [Line (12) minus Line (11)].

The on level, developed premium and loss data underlying the derivation of the annual expected trends are the sums of the data from each of the individual states

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for which NCCI projects rate levels. The loss projections therefore reflect a combination of approaches for developing losses, determined by the methods selected for each state. The annual expected indemnity trend is derived in the same manner as is described above for individual states.

For medical trends, states are separated between those that have "effective" medical fee schedules and those that do not. The medical trend is first determined based on each state's data through the linear regression method discussed previously. The medical trend indications for those states that have medical fee schedules are then reviewed to determine which states have medical trend indications that are higher than the 33rd percentile of the trend indications for states that do not have medical fee schedules. Any state with a fee schedule and a trend indication higher than the 33rd percentile of those with no fee schedule is then combined with the states that do not have a medical fee schedule. The remaining states are deemed to have "effective" medical fee schedules.

The states included in the calculation of the annual expected trend for each of fee and non-fee states as of December 31, 1988 are shown in Table 2, on the next page. Those identified with an asterisk have medical fee schedules that are deemed to be ineffective. All of the states listed are used in the derivation of the indemnity annual expected trend.

The annual expected medical trend for a particular state is the one corresponding to the group in which that state was placed for calculating the annual expected medical trends. As of December 31, 1988, the annual expected medical trends for states with and without effective medical fee schedules were 0.004 and 0.077, respectively. Note that the Arkansas rate filing was initially prepared based on the December 31, 1987 annual expected trends of 0.050 for indemnity and 0.070 for non-fee medical.

H. Credibility-Weighted Trend Factors

The annual expected trends are multiplied by the difference between the midpoints of the rate effective period and the experience period, and 1.00 is added to derive an expected trend factor. The Trend Factors prior to Credibility (based on the state's experience) are then multiplied by their respective credibilities and added to the expected trend factors multiplied by one minus the credibilities to derive the

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Table 2: As of December 31, 1988

<u>Fee States</u>	<u>Non-Fee States</u>	
Alaska	Alabama	Michigan*
Arizona	Arkansas	Mississippi
Hawaii	Colorado*	Missouri
Maine	Connecticut	Nebraska*
Maryland	District of Columbia	New Hampshire
Montana	Florida*	New Mexico
North Carolina	Georgia*	Oregon*
Oklahoma	Idaho	Rhode Island
South Carolina	Illinois	South Dakota
Utah	Indiana	Tennessee
	Iowa	Texas*
	Kansas	Vermont
	Kentucky*	Virginia
	Louisiana*	Wisconsin

Notes:

1. (*) States with medical fee schedules, but high trend indications.
2. Source: 4/4/90 NCCI Actuarial Committee Agenda.

Credibility-Weighted Trend Factors for indemnity and medical. These calculations are shown in Lines (13) through (17) of Appendix A-V, Sections D and E (see Page 14).

I. Overall Trend Factor

The overall trend factor is calculated as a weighted average of the indemnity and medical trends. The weights used are the developed, on level losses for the most recent policy year. These calculations are shown in Section F on our Exhibit 1, Page 10.

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J. Inclusion of Trend in Rate Level Calculation

In recent NCCI rate filings, two approaches are used to recognize the trend. In some states, the trend for the entire period from the midpoint of the experience period through the midpoint of the rate effective period is recognized in a single trend adjustment. This is illustrated in the Iowa filing excerpt included in Exhibit 2. The indicated overall trend factor of 1.115 derived in Section F of Appendix A-V of that filing (Page 5) is included in Line (2) of Exhibit I-B (Page 1).

In other states, the total trend is separated into two components: the trend in the current rates and the change in trend. The trend in the current rates is defined as the total trend factor that was included in the previous filing for that state. (The only circumstance in which a factor different from the one filed is used is if the regulator specifies a different trend assumption in determining the approved rate change.) To the extent that loss ratios have increased due to trend between the experience period in the prior filing and the current one, it is recognized in the rate filing as a part of the rate change due to a change in experience. The trend factor reflected in the current rates is divided out of the factor used to adjust standard earned premiums to the current premium level. This is shown in Columns (7) and (8) of Section A of Appendix A-III in the attached excerpt from an Arkansas rate filing (our Exhibit 1, Page 7).

The change in trend is calculated as the total trend adjustment divided by the portion reflected in the current rate levels. It is multiplied by the Indicated Premium Level Change from Experience to derive the Indicated Change Modified to Reflect Change in Trend Factor. It represents the change in the rate level due to a change in the trend assumption. This calculation is shown in Exhibit I, Section E (our Exhibit 1, Page 5).

The net effect of both approaches is identical (except for possible rounding differences). In the latter approach, the rate level indication from experience is higher than under the former approach. The rate change from trend is lower by an offsetting amount.

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K. Special Situations

In several states, variations from the trend procedure described above are made. Factors leading to such variations include anticipated changes in trend resulting from benefit changes and direction from regulators. This section describes several of these special procedures.

1. Medical Fee Schedules

Historically, no changes were made in the derivation of the trend indication for a state that has introduced a medical fee schedule during or after the five-year experience period from which trend rates are derived. That is, no adjustment was made in the state's own trend calculation. Unless the state's own medical trend indication is less than the 33rd percentile of states with no fee schedule, the annual expected trend (the credibility complement) is the non-fee schedule trend. If the trend indication is less than the 33rd percentile of states with no fee schedule, the annual expected trend is the fee schedule trend.

Recently, a new procedure was used in a Texas filing which recognizes the potential reduction in medical trend due to the implementation of a medical fee schedule. Exhibit 3 shows an example of NCCI's calculations.

In the new procedure, referred to as the "bent-line" procedure, the medical trend is first calculated as if no medical fee schedule had been introduced. The loss ratio at the midpoint of the rate effective period is then calculated under three scenarios regarding trend after the implementation of the fee schedule: (1) using the medical trend indicated by the Texas data (before credibility) using the procedure described above (C, on Page 2 of Exhibit 3), (2) using the annual expected medical trend for states with effective medical fee schedules (B), and (3) using the annual expected medical trend for states with no medical fee schedule or an ineffective one (D). The ratio of the loss ratio based on the Texas trend (C) to the loss ratio based on the non-fee annual expected trend (D) is then used to adjust the loss ratio based on the fee annual expected trend (B) to derive an adjusted loss ratio, E. In other words, to the extent that a particular state's loss ratio trend is higher or lower than the annual expected trend for states with no medical fee schedule, an adjustment is made to the annual expected medical trend for states with effective medical fee schedules. The medical trend is then derived by dividing the adjusted loss ratio, E, by the

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state's fitted loss ratio for the most recent policy year used in the trend calculation, A. An annual trend is also calculated.

An estimate, F, of the loss ratio at the midpoint of the experience period used for determining the rate level (4/1/89) is made by increasing A for 0.25 years of trend. The medical trend factor for the trend period is then the ratio of E, the projected loss ratio at the midpoint of the rate effective period, to F. This trend is then used in the remainder of the trend calculation which corresponds to Section F of Appendix A-V in the Arkansas filing.

2. State Funds

In states with state funds, the experience of the state fund is either (a) reviewed separately, (b) combined with private insurers experience, or (c) excluded from the analysis, depending on the perceived validity for projection purposes of the data received from the state fund. The treatment of the state funds for the trend calculations are as follows:

- a. Reviewed separately: Idaho, Montana, Oregon and Utah
- b. Combined: Arizona and Oklahoma
- c. Excluded: Colorado

In a similar situation, the experience of the assigned risk plan in Michigan is analyzed separately from the experience of the private companies in that state. In states in which the data are reviewed separately, the trend indications from both sources, state fund and private insurers, are weighted. The weights are determined by the relative premium volume of private insurers and the state fund in the most recent policy year.

3. Credibility of Annual Expected Trend Indication

Several years ago, a situation arose in which the annual expected trend indication for medical was not fully credible. That indication was weighted with the fully-credible indication used in the prior year's rate filings.

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4. States with Downward Trend Indications

When losses have decreased relative to wage levels, a decreasing trend will be indicated. This situation occurred in Maryland for the rate level analysis for rates effective January 1, 1991. In light of the decreasing trend and concerns regarding the impact of a significant law change on 1/1/88, a nonstandard procedure for determining trend was used.

As is discussed in Exhibit 4, six regression analyses were performed: linear, exponential and logarithmic regression on each of four and five policy years of experience. The average of the three credibility-weighted indications based on five-year experience periods was used in the rate level calculation. Page 5 of Exhibit 4 shows each of the trend indications and the selected weighted average.

5. Accident Year Trending

Trend calculations based on calendar-accident year data were recently made in three states: Hawaii, Nebraska and New Mexico. Under this approach, accident year losses are compared to calendar year earned premiums to derive the indicated loss ratios used in the trend calculations. As illustrated in Section A (Page 1) of our Exhibit 5 (Hawaii), no earned premium development factors are needed because, at the end of each year, calendar year earned premiums are at their ultimate level.

6. Variations in Experience Period Used for Trend

In some states, the number of policy years underlying the derivation of the indicated trend is other than five. Exhibit 6 shows an excerpt from a Florida filing in which eight policy years' experience are used. In addition, the standard for full credibility was based on a confidence level of 99% of being within 6% of the expected value. It is our understanding that these modifications were made at the request of the Florida Insurance Department.

7. Judgmental Adjustments to Trend

In recent years, the trend rate for medical and/or indemnity has been adjusted judgmentally in response to significant benefit level changes. Examples include:

- a reduction in indemnity benefits in Maine in 1987, and


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- a change in rehabilitation benefits in Colorado in 1987.

In each of these situations, it was anticipated that the change in benefits would change the shape of the trend line. In Maine, no indemnity trend was used for two years. In Colorado, trends were reduced to reflect anticipated reductions in the utilization of vocational rehabilitation.

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IV. PREVIOUS APPROACHES USED BY NCCI IN 1980s

A. Overview

During the 1980s, several refinements were made to the calculations underlying the derivation of the overall trend factors used in the NCCI rate analyses. The refinements included:

- separate trends for indemnity and medical,
- a completely new approach for determining credibility, and
- introduction of trends other than 0% as annual expected trends.

B. Data Underlying Analysis

Until mid-1982, the trend calculations were performed on combined indemnity and medical loss ratios. These loss ratios were calculated in a manner similar to the current approach with the exception that indemnity and medical losses were combined for projection purposes.

C. Credibility

Until 1984, NCCI used a non-parametric approach based on the Spearman D Statistic to determine the credibility of the trend indication. Spearman's D Statistic measures whether a trend (other than zero) exists through the observed loss ratios. The Spearman D Statistic is calculated as the sum of the squares of the differences between the time index and the rank of the loss ratio for each policy year. The probability that the D Statistic could be less than the observed value if there were no underlying trend (i.e., 0% per year) is determined from a table. Credibility was then determined as a function of that probability, such that credibility increased as the probability decreased.

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When the current credibility procedure was introduced in 1984, the criterion for full credibility was that there was 90% confidence that the projected loss ratio would be within $\pm 6\%$ of its theoretical mean. Full credibility was given if the ratio of the sum of squared residuals to the square of the projected loss ratio was less than 0.0006. The revision to this procedure was made in late 1988.

D. Annual Expected Trend

No annual expected trend was needed when the Spearman D Statistic was used to determine credibility. The annual expected trend was assumed to be 0%. Overall trend indications were limited to the range from -5% to +25%.

When annual expected trends were introduced, it was believed that there should be no inherent trend in indemnity loss ratios. A review of trends from all NCCI states combined confirmed this hypothesis. A single medical annual expected trend was derived based on the experience from all NCCI states.

Increasing indemnity trends were observed beginning in the mid-1980s on an all-NCCI-states-combined basis. In late 1988, an annual expected trend other than 0% was introduced for indemnity, reflecting these upward trends. When the indemnity annual expected trend was introduced, the annual expected trend selected was less than the indication in order to limit the impacts of the trends from a few states that were perceived to distort the overall annual expected trend indications.

Beginning in early 1989, the data underlying the annual expected trend indications were revised. Until that time, annual expected trend indications were based on all-NCCI-states-combined data developed using the incurred, including IBNR, development approach. It was observed, however, that the resulting loss ratios and trend indication did not balance to the total of the results from each of the individual states. As a result, the loss ratios underlying the calculation of the annual expected trends are now derived based on the sums of the on level premiums and losses used in each state's rate filing which reflect the development approach used for each state.

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Medical annual expected trends are currently determined by the presence or absence of a medical fee schedule in a state and, if a fee schedule has been implemented, the state's trend relative to those observed in states with no fee schedule. This change in the medical trend calculation was made in early 1986. Before that time, a single annual expected medical trend was used.

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V. EVALUATION OF NCCI APPROACH AND RECOMMENDATIONS FOR CHANGE (SECTIONS 3a and 3b)

"Are there any expected biases or errors present in the NCCI's general trending procedures? If so, discuss their impact. Would more accurate trending be likely with a different model or with revisions to the current model?"

This section of our report will present the details of our evaluation of the NCCI procedure for estimating trend and our recommendations regarding improvements to that procedure. The format of this section will follow the preceding section in which each aspect of the NCCI procedure was described. The specific questions identified by the NAIC are addressed in subsequent sections.

A. Trend Period

In the NCCI procedure, the trend period is from the midpoint of the experience period to the midpoint of the rate effective period. Implicit in this aspect of the procedure are the assumptions that policies are written evenly throughout the policy year, and that the average accident date for each policy is six months after its effective date.

Table 3 shows the distribution of premiums written for all NCCI states except those with significant distortions from state funds. As can be seen, there are large variations in the percentage of premiums written between months. If the rate effective period begins on January 1, as do all policy years included in the experience period, then no distortions will occur in the projected loss ratio based on policy year data because the average accident dates are expected to differ from their respective midpoints by the same amount. There will, however, still be a distortion in the loss ratio projection based on accident year data.

**Table 3:
Countrywide**

January	20.3%
February	4.9%
March	6.2%
April	9.4%
May	6.5%
June	7.3%
July	12.1%
August	5.7%
September	6.3%
October	9.5%
November	5.4%
December	6.4%

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Table 4 shows the differences between the lengths of the trend periods used in the NCCI projections and the correct trend periods for rate effective periods beginning in each month. That is, a positive difference indicates that the use of the midpoint of the rate effective period extends the length of the trend period thereby overstating trend. These differences were calculated by assuming that:

- The distribution of monthly premium writings equals the countrywide distribution in Table 3;
- The average policy inception date within each month is the middle of the month;
- Policy terms are twelve months;
- Accident dates are spread evenly over the term of each policy; and
- The experience period is comprised of the most recent policy year and accident year.

Table 4: Differences

(in months)

January	0.3
February	-1.1
March	-0.7
April	-0.4
May	-0.6
June	-0.3
July	-0.2
August	-0.7
September	-0.3
October	-0.1
November	-0.2
December	0.1

At trend rates of less than 7% per annum, the distortion in the projected loss ratio will be less than 1%. In states with state funds (and possibly others), the potential distortions are much larger. Table 5, on the next page, shows the distributions of premiums written by month and the differences between the lengths of the NCCI and correct trend periods for Oregon and Montana, two of the states with the largest potential distortions. In Montana, for example, the error in the projected loss ratio could be as much as 2% if the rate effective period does not begin on January 1.

We recommend that the length of the trend period be determined based on estimated average accident dates, reflecting the distribution of premium writings by month, rather than based on midpoints.

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Table 5: Skewed Distributions

	Oregon		Montana	
	Percent Written	Difference (months)	Percent Written	Difference (months)
January	18.9%	0.4	17.7%	0.3
February	2.6%	-0.9	2.0%	-0.8
March	2.2%	-0.2	2.2%	0.0
April	16.4%	0.5	4.6%	0.7
May	2.8%	-0.4	2.3%	1.2
June	2.3%	0.2	6.4%	1.9
July	31.6%	0.9	55.2%	2.1
August	1.7%	-1.9	0.8%	-3.5
September	2.1%	-1.1	1.8%	-2.6
October	15.7%	-0.3	2.5%	-1.8
November	1.9%	-1.2	1.8%	-1.1
December	1.8%	-0.4	2.7%	-0.3

B. Data Underlying Calculation

NCCI predicts trends in medical and indemnity loss ratios, separately, based on five policy years of experience. Our evaluation of the underlying data included the review of:

- prediction of frequency and severity rather than loss ratios,
- prediction by injury type,
- use of accident year data rather than policy year data, and
- variations in the number of years in the experience period used to predict trend.

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1. Frequency and Severity

NCCI currently bases trend indications on loss ratios that reflect current rate and benefit levels. An alternative that is common for many casualty lines of insurance is to separately evaluate claim frequency and severity (average claim size) trends. Under such an approach, claim counts and losses are developed to ultimate and losses are adjusted to the current benefit level. Either of on level premiums or payroll can serve as an exposure base for calculating frequencies. In our analyses, on level premiums are used as the base for calculating frequencies based on Financial Call data, whereas payroll is used as the base for Statistical Plan data.

a. Additional Insight

An advantage to this alternate approach is that different models are commonly used for each, linear for frequency and exponential for severity. In addition, different factors influence each of frequency and severity. The impact of external factors, such as economic or benefit changes, can sometimes be more easily evaluated for frequency and severity, separately. Thus, to the extent that additional insight is gained regarding trend rates, projection accuracy could be improved as compared to a projection accuracy of loss ratios.

b. Lack of Historical Financial Call Data

Historically, NCCI did not obtain audited claim count data through the Financial Calls, thereby precluding the use of a frequency/severity approach for estimating trend based on that data. Beginning with the December 31, 1989 Financial Call, the description of the claim count information in the Financial Call was clarified and the claim count fields audited. Thus, only one diagonal of audited claim count data is available, thereby precluding the derivation of reliable claim count development patterns. This will allow for more detailed testing of a frequency/severity approach in the future, after sufficient data are available from which to derive development patterns.

Note that the claim counts included in the Financial Call exclude all medical only claims. To the extent that the percentage of claims that are medical only varies over time, there may be some distortions in the projected

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frequencies and severities. We would not expect these distortions to be significant.

c. Shifts Between Classifications

Shifts in the mix of business between classifications will cause greater distortions in claim frequency and severity projections than loss ratio projections. To the extent that exposures shift to classifications with different frequency rates and/or severities, the projections of frequency and severity trend rates are likely to be distorted. This problem is relatively minor for trend projections based on loss ratios, because loss ratio trends are distorted by shifts between classifications only to the extent that the adequacy of the class rates varies between classes.

d. Statistical Plan Data

An alternative to Financial Call data is to use the claim count and loss data from the Statistical Plan. Claim counts are collected and audited for each injury type separately. A drawback of the Statistical Plan data is its age. Due to the additional detail collected, Statistical Plan data are generally not available until, on average, a year after Financial Call data. Thus, if Statistical Plan data were used, measures of trend would be for a period of time that was an additional year removed from the rate effective period. This could result in increased inaccuracy in the estimates of trended losses.

If analyses of frequency trends were performed using Statistical Plan data, the exposure base could be payroll or on level premiums estimated by extending payroll using current rates. To the extent that exposures shift between classes with different loss expectations, the resulting distortions are likely to be greater if payroll were used as an exposure base as compared to on level premiums.

e. Sources of Distortions

It is generally expected that the number of claims will be closely tied to the number of hours worked. Readily available exposure bases include payroll and on level premium which reflect changes in the number of hours worked,

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as well as changes in average hourly wages. Thus, to the extent that average hourly wages increase frequency will be distorted.

SAWW is often used to measure changes in wage levels. In fact, one approach for removing the distortions mentioned above is to adjust all payroll to a common average weekly wage. SAWW, however, also reflects changes in the length of the average work week. Therefore, frequency based on an adjusted exposure base also would be distorted by changes in the average work week, but not by changes in average hourly wages.

f. Projection Accuracy

We performed an analysis of frequency and severity separately based on the Financial Call data for our sample states. A straight line was found to project frequency more accurately than an exponential curve. Exponential curves were used to project severities. Before performing the regressions, medical severities were indexed using the medical component of the (countrywide) Consumer Price Index (CPI). As shown in Table 6, the prediction errors for the frequency/severity analysis were greater than for the line fit, but less than for exponential regression.

	<u>Indemnity</u>		<u>Medical</u>			
	<u>Average Squared Error</u>	<u>Sample Bias</u>	<u>Average Absolute Error</u>	<u>Average Squared Error</u>	<u>Sample Bias</u>	<u>Average Absolute Error</u>
Loss Ratio Models						
Linear	0.007	0.027	0.064	0.003	0.000	0.034
Exponential	0.018	0.059	0.088	0.014	0.037	0.064
Frequency/Severity Model	0.011	0.038	0.067	0.003	0.007	0.039

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g. Recommendation

We recommend that trend continue to be calculated using on level loss ratios until sufficient claim count data are available to perform tests of projection accuracy of trend estimates based on the separate analyses of frequency and severity. To the extent that changes in trend are observed, separate analyses of frequency and severity trends may identify specific factors leading to such distortions. This type of analysis can assist NCCI in evaluating such factors and mitigating their impact on projected trends.

2. Trends by Injury Type

The trend rates derived by NCCI are for all indemnity losses combined and, separately, all medical losses combined. An alternative is to separate losses by injury type, e.g. fatal, permanent total, etc., or between serious and non-serious claims.

a. Additional Insight

As for separate analyses of the frequency and severity of claims, an advantage of projecting losses by injury type is the increased understanding gained regarding the factors contributing to the trend indication. A shift from non-serious (minor permanent partial and temporary total) to serious (fatal, permanent total and major permanent partial) indemnity claims has been observed in recent years. Note that the delineation between major and minor permanent partial claims is based on a "critical value" that, until 1985, did not keep up with claim cost inflation. This would be expected to explain some or all of the observed shift in claims as an increasing percentage of claims exceeded the critical value.

This shift is illustrated in Table 7, on the next page, using the actual frequency of indemnity claims in Florida, as an example. Similar distributions are shown on Exhibit 7 for three additional states. Relative claim frequencies for these four states by injury type are included in the separate Technical Supplement to this report. Even if the average costs of serious and non-serious benefits are constant, a shift in frequency from non-serious claims to serious claims will produce a positive trend rate. This is illustrated in Table 8, on the next page, using the relative claim frequencies in Table 7 for Florida, as an example.

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In Table 8, average claim costs, total claim frequency and on level premiums are held constant. The only quantity that varies is the distribution of claims between serious and non-serious. If there were no such shift, no trend would be observed because the losses in each year would also be constant. Instead, an 11% annual trend is observed in the loss ratios, due solely to the shift from non-serious claims to serious claims. (Similar analyses in the three other sample states - Louisiana, Illinois, and Michigan - produce much less dramatic results, ranging from -1% to 4% annual trends). While this analysis is valuable in understanding the magnitude of the indicated trends, it is not necessarily expected to improve projection accuracy.

Table 7: Florida Frequency Distribution

<u>Policy Year</u>	<u>Serious</u>	<u>Non-Serious</u>
12/80-11/81	8.4%	91.6%
12/81-11/82	9.1%	90.9%
10/82-9/83	9.9%	90.1%
10/83-9/84	11.3%	88.7%
10/84-9/85	12.6%	87.4%
10/85-9/86	15.3%	84.7%
10/86-9/87	18.3%	81.7%

Table 8: Impact of Frequency Shift

Year	(1) <u>Total Claims</u>	(2) <u>Percent Serious</u>	(3) <u>Serious Average</u>	(4) <u>Non-Serious Average</u>	(5) <u>Losses (000s)</u>	(6) <u>On-Level Premium (000s)</u>	(7) <u>Loss Ratio (5)/(6)</u>
1	30,000	8.4%	\$80,000	\$2,000	\$256,560	\$500,000	0.513
2	30,000	9.1%	80,000	2,000	272,940	500,000	0.546
3	30,000	9.9%	80,000	2,000	291,660	500,000	0.583
4	30,000	11.3%	80,000	2,000	324,400	500,000	0.649
5	30,000	12.6%	80,000	2,000	354,840	500,000	0.710
6	30,000	15.3%	80,000	2,000	418,020	500,000	0.836
7	30,000	18.3%	80,000	2,000	488,220	500,000	0.976

Note: (5) = (1)x[(2)x(3)+[1-(2)]x(4)]/1,000

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b. Age of Statistical Plan Data

A key drawback of analyses of losses by injury type is that these data can only be obtained from the Statistical Plan. Thus, if trends by injury type were to be used, the data underlying the trend calculations would be about one year older, on average. On level premiums could be estimated from the payroll data collected for the Statistical Plan. An alternative is to base loss ratio trends on those observed in pure premiums (losses divided by payroll), but these could be distorted by shifts of business among classes.

c. Projection Accuracy

Another consideration is the potential for increased accuracy if projections were made by injury type. While we did not perform any explicit tests of the accuracy of such projections, a few observations can be made. First, we observed that medical severity trends for different injury types are generally correlated with one another, for a given state. Therefore, to the extent that frequency shifts between injury types are continuous and relatively stable, estimates of medical trends by injury type are not be expected to provide additional accuracy.

Second, with the allocation of claims to injury type, the volume of losses underlying each trend calculation would be reduced. This generally leads to projections that are more volatile. In fact, an analysis of indemnity severities adjusted to the current SAWW indicates that no conclusions could be drawn regarding trends in fatal and permanent total losses in some of our sample states. The data for these injury types were too volatile when analyzed separately to identify an underlying trend line from the random noise. Our sample states were relatively large, so this problem would be more significant in smaller states.

Third, projections of an additional variable, the distribution of claims by injury type, are needed as compared to an analysis of all injury types combined. This could be addressed either through projections of the future distribution itself and the overall frequency or by independently projecting the frequency of claims for each injury type.

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d. Recommendation

We recommend that trends continue to be determined for all injury types combined. The increased volatility and necessity of using the older Statistical Plan data outweigh the potential distortions from shifts in frequency by injury type. If questions arise regarding the magnitude of the indicated indemnity or medical trend or a shift in loss ratios, a review of pure premiums by injury type may provide additional insight. This insight, however, is not generally needed for making routine estimates of trend.

3. Accident Year vs. Policy Year

The current NCCI approach uses premium and loss data sorted by policy year to determine the projected trends for indemnity and medical loss ratios. An alternative is to rely on calendar-accident year data. Under such an approach, premiums earned during a calendar year and losses on claims occurring during a year (accident year losses) are used to determine the loss ratios underlying the trend calculation.

a. Timeliness

The primary advantage of calendar-accident year data is its timeliness. The average accident date for the latest accident year is about six months more recent than that for the latest completed policy year. Thus, accident year data has the advantage that the latest accident year is more current than the latest policy year and will therefore reflect more recent trends. It has, however, the disadvantage of greater uncertainty in the projected ultimate losses.

b. Premium Development

Another advantage of calendar-accident year data is that earned premiums do not need to be developed. Once the calendar year has been completed and Financial Call data tabulated, earned premiums are at their ultimate calendar-year value. Policy year earned premiums, on the other hand, will develop as the result of retrospective premium adjustments and premium audits.

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c. Mismatch of Premiums and Losses

A drawback of calendar year earned premiums is that they do not correspond directly to the loss experience used to determine loss ratios. For other lines of property-casualty insurance, calendar year earned premiums generally more accurately reflect of the exposure during the year. For workers compensation insurance, however, calendar year earned premiums are based on an estimate of the exposure during the year plus adjustments for any errors in the estimates of exposure made in prior years. To the extent that there are differences in the accuracy of these estimates and growth or declines in the volume of premiums, calendar year earned premiums will be distorted. This mismatch does not exist for policy year data.

An alternative method of calculating calendar year earned premiums which NCCI could use to reduce the mismatch with accident year losses was discussed in our report on the NCCI's premium and loss development procedures. In the alternative approach, the premiums from the two policy years contributing to a given calendar year are developed to ultimate. Based on distributions of premium writings by month, the portion of each policy year's exposure that contributes to the accident year's losses is derived. Those portions of each policy year's premiums are then added to approximate calendar year earned premiums.

d. Recommendation

We recommend that NCCI continue to use policy year data in the trend procedure. The benefits of using accident year data that are, on average, six months more recent, are outweighed by the mismatch of premiums and losses and the greater uncertainty regarding the projected ultimate losses for the latest accident year.

4. Number of Years

As for the organization of the data between policy and calendar-accident years, the selection of the number of years of experience to be used in estimating trend is a balance between stability and responsiveness. As the experience period is lengthened, the indicated trend will be less responsive to changes in the trend rate, but will also be more resistant to distortions caused by isolated outliers.

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a. Statistical Accuracy

The variability around the estimator of trend decreases significantly as the number of points in the experience period increases. This can be illustrated, for least squares regression, by reviewing a t-table. To test the statistical significance of a trend estimate, the absolute value of the ratio of the estimate to its standard deviation is often compared to a t-table. If this ratio exceeds the t-value at a given probability level, say α , it is significant

at the $1-\alpha$ level (i.e., if there were no underlying trend, there would be at least $1-\alpha$ probability that the observed trend would be lower than that actually observed). Table 9 shows the t-values at a 90% confidence level. The fact that these values decrease as the number of points in the experience period increases indicates that, given the same relative variation of the points around the fitted line, a trend coefficient of a given magnitude has a greater statistical significance as the number of points in the regression increases. The range around the observed trend estimate in which the true underlying trend rate falls narrows as the number of points increases. To the extent that the trend rate is constant throughout the trend period, more points will improve statistical projection accuracy.

Table 9: t-table ($\alpha = 10\%$)

Number of <u>Points</u>	<u>t-value</u>
3	3.078
4	1.886
5	1.638
6	1.533
7	1.476
8	1.440

b. NCCI Analysis

NCCI performed tests comparing the results of regressions with experience periods of 5 years and 8 years in both 1982 and 1990. The indicated trends were lower using the longer experience period in both sets of tests, reflecting the slower reaction of the analysis performed using the eight-year period to changes in trend rates. The increased responsiveness of the indications from the analysis performed using the five-year period does not necessarily improve projection accuracy. A comparison of the credibilities (based on the sum of squared residuals) of the indicated trends produced mixed results. That is, in the 1982 tests, credibilities were higher when the eight-year experience period was used, whereas, in the 1990 tests, the credibilities were

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generally lower when the eight-year experience period was used. Exhibits 8 and 9 are excerpts from the Minutes and Agendas of the NCCI Actuarial Committee Meetings related to these tests.

c. Projection Accuracy

We performed tests of the projection accuracy of using each of 3, 4, 5, 6, 7, and 8 years of Financial Call data from three of our sample states: Connecticut, Louisiana and Wisconsin. These tests were performed using the experience periods ending with each of Policy Years 1981 through 1986 to project the loss ratios for the policy years two and three years later. As for the tests described below regarding the statistical approach, we included neither the loss ratio for the most recent calendar-accident year nor the effect of the credibility procedure (i.e., the tests focused on the ability to project a future policy year's loss ratio based on different numbers of past policy years' experience).

The analysis of the exponential model indicated that, for medical, the projection errors, measured in points of loss ratio, decreased as the number of years increased, as shown in Table 10. A similar pattern of results was

Table 10: Prediction Errors - Exponential Model

Number of Years	Medical			Indemnity		
	Average Squared Error	Sample Bias	Average Absolute Error	Average Squared Error	Sample Bias	Average Absolute Error
3	0.008	0.024	0.044	0.042	0.037	0.122
4	0.006	0.024	0.043	0.037	0.032	0.123
5	0.005	0.023	0.042	0.030	0.022	0.113
6	0.005	0.018	0.040	0.023	0.008	0.101
7	0.004	0.013	0.037	0.019	-0.004	0.093
8	0.003	0.008	0.033	0.017	-0.014	0.086

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observed for indemnity. The tests showed that the absolute values of the sample biases were minimized using seven years for indemnity and eight years for medical.

The results for the linear model are shown in Table 11. For the linear model, the tests indicated that, as the number of years decreased, so did the sample bias (on an absolute basis). For medical, the average squared and absolute deviations were relatively constant, where as for indemnity, they decreased as the number of points increased.

d. Recommendation

In light of the results of our analysis, the current five-year period appears reasonable for the linear model. If the exponential model is used, we recommend that NCCI consider lengthening the experience period used for trend to include seven or eight years. We also recommend that NCCI periodically (every 3 to 5 years) review the projection accuracy of experience periods of different lengths.

Number of Years	Medical			Indemnity		
	Average Squared Error	Sample Bias	Average Absolute Error	Average Squared Error	Sample Bias	Average Absolute Error
3	0.002	-0.004	0.026	0.018	-0.001	0.093
4	0.002	-0.007	0.026	0.016	-0.005	0.091
5	0.002	-0.011	0.025	0.014	-0.012	0.083
6	0.002	-0.016	0.025	0.013	-0.021	0.076
7	0.002	-0.020	0.024	0.012	-0.029	0.073
8	0.002	-0.024	0.026	0.012	-0.035	0.070

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NCCI will encounter situations in which trend indications from experience periods of different length will vary significantly. In these circumstances, we recommend NCCI review the underlying experience, as well as external factors, such as economic climate and benefit changes, to try to identify the factors leading to the different estimates. It is appropriate for NCCI to judgmentally lengthen or shorten the experience period to reflect any distortions or changes in the underlying experience and/or external factors.

C. Statistical Approach

We evaluated the statistical approach used by NCCI (i.e., use of linear least squares regression) and their planned future approach (exponential regression) by studying the ability of each approach to estimate loss ratios during the rate effective period. For each of the eight sample states, we received eight policy years of Financial Call data. In addition, for three of the eight states, we received an additional seven policy years of Financial Call data. Using the eight policy years of experience, we were able to perform the trend calculations for two experience periods (Policy Years 1981 through 1985 and Policy Years 1982 through 1986) to project the loss ratios two and three policy years later (Policy Years 1987 and 1988) for all eight states. We tested the sensitivity of the results to the time period underlying the trend estimate by using older experience periods for three of our sample states.

The premium and loss data underlying our analysis were adjusted for anticipated development and changes in rate/benefit levels. All of the data for policy years 1979 and subsequent were evaluated as of December 31, 1989. Data for prior policy years were evaluated as of eighth report. We relied on the development and on level factors provided by NCCI. The raw data, development and on level factors, and loss ratios used in our analysis are included in the Technical Supplement to this report.

These projections were used to evaluate the projection accuracy of the statistical methods during the rate effective period. These projections differ from those used in the NCCI rate calculations in two aspects:

- (1) The most recent calendar/accident year loss ratio was omitted; and

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- (2) The indication was derived solely from each state's own data.

The purpose of the former difference was to simplify the calculations, whereas the latter simplification was made to isolate the projection accuracy of the statistical method from that of the overall trend procedure.

It is important to understand in evaluating the results contained herein that our objective was to evaluate the NCCI trend procedure in and of itself. That is, we have assumed that the estimates of ultimate, on level loss ratios are unbiased and that the purpose of the trend procedure does not encompass correction for any biases or variability inherent in the development and on level procedures.

1. Evaluation Criteria

To measure projection accuracy, we reviewed the average deviation (sample bias), average absolute deviation, and average squared deviation of each of the fits performed. These deviations were calculated for forecasts that were two and three years after the end of the experience period used for trend. This represents the general range of prediction periods used in most of the NCCI trend calculations.

R^2 is commonly used to measure the quality of a projection method. It does not, however, measure the ability of a method to make accurate forecasts. Rather, it measures the ability of the independent variable to explain variations in the dependent variable during the historical experience period. Because past correlation does not necessarily imply causation or future correlation, a high R^2 does not necessarily imply good projection accuracy.

2. Linear versus Exponential Trending

a. A Priori Expectations

In most property-casualty lines of business, trend is related, at least in part, to inflation in claim costs. Therefore, exponential curves which represent constant rates of inflation are commonly used to model trend in insurance losses. This suggests a small downward bias in the linear model for medical loss ratios from a theoretical perspective. However, actual loss ratio trends

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are influenced by many factors over any given time period for a given set of states.

This type of trend can be expected to hold for workers compensation medical loss ratios because a major component of medical trend is the excess of medical inflation over wage inflation. On the other hand, the inflationary component of indemnity losses is reflected in the exposure base (on level premium). There is therefore less reason to expect indemnity losses to follow an exponential trend. We, therefore, have no a priori expectations regarding bias in either the linear or exponential model. It is important to recognize the inherent differences in the factors contributing to indemnity and medical loss ratio trend in evaluating all aspects of the trend procedure, not just the selection of a linear versus exponential model.

b. Projection Accuracy

Two sets of tests of projection accuracy were performed: one using all NCCI states, excluding Georgia for which ex-IBNR development data are not available, and one using a sample of three states. The first set of tests were performed by NCCI and were reviewed by M&R. The data underlying these tests included Policy Years 1981 through 1988 evaluated as of December 31, 1990. These tests focused on projection accuracy of the linear and exponential models under recent economic conditions. The latter tests were based on data for Policy Years 1975 through 1988 evaluated as of December 31, 1989. The purpose of these tests was to evaluate the projection accuracy of these models under a wider variety of economic conditions.

Several sets of sample statistics were calculated to summarize the results of the tests for the all-state sample. These included arithmetic averages, as well as averages weighted using Policy Year 1988 on-level premiums as weights. For a sample of this size, we believe that it is appropriate to review the sample statistics calculated using both arithmetic and weighted averages. These statistics are displayed in Table 12, on the next page.

Our interpretation of the results in Table 12, is that, for the time period included in this first set of tests (i.e., using Policy Years 1981 through 1986 to project Policy Years 1987 and 1988):

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Table 12: Summary of Accuracy - Regression Methods

	<u>Indemnity</u>		<u>Medical</u>	
	<u>Exponential</u>	<u>Linear</u>	<u>Exponential</u>	<u>Linear</u>
Arithmetic Averages				
Sample Bias	0.012	-0.008	-0.007	-0.026
Average Squared Error	0.008	0.005	0.005	0.004
Average Absolute Error	0.057	0.051	0.047	0.045
Premium-Weighted Averages				
Sample Bias	-0.001	-0.025	-0.018	-0.039
Average Squared Error	0.005	0.005	0.004	0.004
Average Absolute Error	0.049	0.054	0.044	0.050

Notes:

1. Sample bias is calculated as predicted minus actual.
2. The premiums used in calculating the weighted averages are shown on Exhibit 10, Sheet 1.

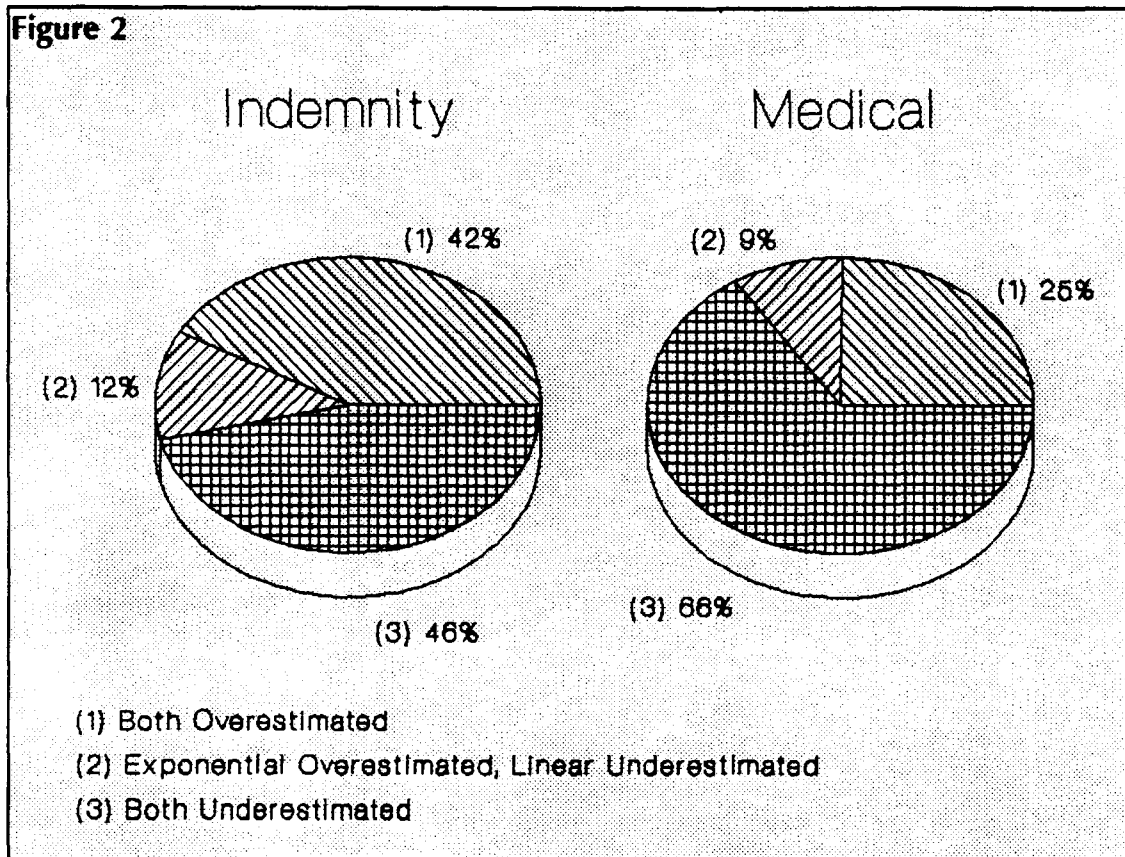
- For medical losses, the exponential model performed significantly better than the linear model. The exponential model was more accurate in terms of sample bias and the two models were about equally accurate in terms of average squared error and average absolute error.
- For indemnity losses, the results were inconclusive, but tended to favor the exponential model when premium-weighted averages were used.

It is interesting to note that when arithmetic averages of the squared errors and absolute errors were used, the exponential model's results were not as good, relative to the linear model's results, as when weighted averages were used. This indicates that the exponential model tended to err by a greater amount in states with small volume, as compared to the linear model.

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The sample bias and errors for each model varied significantly among the states, as shown on Exhibit 10. As can be seen on that exhibit, the absolute value of the sample bias from the exponential model was less than that from the linear model in 22 out of 39 data sets for indemnity and 29 for medical. Similar variations in the average squared and average absolute errors can also be observed. Figure 2 shows two pie charts which illustrate, for indemnity and medical separately, the percentages of projections for which:

- both models overestimated,
- both models underestimated, and
- exponential overestimated and linear underestimated.



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We also compared the projection accuracy of linear and exponential regressions using data from three states for nine sets of five consecutive policy years to determine the sensitivity of the above conclusion to the particular time period underlying our analysis. These measures of projection accuracy are shown in Table 13. The measures for each state from these tests are shown on Exhibit 11. In that comparison, the average squared error and average absolute error were lower for the linear regression than for the exponential, but the absolute value of the sample bias was smaller for exponential regression. The results are less conclusive than those found for medical using the more recent time period for all states.

Table 13: Summary of Accuracy - Regression Methods

	<u>Indemnity</u>		<u>Medical</u>	
	<u>Exponential</u>	<u>Linear</u>	<u>Exponential</u>	<u>Linear</u>
Sample Bias	0.003	-0.019	0.007	-0.016
Squared Error	0.022	0.011	0.004	0.002
Sample Absolute Error	0.095	0.076	0.036	0.026

Notes:

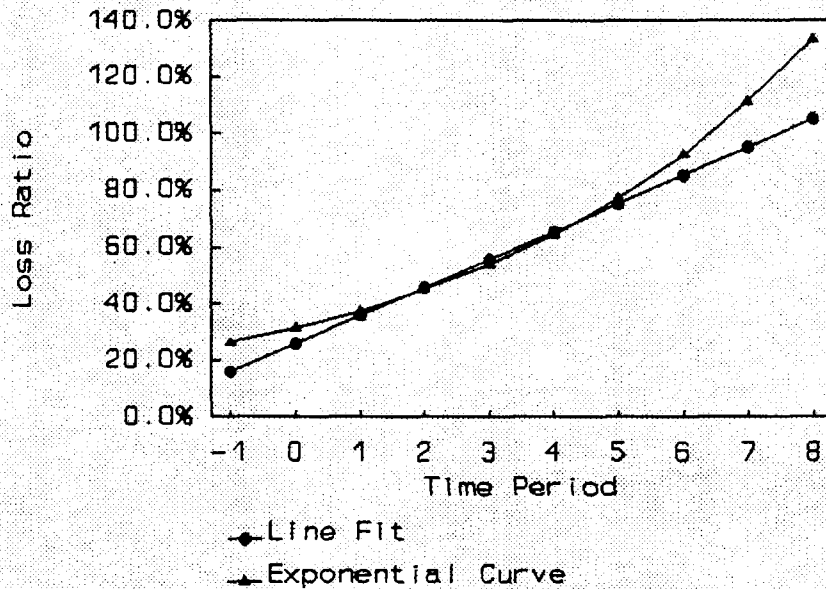
1. Sample Bias is calculated as predicted minus actual.
2. Three-state sample.

c. **Inherent Properties**

As noted above, an exponential curve will usually indicate higher projections for points outside of the experience period used for trend if the underlying data are generally increasing. While exponential projections will eventually exceed linear projections in other situations, this may not occur until some time after the rate projection period. The projected curve will dip below the fitted line during the experience period, as illustrated in Figure 3, on the next page. As a result, in the NCCI trend application, trend will often be higher if

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Figure 3: Exponential versus Linear



Note: Experience period is comprised of Time Periods 1 through 5.

an exponential curve is used. In our tests, the exponential projections were higher than the linear projections in most cases and were never lower by more than an insignificant amount. It should be understood that the higher indications produced by exponential curve fits are not to be considered an indication of increased or reduced projection accuracy of such fits, but rather a reflection of the nature of the assumed underlying trend.

d. Recommendations

The tests reflecting the recent economic environment (i.e., using Policy Years 1981 through 1986 to project Policy Years 1987 and 1988) indicated that for medical losses the exponential model was more accurate than the linear model. For indemnity losses, the results were inconclusive, but tended to favor the exponential model when premium-weighted averages were used. Our limited tests using different time periods, reflecting a range of economic conditions, were inconclusive for both indemnity and medical. We believe

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that it is important that, before a model is adopted for long-term use, it be shown to perform better under a range of conditions, not only those that have existed recently. We therefore recommend that NCCI perform tests similar to those contained herein periodically (every two years) which will reflect the then most recent economic environment. We also recommend that NCCI perform a test of projection accuracy over a longer time frame (i.e., five policy years of data predicting two and three years ahead, but differing five-year periods).

3. Alternate Methods

We studied several alternative methods to exponential and linear regression. These methods are:

- weighted least squares regression,
- non-parametric curve fitting,
- minimum absolute deviation trend line,
- least trimmed squares line fitting,
- exponential smoothing, and
- econometric modelling.

Each of these methods is described in detail in Appendix A.

We performed similar tests of these methods as were done for the NCCI approach on the experience in the sample states. Our analyses indicate that some reduction in the sample bias and the average squared deviation may be possible through the use of exponential smoothing methods. In these families of methods, the trend indication is derived using a weighted average of the loss ratios in which the more recent years are given higher weight.

A few of the exponential smoothing methods resulted in slightly lower errors because of their ability to react to changes in the trend rate during the experience period. Table 14, on the next page, shows a comparison of the prediction errors for

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Table 14: Comparison of Prediction Errors

	<u>Stable States</u>		<u>Erratic States</u>	
	<u>Average Squared Error</u>	<u>Sample Bias</u>	<u>Average Squared Error</u>	<u>Sample Bias</u>
Medical				
Best Exponential Smoothing Method	0.0001	-0.006	0.004	0.004
Linear Regression	0.0001	-0.007	0.005	0.006
Exponential Regression	0.0001	0.003	0.024	0.064
Indemnity				
Best Exponential Smoothing Method	0.003	-0.017	0.008	0.029
Linear Regression	0.003	-0.021	0.011	0.066
Exponential Regression	0.002	-0.010	0.031	0.114

the best overall exponential smoothing method (linear fit) and the regression methods (exponential curve) in the states that appear to have a stable trend during the entire experience period, as well as those in states that have less stable experience. As can be seen, the projection accuracy of the methods is generally the same in the stable states. The most improvement in projection accuracy is observed in the states in which the loss ratios and the trend rate vary significantly over time.

As noted in Appendix A, there are some practical drawbacks to exponential smoothing methods. For the exponential smoothing methods, the results are highly dependent upon the initial values of the location and trend parameters and the smoothing constant. (The smoothing constant determines the responsiveness of the results to the most recent experience.) If a large experience period is available, the initial values influence the results to a lesser extent. If a relatively high smoothing constant were used, say more than 0.5, the fifteen years of experience that will eventually be available from Financial Calls will generally be sufficient to overcome concerns regarding the initial values. Statistics texts commonly recommend that the smoothing constant be determined based on trial and error.

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We recommend that NCCI perform further research into exponential smoothing using the loss experience in all states. Our analyses indicate that NCCI's procedure could benefit from revisions to the methodology, particularly with respect to the identification and evaluation of turning points. The methods identified above are often better able to react to changes in trend rates than the current regression technique.

D. Credibility and the Credibility Complement

Credibility procedures involve estimating a quantity by taking a weighted average between an indication based on the most relevant data (the "observation") and an indication based on more stable, but less relevant, data (the "credibility complement"). The weight assigned to the observation is called the "credibility" of that observation (usually denoted by the letter "Z"). In the current NCCI trend procedure, the complement to the trend indication for a particular state is the trend indication for a group of states. Approaches to credibility can be categorized as "classical" or "Bayesian."

1. Classical Credibility

Classical approaches start with a statistical evaluation of the accuracy of the observation, leading to the construction of "confidence intervals" around that observation. A requirement for the widest acceptable confidence interval (e.g. 95% confidence of being within $\pm 5\%$) is selected, somewhat arbitrarily, and denoted the 100% credibility standard. An observation producing a confidence interval smaller than or equal to the 100% standard is deemed 100% credible, while one with a wider confidence interval is assigned partial credibility equal to the ratio of the width of the confidence interval corresponding to the 100% standard to the width of the confidence interval around the observation. More commonly, the 100% standard is translated to a volume requirement (say P_{100}) and partial credibility is assigned based on the volume underlying the observation (say P_{obs}) according to the

formula $\sqrt{\frac{P_{obs}}{P_{100}}}$ (the "square root rule"). Given the common assumption that variance is inversely proportional to volume, and assuming that the observation is

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drawn from a Normal distribution, the two partial credibility approaches are equivalent (see Venter³).

The classical credibility approach is arbitrary and judgmental in a number of respects. While it can be justified by a "limited fluctuation" line of reasoning, it is not in fact the mathematical solution to any well defined problem. Significant drawbacks include:

- (1) the 100% standard is arbitrary, and
- (2) the credibility does not reflect the predictive ability of the credibility complement.

The second drawback is the area of our greatest concern. For example, suppose a state's experience fails to meet the standard and is assigned 50% credibility, but that no appropriate credibility complement is available. It would be preferable in this case to give 100% weight to the state indication, albeit less stable than we would like, rather than give 50% weight to an inappropriate indication. The appropriateness of the complement should be addressed.

2. Bayesian Analysis and Bayesian Credibility

Bayesian analysis starts with a prior ("a priori") hypothesis and an observation. Bayes' theorem is then applied to produce an "a posteriori" hypothesis, the optimal combination of the available information. The a priori hypothesis corresponds to the credibility complement in our case. To apply Bayes' theorem directly, it is necessary to know the form and parameters of the statistical distributions governing both the complement and the observation. These may be postulated but are rarely known in practice.

3 Gary G. Venter, "Classical Partial Credibility with Application to Trend," PCAS LXXIII, 1986, p. 27.

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Bayesian credibility is an approximation of Bayesian analysis developed by Bühlmann⁴. It takes the familiar form of a credibility weighing between the observation and the credibility complement, and it requires estimates of the means and variances, but not the forms, of the distributions. Note that the only additional information required, as compared to classical credibility, is the variance associated with the credibility complement as an estimator of the mean underlying the observation. The weights given to the observation and the complement are then inversely proportional to the variances. Thus, if the variances of the observation and the credibility complement are α^2 and γ^2 , respectively, the weights for the

observation and the credibility complement are $\frac{\gamma^2}{\alpha^2 + \gamma^2}$ and $\frac{\alpha^2}{\alpha^2 + \gamma^2}$, respectively. It has been proven⁵ that the Bayesian credibility solution is identically the Bayesian analysis solution for certain distributions. Bühlmann proved that in all cases, the Bayesian credibility solution is the best linear unbiased estimator for the Bayesian analysis solution.

3. Empirical Bayesian Credibility

Empirical Bayesian credibility refers to techniques where the necessary parameters are estimated directly from the data. While the variance associated with the observation must be estimated for classical credibility as well as Bayesian credibility, the key to Bayesian credibility is the consideration of the variance associated with the credibility complement.

a. The Bühlmann/Straub Model

Bühlmann and Straub⁶ developed techniques for the credibility weighing of individual reinsurance treaty experience against the experience of a

4 H. Bühlmann, "Experience Rating and Credibility," ASTIN Bulletin IV, Part III, 1967, p. 199.

5 e.g., W. S. Jewell, "The Credible Distribution," ORC73-13, August 1973; The ASTIN Bulletin, 7, 1974, p. 237.

6 H. Bühlmann and E. Straub, "Credibility for Loss Ratios," (Translated by C. E. Brooks), ARCH, 1972.

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combined portfolio. Their model is useful whenever the credibility complement is based on combined experience and the details of the individual contributors to the combination are available. It is a natural model to use in developing credibilities for state versus countrywide data.

The variance associated with the credibility complement is estimated by comparing the variance associated with individual state estimates (the "within-state" variance) with the variance among estimates for different states (the "among-states" variance). If there were no real differences among the states, the observed among-states variance would be similar to the average within-state variance. To the extent that the observed among-states variance significantly exceeds the average within-state variance, it provides evidence of real differences among the states. The greater the real differences among the states, the less the predictive value of the credibility complement.

Hachemeister⁷ applied techniques similar to Bühlmann and Straub to trend models (and to linear models in general), considering the specific case of state versus countrywide trend. Meyers⁸ described the techniques applied to classification relativities.

We tested a number of applications of the Bühlmann/Straub Model. Our approaches, discussed in detail in Appendix B, use the Meyers presentation as a starting point. Results of the applications will be discussed in a subsequent section.

7 Charles A. Hachemeister, Credibility - Theory and Applications, Kahn, editor New York: Academic Press, 1975, pp. 129-169.

8 Glenn Meyers, "Empirical Bayesian Credibility for Workers' Compensation Classification Ratemaking," PCAS LXXI, 1984, p. 96.

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b. The Van Slyke Approach

Van Slyke⁹ presented an empirical Bayesian credibility approach for trend factors in which the credibility complement is no (i.e., 0%) trend. The variance associated with the observation was calculated based on the linear regression model while the variance associated with the (no trend) complement was based on the very simple no-trend model. Since the former model predicts variance increasing with the length of the projection period while the latter model does not, Van Slyke's result is that the trend rate asymptotically approaches no trend as the length of the projection period increases. We consider this result counter-intuitive, a consequence of using inconsistent models to measure the two variances.

c. The Brehm/Guenther Approach

Brehm and Guenther¹⁰ apply the method of mixed estimation to trend credibility. They demonstrate that their approach is equivalent to an empirical Bayesian credibility approach, and cite a state versus countrywide trend example (among others). In the Brehm/Guenther example, the state and countrywide variances are based directly on the variances associated with the state and countrywide trend indications. Under this approach, the countrywide trend will generally be more reliable than that of any single state; accordingly, all states will receive credibilities less than 50%. The distinction in this case is that the Brehm/Guenther measure of countrywide variance relates to the accuracy of the countrywide trend rate as a predictor of countrywide trend rather than its accuracy as a predictor of trend in a particular state.

9 Oakley E. Van Slyke, "Credibility-Weighted Trend Factors," PCAS LXVIII, 1981, p. 160.

10 Paul Brehm & Denis Guenther, "The Econometric Method of Mixed Method Estimation: An Application to the Credibility of Trend," 1990 CAS Discussion Paper Program, p. 171.

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d. Using Historical Prediction Errors

Given an adequate data base, it may be possible to derive empirical Bayesian credibilities from direct measurements of the projection accuracy of state versus countrywide experience. In general, the approach is to assemble data for many states over a number of years, and then to compare the accuracy of projections made using only state data with the accuracy of projections using only countrywide data. These measurements of projection accuracy would be used to calculate the state and countrywide variances used in determining the parameters in the Bayesian credibility formulas.

Producing an adequate data base for this type of calculation does not appear to be onerous. As discussed below, eight years of data for all states might be adequate, and a somewhat longer period (say fifteen years) would be ample. With eight years of trend data available, we fit trend lines to five-year periods and measured projection accuracy for projections two and three years beyond the trend data. Thus, for each state we had two readings of the two-year prediction error and one reading of the three-year prediction error. If we had eight years of data for 33 states (the "countrywide" group), we would have 99 readings of prediction errors. Making the data base longer would have advantages of increasing the number of readings and providing measurements over a greater range of economic conditions.

The procedure then involves calculating prediction errors, once with 100% weight to state data and once with 100% weight to countrywide data. Prediction errors would be expressed as percentages of the actual data and mean square errors would be calculated for state and countrywide projections. If α^2 and γ^2 represent mean square errors for state and countrywide projections respectively, then $\frac{\gamma^2}{\alpha^2 + \gamma^2}$ would represent the credibility of the "average" state.

To measure the credibility for individual states, some "base" would be introduced. Measures of volume are commonly used for credibility bases. The current NCCI procedure uses the quality of the fit of the state trend line, and a base of this type could be used as well. Credibility bases are

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discussed further in the next section. The procedure discussed above is presented in greater detail in Appendix B-2.

4. Base for Measuring State Credibility

Whatever credibility method is used, credibility must be assigned according to some "base" which reflects the relative variability of results.

a. Volume

Most commonly, credibility is assigned according to some measure of volume. Five-year state on level premiums provide a readily available, reasonable measure of volume in our case. Five years of claim counts, if available, may make a good alternative measure. For the purposes of this discussion, we will denote the volume measure for state i as P_i (whether or not it represents premiums).

The use of the volume measure is generally predicated on the assumption that volume is inversely proportional to variance. That is, if the variance for state i is α_i^2 , then α_i^2 can be estimated by $\frac{V^2}{P_i}$, where V^2 is a proportionality constant.

Recalling that the Bayesian credibility for state i is $Z_i = \frac{\gamma^2}{\alpha_i^2 + \gamma^2}$, where γ^2 is

the variance of the complement, we can replace α_i^2 by its estimator $\frac{V^2}{P_i}$.

Then, the credibility is:

$$Z_i = \frac{\gamma^2}{\frac{V^2}{P_i} + \gamma^2} = \frac{P_i}{\frac{V^2}{\gamma^2} + P_i} = \frac{P_i}{P_i + K}$$

$$\text{where } K = \frac{V^2}{\gamma^2} .$$

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This is the most common form for Bayesian credibility.

b. Volume Plus a Constant

There may be sources of variance that do not tend to decrease with volume. An example is the possible general failure of the regression model to perfectly model trend. Meyers and Schenker¹¹ suggest the introduction of a constant

term. Thus, the estimator for α_i^2 is now $\frac{V^2}{P_i} + C$. Substituting, the credibility becomes:

$$Z_i = \frac{\gamma^2}{\alpha_i^2 + \gamma^2} = \frac{\gamma^2}{\frac{V^2}{P_i} + C + \gamma^2} = \frac{P_i}{\frac{V^2}{\gamma^2} + \frac{CP_i}{\gamma^2} + P_i} = \frac{P_i}{P_i d + K}$$

$$\text{where } K = \frac{V^2}{\gamma^2} \quad \text{and} \quad d = 1 + \frac{C}{\gamma^2}$$

c. Quality of Line Fit

Under NCCI's current classical credibility approach, credibility is a direct function of the sum of squared residuals ("SSR") of the fitted line (or exponential curve). Volume affects credibility only indirectly to the extent it influences the goodness of the fit.

Directly reflecting the quality of the fit is straightforward in the Bayesian approach. In this case, the variance of the state trend indication, α_i^2 , can be estimated directly as a function of the SSR. Credibility is then calculated according to the basic formula:

11 Glenn Meyers and Nathaniel Schenker, "Parameter Uncertainty in the Collective Risk Model," PCAS LXX, 1983, p. 111.

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$$Z_i = \frac{\gamma^2}{\alpha_i^2 + \gamma^2}$$

5. Results of Testing - Empirical Bayesian Credibility

We performed extensive testing of empirical Bayesian credibility according to the Bühlmann-Straub model. Our applications are discussed in detail in Appendix B. Our tests were based on five years of Financial Call data for thirty-three states. We tested many combinations of data and methods, as follows:

- Loss Types: Indemnity and Medical.
- Data Types: Paid, Incurred, and Incurred excluding IBNR.
- Trend Model: Linear, Exponential, and Adjusted Linear. In Adjusted Linear, all states are adjusted to a common loss ratio level before calculating trends.
- Credibility Formula: Varied according to the three credibility bases previously discussed. We also tested a correction for bias in the credibility estimates.
- State Groupings for Medical: All states combined, fee states vs. non-fee states, "effective" fee states vs. all other.

a. Comparison of Within-State and Among-State Variances

As a general pattern, we found that the variances among the state trend indications were far greater than the variances of the within state trend indications. In other words, the observed variation in trend estimates from state to state is far greater than the random variation which would occur if there were no systematic differences between the states.

Table 15, on page 66, compares the within-state and among-state variances for the various data and method combinations. (Variances for the exponential model, denoted with asterisks, are based on natural logarithms of loss ratios and therefore, differ in scale from the linear variances; however,

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the relationship between among-state and within-state variances is comparable to the linear models).

Note that the among-states variances are many times the within-state variances. Even though the medical fee states are apparently more homogeneous than the other groupings, the analysis indicates that there are significant non-random differences among the states.

b. Comparison with NCCI Credibilities

As a result of the comparison of variances, the credibilities resulting from the empirical Bayesian approach are much higher than those produced by the NCCI formula. Note that the higher Bayesian credibility does not imply that state results are any more reliable than indicated by NCCI's classical credibility approach (in fact, the identical theory has been applied to measure the reliability of state results). Rather, the implication is that the credibility complement is relatively unreliable as an indicator for the trend in any given state.

Table 16, on page 67, compares average credibilities between the volume based Bayesian method and the NCCI method. The Bayesian credibilities based on volume plus a constant or quality of line fit give different estimates for credibilities of individual states, but very similar average credibilities (over all states) to these shown in Table 16 for the volume based method. The Bayesian credibilities are much higher than the NCCI credibilities, even for the relatively more homogeneous medical fee states group.

c. Possible Inaccuracy in Assumptions

Given the dramatic nature of the above results, it is important to examine the assumptions underlying the empirical Bayesian credibility model with a critical eye. In particular, we focus on the "within-state" variance, i.e. the variance associated with estimates of the trend rate in each state.

The variances of the estimates of the trend rate have been derived using standard regression formulas. These variances are valid only to the extent that the trend model itself is valid. In other words, the assumption is that except for random noise, there is a true underlying trend which is constant over time. Given observations of the changing trend rates over long periods

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Table 15: Within-State vs. Among-State Variance

<u>Loss Type</u>	<u>Data Type</u>	<u>Model</u>	<u>Group</u>	<u>Among- State Variance</u>	<u>Average Within-State Variance</u>	
Indemnity	Incurred	Linear	CW	0.808	0.033	
		Adj. Linear		0.878	0.031	
		Exponential*		5.076	0.130	
	Excluding IBNR	Linear		0.949	0.037	
		Adj. Linear		0.960	0.035	
		Exponential*		5.243	0.121	
	Paid	Linear		0.848	0.027	
		Adj. Linear		0.824	0.024	
		Exponential*		4.839	0.128	
Medical	Incurred	Linear	Non-Fee States	0.332	0.024	
		Adj. Linear		0.349	0.022	
		Exponential*		4.473	0.151	
	Excluding IBNR	Linear		0.314	0.032	
		Adj. Linear		0.336	0.029	
		Exponential*		4.085	0.162	
	Paid	Linear		0.276	0.022	
		Adj. Linear		0.324	0.020	
		Exponential*		4.264	0.145	
	Incurred	Linear		Fee States	0.262	0.026
		Adj. Linear			0.121	0.019
		Exponential*			1.800	0.262
	Excluding IBNR	Linear			0.209	0.029
		Adj. Linear			0.182	0.022
		Exponential*			2.682	0.270
Paid	Linear	0.046	0.022			
	Adj. Linear	0.070	0.015			
	Exponential*	1.142	0.208			

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**Table 16: Average Credibilities
Empirical Bayesian vs. NCCI**

<u>Loss Type</u>	<u>Data Type</u>	<u>Model</u>	<u>Group</u>	<u>Average Bayesian Credibility</u>	<u>Average NCCI Credibility</u>	
Indemnity	Incurred	Linear	CW	0.918	0.542	
		Adj. Linear		0.928	0.542	
		Exponential		0.946	0.532	
	Excluding IBNR	Linear		0.922	0.568	
		Adj. Linear		0.925	0.568	
		Exponential		0.951	0.603	
	Paid	Linear		0.935	0.574	
		Adj. Linear		0.939	0.574	
		Exponential		0.982	0.568	
Medical	Incurred	Linear	Non-Fee States	0.873	0.429	
		Adj. Linear		0.889	0.429	
		Exponential		0.934	0.470	
	Excluding IBNR	Linear		0.835	0.403	
		Adj. Linear		0.855	0.403	
		Exponential		0.924	0.461	
	Paid	Linear		0.861	0.465	
		Adj. Linear		0.922	0.465	
		Exponential		0.934	0.521	
	Incurred	Linear		Fee States	0.815	0.362
		Adj. Linear			0.745	0.362
		Exponential			0.760	0.381
Excluding IBNR	Linear	0.769	0.346			
	Adj. Linear	0.786	0.346			
	Exponential	0.815	0.358			
Paid	Linear	0.524	0.354			
	Adj. Linear	0.689	0.354			
	Exponential	0.722	0.391			

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of time, the imperfection in this assumption is apparent. The implication is that the within-state variances are understated. This in turn leads the estimates of the among-state variances to be overstated, which in turn leads the credibilities to be overstated.

By way of contrast, in most applications of the credibility theory, the quantity being estimated is a mean rather than a trend rate. Unlike trend rates, the standard formulas for the variances of sample means are not dependent on any model for their validity. Thus, in estimating a trend rate rather than a mean, we have an a priori expectation that the model will lead to credibilities that are overstated to some degree. The NCCI procedure is based on the same regression assumptions, and therefore will also tend to understate the variance of the state trend indication.

d. Credibility Formulas

Credibility formulas varied according to the three credibility bases tested and whether the adjustment for bias was applied. We were able to apply each of the formulas discussed without practical difficulty.

The "volume plus a constant" credibility base flattened credibilities, i.e. raised credibilities for low credibility states and vice versa. Overall, average credibility was not significantly affected. The constant was generally found to be statistically significant. In the example of linear trend applied to incurred indemnity losses excluding IBNR, the constant accounted for 43% of the average within-state variance with the remaining 57% inversely proportional to volume.

The quality of line fit credibility base produces a different distribution of credibilities by state, again with similar overall average credibility. Since this base is used in the current NCCI credibility procedure, the pattern of credibilities by state more nearly matches the results of the NCCI procedure, although the Bayesian credibilities are significantly higher.

We were concerned that the quality of line fit base is subject to random variation; i.e., give the same underlying variance in loss ratios around their theoretical mean, the quality of line fit will vary from one trial to the next. This variation could be beneficial if a poor quality of fit has value in

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predicting a poor reading of the trend rate; otherwise, a more stable indicator of state credibility is preferable.

We used a Monte Carlo simulation to test the hypothesis that quality of fit helps predict the accuracy of the trend rate, given constant underlying variance in loss ratios. We simulated 300 sets of five years of loss ratios, each assuming the same (linear) underlying trend, plus independent, identically distributed normal errors. We fit a line to each set by ordinary least squares, and calculated the sum of squared residuals (SSR) and the error in the trend rate. We found no significant correlation between the SSR and the squared error in the trend rate (actual correlation coefficient = -4.3%). We concluded that credibility should be based on the best available estimate of the underlying variance and that the quality of fit in a particular case provides no additional explanatory value.

In accordance with the above result, we conclude that credibilities based on volume are preferable to credibilities based on quality of line fit. Furthermore, the significance of the constant in the volume plus a constant credibility base leads us to conclude that the volume plus a constant approach is preferable to credibilities based on volume alone. Thus, we consider the volume plus a constant credibility base to be the most reliable approach.

The adjustment for bias in the credibility estimates (described in greater detail in Appendix B) is straight forward to apply. The adjustment always increases credibilities, but has a minor effect when credibilities are close to one. The adjustment is imperfect, and given the high credibilities indicated in our testing, is probably unnecessary. However, if additional tests of Bayesian credibility methods produce substantially lower credibilities, the bias issue will be more significant and should be explored further.

6. Results of Testing - Historical Prediction Errors

Using the eight years of available data in our eight-state sample, we projected two and three years ahead from the first five years, and two years ahead from the second through sixth years. We expressed each projection error as a fraction of the projected point, and averaged the squared errors across all states and all two-year and three-year projections. We made projections using state data alone,

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countrywide data alone, the NCCI credibility formula, and the Bühlmann-Straub Model (using quality of line fit as the credibility base). The results displayed in Table 17 are based on linear trend applied to ultimate loss ratios projected using incurred losses excluding IBNR.

**Table 17: Average Squared Relative Error
2 and 3 year projections**

	<u>100% State</u>	<u>100% C.W.</u>	<u>NCCI Cred.</u>	<u>Bayesian Cred.</u>
Indemnity	.0169	.0151	.0139	.0147
Medical	.0806	.0059	.0079	.0072

In particular, note that the errors based entirely on countrywide data are smaller than the errors based on statewide data. This contrasts sharply with the implications of our application of the Bühlmann-Straub Model. While we must be wary of results based on small sample sizes, this test supports the hypothesis that the Bühlmann-Straub credibilities are overstated.

7. Recommendations

We recommend that NCCI continue testing in this area. Our recommendation is based on our conviction that the optimal weights for an average of two estimates should be based on the value of each of the two estimates. Bayesian credibility provides the framework for doing so.

Empirical estimates of the variances of the state trend indication and the complement still need to be developed. In our testing, we found that the Bühlmann-Straub Model produced results which are likely biased towards excessive credibility for the states. The method for determining empirical credibilities using historical prediction errors, as outlined in Appendix B, seems promising. We recommend that NCCI assemble the necessary data and continue testing this approach, as well as other approaches aimed at measuring the relative value of state trend versus the countrywide (or other) complement.

We recommend that NCCI assign credibilities to individual states based on volume, preferably using an approach analogous to the "volume plus a constant" credibility base. This recommendation is not directly related to the issue of Bayesian versus

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classical credibility. It could be implemented as part of a Bayesian credibility procedure or as part of a classical credibility framework if, after investigation, NCCI does not implement a Bayesian credibility procedure.

E. Effective versus Ineffective Fee Schedules

As described above, NCCI splits states with medical fee schedules between those that are effective and those that are ineffective based on the trend rate observed in each state relative to the trend rates observed in non-fee states. An alternative is to evaluate the characteristics of each fee schedule prospectively to identify its anticipated effectiveness. The determination of these characteristics can be validated statistically in those states that have had medical fee schedules for several years.

1. Considerations

a. A Posteriori Groupings

It is always possible to create arbitrary subsets of the states that will show less among-states variance than that of the entire group. These groupings and the resultant reduction in variance do not, however, necessarily increase the appropriateness of the credibility complement.

b. Random Fluctuations Expected

As for all trend calculations, random fluctuations in trend indications for fee states are expected. That is, the trend indication for a particular year for a state that has a generally effective fee schedule could exceed the 33rd percentile of the indications for non-fee states solely due to random variability. It would not be appropriate to infer that the fee schedule was necessarily ineffective.

c. Consistency Between Years

The current procedure for allocating states leads to changes in the group of states that are considered to have effective medical fee schedules from year-to-year. In some circumstances, this has led to increased variations in the

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credibility complement for states with effective medical fee schedules. The alternate approach (grouping states according to fee schedule characteristics) will increase the consistency of the groupings over time.

d. Reduced Trend Expected in Fee States

After a medical fee schedule is introduced, unit charges for each procedure remain constant except when a change is made to the schedule itself. When this occurs, a law amendment factor is derived and the increase in costs is reflected in the benefit on level factors. As a result, the trend observed in on level loss ratios is expected to be reduced with the introduction of a medical fee schedule, even if the fee schedule itself is not effective at controlling losses and trend.

2. Recommendation

In light of the above considerations, we recommend that NCCI perform research to attempt to identify those characteristics of medical fee schedules that determine their effectiveness in reducing medical trends and use that information to split states with medical fee schedules on an a priori basis. If such characteristics cannot be identified, we recommend that states with fee schedules be grouped together for the purpose of calculating credibility complements, rather than including those currently deemed to have ineffective fee schedules with states that do not have fee schedules.

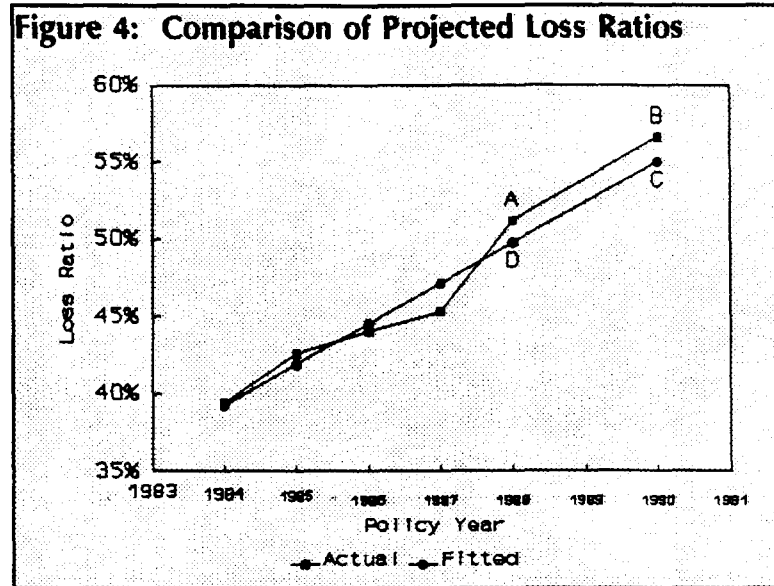
F. Application of Indicated Trend to Data

NCCI calculates the trend between the experience period and the rate effective period as the ratio of the loss ratios derived from the curve fits at the midpoints of each of these periods. The projected loss ratio during the rate effective period is then calculated as the selected trend rate times the average of the loss ratios from the most recent calendar-accident year and the most recent policy year. An alternative that is more commonly used in statistics is to project the loss ratio from the trend line itself. That is, the level of the projected loss ratio, as well as the rate of increase, is determined from the trend line.

This is illustrated in Figure 4, on the next page. The observed loss ratios and the fitted trend line are shown. The point labeled A is the loss ratio for the most recent

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policy year. If we ignore the averaging with the most recent calendar-accident year, the loss ratio projected for the rate effective period is represented by B. Under the alternate approach, the loss ratio projected for the rate effective period would be represented by C which is derived by extrapolating the fitted trend line to the midpoint of the rate effective period. Under the current procedure, B is derived as the product of A and the ratio of C to D.



1. Reliance on a Single Point

The projected loss ratio under the NCCI approach will be much more responsive to the last observed loss ratio than it will be under the alternate approach. To the extent that the most recent point is indicative of future losses, the NCCI approach will more accurately project the loss ratio during the rate effective period. That approach, however, also subjects the projected loss ratio to higher random variability. Because the volume of losses and premiums for each policy year are large, the loss ratio for that policy year is generally considered to be credible.

2. Projection Accuracy

We have evaluated this aspect of the trend projection by comparing the accuracy of the loss ratios projected for the rate effective period using both approaches. As for the tests described above, we have ignored the loss ratio from the most recent calendar-accident year in our comparisons. Our analysis indicates that the NCCI approach is more accurate (has lower average deviations) than the alternative approach for projecting indemnity loss ratios, as shown in Table 18, on the next page. This indicates that valuable information is gained regarding the level of future

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	<u>NCCI Approach</u>		<u>Alternative Approach</u>	
	<u>Average Squared Error</u>	<u>Sample Bias</u>	<u>Average Squared Error</u>	<u>Sample Bias</u>
Eight States -				
Two sets of projections per state				
Indemnity	0.018	0.059	0.028	0.079
Medical	0.014	0.037	0.014	0.042
Three States -				
Nine sets of projections per state				
Indemnity	0.022	0.003	0.025	0.001
Medical	0.004	0.007	0.005	0.008

loss ratios from the loss ratio observed in the most recent policy period. For medical, the prediction errors from the two approaches are essentially the same.

3. Recommendation

Based on the tests of projection accuracy, we recommend that NCCI continue with its current approach.

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VI. ECONOMIC AND BENEFIT CHANGES (SECTION 3c)

"Are adequate adjustments made to projections by the NCCI's trend model when significant legal or economic changes occur on a state or national level?"

In this section, we will identify several different types of economic and legal (benefit) changes that may affect workers compensation trend. For each, we will identify the types of adjustments that have been made in the past by NCCI, as well as our evaluation of the reasonableness and adequacy of the adjustments. Suggestions regarding alternate approaches will be made, but full testing of such alternatives is outside of the scope of this assignment.

A. Economic Changes

Changes in the economic environment of a state or region can affect workers compensation costs. Examples of such changes include those affecting a major industry, such as the decline in the oil and gas industry in Texas, Louisiana, and Oklahoma in the early 1980s, and those affecting the types of workers, such as the shift generally observed throughout the U.S from the manufacturing sector to the service sector. The latter type of shift will be discussed in a later section of this report.

1. Considerations

Historically, NCCI has not revised the trend procedure to reflect economic changes. In practice, it is not only difficult to predict the impact of economic changes on workers compensation losses, but also the timing and magnitude of the economic changes themselves. Due to the lag between the experience period and the time when filings are prepared, however, additional information regarding the economic situation in a state is available. For example, an industry could be newly experiencing difficulties or a region could be beginning a recovery that is not reflected in the loss experience. In these situations, an understanding of the impact of economic changes on workers compensation losses would be of value in making more reliable projections of the losses expected during the rate effective period.

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A difficulty in interpreting the impact of economic changes on workers compensation losses arises from three sources: (1) explanations of a similar phenomenon by two contradictory reasons, (2) the difficulty in identifying that "best" data in advance of the analysis, and (3) to a lesser extent, the smoothing effect implicit in policy year data. An example of the first relates to explanations of increases in claim frequency. A case can be made that, as the economy expands, there is a greater number of less experienced workers who will tend to have a higher frequency of injuries. On the other hand, a case can be made that, as the economy is declining and workers are laid off, the number of soft tissue injury claims tends to increase as workers seek an additional source of income. As a result of such contradictory explanations for increases in frequency, it is difficult to predict whether claim costs will increase with a recovery or a decline in the economy.

It is often difficult to know in advance what types of insurance data and economic statistics will be valuable in determining a good econometric model. As such, econometric analysis often involves extensive research, data collection, and analysis in the model identification phase, not all of which will be cost-justified.

The study of historical linkages between economic changes and workers compensation losses can sometimes be obscured by the smoothing effect of policy year data. Economic changes can often be identified with specific periods of time. Many of the linkages between economic changes and claim costs are more closely related to accident date than to policy issuance date. Since two policy years cover each accident date, what might be a fairly obvious change could be obscured by the policy year trend line.

2. Recommendations

We recommend that NCCI undertake a detailed analysis of econometric modeling for projecting future loss ratios. Such modeling may increase the reliability of projections, as well as provide explanations for changes in losses. In particular, econometric modeling can capture the turning points in projected losses.

In addition, we recommend the review of the loss experience in states in which significant economic changes have occurred to identify any consistently measurable changes in losses or trend rates. In particular, to the extent that the trend rate or level of loss ratios has changed at the inception of a period of difficult economic

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times, it would not be unreasonable to assume that the trend rate or level of loss ratios would revert to its historical level, as the economy reverses itself.

This type of measurement can be performed judgmentally or through the use of regression analysis. A review of losses, pure premiums or loss ratios in graphical form can often assist in such analyses. Regression lines can be fit using not only time as an independent variable, but also an index that measures the state of the economy. If the level of loss ratios is believed to have been affected by a recession, the independent variables would be time and the index. If the trend rate is believed to be affected, the independent variables would be time and the product of time and the index. To the extent that an additional variable is added to the trend projection, a longer experience period will be needed to produce reliable indications. In addition, current information regarding the state of the economy, along with forecasts thereof, will be needed to estimate the value of the index during the rate effective period.

B. Introduction of Medical Fee Schedules

The introduction of an effective medical fee schedule is expected to not only reduce medical costs, but also the rate at which they increase. NCCI has recognized this through the use of different credibility complements for states with and without effective medical fee schedules. In addition, the bent-line procedure, recently used in Texas, provides an adjustment for the trend rate in states in which the medical fee schedule was introduced after the experience period used for trending.

The differentiation in credibility complements for states with and without effective medical fee schedules is reasonable, but that the implementation can be improved as described in an earlier section. For states in which a medical fee schedule has been introduced during or after the experience period used for trending, we recommend that additional adjustments be made and that the bent-line procedure be refined further.

1. States in which a Medical Fee Schedule is Introduced After the Experience Period

The bent-line procedure, described earlier, has been introduced for Texas, where a medical fee schedule was introduced after the experience period. The overall

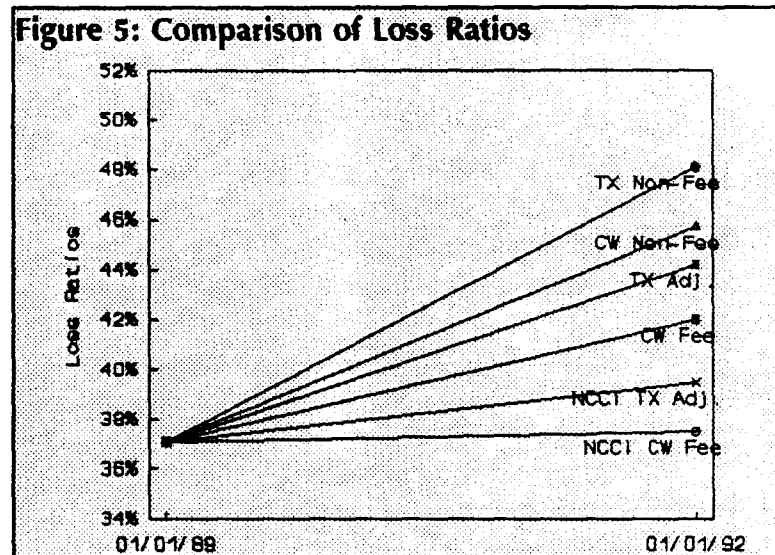
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approach is a reasonable method for adjusting the state's indicated medical trend in light of the change in the benefit structure. At the same time, the state's trend relative to other states is still maintained. This procedure can be used in states in which the medical fee schedule was implemented after the beginning of the experience period used for the overall rate level calculation.

We recommend, however, that the trend for all states with medical fee schedules be used to determine the adjustment, rather than the trend for states with *effective* medical fee schedules. Unless specific components of medical fee schedules are identified that are clear predictors of the effectiveness of the schedule in reducing medical trend, it is not appropriate to recognize the total potential reduction in medical trend from no fee schedule to an effective fee schedule. Note that the trend for all states with a medical fee schedule may not currently be calculated on a regular basis by NCCI.

Exhibit 12 shows a comparison of the calculations under both the NCCI approach and the proposed modification. The difference in the calculations can be seen in

the Countrywide Fee Loss Ratios at 1/92 in which the pure fee trend of 0.044 is used in the M&R column and the Countrywide (effective) Fee Trend of 0.004 is used in the NCCI column. This change is carried through to the calculation of the Texas Fee Loss Ratio at 1/92, resulting in a significantly higher indicated loss ratio. Figure 5 illustrates the different loss ratios and trends graphically.



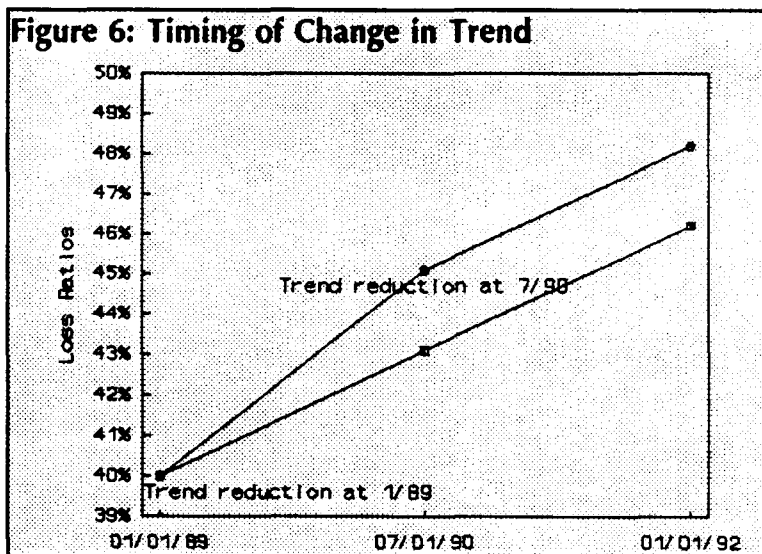
The calculations shown on Exhibit 12 involve loss ratios for policy years in the experience period, almost all of which occur before the implementation of the medical fee schedule in Texas on September 1, 1988. If the procedure is applied in

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a state in which the medical fee schedule is introduced after the end of the experience period, we recommend that the procedure be refined so that the lower projected trend is used only after the date that the schedule was introduced. Otherwise, the bent-line procedure will understate the total trend between the experience period and the rate effective period.

Medical costs are expected to increase at the existing trend rate until the fee schedule is implemented. Only after implementation is the lower trend rate expected to be observed. The trend factor between the experience period and the rate effective period should therefore be a weighted average of these two trends. The weights would be determined by the relative time periods between the midpoint of the experience period, the effective date of the medical fee schedule, and the midpoint of the rate effective period.

This is illustrated in Figure 6 for a hypothetical state in which the medical fee schedule is assumed to have been introduced on July 1, 1990. The midpoint of the experience period is January 1, 1989 and the midpoint of the rate effective period is January 1, 1992. The calculations underlying these loss ratios are shown on Exhibit 13.



2. States in which a Medical Fee Schedule is Introduced During Experience Period

It is our understanding that no adjustments are made to the medical trend calculation in states in which a medical fee schedule was introduced during the experience period used for determining trend. The result is that, until a medical fee schedule has reduced medical trend to below the 33rd percentile of states without a

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medical fee schedule, the medical losses may be trended at a higher rate than necessary. This is the combined result of relying on trends during a period in which no medical fee schedule was effective and the use of the higher (non-fee state) credibility complement. Note that this higher medical trend from the state's own experience will be tempered over time as the medical fee schedule reduces losses on claims that remain open from policy years during the experience period.

For states in which the medical fee schedule was implemented early in the experience period, such as during the oldest policy year, we recommend decreasing the number of years used to determine the medical trend. This will tend to eliminate potential distortions in the trend calculation due solely to the implementation of the medical fee schedule.

For other states, we recommend increasing the number of years used to determine the medical trend before the introduction of the medical fee schedule and then performing the bent-line procedure to determine the trend rate after the implementation of the fee schedule. The state's base trend would be estimated using only policy years before the introduction of the medical fee schedule. For these states, the adjusted trend is used for the entire trend period, because the medical fee schedule will have been implemented before the midpoint of the experience period used in the rate level calculation.

As two to three years of experience become available under the medical fee schedule, its impact on trend can be tested by reviewing the trends between policy years after the schedule was introduced. To the extent that measurable decreases in trend are observed, the trend factor can be adjusted accordingly. If no measurable decreases in trend are observed, the bent-line procedure can be used until the most or all of the experience period used for trending is after the introduction of the medical fee schedule.

C. Other Significant Benefit Changes

There are other benefit changes that may change the trend rate. In the past, a few adjustments have been made for such changes. For example, in 1987, Colorado eliminated vocational rehabilitation from its benefit structure. It was believed that the growth of the vocational rehabilitation industry may have led to a higher trend

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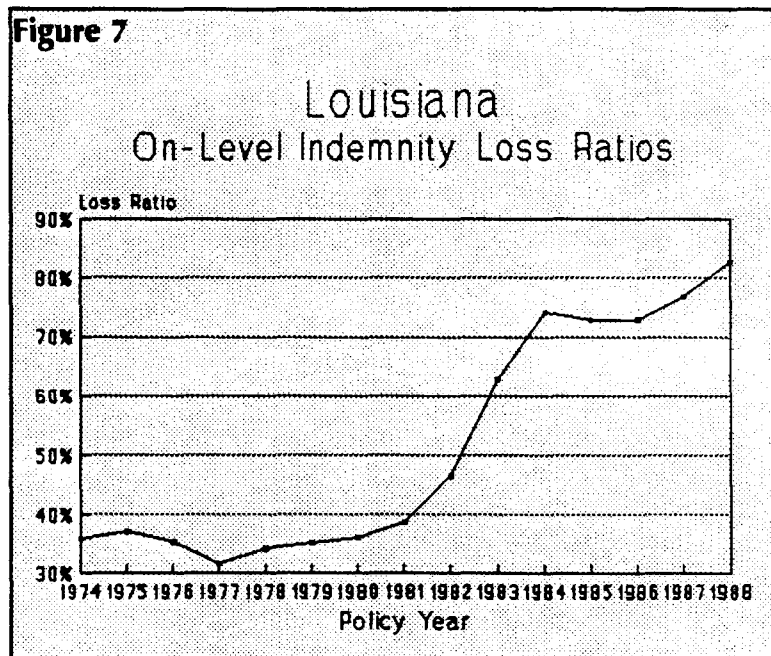
rate. Judgmental adjustments were made for several years in anticipation of a reversal of such changes.

Also, there was a large reduction in indemnity benefits in Maine in 1987. As in Colorado, it was believed that both the level of losses and the rate at which they trended would be reduced. As a result, no trend was used for indemnity for two years. In our sample states, there were several large benefit changes, including:

- a significant change in permanent partial benefits in Louisiana in 1983 to a wage loss/impairment schedule system,
- an increase in the maximum benefit from 100% to 150% of the SAWW in Connecticut in 1986, and
- a redefinition of losses to include vocational rehabilitation in Oregon in 1986.

Reviews of the ultimate, on level loss ratios in each state do not generally point to any significant changes in trend resulting from these benefit changes with the exception of indemnity loss ratios in Louisiana. Figure 7 shows the on level indemnity loss ratios for Louisiana. Graphs of the loss ratios in each state are shown in Exhibits 14 through 31 for indemnity and medical, separately.

It is difficult to evaluate whether the change in trend in Louisiana resulted from the change in benefits or the change



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in the economy in that region that occurred concurrently. A review of similar graphs for other states in the same region, e.g., Texas and Oklahoma, may provide some insight. The lack of a parallel change in medical loss ratios is an indication that the benefit change may have led to the change in trend. It may, therefore, be appropriate to review indemnity benefit structures and give separate treatment to those states with wage loss systems or, at a minimum, to implement a procedure that could be similar to the bent-line procedure to recognize the impact on trend of changes to a wage loss system.

In general, we recommend a systematic review of on level loss ratios to identify any benefit changes that are consistently related to changes in the observed trend (a bend in the graph).

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VII. ADJUSTMENTS FOR AUTOMATIC BENEFIT CHANGES (SECTION 3d)

"Contrast the current model, which puts all losses to a current benefit level, to a model which puts all past losses to the same "relative" value of prospective benefits. (In other words, if the prospective min/max benefit level and state AWW were \$100/\$300 and \$320, respectively, then no adjustment would be made to past losses if the past values were \$80/\$240 and \$256. This method would apply a steeper trend line to a lower historic loss level.)"

The NAIC requested that we evaluate an alternate approach for adjusting indemnity losses to current benefit levels in the trend calculation. It was suggested that benefits be brought to the same relative benefit level, rather than to a common absolute benefit level. Examples of the types of benefit on level factor calculations that would be affected by such a change include those for minimum and maximum weekly benefits, the percentage compensation rate, and increases in medical fee schedules.

A. Current Approach

Under the current NCCI approach, historical indemnity losses are adjusted to the current benefit level, with the intention that the losses for each year reflect the provisions, e.g., dollar amount of the minimum and maximum benefits, in effect at the time the filing is prepared. These adjustments are made through the on level factors. Each time the SAWW is increased, a law amendment factor is calculated which estimates the increase in benefits paid in a recent twelve-month calendar period to reflect the revised benefits.

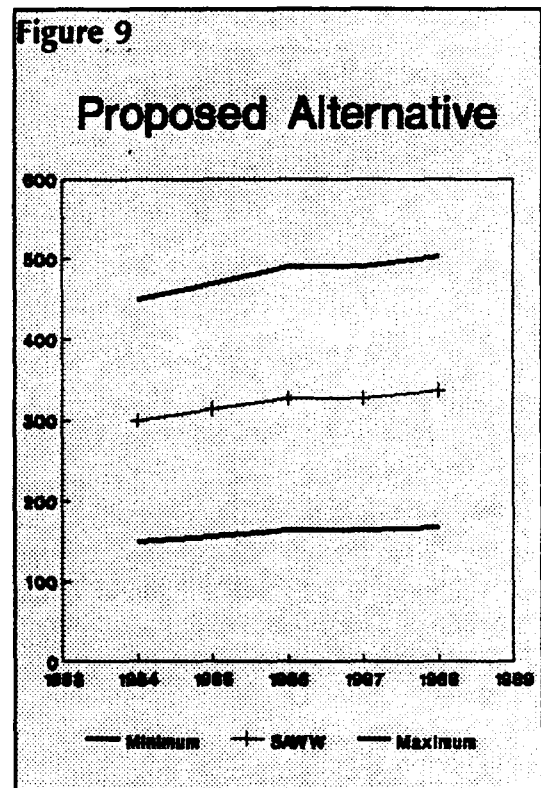
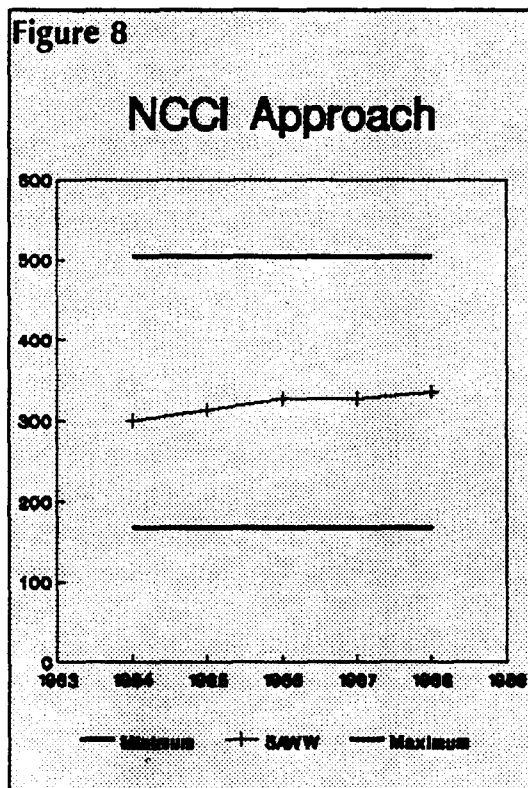
B. Alternate Approach

Under the proposed alternative, law amendment factors would be calculated whenever benefits change relative to the SAWW or other changes in benefits unrelated to the SAWW were enacted. That is, historical losses used in the trend

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calculation would reflect constant ratios of limited benefits to unlimited benefits, rather than a constant dollar level of benefits.

This difference can be illustrated graphically for minimum and maximum benefits, as shown in Figures 8 and 9. These figures show the relationship between the SAWW and the minimum and maximum benefits reflected in the losses used for trend under each approach. In Figure 8, the minimum and maximum benefits are represented by horizontal lines, as they are adjusted to a constant dollar amount. In Figure 9, the lines representing the minimum and maximum benefits increase proportionally to SAWW. (For this illustration, minimum benefits of 50% of SAWW and maximum benefits of 150% of SAWW were used.)



A comparison of the calculations of indemnity trend and the resultant indications in two states, Connecticut and Illinois, will be used to illustrate the differences in the approaches. The minimum and maximum benefits in Illinois have remained constant percentages of the SAWW during the entire period used for the trend

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calculation, whereas the maximum benefit in Connecticut increased from 100% to 150% on October 1, 1987.

Exhibits 32 and 33 show the trend calculations for Connecticut and Illinois using the current NCCI procedure. Table 19 shows a comparison of the law amendment factors including and excluding those related solely to increases in minimum and maximum benefits tied to the SAWW. As can be seen, fewer law amendment factors are needed under the alternate procedure. Exhibits 34 and 35 show the trend calculations under the proposed alternative. The trend rate under the alternate approach is somewhat higher than under the NCCI approach. The trend is, however, applied to lower loss ratios resulting from the lower on level factors. It is important to recognize that this change in the trend procedure requires a

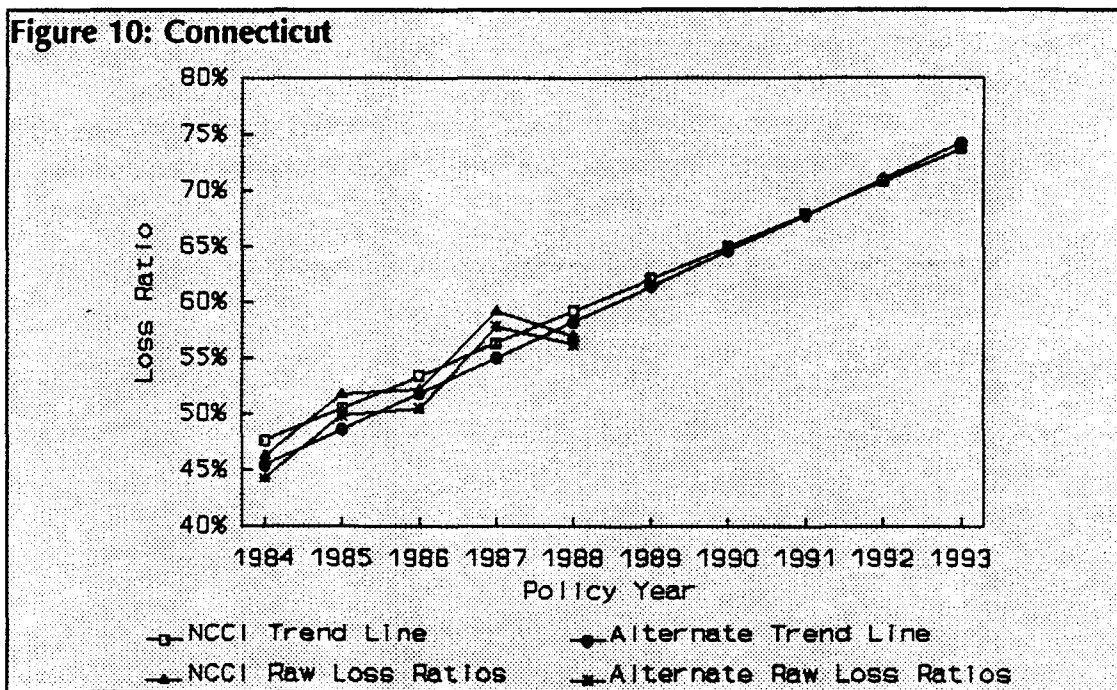
Table 19: Law Amendment Factors

	<u>Illinois</u>			<u>Connecticut</u>	
	<u>NCCI</u>	<u>Alternate</u>		<u>NCCI</u>	<u>Alternate</u>
1/15/84	1.005		10/1/84	1.020	1.020
7/1/84	0.960	0.960	10/1/85	1.008	
7/1/84	1.002	1.002	10/1/86	1.006	
7/15/84	1.001		10/1/87	1.012	
1/15/85	1.002		10/1/87	1.076	1.076
7/15/85	1.001		10/1/88	1.006	
1/15/86	1.001		10/1/89	1.005	
7/15/86	1.001		10/1/89	1.0003	1.0003
1/15/87	1.001		10/1/90	1.004	
7/1/87	1.007				
7/15/87	1.0004				
1/15/88	1.0004				
7/1/88	1.002				
7/15/88	1.001				
1/1/89	1.001				
7/1/89	1.006				
7/15/89	1.002				
1/15/90	1.0005				
7/1/90	1.006				
7/15/90	1.0004				

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corresponding change in the on level factors used in the overall rate level calculation.

Figure 10 and Figure 11, on the next page, show the resultant fitted trend lines under both approaches.

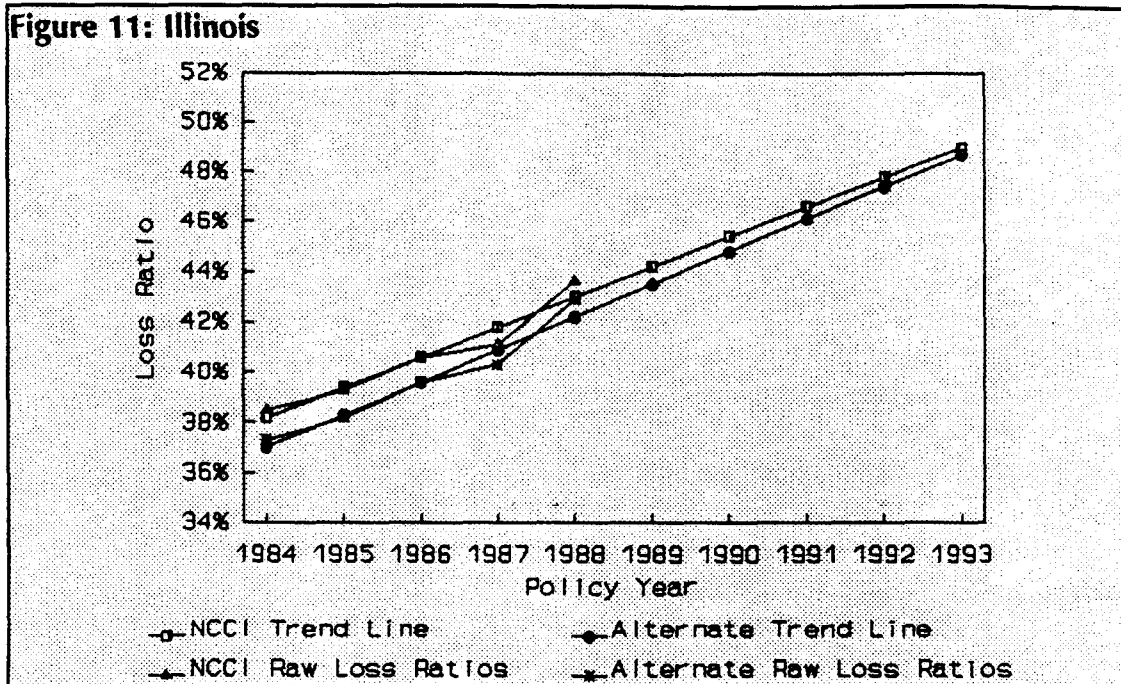


C. Possible Implementation Procedure

A procedure for implementing the alternate approach has been used internally by one or more state insurance departments. The following steps are performed for each policy period and for the Rate Effective Period.

1. Calculate (or estimate) average values of the minimum benefit, the maximum benefit, the percentage compensation rate, and the average weekly wage.

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2. Based on the values in (1) and the wage distribution table, calculate the average benefit.
3. Divide the average benefit in (2) by the average weekly wage.
4. Benefit on level factors are equal to the value for (3) for the Rate Effective Period divided by the value for (3) for each policy period.

Note that once actual values of the average weekly wage are known, the values in Step (3) above will never need to be recalculated.

D. Considerations

Our discussion of the considerations underlying each approach will focus on indemnity minimum and maximum benefits and changes in the SAWW. These comments also apply to other benefit changes.

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1. Actual versus Estimate

Under the proposed alternative, actual experience regarding the impact of increases in minimum and maximum benefits tied to the SAWW would be included in the trend calculation. This actual experience replaces the law amendment factors which represent theoretical estimates of experience. Accuracy regarding this impact will be increased by the use of the actual experience.

As additional data regarding claim counts become available, a trend procedure that depends upon separate estimates of frequency and severity trend may be considered. If the alternate procedure were also implemented, severity would be expected to be more highly correlated with the SAWW because the limiting effect of the current minimum and maximum benefits on benefits awarded in the past would be eliminated.

2. Understatement of Trend

Under the current NCCI approach, only changes in minimum and maximum benefits tied to the SAWW through the date that the filing is made are included in the on level factors. Any subsequent increases in benefits due to increases in minimum and maximum benefits after the filing is prepared may not be reflected in the rate level calculation. Thus, to the extent that minimum and maximum benefits automatically increase as a result of subsequent increases in the SAWW, the projected rate level will be understated to a small degree by the current approach. Under the proposed procedure, the impact of increases in the minimum and maximum benefits to the midpoint of the rate effective period will be implicitly included in the trend factor, thereby eliminating the understatement of indemnity losses. This can be observed in the graph in Figure 10 comparing the trend lines for Connecticut. The alternate trend line in that graph crosses the NCCI trend line at about the midpoint of the rate effective period.

3. Theoretical Bias

In all actuarial analyses, the existence of a constant dollar minimum or maximum will distort the underlying shape of the trend line. If, for example, it is believed that unlimited losses are trending exponentially at 5% per annum, the observed trend

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will be less than 5% and will decrease over time in the presence of a constant dollar limit on losses. This is illustrated with a simplified example in Table 20.

In that table, 10 claims are shown, each of which is assumed to increase uniformly by 5% per annum. Three averages are calculated: (1) the average of the unlimited claim sizes, (2) the average of the claims limited to a constant dollar amount, and

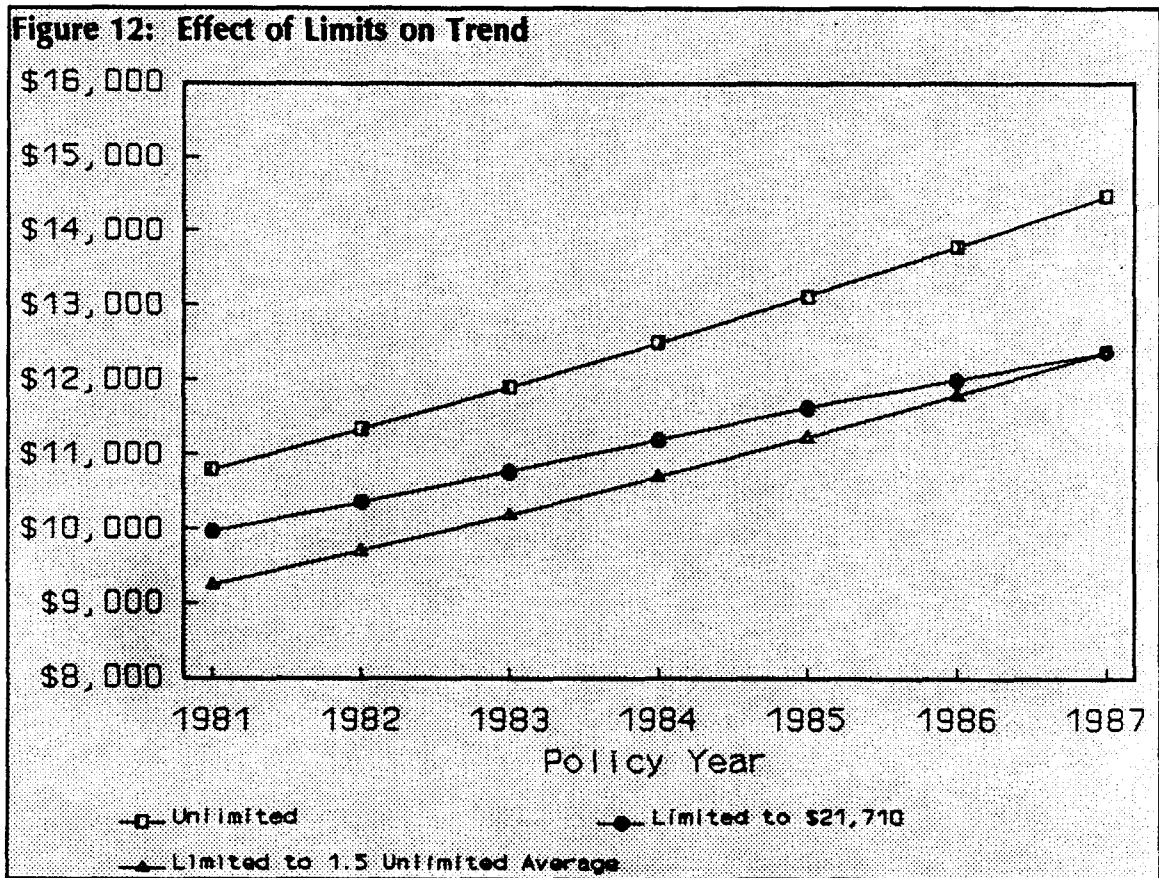
Table 20: Effect of Limits on Trend

Claim Number	Policy Year						
	1981	1982	1983	1984	1985	1986	1987
1	\$ 2,000	\$ 2,100	\$ 2,205	\$ 2,315	\$ 2,431	\$ 2,553	\$ 2,681
2	3,000	3,150	3,307	3,472	3,646	3,828	4,019
3	4,500	4,725	4,961	5,209	5,469	5,742	6,029
4	6,000	6,300	6,615	6,946	7,293	7,658	8,041
5	8,500	8,925	9,371	9,840	10,332	10,849	11,391
6	9,000	9,450	9,923	10,419	10,940	11,487	12,061
7	12,000	12,600	13,230	13,891	14,586	15,315	16,081
8	15,000	15,750	16,538	17,365	18,233	19,145	20,102
9	18,000	18,900	19,845	20,837	21,879	22,973	24,122
10	30,000	31,500	33,075	34,729	36,465	38,288	40,202
Unlimited Average	\$10,800	\$11,340	\$11,907	\$12,502	\$13,127	\$13,784	\$14,473
		5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Average Limited to \$21,710	\$9,971	\$10,361	\$10,770	\$11,200	\$11,635	\$12,000	\$12,382
		3.9%	4.0%	4.0%	3.9%	3.1%	3.2%
Average Limited to 1.5 times Unlimited Average	\$9,240	\$9,702	\$10,187	\$10,696	\$11,231	\$11,793	\$12,382
		5.0%	5.0%	5.0%	5.0%	5.0%	5.0%

TREND

(3) the averages limited to 150% the unlimited average. Also shown are the indicated trend rates for each of the averages. The trend rates for the unlimited average and the average calculated using an increasing limit are 5%, as expected. The trend rate for the average limited to a constant dollar amount decreases over time. The three averages are shown graphically in Figure 12. The trend lines corresponding to the unlimited average and the average limited to an increasing limit show an exponential shape consistent with the assumption underlying the example, whereas the third trend line is concave downward, reflecting a continuously declining trend rate.

As the trend line continues to flatten using the current NCCI approach, a bias will be created in the trend. The fitted trend line will tend to overstate the true future



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limited trend. This bias of the current approach is in the opposite direction from that discussed in the previous section. Neither of these biases appears likely to be substantial. An additional concern is the difficulty encountered in deriving econometric models using data that has been adjusted using the NCCI approach. To the extent that underlying trends are distorted, it increases the difficulty in identifying relationships between workers compensation losses (loss ratios) and external economic indices.

4. Impact on Law Amendment Factors

If the alternate approach were used, fewer law amendment factors would need to be estimated in states with automatic increases in the minimum and maximum benefits. Only those benefit changes not tied to the SAWW or those affecting the minimum and maximum percentages would need to be evaluated. In many states, this would considerably reduce the number of law amendment factors that need to be calculated. As of early-1990, 72% of states had indemnity benefits tied to the SAWW. In the examples shown above for Connecticut and Illinois, more than 85% of the law amendment factor calculations for indemnity would be eliminated.

Although the number of law amendment factors differs between methods, the difference in their impact is recognized in the trend calculation. Thus, under neither the current nor the proposed approach are benefit changes double-counted as a result of the trend procedure.

5. Automatic Increases Versus Intermittent Increases

The current approach could be continued in those states in which the minimum and maximum benefits do not automatically increase with the SAWW. If the minimum and maximum benefit are stated as dollar amounts and are only changed intermittently, the percentage relationship between the minimum and maximum benefits and the SAWW will vary over time. This necessitates the use of law amendment factors under both approaches. In the alternate approach, indemnity losses in each year would need to be adjusted to common ratios of minimum benefit to SAWW and maximum benefit to SAWW, whereas, in the NCCI approach, indemnity losses would need to be adjusted to reflect the current minimum and maximum benefit. To the extent that the minimum and maximum dollar amounts are not revised annually, the alternate approach would require the calculation of more adjustment factors to adjust losses to common minimum and maximum

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percentages than are currently needed. It is our understanding that these additional calculations are not difficult and do not add significantly to the time needed to prepare a filing.

6. Ease of Explanation

The alternate procedure, in and of itself, is not particularly easier or more difficult to understand. Any new approach, however, may temporarily appear more difficult simply because it is different from expectations.

E. Recommendations

Our conclusion is that the alternative approach is likely to increase projection accuracy to a small degree by removing potential distortions in the loss ratios used in the trend calculation. Also, the alternative approach is strongly preferable for purposes of econometric analysis. We recommend that the alternative approach be adopted at least with regard to benefit changes that occur automatically as a function of the state average weekly wage or a similar index. However, it should be recognized that the impact of this change will be small in most situations and could be in either direction for a particular filing, although increases in indicated rate changes appear likely to be more common than decreases. In addition, work will be required to change the NCCI systems and to educate those involved in the rate filing and review process regarding the change. We do not consider this to be a high priority recommendation to implement.

We have described a method for implementing the alternative approach which could be used for other types of benefit changes as well. We recommend that the practicality of this method (or possibly a different method of implementing the alternative approach) for all benefit changes be evaluated by NCCI.

It should be noted that any changes of this type in the trend calculation should also be made in the calculation of the on level losses used in determining the overall rate change indication.

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VIII. PREMIUM ON LEVEL FACTORS (SECTION 3e)

"The NCCI determines the overall impact of all classification rate changes combined based on the three years of payroll used in the filing at that time. If the mix of business in a state changes over the years, this estimation of the effect of a past rate filing as it would relate to the current mix of classifications may be distorted. Estimate the likely magnitude of these distortions and discuss whether an improved procedure would be warranted."

Premiums used in the trend calculation are first adjusted to current rate levels. When rate changes vary by class, the overall effect of the rate change is a function of the distribution of business among classes. If the class distribution shifts over time, a particular rate change will have different overall effects on different years' premiums. To the extent that inaccurate estimates of overall rate changes are used to bring premiums on level, the trend rate may be distorted.

A. NCCI Approach

Under the NCCI approach, an overall rate change is determined in each rate filing. To the extent that the rate change varies by class, the class rate changes are calculated to balance to the overall rate change. That "balance" is a function of the distribution of payroll by class. NCCI uses the most recent three years of available Statistical Plan data to perform the balancing calculation. Typically, the class distribution used to balance to the overall rate change is from policies written from three to six years prior to the effective date.

NCCI does not use the details of rates or rate changes by class in calculating on level premiums. Rather, on level factors to be applied to total premiums are calculated based on the estimated overall rate changes.

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B. Alternate Approach

Given adequate data, premiums reflecting current rates in combination with exposures for a past year can be calculated directly by multiplying the exposures (i.e. payroll) from the past year times the current rates. This method, called "extension of exposures" or "premiums at present rates" is widely used and is considered superior to the on level factors approach. In particular, a shifting class distribution does not cause a distortion.

For NCCI, only Statistical Plan data has the detailed exposures by class necessary to perform this calculation.

C. Potential Distortion in the NCCI Approach

To describe the potential distortion, we will introduce some notation relating to a single rate change. We will denote the "old" rate (prior to the change) for class i as OR_i and the "new" rate as NR_i . The exposures for class i in year j will be denoted ${}_jE_i$, while the exposures used for "balancing" the rate change will be denoted ${}_kE_i$.

Assuming that the old rates were in effect during year j , the actual manual premiums in year j were $\sum_i {}_jE_i \cdot OR_i$. NCCI procedures use standard premium rather than manual premium. For the purposes of evaluating the effects of shifting classification mix, we have based our calculations on manual premiums.

Since the exposures ${}_kE_i$ were used to balance the rate change, the overall effect of the rate change was calculated as:

$$\frac{\sum_i {}_kE_i \cdot NR_i}{\sum_i {}_kE_i \cdot OR_i}$$

The on level premiums for year j are then the product of the actual manual premiums and the estimated rate change:

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$$\sum_i {}_j E_i \cdot OR_i \cdot \frac{\sum_i {}_k E_i \cdot NR_i}{\sum_i {}_k E_i \cdot OR_i}$$

The more accurate premiums at present rates are calculated directly as $\sum_i {}_j E_i \cdot NR_i$, with the potential distortion caused by the possible differences between ${}_j E_i$ and ${}_k E_i$. In some states, the class distribution has shifted rapidly, so that the potential distortion in on level factors is significant.

Note that ${}_k E_i$ may be older or younger than ${}_j E_i$. The exposures used to balance the rate change average roughly four to five years prior to the effective date, while the years being adjusted precede the effective date by zero to about seven.

The direction of the potential distortion is difficult to predict. Even if the direction of shift in the class distribution is known, the distortion in the estimate of the overall rate change will be a function of the way the rate change varies among classes.

D. Testing

We tested for the distortion using Statistical Plan data from Connecticut, Florida, Illinois, Louisiana, Michigan, Nebraska, North Carolina and Oregon. These include two states (Florida and Louisiana) with dramatic shifts in class distribution. Table 21 displays the percentage change in average class relativity for each test state over a six year period. Specifically the values in the table are average rates using current rates, year 6 distribution, divided by average rates using current rates, year 1 distribution.

Based on the Statistical Plan data we received, we were able to calculate premiums at present rates directly. In addition, we were able to approximate the NCCI on level factor calculations. A detailed description of these calculations is provided in Appendix C.

Table 21: % Change in Average Class Relativities

Connecticut	-2.3%
Florida	-14.5%
Illinois	-4.7%
Louisiana	-16.4%
Michigan	-1.6%
Nebraska	-6.6%
N. Carolina	+0.1%
Oregon	+5.5%

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Table 22 presents, for the State of Florida, the on level premiums calculated with the NCCI approach compared with the more accurate premiums at present rates.

The distortion in fitted annual trend rates for each of the test states is displayed in

**Table 22: Florida
Comparison of Premium Methodologies**

<u>Policy Year</u>	(1) <u>On-level Premiums</u>	(2) <u>Premiums at Present Rates</u>	(3) <u>% Error in (1)</u>
82/83	1,361	1,346	1.2%
83/84	1,551	1,579	(1.8%)
84/85	1,581	1,594	(0.8%)
85/86	1,546	1,562	(1.0%)
86/87	1,550	1,574	(1.5%)

Table 23, on the next page. Note in the case of Florida, a state with a dramatic shift in class distributions, that although the distortion in on level premiums is significant, the resulting distortion in trend factors is small. We generally noted very small distortions in trend, even when large distortions in on level premiums were apparent. We also noted that, in most cases, trend rates were overstated, although by very small amounts.

E. Implications for Overall Ratemaking

Although the focus of this report is trend calculations, the magnitude of possible distortions in on level premiums implies that these issues are important in the determination of the overall indicated rate change.

In the overall ratemaking procedure, earned premiums for the experience period are brought to current rate level based on the estimated overall effects of the applicable rate changes, as calculated at the time those rate changes were implemented. To bring premiums on level accurately, those estimated overall rate changes should reflect the distribution of exposures by class that existed during the experience period. NCCI's method uses older exposure distributions. Our testing as discussed above indicated that the resulting distortion can be significant, especially in a state where the exposure distribution is shifting.

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Table 23: Comparison of Trend Rates

	(1) On-Level Premiums	(2) Premiums at Present Rates		(1) On-Level Premiums	(2) Premiums at Present Rates
Connecticut*			Michigan		
Indemnity	.027	.027	Indemnity	.014	.008
Medical	.013	.013	Medical	.015	.013
Florida			Nebraska*		
Indemnity	.042	.041	Indemnity	.021	.022
Medical	.013	.012	Medical	.017	.017
Illinois			N. Carolina*		
Indemnity	.013	.011	Indemnity	.014	.013
Medical	.009	.009	Medical	.015	.014
Louisiana			Oregon*		
Indemnity	.026	.025	Indemnity	.040	.038
Medical	.029	.028	Medical	.024	.025

* For these states, we could not bring losses on current benefit level. Therefore, the trend rates may be misstated; however, the comparison between trend rates remains valid.

Ideally, the overall effects of the applicable rate changes could be recalculated using the exposure distribution from the experience period. In practice, that exposure distribution is not available, since the exposure distribution is derived from Statistical Plan data, whereas the experience period is based on the latest available Financial Call data. However, if the latest available year of exposures from Statistical Plan data were used to recalculate the overall effects of the rate changes, that would provide a more current exposure distribution than is used in NCCI's procedure. This change would reduce, although not completely eliminate, the possible distortions.

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The procedure for recalculating the effects of prior rate changes is straightforward. For each applicable rate change, average rates before and after the rate change would be calculated as weighted averages of the manual rates by class, using the latest available exposure distribution as weights. The estimated overall effect of each rate change would be the ratio of the average rate after the change to the average rate before the change. On level factors would then be calculated as in the current procedure.

F. Considerations

It is important to consider the likely magnitude of the potential distortions relative to the practicality of correcting them.

1. Likely Magnitude of Distortions

Although we observed some significant distortions in the calculations of on level premiums, they did not generally lead to significant distortions in measured trend rates. Based on our limited sample, we would not, however, conclude that significant distortions in trend rates are not possible.

2. Practicality of Alternate Approach

The alternate approach outlined herein requires Statistical Plan data, which are approximately one year older than Financial Call data. Using older data for the trend calculation would not be desirable, especially considering the minor distortions identified in the sample states.

For the change in the overall ratemaking procedure, implementation would be somewhat easier since fewer rate changes are involved and only one exposure distribution would be used.

G. Recommendations

We recommend that NCCI use Statistical Plan data to test for distortions in trend rates caused by inaccuracy in the on level premiums calculation. If a significant

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distortion is identified in a particular state, an appropriate adjustment to the trend rate should be made.

For the purpose of calculating premium on level factors for the overall ratemaking procedure, we recommend that the effects of applicable rate changes be re-estimated using the exposure distribution from the year of Statistical Plan data that is closest (or equal) to the experience year.



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IX. BENEFIT ON LEVEL FACTORS (SECTION 3f)

"The NCCI brings past losses to a current benefit level by multiplying the various law change factors estimated at about the time the law changes went into effect. Is this an accurate method?"

Losses used in the trend calculation are first adjusted to current benefit levels. When there have been several intervening benefit changes, the current NCCI procedure estimates their cumulative effect by multiplying the estimates of the effect of each individual benefit change. As an alternative, the combined effect of several benefit changes can be estimated in one step. To the extent that the current procedure produces an inaccurate adjustment to current benefit levels, the trend rate may be distorted.

A. NCCI Approach

Under the NCCI approach, each benefit change is evaluated once, in the rate filing coinciding with the implementation of that change. The estimate of the percentage effect of that change made at that time is used in all subsequent calculations of benefit on level factors.

1. Evaluation of Single Benefit Change

While there are many complex types of benefit changes possible, the most common elements of benefit changes are changes in the minimum and maximum weekly benefits. The percentage rate of compensation may be modified as well.

For benefit changes of these kinds, the central calculation is the determination of the average weekly benefit before and after the change. The result is a function of the distribution of weekly wages among insured workers, as well as of the benefit provisions before and after the change. For the distribution of weekly wages, NCCI uses a standard table expressing that distribution in percentages of the average weekly wage, along with the average weekly wage for the year preceding the change.

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Changes in the average weekly benefits as described above do not generally affect all kinds of claimants to the same degree, with the variations governed by the specifics of state laws. To determine the overall effect of a benefit change, the distribution of different kinds of claimants is used in combination with the degree to which each is affected by the benefit changes. A discussion of NCCI's procedure to evaluate benefit level changes appears in Section IIB - Part 5.

2. Evaluation of Multiple Benefit Changes

The percentage effect of each benefit change is evaluated only once. The effect of multiple changes is then calculated as the product of the individual changes. For example, if the effects of 1987 and 1988 benefit changes have been estimated at +2.4% and +3.6%, respectively, then the combined effect of both changes is estimated to be +6.1% (i.e. $1.024 \times 1.036 = 1.061$). Assuming no other benefit changes, a factor of 1.061 would be used to bring 1986 losses to 1989 benefit levels.

B. Alternate Approach

A more accurate approach to bringing losses for a given year to the current benefit level would be to calculate, in one step, the effect of all subsequent benefit changes applied to the losses for that year. This is different from the current procedure in two important respects:

1. Intermediate benefit levels would not enter the calculation. Only the benefit levels in effect during the year being adjusted and the current benefit levels would be used.
2. The calculation would be based on the wage distribution and distribution of affected claimants that apply to the year being adjusted.

As we will discuss in the next section, the latter difference is more important.

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C. Potential Distortion in the NCCI Approach

Let us consider the central calculation, the determination of the average weekly benefit before and after the benefit changes. For a simple example, we will consider time periods 1, 2, and 3, with benefit changes occurring between Periods 1 and 2 and between Periods 2 and 3. The problem is to adjust losses from Period 1 to the benefit level existing in Period 3.

Introducing some notation, let ${}_xAWB_y$ represent the average weekly benefit based on the wage distribution existing in Period x and the benefit level existing in Period y . Then, according to the NCCI approach, the effect of the first change would be estimated as ${}_1AWB_2 \div {}_1AWB_1$ and the effect of the second change would be ${}_2AWB_3 \div {}_2AWB_2$. The combined effect would be:

$$\frac{{}_1AWB_2}{{}_1AWB_1} \times \frac{{}_2AWB_3}{{}_2AWB_2}$$

Under the alternate procedure, the combined effect would be estimated as ${}_1AWB_3 \div {}_1AWB_1$.

Note that the crucial difference is the use of the wage distribution from Period 1 to evaluate all subsequent changes. If the two-step NCCI approach were used, but using the wage distribution from period 1 both times, then the combined effect would be:

$$\frac{{}_1AWB_2}{{}_1AWB_1} \times \frac{{}_1AWB_3}{{}_1AWB_2} = \frac{{}_1AWB_3}{{}_1AWB_1}$$

which is the alternate procedure. The potential distortion arises not from the intermediate benefit level, but from using the wrong wage distribution to calculate the second benefit change. Assuming average wages usually rise over time, the distortion will usually be related to using an average wage level that is too high when bringing old years on level. Another potential distortion arises from using distributions of affected claimants different from the one that applies to the year being adjusted. However, it would be difficult to postulate any consistent pattern to this potential distortion.

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D. Illustrative Examples

We calculated a number of illustrative examples. In these examples, we used Colorado 1988 average wages and benefit levels as a starting point. We then evaluated the cumulative effect of two hypothetical benefit changes. We considered changes in which the minimum and maximum each increased by 10% per year, as well as changes in the minimum only and the maximum only. We tested wage inflation at 5% and 10% per year. Table 24 displays the estimated combined effects of the two benefit changes applied to losses occurring just prior to the first change.

<u>Wage Inflation</u>	<u>Benefit Changes @ 10%</u>	<u>Overall Effect</u>		
		<u>NCCI</u>	<u>Alternate</u>	<u>% Distortion</u>
5%	Min. & Max	1.0400	1.0378	0.21%
	Min. Only	1.0033	1.0034	(0.01%)
	Max. Only	1.0367	1.0344	0.22%
10%	Min. & Max	1.0423	1.0378	0.43%
	Min. Only	1.0030	1.0034	(0.04%)
	Max. Only	1.0393	1.0344	0.47%

Note that when the minimum and maximum are both adjusted, the distortion is an over-adjustment of losses. However, when the effects of maximums and minimums are isolated, we note that the effect of adjusting the minimums is in the opposite direction. The combined effect of the maximum and minimum is an overadjustment because the maximum affects much more of the wages than the minimum. While this is a function of the Colorado example, we speculate that it is commonly true.

Note also that a higher rate of wage inflation leads to a larger distortion. This also implies that a greater length of time between the year being adjusted and the benefit change leads to a larger distortion. This has implications for trend, since the extent of distortion increases with the age of the year.

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We also tested scenarios in which the rate of compensation increases from 66.67% to 75% and then to 80%. The results are summarized in Table 25.

<u>Wage Inflation</u>	<u>Benefit Changes @ 10%</u>	<u>Overall Effect</u>		
		<u>NCCI</u>	<u>Alternate</u>	<u>% Distortion</u>
5%	Min. & Max	1.2048	1.2032	0.13%
	Min. Only	1.1341	1.1369	(0.25%)
	Max. Only	1.2024	1.2007	0.14%
10%	Min. & Max	1.2063	1.2032	0.26%
	Min. Only	1.1313	1.1369	(0.49%)
	Max. Only	1.2041	1.2007	0.28%

Note that increasing the rate of compensation moderates the upward distortions and increases the downward distortions.

E. Considerations

It is important to consider the likely magnitude of the distortions versus the practicality of correcting them.

1. Likely Magnitude of Distortions

We intentionally postulated large benefit adjustments in our examples. Smaller benefit adjustments would lead to smaller distortions. However, if we postulate that in most states, the maximum affects more wages than the minimum, the NCCI procedure leads to overadjustment of losses to current benefit level, with the extent of overadjustment increasing with the age of the year. This will lead to a downward bias in estimated trend factors. It appears unlikely that the bias will be large, although quantification of the amount of bias in real situations is beyond the scope of this analysis.

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2. Practicality of Alternate Approach

The alternate approach as we have described it would involve, in every rate filing, a full benefit change calculation for each year of data in the trend calculation. Such calculations are frequently quite voluminous, and the practical difficulties of this approach should be recognized.

Note, however, that the "Possible Implementation Procedure" for benefit on level factors described in Section VII.C., would also correct for the distortion discussed in this section. This approach would address using the average wage level from the year being adjusted without addressing the less important issue of the distribution of affected claimants from the year being adjusted.

F. Recommendations

The distortion analyzed in this section likely causes a downward bias in trend indications. While this bias may be quite small, we recommend that additional study be performed to estimate the magnitude of the bias. Should the bias prove significant enough to require correction, it may be possible to develop an approach somewhat more practical than the alternative approach as previously described.

While the illustrations discussed above were calculated within the current NCCI approach (adjusting past losses to current benefit levels), the same calculations could be used under the alternate approach discussed in Section VII. As noted above, a single change in procedure, as described in Section VII.C., could simultaneously address the issues raised in Sections VII and IX. We recommend that NCCI consider implementing a change in procedure along these lines.

Exhibit 1

Excerpts from Arkansas filing effective 1/1/91



DETERMINATION OF
INDICATED PREMIUM
LEVEL CHANGE

ARKANSAS

EXHIBIT I

Exhibit I-A - Policy Year 1987 Experience

Premium:

(1) Standard Earned Premium valued as of December 31, 1988 (first report)		\$211,479,711
(2) Factor to develop premium (See Appendix A-II)	1.055	(+5.5%)
(3) Factor to adjust premium to current premium level (See Appendix A-I)	1.033	(+3.3%)
(4) Composite adjustment factor - (2)x(3)	1.090	(+9.0%)
(5) Adjusted Standard Earned Premium - (1)x(4)		\$230,512,885

Benefit Cost:

(6) Indemnity Paid Benefit Cost valued as of December 31, 1988 (first report)		\$31,453,349
(7) Factor to develop indemnity benefit cost (See Appendix A-II)	2.701	(+170.1%)
(8) Factor to adjust indemnity benefit cost to current benefit level (See Appendix A-I) ...	1.022	(+2.2%)
(9) Factor to include claim adjustment cost	1.120	(+12.0%)
(10) Composite adjustment factor - (7)x((8)x(9))	3.093	(+209.3%)
(11) Adjusted Indemnity Benefit Cost - (6)x(10)		\$97,285,208



ARKANSAS

EXHIBIT I

Benefit Cost (Contd.):

(12) Medical Paid Benefit Cost valued as of December 31, 1988 (first report)	\$45,275,589
(13) Factor to develop medical benefit cost (See Appendix A-II)	1.672 (+67.2%)
(14) Factor to adjust medical benefit cost to current benefit level (See Appendix A-I) ...	1.000 (0.0%)
(15) Factor to include claim adjustment cost	1.120 (+12.0%)
(16) Composite adjustment factor - (13)x((14)x(15))	1.873 (+87.3%)
(17) Adjusted Medical Benefit Cost - (12)x(16)	\$84,801,178
(18) Adjusted Total Benefit Cost - (11)+(17)	\$182,086,386

Cost Ratio:

(19) Cost Ratio -	Adj. Total Benefit Cost ----- Adj. Premium	Line (18) ----- Line (5)	= .790 (79.0%)
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DETERMINATION OF
INDICATED PREMIUM
LEVEL CHANGE

ARKANSAS

EXHIBIT I

Exhibit I-B - Calendar-Accident Year 1988 Experience

Premium:

(1) Standard Earned Premium	\$232,533,267
(2) Factor to adjust premium to current premium level (See Appendix A-III)	1.007 (+0.7%)
(3) Adjusted Standard Earned Premium - (1)x(2)	\$234,161,000

Benefit Cost:

(4) Indemnity Paid Benefit Cost valued as of December 31, 1988 (first report)	\$16,823,214
(5) Factor to develop indemnity benefit cost (See Appendix A-IV)	5.218 (+421.8%)
(6) Factor to adjust indemnity benefit cost to current benefit level (See Appendix A-III)...	1.019 (+1.9%)
(7) Factor to include claim adjustment cost	1.120 (+12.0%)
(8) Composite adjustment factor - (5)x((6)x(7))	5.954 (+495.4%)
(9) Adjusted Indemnity Benefit Cost - (4)x(8)	\$100,165,416



DETERMINATION OF
INDICATED PREMIUM
LEVEL CHANGE

ARKANSAS

EXHIBIT I

Benefit Cost (Contd.):

(10) Medical Paid Benefit Cost valued as of December 31, 1988 (first report)	\$31,629,057
(11) Factor to develop medical benefit cost (See Appendix A-IV)	2.505 (+150.5%)
(12) Factor to adjust medical benefit cost to current benefit level (See Appendix A-III)...	1.000 (0.0%)
(13) Factor to include claim adjustment cost	1.120 (+12.0%)
(14) Composite adjustment factor - (11)x((12)x(13))	2.806 (+180.6%)
(15) Adjusted Medical Benefit Cost - (10)x(14)	\$88,751,134
(16) Adjusted Total Benefit Cost - (9)+(15)	\$188,916,550

Cost Ratio:

(17) Cost Ratio =	Adj. Total Benefit Cost	Line (16)	=	-----	=	.807 (80.7%)
	Adj. Premium	Line (3)				

Exhibit I-C - Average Cost Ratio

(1) Policy Year Adjusted Cost Ratio .....	.790 (79.0%)
(2) Calendar-Accident Year 1988 Adjusted Cost Ratio .....	.807 (80.7%)
(3) Average Cost Ratio =	.7985 (79.85%)
(1)+(2)	
2	



DETERMINATION OF
INDICATED PREMIUM
LEVEL CHANGE

ARKANSAS

EXHIBIT I

Exhibit I-D - Indicated Change Based Upon Experience

(1) Average Cost Ratio .....	.7985	(79.85%)
(2) Current Target Cost Ratio (See Exhibit II) .....	.693	(69.3%)
(3) Indicated Change Based Upon Experience - (1)/(2)	1.152	(+15.2%)

Exhibit I-E - Application of Change in Trend Factor

(1) Indicated Premium Level Change from Experience	1.152	(+15.2%)
(2) Effect of Change in Trend Factor (See Appendix A-V)	1.077	(+7.7%)
(3) Indicated Change Modified to Reflect Change in Trend Factor - (1) x (2)	1.241	(+24.1%)

Exhibit I-F - Application of Change in Expenses

(1) Indicated Premium Level Change	1.241	(+24.1%)
(2) Effect of Change in Expenses (See Exhibit II)	N/A	
(3) Indicated Change Modified to Reflect Change in Expenses - (1) x (2)	1.241	(+24.1%)

Exhibit I-G - Application of Change in Benefit Provisions

(1) Indicated Premium Level Change	1.241	(+24.1%)
(2) Effect of Change in Benefit Provisions	1.006	(+0.6%)
(3) Indicated Change Modified to Reflect Change in Benefits - (1) x (2)	1.248	(+24.8%)



ARKANSAS

EXHIBIT I

Exhibit I-H - Application of Change in Taxes

(1) Indicated Premium Level Change	1.248	(+24.8%)
(2) Effect of Change in Taxes (See Exhibit II)	N/A	
(3) Indicated Change Modified to Reflect Change in Taxes = (1) x (2)	1.248	(+24.8%)

Exhibit I-I - Application of Change in Assessment Provision

(1) Indicated Premium Level Change	1.248	(+24.8%)
(2) Effect of Change in Assessment (See Exhibit II)	N/A	
(3) Indicated Change Modified to Reflect Change in Assessment = (1) x (2)	1.248	(+24.8%)



ARKANSAS

APPENDIX A-III

CALCULATION OF CALENDAR-ACCIDENT YEAR ON LEVEL FACTORS

SECTION A - Factor Adjusting 1988 Calendar Year Premium to Present Premium Level

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Date	Premium Level Change	Cumulative Index	Weight	Product (2)x(3)	Adj. Factor Pres. Index/ Sum Col.(4)	Adj. For Exp. Const. Removal**	Prem. Adj. Factor (5)x(6)	Prem. Adj. Factor Excl. Trend+
12/10/86	Base	1.000	.707	.707	1.099	.983	1.080	1.007
R 04/01/88	1.090	1.090	.293	.319				
R 01/01/90	1.035	1.128		----- 1.026				

SECTION B - Factor Adjusting 1988 Accident Year Indemnity Losses to Present Benefit Level

Date	(1)	(2)	(3)	(4)	(5)
Date	Benefit Level Change	Cumulative Index	Weight	Product (2)x(3)	Adj. Factor Pres. Index/ Sum Col.(4)
07/01/87	Base	1.000	1.000	1.000	1.019
01/01/89	1.019	1.019		----- 1.000	

SECTION C - Factor Adjusting 1988 Accident Year Medical Losses to Present Benefit Level

Date	(1)	(2)	(3)	(4)	(5)
Date	Benefit Level Change	Cumulative Index	Weight	Product (2)x(3)	Adj. Factor Pres. Index/ Sum Col.(4)
07/01/87	Base	1.000	1.000	1.000	1.000
01/01/89	1.000	1.000		----- 1.000	

NR = New and renewal business

** Eliminates premium derived from expense constants.

+ Trend Factor in current rates (effective 01/01/90) is 1.073 (1.007 = 1.080 / 1.073).



ARKANSAS

APPENDIX A-V

CALCULATION OF POLICY YEAR TREND FACTOR

SECTION A - STANDARD EARNED PREMIUM

(1)	(2)	(3)	(4)
Policy Year	Std. Earned Premium	Dev. Factor to Fifth Report	Premium On Level (1)x((2)x(3))
1983	146,619,196	1.000	164,653,357
1984	161,156,389	1.002	190,809,165
1985	165,150,473	1.008	216,016,819
1986	185,737,446	1.008	225,856,734
1987	211,479,711	1.055	230,512,885

SECTION B - INDEMNITY LOSSES

(1)	(2)	(3)	(4)
Policy Year	Indemnity Losses	Dev. Factor to Ultimate Report	Ind. Losses On Level (1)x((2)x(3))
1983	47,138,932	1.159	58,640,831
1984	47,970,887	1.226	63,081,716
1985	49,726,030	1.349	71,754,661
1986	41,967,197	1.653	72,225,546
1987	31,453,349	2.701	86,811,243

SECTION C - MEDICAL LOSSES

(1)	(2)	(3)	(4)
Policy Year	Medical Losses	Dev. Factor to Ultimate Report	Med. Losses On Level (1)x((2)x(3))
1983	41,323,696	1.199	49,547,112
1984	42,802,373	1.217	52,090,488
1985	45,959,042	1.257	57,770,516
1986	46,591,136	1.344	62,618,487
1987	45,275,589	1.672	75,700,785



ARKANSAS

APPENDIX A-V

CALCULATION OF POLICY YEAR TREND FACTOR (CONTD.)

SECTION D - DATA FOR INDEMNITY TREND FACTOR

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Policy Year	Time Index	Premium On Level (See App. A-V Sect.A)	Ind.Losses On Level (See App. A-V Sect.B)	Ind. Loss Ratio (4)/(3)	(2)x(2)	(2)x(5)	Ind. Loss Ratio On Line ((9)x(2))+ (10)
1983	1	164,653,357	58,640,831	.356	1	.356	.337
1984	2	190,809,165	63,081,716	.331	4	.662	.340
1985	3	216,016,819	71,754,661	.332	9	.996	.343
1986	4	225,856,734	72,225,546	.320	16	1.280	.346
1987	5	230,512,885	86,811,243	.377	25	1.885	.349
Total	15	xxx	xxx	1.716	55	5.179	xxx

SECTION E - DATA FOR MEDICAL TREND FACTOR

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Policy Year	Time Index	Premium On Level (See App. A-V Sect.A)	Med.Losses On Level (See App. A-V Sect.C)	Med. Loss Ratio (4)/(3)	(2)x(2)	(2)x(5)	Med. Loss Ratio On Line ((9)x(2))+ (10)
1983	1	164,653,357	49,547,112	.301	1	.301	.277
1984	2	190,809,165	52,090,488	.273	4	.546	.283
1985	3	216,016,819	57,770,516	.267	9	.801	.289
1986	4	225,856,734	62,618,487	.277	16	1.108	.295
1987	5	230,512,885	75,700,785	.328	25	1.640	.301
Total	15	xxx	xxx	1.446	55	4.396	xxx

SECTIONS D AND E, CONTD. - CALCULATION OF INDEMNITY AND MEDICAL TREND FACTORS

	INDEMNITY (See Section D)	MEDICAL (See Section E)
(9) Annual Increment in Loss Ratio: $(n \text{ Sum}(7) - \text{Sum}(2)\text{Sum}(5)) / (n \text{ Sum}(6) - \text{Sum}(2)\text{Sum}(2))$	.003	.006
(10) Loss Ratio at Base: $(\text{Sum}(5) - (9)\text{Sum}(2)) / n$	.334	.271
(11) Midpoint of Experience in Filing is 04-01-88. Time Index for 04-01-88 is:	5.250	5.250
(12) Midpoint of Period during which Proposed Rates Effective is 06-01-91. Time Index for 06-01-91 is:	8.417	8.417
(13) Trend Factor prior to Credibility: $((10) + (9)x(12)) / ((10) + (9)x(11))$	1.026	1.063
(14) E = Sum of Squares of $((5) - (8))$	.002023	.002213
(15) Credibility (Limited to 100%): $(.0011 / ((14) / ((10) + (9)X3.00)**2))**2$	25%	20%
(16) Annual Expected Trend	.050	.070
(17) Credibility Weighted Trend Factor: $(1.000 - (15)) x (1.000 + (16)x((12) - (11))) + ((13)x(15))$	1.126	1.191



ARKANSAS

APPENDIX A-V

CALCULATION OF POLICY YEAR TREND FACTOR (CONTD.)

SECTION F - DETERMINATION OF OVERALL TREND FACTOR

(1) Adjusted Indemnity Losses for Policy Year 1987 valued as of 12-31-88 (See Appendix A-V - Section B)	86,811,243
(2) Adjusted Medical Losses for Policy Year 1987 valued as of 12-31-88 (See Appendix A-V - Section C)	75,700,785
(3) Indemnity Trend Factor	1.126
(4) Medical Trend Factor	1.191
(5) Indicated Overall Trend Factor ((1)x(3)) + ((2)x(4)) -----	1.156
(1) + (2)	

SECTION G - DERIVATION OF EFFECT OF TREND FACTOR

Policy year 1987 with an average accident date of January 1, 1988 (Exhibit I-A) and calendar-accident year 1988 with an average accident date of July 1, 1988 (Exhibit I-B) are used in the determination of the indicated change based upon experience (Exhibit I-D). This experience reflects, on average, conditions as of April 01, 1988. The midpoint of the time period for which the revised rates are being proposed is June 01, 1991. The premium level must therefore reflect experience levels which will exist 38 months later than the midpoint of the experience on which the current indication has been derived. The indicated trend factor is 1.156 which represents a trend factor of approximately 4.9% on an annual basis. Since the present rates include a factor of 1.073, the appropriate factor to incorporate the effect of trend into the overall change in premium level is the ratio of these two trend factors: 1.077 (1.077 - 1.156 / 1.073).

Exhibit 2

Excerpt from Iowa filing effective 4/1/90



DETERMINATION OF
INDICATED PREMIUM
LEVEL CHANGE

IOWA

EXHIBIT I

Exhibit I-A - Indicated Change Based Upon Experience

(1) Average Cost Ratio .....	.7555	(75.55%)
(2) Current Target Cost Ratio (See Exhibit II) .....	.718	(71.8%)
(3) Indicated Change Based Upon Experience = (1)/(2)	1.052	(+5.2%)

Exhibit I-B - Application of Trend Factor

(1) Indicated Premium Level Change from Experience	1.052	(+5.2%)
(2) Effect of Trend Factor (See Appendix A-V)	1.115	(+11.5%)
(3) Indicated Change Modified to Reflect Trend Factor = (1)x(2)	1.173	(+17.3%)

Exhibit I-C - Application of Change in Expenses

(1) Indicated Premium Level Change	1.173	(+17.3%)
(2) Effect of Change in Expenses (See Exhibit II) .....	.992	(-0.8%)
(3) Indicated Change Modified to Reflect Change in Expenses = (1)x(2)	1.164	(+16.4%)

Exhibit I-D - Application of Change in Benefit Provisions

(1) Indicated Premium Level Change	1.164	(+16.4%)
(2) Effect of Change in Benefit Provisions	1.001	(+0.1%)
(3) Indicated Change Modified to Reflect Change in Benefits = (1)x(2)	1.165	(+16.5%)



DETERMINATION OF INDICATED
PREMIUM LEVEL CHANGE
DUE TO TREND

IOWA

EXHIBIT I

Exhibit I-A - Determination of Indicated Change in
Statewide Premium Level Due to Trend

(1) Effect of Trend Factor (See Appendix A-V)	1.115	(+11.5%)
--	-------	----------



IOWA

APPENDIX A-V

CALCULATION OF POLICY YEAR TREND FACTOR

SECTION A - STANDARD EARNED PREMIUM

Policy Year	(1) Std. Earned Premium	(2) Dev. Factor to Fifth Report	(3) On Level Factor	(4) Premium On Level (1)x((2)x(3))
1983	168,216,776	1.000	1.429	240,381,773
1984	167,562,935	1.001	1.543	258,884,735
1985	169,357,597	.997	1.549	261,488,130
1986	225,277,291	1.002	1.274	287,679,101
1987	245,000,486	1.034	1.191	301,595,598

SECTION B - INDEMNITY LOSSES

Policy Year	(1) Indemnity Losses*	(2) Dev. Factor to Ultimate Report	(3) On Level Factor	(4) Ind. Losses On Level (1)x((2)x(3))
1983	77,366,620	1.024	1.011	80,074,452
1984	89,093,106	1.008	1.010	90,696,782
1985	63,288,555	1.469	1.010	93,920,216
1986	52,861,944	1.860	1.006	98,904,697
1987	37,814,162	3.037	1.000	114,841,610

SECTION C - MEDICAL LOSSES

Policy Year	(1) Medical Losses*	(2) Dev. Factor to Ultimate Report	(3) On Level Factor	(4) Med. Losses On Level (1)x((2)x(3))
1983	42,448,894	1.045	1.000	44,359,094
1984	54,707,505	1.029	1.000	56,294,023
1985	42,604,668	1.238	1.000	52,744,579
1986	47,866,006	1.342	1.000	64,236,180
1987	47,053,604	1.663	1.000	78,250,143

* All reported losses are paid except for those reported in policy years 1983 and 1984 which are including IBNR.



IOWA

APPENDIX A-V

CALCULATION OF POLICY YEAR TREND FACTOR (CONTD.)

SECTION D - DATA FOR INDEMNITY TREND FACTOR

(1) Policy Year	(2) Time Index	(3) Premium On Level (See App. A-V Sect.A)	(4) Ind.Losses On Level (See App. A-V Sect.B)	(5) Ind. Loss Ratio (4)/(3)	(6) (2)x(2)	(7) (2)x(5)	(8) Ind. Loss Ratio On Line ((9)x(2))+ (10)
1983	1	240,381,773	80,074,452	.333	1	.333	.335
1984	2	258,884,735	90,696,782	.350	4	.700	.344
1985	3	261,488,130	93,920,216	.359	9	1.077	.353
1986	4	287,679,101	98,904,697	.344	16	1.376	.362
1987	5	301,595,598	114,841,610	.381	25	1.905	.371
Total	15	xxx	xxx	1.767	55	5.391	xxx

SECTION E - DATA FOR MEDICAL TREND FACTOR

(1) Policy Year	(2) Time Index	(3) Premium On Level (See App. A-V Sect.A)	(4) Med.Losses On Level (See App. A-V Sect.C)	(5) Med. Loss Ratio (4)/(3)	(6) (2)x(2)	(7) (2)x(5)	(8) Med. Loss Ratio On Line ((9)x(2))+ (10)
1983	1	240,381,773	44,359,094	.185	1	.185	.187
1984	2	258,884,735	56,294,023	.217	4	.434	.202
1985	3	261,488,130	52,744,579	.202	9	.606	.217
1986	4	287,679,101	64,236,180	.223	16	.892	.232
1987	5	301,595,598	78,250,143	.259	25	1.295	.247
Total	15	xxx	xxx	1.086	55	3.412	xxx

SECTIONS D AND E, CONTD. - CALCULATION OF INDEMNITY AND MEDICAL TREND FACTORS

	INDEMNITY (See Section D)	MEDICAL (See Section E)
(9) Annual Increment in Loss Ratio: $(n \text{ Sum}(7) - \text{Sum}(2)\text{Sum}(5)) / (n \text{ Sum}(6) - \text{Sum}(2)\text{Sum}(2))$	.009	.015
(10) Loss Ratio at Base: $(\text{Sum}(5) - (9)\text{Sum}(2)) / n$	.326	.172
(11) Midpoint of Experience in Filing is 4-1-88. Time Index for 4-1-88 is:	5.250	5.250
(12) Midpoint of Period during which Proposed Rates Effective is 4-1-91. Time Index for 4-1-91 is:	8.250	8.250
(13) Trend Factor: $((10) + (9)x(12)) / ((10) + (9)x(11))$	1.072	1.179



IOWA

APPENDIX A-V

CALCULATION OF POLICY YEAR TREND FACTOR (CONTD.)

SECTION F - DETERMINATION OF OVERALL TREND FACTOR

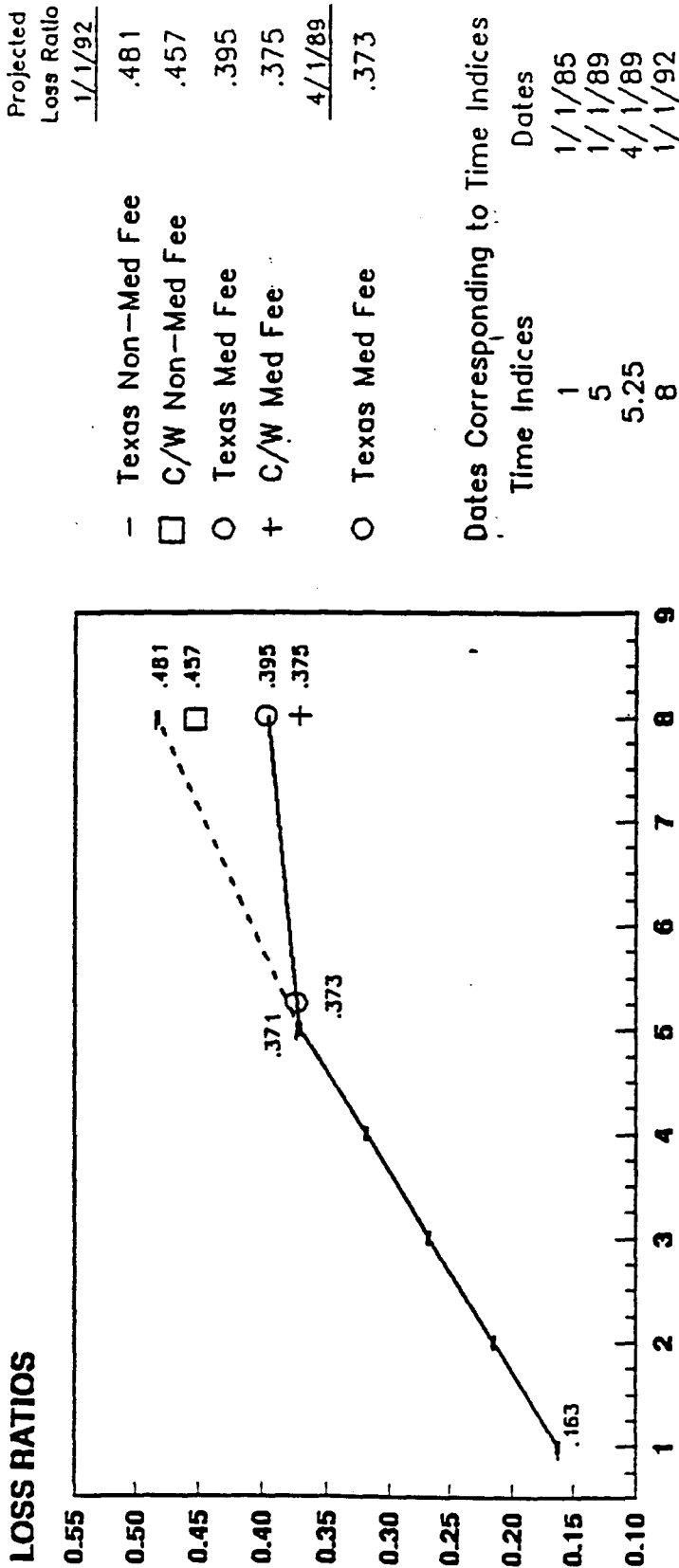
(1) Adjusted Indemnity Losses for Policy Year 1987 valued as of 12-31-88 (See Appendix A-V - Section B)	114,841,610
(2) Adjusted Medical Losses for Policy Year 1987 valued as of 12-31-88 (See Appendix A-V - Section C)	78,250,143
(3) Indemnity Trend Factor	1.072
(4) Medical Trend Factor	1.179
(5) Indicated Overall Trend Factor ((1)x(3)) + ((2)x(4))	

(1) + (2)	1.115

Exhibit 3

Texas Bent-line Procedure

TEXAS ADJUSTMENT FOR MEDICAL FEE SCHEDULE GRAPHICAL REPRESENTATION



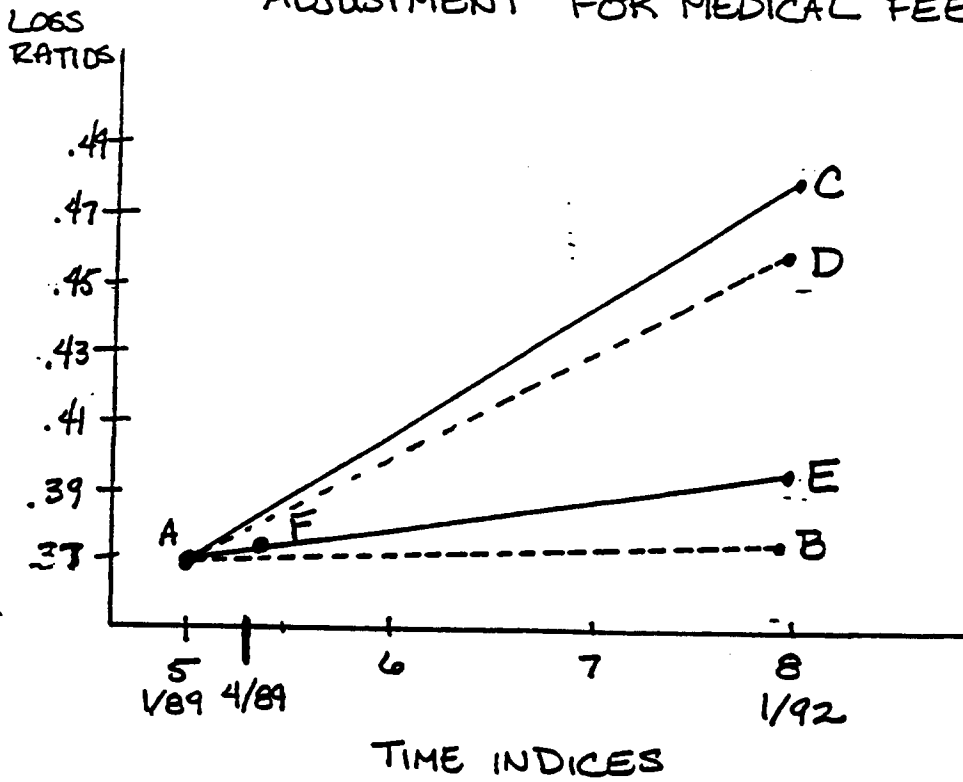
Texas Overall Trend Without Consideration of Medical Fee Schedule = 1.251 (See Appendix A-V of Rate Level)

Texas Trend With Medical Fee Schedule: .395/.373 = 1.059 Wtd. with Indemnity = 1.158

Adjustment In Rates due to Medical Fee Schedule: 1.158/1.251 = .926 or -7.4%

TEXAS

ADJUSTMENT FOR MEDICAL FEE SCHEDULE



+ C/w Ann. Med. Trend
 Non-Fee Fee
 1.077 1.000
 (7.7%) (0.4%)

+ Tx. Ann. Med. Trend
 Non-Fee
 1.099 \Rightarrow (.272/2)
 (9.9%) = .099

$A = .371$ (Appendix A-V) [TX L.R. at 1/89]

$B = .371 * (1 + 3(.004)) = .375$ [C/w Med Fee L.R. at 1/9]

$C = .371 * (1 + 3(.099)) = .481$ [Tx Non-Fee LR at 1/92]

$D = .371 * (1 + 3(.077)) = .457$ [C/w Non-Fee LR at 1/92]

Difference between Texas & C/w LR = $.481 / .457 = 1.053$

$E = B * 1.053 = .375 * 1.053 = .395$ [Tx Fee LR at 1/92]

Trend from 1/89 \rightarrow 1/92 = $.395 / .371 = 1.065$

\therefore Annual Trend = $.065 / 3 = .022$

(CONTD.)

$$F = .371 * (1 + .25(.022)) = .373 \text{ [Tx Fee UR at 4/89]}$$

$$\begin{aligned} \text{Tx Fee Med Trend from 4/89} \rightarrow 1/92 &= .395 / .373 \\ &= 1.059 \text{ (E/F)} \end{aligned}$$

Overall Tx Trend from 4/89 \rightarrow 1/92 (wtd. w/ indemnity)
With Consideration of Med Fee Schedule = 1.158

Overall Tx Trend from 4/89 \rightarrow 1/92
Without Consideration of Med Fee
(See Appendix A-V) = 1.251

Adjustment in Rates due to Medical Fee
Schedule = $1.158 / 1.251 = .926$ (-7.4%)

GP
10/2/90

Exhibit 4

Excerpt from Maryland rate filing effective 1/1/91



Maryland
1/1/91 Pure Premium Filing
Selection of Trend Factor

The purpose of this memorandum is to explain the analysis which led to the selection of the trend factor.

The trend period in this filing is from 4/1/89, the midpoint of the experience period, to 1/1/92, the midpoint of the period during which rates will become effective. Our goal is to determine whether benefits will rise faster than wages or vice versa during this 33 month period. This is done through the trend factor which is based upon the latest five Maryland policy year loss ratios (Appendix A-V).

Least squares regression curves (linear, exponential, logarithmic) were fit to the five loss ratio points. In each case a credibility value is assigned based upon the goodness of fit of the curve to the actual points. To the extent that state data is not credible countrywide data is employed. The results are displayed on Attachment A. The indicated linear, exponential and logarithmic trends are averaged to obtain the proposed trend factors, .878 and .989 for indemnity and medical respectively. A trend factor less than 1.00 implies that wages are growing at a faster rate than benefits.

We feel that our approach is reasonable, yet conservative for the following reasons:

First, contributing to the downward trend is the fact that the latest loss ratio (Policy year 1988) is extremely low. Policy year 1988 is the only year included in the trend calculation which is entirely subsequent to the enactment of H.B. 239 on 1/1/88. If the low loss ratio for policy year 1988 is a "one time" change due to the 1/1/88 reform then we would expect future policy year (1989, 1990, etc.) loss ratios to be in line with 1988. If this is the case then a trend factor of 1.00 would be appropriate for this filing and a trend factor of less than one would result in an understatement of the true rate level need.

Secondly, having significant impact on the downward trend is the fact that the oldest loss ratio (policy year 1984) is very high relative to the more recent four years (1985 through 1988). For comparison purposes we have calculated trends based upon the latest four points (Attachment A). As expected removal of policy year 1984 has the effect of flattening the downward trends thereby increasing the overall average trend factor from .923 to .945.

Aggregate Rate Level
1990-1991



MARYLAND

APPENDIX A-V

CALCULATION OF POLICY YEAR TREND FACTOR

SECTION A - STANDARD EARNED PURE PREMIUM

Policy Year	(1) Std. Earned Pure Premium	(2) Dev. Factor to Fifth Report	(3) On Level Factor	(4) Pure Premium On Level (1)x((2)x(3))
1984	469,526,930	1.000	.539	253,075,015
1985	513,146,707	1.003	.532	274,020,342
1986	558,635,019	1.004	.499	279,876,145
1987	561,892,134	1.007	.547	309,602,566
1988	355,143,855	1.057	.839	315,012,599

SECTION B - INDEMNITY LOSSES

Policy Year	(1) Indemnity Losses*	(2) Dev. Factor to Ultimate Report	(3) On Level Factor	(4) Ind. Losses On Level (1)x((2)x(3))
1984	169,106,358	1.080	1.153	210,537,416
1985	175,526,079	1.098	1.116	215,019,447
1986	109,357,413	1.751	1.082	207,232,298
1987	91,617,855	2.231	1.055	215,668,431
1988	51,081,676	3.715	1.035	196,409,044

SECTION C - MEDICAL LOSSES

Policy Year	(1) Medical Losses*	(2) Dev. Factor to Ultimate Report	(3) On Level Factor	(4) Med. Losses On Level (1)x((2)x(3))
1984	92,165,861	1.192	1.090	119,723,453
1985	88,380,067	1.197	1.090	115,335,987
1986	72,059,169	1.584	1.085	123,869,712
1987	74,061,537	1.782	1.021	134,717,936
1988	57,701,294	2.354	1.000	135,828,846

* All reported losses are paid except for those reported in policy years 1984 and 1985 which are including IBNR.



MARYLAND

APPENDIX A-V

CALCULATION OF POLICY YEAR TREND FACTOR (CONTD.)

SECTION D - DATA FOR INDEMNITY TREND FACTOR

(1) Policy Year	(2) Time Index	(3) Pure Premium On Level (See App. A-V Sect.A)	(4) Ind.Losses On Level (See App. A-V Sect.B)	(5) Ind. Loss Ratio (4)/(3)	(6) (2)x(2)	(7) (2)x(5)	(8) Ind. Loss Ratio On Line ((9)x(2))+ (10)
1984	1	253,075,015	210,537,416	.832	1	.832	.837
1985	2	274,020,342	215,019,447	.785	4	1.570	.786
1986	3	279,876,145	207,232,298	.740	9	2.220	.735
1987	4	309,602,566	215,668,431	.697	16	2.788	.684
1988	5	315,012,599	196,409,044	.623	25	3.115	.633
Total	15	xxx	xxx	3.677	55	10.525	xxx

SECTION E - DATA FOR MEDICAL TREND FACTOR

(1) Policy Year	(2) Time Index	(3) Pure Premium On Level (See App. A-V Sect.A)	(4) Med.Losses On Level (See App. A-V Sect.C)	(5) Med. Loss Ratio (4)/(3)	(6) (2)x(2)	(7) (2)x(5)	(8) Med. Loss Ratio On Line ((9)x(2))+ (10)
1984	1	253,075,015	119,723,453	.473	1	.473	.455
1985	2	274,020,342	115,335,987	.421	4	.842	.448
1986	3	279,876,145	123,869,712	.443	9	1.329	.441
1987	4	309,602,566	134,717,936	.435	16	1.740	.434
1988	5	315,012,599	135,828,846	.431	25	2.155	.427
Total	15	xxx	xxx	2.203	55	6.539	xxx

SECTIONS D AND E, CONTD. - CALCULATION OF INDEMNITY AND MEDICAL TREND FACTORS

	INDEMNITY (See Section D)	MEDICAL (See Section E)
(9) Annual Increment in Loss Ratio: $(n \text{ Sum}(7) - \text{Sum}(2)\text{Sum}(5)) / (n \text{ Sum}(6) - \text{Sum}(2)\text{Sum}(2))$	(.051)	(.007)
(10) Loss Ratio at Base: $(\text{Sum}(5) - (9)\text{Sum}(2)) / n$	.888	.462
(11) Midpoint of Experience in Filing is 4-1-89. Time Index for 4-1-89 is:	5.250	5.250
(12) Midpoint of Period during which Proposed Rates Effective 1-1-92. Time Index for 1-1-92 is:	8.000	8.000
(13) Trend Factor prior to Credibility: $((10) + (9)x(12)) / ((10) + (9)x(11))$	.774	.955
(14) E = Sum of Squares of $((5) - (8))$	.000320	.001074
(15) Credibility (Limited to 100%): $(.0011 / ((14) / ((10) + (9)X3.00)**2))** .5$	100%	45%
(16) Annual Expected Trend	.050	.004
(17) Credibility Weighted Trend Factor: $(1.000 - (15)) \times (1.000 + (16)x((12) - (11))) + ((13)x(15))$	.774	.986



MARYLAND

APPENDIX A-V

CALCULATION OF POLICY YEAR TREND FACTOR (CONTD.)

SECTION F - DETERMINATION OF OVERALL TREND FACTOR

	<u>Indicated</u>	<u>Selected</u>
(1) Adjusted Indemnity Losses for Policy Year 1988 valued as of 12-31-89 (See Appendix A-V - Section B)	196,409,044	
(2) Adjusted Medical Losses for Policy Year 1988 valued as of 12-31-89 (See Appendix A-V - Section C)	135,828,846	
(3) Indemnity Trend Factor	.774	.8.
(4) Medical Trend Factor	.986	.989
(5) Indicated Overall Trend Factor ((1)x(3)) + ((2)x(4)) -----	.861	.923
(1) + (2)		

SECTION G - DERIVATION OF EFFECT OF TREND FACTOR

Policy year 1988 with an average accident date of January 1, 1989 (Exhibit I-A) and calendar-accident year 1989 with an average accident date of July 1, 1989 (Exhibit I-B) are used in the determination of the indicated change based upon experience (Exhibit I-D). This experience reflects, on average, conditions as of April 1, 1989. The midpoint of the time period for which the revised pure premiums are being proposed is January 1, 1992. The pure premium level must therefore reflect experience levels which will exist 33 months later than the midpoint of the experience on which the current indication has been derived. The selected trend factor is .923 which represents a trend factor of approximately -2.8 % on an annual basis.



MARYLAND

SELECTION OF TREND FACTOR

After Credibility Trends

<u>5 Policy Years</u>	<u>Indemnity</u>	<u>Medical</u>	<u>Overall</u>
Linear	0.774	0.986	0.861
Exponential	0.824	0.988	0.891
Logarithmic	1.035	0.994	1.018
Average	0.878	0.989	0.923

<u>4 Policy Years</u>	<u>Indemnity</u>	<u>Medical</u>	<u>Overall</u>
Linear	0.772	1.011	0.870
Exponential	0.881	1.014	0.935
Logarithmic	1.047	1.009	1.031
Average	0.900	1.011	0.945

Selected Overall Trend Factor = .923

Exhibit 5

Excerpt from Hawaii rate filing effective 1/1/91



HAWAII

APPENDIX A-V

CALCULATION OF CALENDAR-ACCIDENT YEAR TREND FACTOR

SECTION A - STANDARD EARNED PREMIUM

Calendar Year	(1) Std. Earned Premium	(2) On Level Factor	(3) Premium On Level (1)x(2)
1985	215,233,040	.646	139,040,544
1986	262,202,110	.648	169,906,967
1987	271,247,910	.721	195,569,743
1988	258,436,482	.861	222,513,811
1989	258,782,011	.924	239,114,578

SECTION B - INDEMNITY LOSSES

Accident Year	(1) Indemnity Losses	(2) Dev. Factor to Ultimate Report	(3) On Level Factor	(4) Ind. Losses On Level (1)x((2)x(3))
1985	56,685,834	1.001	1.080	61,277,387
1986	59,755,727	1.027	1.090	66,866,659
1987	69,968,041	1.088	1.059	80,603,183
1988	73,145,623	1.219	1.034	92,163,485
1989	56,780,468	1.731	1.000	98,286,990

SECTION C - MEDICAL LOSSES

Accident Year	(1) Medical Losses	(2) Dev. Factor to Ultimate Report	(3) On Level Factor	(4) Med. Losses On Level (1)x((2)x(3))
1985	30,749,409	1.081	1.078	35,823,061
1986	34,722,170	1.081	1.072	40,242,995
1987	41,554,941	1.092	1.058	47,995,957
1988	47,467,914	1.141	1.034	56,012,139
1989	47,239,315	1.429	1.000	67,504,981



CALCULATION OF CALENDAR-ACCIDENT YEAR TREND FACTOR (CONTD.)

SECTION D - DATA FOR INDEMNITY TREND FACTOR

(1) Calendar- Accident Year	(2) Time Index	(3) Premium On Level (See App. A-V Sect.A)	(4) Ind.Losses On Level (See App. A-V Sect.B)	(5) Ind. Loss Ratio (4)/(3)	(6) (2)x(2)	(7) (2)x(5)	(8) Ind. Loss Ratio On Line ((9)x(2))+10)
1985	1	139,040,544	61,277,387	.441	1	.441	.422
1986	2	169,906,967	66,866,659	.394	4	.788	.418
1987	3	195,569,743	80,603,183	.412	9	1.236	.414
1988	4	222,513,811	92,163,485	.414	16	1.656	.410
1989	5	239,114,578	98,286,990	.411	25	2.055	.406
Total	15	xxx	xxx	2.072	55	6.176	xxx

SECTION E - DATA FOR MEDICAL TREND FACTOR

(1) Calendar- Accident Year	(2) Time Index	(3) Premium On Level (See App. A-V Sect.A)	(4) Med.Losses On Level (See App. A-V Sect.C)	(5) Med. Loss Ratio (4)/(3)	(6) (2)x(2)	(7) (2)x(5)	(8) Med. Loss Ratio On Line ((9)x(2))+10)
1985	1	139,040,544	35,823,061	.258	1	.258	.243
1986	2	169,906,967	40,242,995	.237	4	.474	.249
1987	3	195,569,743	47,995,957	.245	9	.735	.255
1988	4	222,513,811	56,012,139	.252	16	1.008	.261
1989	5	239,114,578	67,504,981	.282	25	1.410	.267
Total	15	xxx	xxx	1.274	55	3.885	xxx

SECTIONS D AND E, CONTD. - CALCULATION OF INDEMNITY AND MEDICAL TREND FACTORS

	INDEMNITY (See Section D)	MEDICAL (See Section E)
(9) Annual Increment in Loss Ratio: $(n \text{ Sum}(7) - \text{Sum}(2)\text{Sum}(5)) / (n \text{ Sum}(6) - \text{Sum}(2)\text{Sum}(2))$	(.004)	.006
(10) Loss Ratio at Base: $(\text{Sum}(5) - (9)\text{Sum}(2)) / n$	.426	.237
(11) Midpoint of Experience in Filing is 4-1-89. Time Index for 4-1-89 is:	4.750	4.750
(12) Midpoint of Period during which Proposed Advisory Loss Costs Effective is 01-01-92. Time Index for 01-01-92 is:	7.500	7.500
(13) Trend Factor prior to Credibility: $((10) + (9)x(12)) / ((10) + (9)x(11))$	.973	1.060
(14) E = Sum of Squares of $((5) - (8))$	.000982	.000775
(15) Credibility (Limited to 100%): $(.0011 / ((14) / ((10) + (9)X3.00)**2))**2$	44%	30%
(16) Annual Expected Trend	.000	.004
(17) Credibility Weighted Trend Factor: $(1.000 - (15)) x (1.000 + (16)x((12) - (11))) + ((13)x(15))$	.988	1.026



HAWAII

APPENDIX A-V

CALCULATION OF CALENDAR-ACCIDENT YEAR TREND FACTOR (CONTD.)

SECTION F - DETERMINATION OF OVERALL TREND FACTOR

(1)	Adjusted Indemnity Losses for Accident Year 1989 valued as of 12-31-89 (See Appendix A-V - Section B)	98,286,990
(2)	Adjusted Medical Losses for Accident Year 1989 valued as of 12-31-89 (See Appendix A-V - Section C)	67,504,981
(3)	Indemnity Trend Factor	.988
(4)	Medical Trend Factor	1.026
(5)	Indicated Overall Trend Factor ((1)x(3)) + ((2)x(4)) -----	1.003
	(1) + (2)	

SECTION G - DERIVATION OF EFFECT OF TREND FACTOR

Policy year 1988 with an average accident date of January 1, 1989 (Exhibit I-A) and calendar-accident year 1989 with an average accident date of July 1, 1989 (Exhibit I-B) are used in the determination of the indicated change based upon experience (Exhibit I-C). This experience reflects, on average, conditions as of April 1, 1989. The midpoint of the time period for which the revised advisory loss costs are being proposed is January 01, 1992. The pure premium level must therefore reflect experience levels which will exist 33 months later than the midpoint of the experience on which the current indication has been derived. The indicated trend factor is 1.003 which represents a trend factor of approximately 0.1% on an annual basis.

Exhibit 6

Excerpt from Florida rate filing effective 1/1/90



FLORIDA

APPENDIX A-V

CALCULATION OF POLICY YEAR TREND FACTOR

SECTION A - STANDARD EARNED PREMIUM

(1)	(2)	(3)	(4)
Policy Year	Std. Earned Premium	Dev. Factor to Fifth Report	On Level Factor
			Premium On Level (1)x((2)x(3))
1980	660,356,086	1.000	1.713
1981	543,088,358	1.000	2.049
1982	525,074,140	1.000	2.235
1983	622,535,326	1.000	1.983
1984	776,258,920	1.004	1.818
1985	966,377,985	1.006	1.519
1986	1,104,574,907	1.006	1.365
1987	1,122,875,195	1.053	1.327

SECTION B - INDEMNITY LOSSES

(1)	(2)	(3)	(4)
Policy Year	Indemnity Losses	Dev. Factor to Ultimate Report	On Level Factor
			Ind. Losses On Level (1)x((2)x(3))
1980	229,690,710	1.068	1.176
1981	278,565,712	1.097	1.120
1982	295,536,977	1.128	1.094
1983	337,226,478	1.171	1.080
1984	423,087,682	1.239	1.024
*1985	281,345,101	2.272	1.009
*1986	228,163,337	3.210	1.007
*1987	147,201,872	5.739	1.003

SECTION C - MEDICAL LOSSES

(1)	(2)	(3)	(4)
Policy Year	Medical Losses	Dev. Factor to Ultimate Report	On Level Factor
			Med. Losses On Level (1)x((2)x(3))
1980	191,425,200	1.112	1.209
1981	211,410,086	1.143	1.161
1982	246,808,392	1.178	1.023
1983	272,437,595	1.213	.954
1984	313,079,168	1.258	.953
*1985	257,587,536	1.692	.950
*1986	243,830,361	1.910	1.004
*1987	203,988,433	2.519	1.017

* Paid losses.



FLORIDA

APPENDIX A-V

CALCULATION OF POLICY YEAR TREND FACTOR (CONTD.)

SECTION D - DATA FOR INDEMNITY TREND FACTOR

(1) Policy Year	(2) Time Index	(3) Premium On Level (See App. A-V Sect.A)	(4) Ind.Losses On Level (See App. A-V Sect.B)	(5) Ind. Loss Ratio (4)/(3)	(6) (2)x(2)	(7) (2)x(5)	(8) Ind. Loss Ratio On Line ((9)x(2))+ (10)
1980	1	1,131,189,975	288,491,532	.255	1	.255	.246
1981	2	1,112,788,046	342,357,260	.308	4	.616	.285
1982	3	1,173,540,703	364,692,630	.311	9	.933	.324
1983	4	1,234,487,551	426,591,495	.346	16	1.384	.363
1984	5	1,416,672,529	536,898,268	.379	25	1.895	.402
1985	6	1,476,625,561	644,842,971	.437	36	2.622	.441
1986	7	1,516,581,347	737,423,905	.486	49	3.402	.480
1987	8	1,568,656,647	847,293,975	.540	64	4.320	.519
Total	36	xxx	xxx	3.062	204	15.427	xxx

SECTION E - DATA FOR MEDICAL TREND FACTOR

(1) Policy Year	(2) Time Index	(3) Premium On Level (See App. A-V Sect.A)	(4) Med.Losses On Level (See App. A-V Sect.C)	(5) Med. Loss Ratio (4)/(3)	(6) (2)x(2)	(7) (2)x(5)	(8) Med. Loss Ratio On Line ((9)x(2))+ (10)
1980	1	1,131,189,975	257,275,469	.227	1	.227	.226
1981	2	1,112,788,046	280,541,184	.252	4	.504	.239
1982	3	1,173,540,703	297,404,112	.253	9	.759	.252
1983	4	1,234,487,551	315,210,297	.255	16	1.020	.265
1984	5	1,416,672,529	375,381,922	.265	25	1.325	.278
1985	6	1,476,625,561	413,943,170	.280	36	1.680	.291
1986	7	1,516,581,347	467,666,632	.308	49	2.156	.304
1987	8	1,568,656,647	522,618,365	.333	64	2.664	.317
Total	36	xxx	xxx	2.173	204	10.335	xxx



FLORIDA

APPENDIX A-V

CALCULATION OF POLICY YEAR TREND FACTOR (CONTD.)

SECTIONS D AND E, CONTD. - CALCULATION OF INDEMNITY AND MEDICAL TREND FACTORS

	INDEMNITY (See Section D) -----	MEDICAL (See Section E) -----
(9) Annual Increment in Loss Ratio: $(n \text{ Sum}(7) - \text{Sum}(2)\text{Sum}(5)) / (n \text{ Sum}(6) - \text{Sum}(2)\text{Sum}(2))$	.039	.013
(10) Loss Ratio at Base: $(\text{Sum}(5) - (9)\text{Sum}(2)) / n$	.207	.213
(11) Midpoint of Experience in Filing is 4-1-88. Time Index for 4-1-88 is:	8.250	8.250
(12) Midpoint of Period during which Proposed Rates Effective is 1-1-91. Time Index for 1-1-91 is:	11.000	11.000
(13) Trend Factor prior to Credibility: $((10) + (9) \times (12)) / ((10) + (9) \times (11))$	1.202	1.113
(14) E - Sum of Squares of $((5) - (8))$	.002090	.000833
(15) Constant for Credibility	.0014*	.0014*
(16) Credibility (Limited to 100%): $\{(15) / \{(14) / ((10) + (9) \times 4.5)^{**2}\}\}^{**}.5$	31%	35%
(17) Annual Expected Trend	.050	.013
(18) Credibility Weighted Trend Factor: $(1.000 - (16)) \times (1.000 + (17) \times ((12) - (11))) + ((13) \times (16))$	1.157	1.063

* 99% probability of being within 6% of expected.



FLORIDA

APPENDIX A-V

CALCULATION OF POLICY YEAR TREND FACTOR (CONTD.)

SECTION F - DETERMINATION OF OVERALL TREND FACTOR

(1) Adjusted Indemnity Losses for Policy Year 1987 valued as of 12-31-88 (See Appendix A-V - Section B)	847,293,975
(2) Adjusted Medical Losses for Policy Year 1987 valued as of 12-31-88 (See Appendix A-V - Section C)	522,618,365
(3) Indemnity Trend Factor	1.157
(4) Medical Trend Factor	1.063
(5) Indicated Overall Trend Factor ((1)x(3)) + ((2)x(4)) -----	1.121
(1) + (2)	

SECTION G - DERIVATION OF EFFECT OF TREND FACTOR

Policy year 1987 with an average accident date of January 1, 1988 (Exhibit I-A) and calendar-accident year 1988 with an average accident date of July 1, 1988 (Exhibit I-B) are used in the determination of the indicated change based upon experience (Exhibit I-D). This experience reflects, on average, conditions as of April 1, 1988. The midpoint of the time period for which the revised rates are being proposed is January 1, 1991. The premium level must therefore reflect experience levels which will exist 33 months later than the midpoint of the experience on which the current indication has been derived. The indicated trend factor is 1.121 which represents a trend factor of approximately 4.4% on an annual basis. Since the present rates include a factor of 1.090, the appropriate factor to incorporate the effect of trend into the overall change in premium level is the ratio of these two trend factors: 1.028 (1.028 = 1.121 / 1.090).

NATIONAL COUNCIL ON COMPENSATION INSURANCE

AGENDA
ACTUARIAL COMMITTEE
MEETING OF AUGUST 25, 1982

AC-82-9

TREND PROCEDURES

Indemnity and Medical Trends

Staff is currently working on completing split indemnity/medical trends on a policy year basis utilizing data valued as of December 31, 1981 for all states. A complete analysis of the results will follow shortly in a separate mailing.

The analysis will include comparisons between:

- a) combined policy year trends based on a weighting of the indemnity and medical trends.
- b) policy year trends computed on a combined loss ratio basis and
- c) calendar year trends.

These trends are all based on a least-squares linear regression approach. A sample of all the trends which will be provided can be seen in attachments 4, 5 and 6.

In order to provide historical results of these comparisons, the following three sets of experience periods will be examined.

	<u>Policy Years Used in Trend</u>	<u>Calendar Years Used in Trend</u>	<u>Attachment</u>
Set I	1976-1980	1977-1981	4
Set II	1975-1979	1976-1980	5
Set III	1974-1978	1975-1979	6

In addition, indemnity/medical and combined policy year trends based on policy years 1973 through 1980 (i.e. eight years of experience rather than five) are also being calculated for comparison with results obtained in set I. Attachment 7 provides a sample of results for these eight point trends.

NATIONAL COUNCIL ON COMPENSATION INSURANCE

Attachment 4

STATE	POLICY YEAR TRENDS 1976 THROUGH 1980										CALENDAR YEAR 1977 - 1981			
	INDEMNITY			MEDICAL			AVERAGE				COMBINED		TRENDS PRIOR TO CRED. TRENDS	CRED. TRENDS PRIOR TO CRED. TRENDS
	TRENDS PRIOR TO CRED. TRENDS	CRED. TRENDS WEIGHTED	TRENDS PRIOR TO CRED. TRENDS	CRED. TRENDS WEIGHTED	TRENDS PRIOR TO CRED. TRENDS	CRED. TRENDS WEIGHTED	TRENDS PRIOR TO CRED. TRENDS	CRED. TRENDS WEIGHTED	TRENDS PRIOR TO CRED. TRENDS	CRED. TRENDS WEIGHTED				
ALABAMA	.938	86%	.947	1.123	99%	1.122	1.028	1.033	1.029	0%	1.000	N/A	N/A	
ALASKA	1.113	55%	1.062	1.102	55%	1.056	1.110	1.060	1.110	55%	1.061	1.093	0%	
ARIZONA +	.858	73%	.896	1.044	73%	1.032	.954	.966	.952	55%	.974	.587	99%	
COLORADO +	1.173	92%	1.159	1.027	55%	1.015	1.122	1.108	1.120	99%	1.119	1.151	92%	
FLORIDA	.757	99%	.759	.942	0%	1.000	.853	.884	.854	92%	.866	.603	92%	
GEORGIA	1.004	0%	1.000	1.218	99%	1.216	1.098	1.095	1.100	99%	1.099	1.080	92%	
IDAHO +	1.003	0%	1.000	1.123	73%	1.090	1.048	1.033	1.049	73%	1.036	N/A	N/A	
IOWA	1.119	73%	1.087	1.157	99%	1.155	1.132	1.110	1.132	92%	1.121	1.037	0%	
LOUISIANA	1.008	0%	1.000	1.123	92%	1.113	1.041	1.033	1.043	55%	1.024	1.109	92%	
MAINE	1.303	92%	1.279	1.210	92%	1.193	1.291	1.268	1.290	92%	1.267	1.276	92%	
MARYLAND	1.017	0%	1.000	.979	0%	1.000	1.006	1.000	1.005	0%	1.000	1.053	0%	
MONTANA ++	1.111	31%	1.034	1.188	92%	1.173	1.038	1.074	1.133	55%	1.073	1.113	31%	
NEBRASKA	1.107	86%	1.092	1.160	99%	1.158	1.129	1.120	1.129	92%	1.119	1.159	86%	
NEW MEXICO	1.133	92%	1.122	1.164	99%	1.162	1.143	1.134	1.142	92%	1.139	1.122	92%	
OKLAHOMA +	.794	86%	.823	1.202	92%	1.186	.920	.935	.933	0%	1.000	.921	92%	
OREGON +	.751	99%	.753	1.097	99%	1.096	.899	.900	.901	99%	.902	.636	92%	
S. CAROLINA	1.094	99%	1.093	1.207	99%	1.205	1.135	1.133	1.136	99%	1.135	1.110	86%	
TENNESSEE	1.019	55%	1.010	1.141	92%	1.130	1.070	1.060	1.072	86%	1.062	.982	0%	
VERMONT	1.000	0%	1.000	1.089	0%	1.000	1.032	1.000	1.033	0%	1.000	N/A	N/A	

+ INCLUDES STATE FUND
++ MONTANA'S STATE FUND IS INCLUDED IN THE CALENDAR YEAR TRENDS AND TOTALS FOR POLICY YEARS 1979 AND 1980, BUT IS EXCLUDED FROM DEVELOPMENT FACTORS IN THE POLICY YEAR TRENDS.

NATIONAL COUNCIL ON COMPENSATION INSURANCE

STATE	POLICY YEAR TRENDS 1975 THROUGH 1979										CALENDAR YEAR 1976 - 1980*			
	INDEMNITY					MEDICAL					AVERAGE		COMBINED	
	TREND PRIOR TO CRED.	CRED. WEIGHTED TREND	TREND PRIOR TO CRED.	CRED. WEIGHTED TREND	CRED. WEIGHTED TREND	TREND PRIOR TO CRED.	CRED. WEIGHTED TREND	TREND PRIOR TO CRED.	CRED. WEIGHTED TREND	TREND PRIOR TO CRED.	CRED. WEIGHTED TREND	TREND PRIOR TO CRED.	CRED. WEIGHTED TREND	
ALABAMA	.979	0%	1.000	1.174	99%	1.172	1.074	1.084	1.072	0%	1.000	1.084	92%	1.077
ALASKA	1.281	92%	1.259	1.227	92%	1.209	1.266	1.245	1.266	92%	1.245	1.206*	92%	1.190
ARIZONA +	.865	73%	.901	1.031	55%	1.017	.951	.961	.947	55%	.971	.910	0%	1.000
COLORADO +	1.151	92%	1.139	1.019	0%	1.000	1.104	1.090	1.101	73%	1.074	1.089	73%	1.065
FLORIDA	.847	99%	.849	.973	0%	1.000	.912	.927	.911	92%	.918	.479	99%	.484
GEORGIA	.985	55%	.992	1.237	99%	1.235	1.097	1.100	1.094	99%	1.093	1.067	92%	1.062
IDAHO +	.884	0%	1.000	1.101	73%	1.074	.965	1.028	.967	0%	1.000	.943*	0%	1.000
IOWA	1.144	99%	1.143	1.169	99%	1.167	1.153	1.151	1.152	99%	1.150	1.145	99%	1.144
LOUISIANA	.979	55%	.988	1.157	92%	1.144	1.031	1.033	1.032	55%	1.018	1.094*	06%	1.081
MAINE	1.267	73%	1.195	1.231	99%	1.229	1.262	1.199	1.261	92%	1.240	1.374	99%	1.370
MARYLAND	1.026	0%	1.000	.934	92%	.939	.998	.982	1.000	0%	1.000	1.124	0%	1.000
MONTANA **	1.115	55%	1.063	1.166	92%	1.153	1.130	1.089	1.129	73%	1.094	1.026	0%	1.000
NEBRASKA	1.014	0%	1.000	1.103	92%	1.095	1.051	1.040	1.050	55%	1.028	1.062	31%	1.019
NEW MEXICO	1.140	92%	1.129	1.156	99%	1.154	1.144	1.081	1.143	92%	1.132	1.108	06%	1.093
OKLAHOMA +	.807	86%	.834	1.214	92%	1.197	.933	.946	.933	55%	.963	.873*	99%	.874
OREGON +	.763	99%	.765	1.105	99%	1.104	.909	.910	.901	99%	.902	.863	55%	.925
S. CAROLINA	1.051	73%	1.037	1.181	92%	1.167	1.098	1.084	1.098	73%	1.072	1.162	92%	1.149
TENNESSEE	1.010	0%	1.000	1.107	73%	1.078	1.051	1.033	1.040	55%	1.026	.958*	92%	.961
VERMONT	.994	0%	1.000	1.121	0%	1.000	1.040	1.000	1.037	0%	1.000	.902*	31%	.970

* INCLUDES STATE FUND
 ** MONTANA STATE FUND IS EXCLUDED FROM THE CALENDAR YEAR TREND THE POLICY YEAR DEVELOPMENT FACTORS. THE STATE FUND IS ONLY IN TOTALS FOR POLICY YEAR 1979.
 + POLICY YEAR DEVELOPMENT FACTORS BASED ON EXPERIENCE THROUGH JUNE 30, 1981

NATIONAL COUNCIL ON COMPENSATION INSURANCE

STATE	POLICY YEAR TRENDS										CALENDAR YEAR			
	1974 THROUGH 1978					AVERAGE					1975 - 1979*			
	INDEMNITY		MEDICAL		AVERAGE		COMBINED		TRENDS		TRENDS			
TREND PRIOR TO CRED.	CRED. TRENDS TO WEIGHTED TRENDS	TREND PRIOR TO CRED.	CRED. TRENDS TO WEIGHTED TRENDS	TREND PRIOR TO CRED.	CRED. TRENDS TO WEIGHTED TRENDS	TREND PRIOR TO CRED.	CRED. TRENDS TO WEIGHTED TRENDS	TREND PRIOR TO CRED.	CRED. TRENDS TO WEIGHTED TRENDS	TREND PRIOR TO CRED.	CRED. TRENDS TO WEIGHTED TRENDS	TREND PRIOR TO CRED.	CRED. TRENDS TO WEIGHTED TRENDS	
ALABAMA	1.011	0%	1.000	1.216	99%	1.214	1.111	1.104	1.108	73%	1.079	1.076*	92%	1.070
ALASKA	1.225	73%	1.164	1.215	92%	1.198	1.222	1.173	1.223	92%	1.205	1.298*	99%	1.295
ARIZONA +	.817	73%	.866	1.021	31%	1.007	.922	.939	.913	55%	.952	1.034	31%	1.011
COLORADO +	1.127	92%	1.117	1.071	73%	1.052	1.107	1.093	1.102	73%	1.074	1.074	73%	1.054
FLORIDA	.872	92%	.882	.971	31%	.991	.923	.938	.921	86%	.932	.799	73%	.853
GEORGIA	1.020	0%	1.000	1.240	99%	1.238	1.122	1.105	1.112	99%	1.111	1.134	92%	1.123
IDAHO +	.861	55%	.924	1.073	31%	1.023	.940	.961	.940	31%	.981	1.050*	73%	1.037
IOWA	1.157	99%	1.155	1.211	99%	1.209	1.175	1.174	1.174	99%	1.172	1.193	99%	1.191
LOUISIANA	.940	92%	.945	1.227	92%	1.209	1.024	1.022	1.024	31%	1.007	1.118	99%	1.117
MAINE	1.220	73%	1.161	1.228	99%	1.226	1.221	1.170	1.221	92%	1.203	1.388*	99%	1.384
MARYLAND	1.090	73%	1.066	1.070	0%	1.000	1.084	1.046	1.087	73%	1.064	1.165	99%	1.163
MONTANA ++	1.018	31%	1.006	1.011	0%	1.000	1.016	1.004	1.015	0%	1.000	1.092	0%	1.000
NEBRASKA	.975	0%	1.000	1.019	0%	1.000	.993	1.000	.992	0%	1.000	1.002	0%	1.000
NEW MEXICO	1.076	31%	1.024	1.137	99%	1.136	1.095	1.058	1.094	86%	1.081	1.076	92%	1.070
OKLAHOMA +	1.016	0%	1.000	1.289	92%	1.266	1.100	1.082	1.086	0%	1.000	.843*	99%	.845
OREGON +	.780	99%	.782	1.127	99%	1.126	.928	.929	.909	99%	.910	1.015	0%	1.000
S. CAROLINA	1.018	0%	1.000	1.136	92%	1.125	1.060	1.045	1.057	73%	1.042	1.116	92%	1.107
TENNESSEE	.951	73%	.964	1.095	73%	1.069	1.011	1.008	1.006	0%	1.000	.961*	0%	1.000
VERMONT	.990	0%	1.000	1.184	73%	1.134	1.060	1.048	1.057	31%	1.010	1.097	0%	1.000

+ INCLUDES STATE FUND
 ++ EXCLUDES STATE FUND
 * STATES FOR WHICH CALENDAR YEAR TRENDS BASED ON EXPERIENCE THROUGH JUNE 30, 1979

NATIONAL COUNCIL ON COMPENSATION INSURANCE

STATE	1973 - 1980 POLICY YEAR													
	INDEMNITY				MEDICAL				AVERAGE				COMBINED	
	TREND PRIOR TO CRED. TREND	CRED. WEIGHTED TREND	TREND PRIOR TO CRED. TREND	CRED. WEIGHTED TREND	TREND PRIOR TO CRED. TREND	CRED. WEIGHTED TREND	TREND PRIOR TO CRED. TREND	CRED. WEIGHTED TREND	TREND PRIOR TO CRED. TREND	CRED. WEIGHTED TREND	TREND PRIOR TO CRED. TREND	CRED. WEIGHTED TREND	TREND PRIOR TO CRED. TREND	CRED. WEIGHTED TREND
ALABAMA	.967	81%	.973	1.163	100%	1.163	1.063	1.066	1.066	100%	1.066	1.066	100%	1.066
ALASKA	1.098	64%	1.063	1.156	100%	1.156	1.114	1.089	1.113	96%	1.108	1.108	96%	1.108
ARIZONA +	.777	100%	.777	1.027	97%	1.026	.906	.905	.907	100%	.907	.907	100%	.907
COLORADO +	1.152	100%	1.152	1.065	89%	1.058	1.121	1.119	1.120	100%	1.120	1.120	100%	1.120
FLORIDA	.863	100%	.863	.984	28%	.996	.926	.932	.926	87%	.936	.936	87%	.936
GEORGIA	1.042	59%	1.025	1.201	100%	1.201	1.112	1.103	1.112	100%	1.112	1.112	100%	1.112
IDAHIO +	.819	97%	.824	1.036	0%	1.000	.899	.889	.904	69%	.934	.934	69%	.934
IOWA	1.105	100%	1.105	1.130	100%	1.130	1.114	1.114	1.114	100%	1.114	1.114	100%	1.114
LOUISIANA	.936	82%	.948	1.170	100%	1.170	1.004	1.012	1.010	0%	1.000	1.000	0%	1.000
MAINE	1.232	100%	1.232	1.200	100%	1.200	1.228	1.228	1.228	100%	1.228	1.228	100%	1.228
MARYLAND	1.068	100%	1.068	1.086	69%	1.059	1.073	1.065	1.072	100%	1.072	1.072	100%	1.072
MONTANA ++	1.037	76%	1.028	1.105	97%	1.102	1.056	1.050	1.055	53%	1.029	1.029	53%	1.029
NEBRASKA	.978	0%	1.000	1.010	0%	1.000	.991	1.000	.991	0%	1.000	1.000	0%	1.000
NEW MEXICO	1.076	31%	1.013	1.133	100%	1.133	1.093	1.049	1.092	31%	1.029	1.029	31%	1.029
OKLAHOMA +	.982	0%	1.000	1.209	100%	1.209	1.053	1.065	1.052	36%	1.020	1.020	36%	1.020
OREGON +	.738	100%	.738	1.110	100%	1.110	.897	.897	.901	100%	.901	.901	100%	.901
S. CAROLINA	1.048	96%	1.046	1.143	100%	1.143	1.082	1.081	1.082	100%	1.082	1.082	100%	1.082
TENNESSEE	.967	79%	.974	1.114	100%	1.114	1.029	1.033	1.029	84%	1.024	1.024	84%	1.024
VERMONT	.988	0%	1.000	1.134	98%	1.131	1.040	1.047	1.042	84%	1.035	1.035	84%	1.035

+ INCLUDES STATE FUND
++ MONTANA'S STATE FUND IS EXCLUDED FROM DEVELOPMENT, BUT IS INCLUDED IN THE TOTALS FOR POLICY YEARS 1979 AND 1980.

MINUTES
ACTUARIAL COMMITTEE
MEETING OF JUNE 20, 1990

AC-90-26

AGGREGATE LOSS RATIO TREND

Item 2

Accident Year Trend vs. Policy Year Trend

Background:

The data underlying the current trend procedure are based on the latest five policy year loss ratios. It was suggested at the October 10, 1989 meeting that accident year trend indications be analyzed and compared to policy year data.

At the February 13 and April 4, 1990 meetings, a countrywide analysis of accident year and policy year trend was presented. While the accident year trend was slightly higher in magnitude, the credibility was noticeably lower. Staff demonstrated that policy year data was more credible than accident year using either linear or exponential regressions.

Discussion:

A comparative analysis using eight points of data was performed to determine if more points would help the accident year instability without forfeiting too much responsiveness. Accident year and policy year trend indications for a sample of nine states were computed using both linear and exponential regression models. Loss development based on both the incurred including IBNR and paid to an 8th report methodologies for accident years 1981-1988 and policy years 1980-1987 were utilized. The results of this analysis was included in the Agenda.

When accident year trend indications based on eight data points were compared to accident year trend indications based on five data points, no definite conclusions could be drawn. However, additional years of data did not appear to necessarily improve accident year credibilities.

Staff

Recommendation:

That the Committee discuss.

Committee Action:

Based on the above results, the Committee agreed that accident year data should not be considered for trend at this time.

AGENDA
ACTUARIAL COMMITTEE
MEETING OF JUNE 20, 1990

AC-90-26

AGGREGATE LOSS RATIO TREND

Item 2

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Background:

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Discussion:

A comparative analysis using eight points of data was performed to determine if more points would help the accident year instability without forfeiting too much responsiveness. Accident year and policy year trend indications for a sample of nine states were computed using both linear and exponential regression models. Loss development based on both the incurred including IBNR and paid to an 8th report methodologies for accident years 1981-1988 and policy years 1980-1987 were utilized. The results of this analysis are presented on Exhibit 26-5.

When accident year trend indications based on eight data points were compared to accident year trend indications based on five data points, no definite conclusions could be drawn. However, additional years of data did not appear to necessarily improve accident year credibilities.

Staff

Recommendation:

That the Committee discuss.

Exhibit 26-5, p. 1 of 6

LINEAR REGRESSION MODEL
Incurred Including IBNR Losses

	ANNUAL INDEMNITY TREND				CREDIBILITIES			
	AY	AY	PY	PY	AY	AY	PY	PY
	<u>8 PTS</u>	<u>5 PTS</u>	<u>8 PTS</u>	<u>5 PTS</u>	<u>8 PTS</u>	<u>5 PTS</u>	<u>8 PTS</u>	<u>5 PTS</u>
CT	1.056	1.076	1.052	1.074	46%	50%	35%	74%
FL	1.100	1.136	1.088	1.124	20	23	19	26
HI	0.911	0.930	0.959	0.937	29	42	50	65
KS	1.052	1.043	1.047	1.040	47	33	71	66
NC	1.046	1.061	1.040	1.043	38	28	70	46
SC	1.054	1.056	1.055	1.050	57	48	66	43
TN	1.045	1.048	1.032	1.041	40	30	47	45
TX	1.102	1.131	1.089	1.114	20	23	23	33
VA	1.024	1.014	1.022	1.026	88	62	93	69
WEIGHTED AVERAGE	1.081	1.104	1.071	1.092	30%	30%	34%	41%

	ANNUAL MEDICAL TREND				CREDIBILITIES			
	AY	AY	PY	PY	AY	AY	PY	PY
	<u>8 PTS</u>	<u>5 PTS</u>	<u>8 PTS</u>	<u>5 PTS</u>	<u>8 PTS</u>	<u>5 PTS</u>	<u>8 PTS</u>	<u>5 PTS</u>
CT	1.078	1.097	1.076	1.094	39%	37%	49%	90%
FL	1.078	1.115	1.060	1.101	21	23	24	31
HI	0.925	0.963	0.972	0.935	21	87	32	32
KS	1.060	1.058	1.055	1.046	29	20	43	28
NC	1.043	1.067	1.032	1.039	30	23	53	34
SC	1.055	1.067	1.055	1.062	40	29	35	23
TN	1.072	1.079	1.060	1.058	32	22	43	35
TX	1.113	1.146	1.100	1.126	17	20	22	25
VA	1.052	1.042	1.055	1.049	61	48	87	61
WEIGHTED AVERAGE	1.085	1.111	1.074	1.095	25%	25%	33%	35%

Exhibit 26-5, p. 2 of 6

LINEAR REGRESSION MODEL
Paid to an 8th Losses

	ANNUAL INDEMNITY TREND				CREDIBILITIES			
	AY	AY	PY	PY	AY	AY	PY	PY
	<u>8 PTS</u>	<u>5 PTS</u>	<u>8 PTS</u>	<u>5 PTS</u>	<u>8 PTS</u>	<u>5 PTS</u>	<u>8 PTS</u>	<u>5 PTS</u>
CT	1.055	1.062	1.054	1.062	47%	42%	48%	100%
FL	1.088	1.088	1.082	1.090	52	60	47	76
HI	0.946	0.958	0.988	0.965	20	37	43	71
KS	1.049	1.024	1.042	1.019	35	33	48	71
NC	1.024	1.022	1.017	1.006	57	43	70	50
SC	1.048	1.039	1.050	1.032	47	50	56	68
TN	1.038	1.028	1.026	1.029	46	39	50	44
TX	1.103	1.125	1.093	1.114	27	31	28	45
VA	1.020	1.005	1.017	1.013	49	55	71	50
WEIGHTED AVERAGE	1.076	1.085	1.070	1.080	39%	42%	41%	61%

	ANNUAL MEDICAL TREND				CREDIBILITIES			
	AY	AY	PY	PY	AY	AY	PY	PY
	<u>8 PTS</u>	<u>5 PTS</u>	<u>8 PTS</u>	<u>5 PTS</u>	<u>8 PTS</u>	<u>5 PTS</u>	<u>8 PTS</u>	<u>5 PTS</u>
CT	1.071	1.078	1.065	1.071	47%	39%	66%	71%
FL	1.058	1.066	1.046	1.057	40	34	37	56
HI	0.965	1.003	1.008	0.979	15	45	25	26
KS	1.060	1.064	1.054	1.042	29	19	49	34
NC	1.032	1.036	1.023	1.016	42	28	58	41
SC	1.045	1.042	1.045	1.026	38	28	46	43
TN	1.065	1.055	1.060	1.046	38	26	48	36
TX	1.107	1.132	1.099	1.119	23	26	28	30
VA	1.049	1.034	1.050	1.034	40	59	44	53
WEIGHTED AVERAGE	1.076	1.088	1.070	1.077	32%	31%	38%	41%

Exhibit 26-5, p. 3 of 6

EXPONENTIAL REGRESSION MODEL
Incurred Including IBNR Losses

	ANNUAL INDEMNITY TREND				CREDIBILITIES			
	AY	AY	PY	PY	AY	AY	PY	PY
	<u>8 PTS</u>	<u>5 PTS</u>	<u>8 PTS</u>	<u>5 PTS</u>	<u>8 PTS</u>	<u>5 PTS</u>	<u>8 PTS</u>	<u>5 PTS</u>
CT	1.074	1.098	1.067	1.100	56%	52%	40%	79%
FL	1.179	1.221	1.152	1.213	30	35	27	43
HI	0.937	0.941	0.965	0.949	28	40	47	62
KS	1.070	1.048	1.064	1.045	44	35	66	68
NC	1.057	1.072	1.048	1.050	41	30	73	47
SC	1.073	1.067	1.075	1.061	56	51	63	45
TN	1.056	1.052	1.038	1.048	42	31	49	44
TX	1.184	1.209	1.155	1.186	33	34	36	53
VA	1.027	1.016	1.025	1.029	85	63	95	68
WEIGHTED AVERAGE	1.139	1.162	1.117	1.148	39%	38%	42%	54%

	ANNUAL MEDICAL TREND				CREDIBILITIES			
	AY	AY	PY	PY	AY	AY	PY	PY
	<u>8 PTS</u>	<u>5 PTS</u>	<u>8 PTS</u>	<u>5 PTS</u>	<u>8 PTS</u>	<u>5 PTS</u>	<u>8 PTS</u>	<u>5 PTS</u>
CT	1.120	1.137	1.121	1.138	53%	46%	100%	100%
FL	1.111	1.168	1.084	1.148	25	29	26	38
HI	0.944	0.966	0.975	0.950	20	86	31	34
KS	1.084	1.067	1.074	1.056	29	20	42	30
NC	1.051	1.079	1.038	1.044	31	24	55	35
SC	1.073	1.084	1.072	1.074	44	30	38	24
TN	1.104	1.096	1.088	1.072	36	24	45	37
TX	1.218	1.250	1.200	1.218	30	31	43	40
VA	1.070	1.049	1.074	1.058	55	49	72	62
WEIGHTED AVERAGE	1.145	1.173	1.130	1.151	33%	32%	46%	44%

Exhibit 26-5, p. 4 of 6

EXPONENTIAL REGRESSION MODEL
Paid to an 8th Losses

	ANNUAL INDEMNITY TREND				CREDIBILITIES			
	AY	AY	PY	PY	AY	AY	PY	PY
	<u>8 PTS</u>	<u>5 PTS</u>	<u>8 PTS</u>	<u>5 PTS</u>	<u>8 PTS</u>	<u>5 PTS</u>	<u>8 PTS</u>	<u>5 PTS</u>
CT	1.075	1.074	1.075	1.079	46%	43	48%	100%
FL	1.155	1.120	1.143	1.130	32	71	44	97
HI	0.956	0.962	0.988	0.968	20	37	43	74
KS	1.066	1.024	1.057	1.020	32	33	42	72
NC	1.028	1.022	1.020	1.005	57	44	69	51
SC	1.065	1.044	1.066	1.036	43	50	48	65
TN	1.044	1.030	1.031	1.034	46	40	50	44
TX	1.194	1.194	1.172	1.184	63	52	56	82
VA	1.024	1.005	1.020	1.014	48	55	70	51
WEIGHTED AVERAGE	1.135	1.123	1.122	1.121	50%	53%	52%	81%

	ANNUAL MEDICAL TREND				CREDIBILITIES			
	AY	AY	PY	PY	AY	AY	PY	PY
	<u>8 PTS</u>	<u>5 PTS</u>	<u>8 PTS</u>	<u>5 PTS</u>	<u>8 PTS</u>	<u>5 PTS</u>	<u>8 PTS</u>	<u>5 PTS</u>
CT	1.101	1.104	1.098	1.098	50%	45%	85%	79%
FL	1.078	1.079	1.058	1.072	40	36	37	65
HI	0.971	1.002	1.007	0.980	15	46	25	26
KS	1.085	1.072	1.072	1.048	29	20	45	35
NC	1.036	1.039	1.028	1.014	42	29	57	42
SC	1.057	1.046	1.059	1.030	37	28	42	43
TN	1.094	1.064	1.086	1.054	37	27	43	37
TX	1.206	1.213	1.195	1.194	51	41	69	49
VA	1.067	1.036	1.070	1.036	36	61	38	54
WEIGHTED AVERAGE	1.130	1.130	1.122	1.116	44%	39%	56%	52%

Exhibit 26-5, p. 5 of 6

LINEAR REGRESSION MODEL

Incurred Including IBNR Losses

	CREDIBILITY WEIGHTED INDEMNITY TREND				CREDIBILITY WEIGHTED MEDICAL TREND			
	AY	AY	PY	PY	AY	AY	PY	PY
	<u>8 PTS</u>	<u>5 PTS</u>	<u>8 PTS</u>	<u>5 PTS</u>	<u>8 PTS</u>	<u>5 PTS</u>	<u>8 PTS</u>	<u>5 PTS</u>
CT	1.072	1.092	1.065	1.080	1.083	1.108	1.077	1.095
FL	1.088	1.114	1.075	1.104	1.084	1.114	1.074	1.100
HI	1.035	1.033	1.016	0.993	1.052	0.983	1.044	1.047
KS	1.069	1.086	1.054	1.059	1.078	1.103	1.068	1.085
NC	1.070	1.094	1.050	1.072	1.073	1.103	1.054	1.079
SC	1.067	1.083	1.061	1.077	1.074	1.100	1.070	1.091
TN	1.069	1.089	1.053	1.072	1.082	1.106	1.070	1.085
TX	1.088	1.113	1.076	1.103	1.091	1.120	1.083	1.107
VA	1.031	1.049	1.026	1.048	1.065	1.079	1.058	1.069
WEIGHTED AVERAGE	1.079	1.102	1.067	1.090	1.084	1.110	1.075	1.097
"CW"	1.085	1.107	1.072	1.097	1.086	1.114	1.078	1.100

Paid to an 8th Losses

	CREDIBILITY WEIGHTED INDEMNITY TREND				CREDIBILITY WEIGHTED MEDICAL TREND			
	AY	AY	PY	PY	AY	AY	PY	PY
	<u>8 PTS</u>	<u>5 PTS</u>	<u>8 PTS</u>	<u>5 PTS</u>	<u>8 PTS</u>	<u>5 PTS</u>	<u>8 PTS</u>	<u>5 PTS</u>
CT	1.068	1.077	1.063	1.062	1.076	1.087	1.068	1.074
FL	1.084	1.088	1.076	1.088	1.071	1.083	1.063	1.067
HI	1.053	1.039	1.035	0.999	1.063	1.052	1.057	1.054
KS	1.069	1.066	1.057	1.037	1.074	1.087	1.064	1.067
NC	1.048	1.059	1.033	1.044	1.060	1.076	1.044	1.054
SC	1.065	1.063	1.059	1.048	1.067	1.078	1.060	1.057
TN	1.061	1.064	1.049	1.059	1.074	1.082	1.067	1.068
TX	1.086	1.099	1.077	1.096	1.086	1.102	1.080	1.092
VA	1.051	1.042	1.033	1.048	1.068	1.058	1.063	1.056
WEIGHTED AVERAGE	1.077	1.084	1.067	1.078	1.077	1.089	1.070	1.076
"CW"	1.080	1.087	1.071	1.082	1.080	1.092	1.073	1.080

EXPONENTIAL REGRESSION MODEL

Incurred Including IBNR Losses

	CREDIBILITY WEIGHTED INDEMNITY TREND				CREDIBILITY WEIGHTED MEDICAL TREND			
	AY	AY	PY	PY	AY	AY	PY	PY
	<u>8 PTS</u>	<u>5 PTS</u>	<u>8 PTS</u>	<u>5 PTS</u>	<u>8 PTS</u>	<u>5 PTS</u>	<u>8 PTS</u>	<u>5 PTS</u>
CT	1.100	1.124	1.092	1.109	1.130	1.153	1.121	1.138
FL	1.148	1.176	1.120	1.173	1.134	1.167	1.117	1.147
HI	1.079	1.068	1.041	1.023	1.102	0.994	1.081	1.080
KS	1.106	1.116	1.079	1.076	1.124	1.146	1.106	1.120
NC	1.102	1.128	1.064	1.099	1.113	1.145	1.079	1.111
SC	1.100	1.109	1.087	1.106	1.111	1.141	1.107	1.129
TN	1.101	1.121	1.074	1.101	1.128	1.149	1.111	1.119
TX	1.151	1.171	1.125	1.166	1.164	1.192	1.160	1.175
VA	1.043	1.066	1.029	1.065	1.102	1.109	1.089	1.092
WEIGHTED AVERAGE	1.130	1.152	1.105	1.142	1.141	1.166	1.130	1.148
"CW"	1.134	1.152	1.108	1.143	1.141	1.166	1.129	1.147

Paid to an 8th Losses

	CREDIBILITY WEIGHTED INDEMNITY TREND				CREDIBILITY WEIGHTED MEDICAL TREND			
	AY	AY	PY	PY	AY	AY	PY	PY
	<u>8 PTS</u>	<u>5 PTS</u>	<u>8 PTS</u>	<u>5 PTS</u>	<u>8 PTS</u>	<u>5 PTS</u>	<u>8 PTS</u>	<u>5 PTS</u>
CT	1.104	1.097	1.094	1.079	1.113	1.114	1.101	1.101
FL	1.137	1.119	1.125	1.130	1.106	1.107	1.096	1.086
HI	1.094	1.058	1.058	1.006	1.102	1.067	1.091	1.078
KS	1.109	1.085	1.088	1.047	1.113	1.113	1.098	1.090
NC	1.071	1.074	1.048	1.059	1.088	1.099	1.067	1.071
SC	1.101	1.080	1.089	1.064	1.100	1.101	1.094	1.077
TN	1.090	1.081	1.071	1.079	1.114	1.107	1.105	1.091
TX	1.170	1.156	1.145	1.172	1.166	1.160	1.171	1.152
VA	1.079	1.055	1.047	1.063	1.104	1.070	1.100	1.071
WEIGHTED AVERAGE	1.136	1.122	1.116	1.126	1.132	1.127	1.129	1.114
"CW"	1.129	1.115	1.111	1.115	1.125	1.123	1.119	1.112

TEST STATISTICS BY STATE – LINEAR VS. EXPONENTIAL
39 State Sample

		Indemnity		Medical	
		Exponential	Linear	Exponential	Linear
CT	Sample Bias	0.126	0.048	0.068	0.017
	Squared Error	0.018	0.003	0.006	0.001
	Absolute Error	0.126	0.048	0.068	0.019
FL	Sample Bias	-0.052	-0.078	-0.061	-0.066
	Squared Error	0.003	0.006	0.004	0.005
	Absolute Error	0.052	0.078	0.061	0.066
IL	Sample Bias	0.020	0.009	-0.005	-0.012
	Squared Error	0.000	0.000	0.000	0.000
	Absolute Error	0.020	0.009	0.005	0.013
LA	Sample Bias	0.267	0.148	0.127	0.044
	Squared Error	0.087	0.026	0.020	0.003
	Absolute Error	0.267	0.148	0.126	0.044
MI	Sample Bias	-0.061	-0.066	-0.034	-0.034
	Squared Error	0.004	0.005	0.001	0.001
	Absolute Error	0.061	0.066	0.034	0.034
NC	Sample Bias	-0.055	-0.059	-0.060	-0.062
	Squared Error	0.004	0.004	0.004	0.004
	Absolute Error	0.055	0.059	0.060	0.062
ORPC	Sample Bias	-0.010	-0.010	0.019	0.009
	Squared Error	0.003	0.004	0.002	0.001
	Absolute Error	0.051	0.052	0.042	0.034
ORSF	Sample Bias	0.283	0.229	0.288	0.185
	Squared Error	0.086	0.055	0.089	0.036
	Absolute Error	0.283	0.229	0.288	0.185
WI	Sample Bias	0.047	0.045	0.011	-0.002
	Squared Error	0.002	0.002	0.000	0.000
	Absolute Error	0.047	0.046	0.013	0.006

Notes: 1. ORPC and ORSF are Oregon Private Companies and State Fund, respectively.
2. Differences are expressed in loss ratio points.

TEST STATISTICS BY STATE – LINEAR VS. EXPONENTIAL
39 State Sample

		Indemnity		Medical	
		Exponential	Linear	Exponential	Linear
AL	Sample Bias	0.024	-0.001	0.004	-0.041
	Squared Error	0.001	0.000	0.001	0.003
	Absolute Error	0.024	0.013	0.032	0.051
AK	Sample Bias	0.046	0.038	0.024	0.015
	Squared Error	0.003	0.003	0.001	0.001
	Absolute Error	0.046	0.042	0.032	0.024
AZPC	Sample Bias	-0.007	-0.009	0.010	0.006
	Squared Error	0.000	0.000	0.000	0.000
	Absolute Error	0.008	0.009	0.010	0.008
AZSF	Sample Bias	-0.074	-0.074	-0.062	-0.063
	Squared Error	0.006	0.006	0.004	0.005
	Absolute Error	0.073	0.074	0.062	0.063
AR	Sample Bias	-0.037	-0.039	-0.074	-0.082
	Squared Error	0.002	0.002	0.006	0.007
	Absolute Error	0.037	0.039	0.074	0.082
COPC	Sample Bias	0.009	-0.032	0.029	0.006
	Squared Error	0.000	0.001	0.001	0.000
	Absolute Error	0.011	0.032	0.029	0.006
DC	Sample Bias	-0.045	-0.067	-0.014	-0.016
	Squared Error	0.002	0.005	0.000	0.000
	Absolute Error	0.045	0.067	0.014	0.016
HI	Sample Bias	-0.063	-0.066	-0.061	-0.064
	Squared Error	0.005	0.005	0.004	0.004
	Absolute Error	0.063	0.066	0.061	0.063
ID	Sample Bias	0.018	0.012	-0.005	-0.020
	Squared Error	0.001	0.000	0.000	0.001
	Absolute Error	0.026	0.021	0.011	0.020

Notes: 1. AZPC and AZSF are Arizona Private Companies and State Fund, respectively.
2. COPC is Colorado Private Companies.
3. Differences are expressed in loss ratio points.

TEST STATISTICS BY STATE – LINEAR VS. EXPONENTIAL
39 State Sample

		Indemnity		Medical	
		Exponential	Linear	Exponential	Linear
IN	Sample Bias	-0.017	-0.018	-0.038	-0.045
	Squared Error	0.000	0.000	0.002	0.002
	Absolute Error	0.017	0.018	0.038	0.045
IA	Sample Bias	0.002	-0.004	-0.020	-0.032
	Squared Error	0.000	0.000	0.000	0.001
	Absolute Error	0.014	0.011	0.020	0.032
KS	Sample Bias	-0.024	-0.035	-0.068	-0.074
	Squared Error	0.002	0.002	0.005	0.006
	Absolute Error	0.037	0.041	0.068	0.075
KYVO	Sample Bias	-0.092	-0.093	-0.066	-0.084
	Squared Error	0.010	0.010	0.006	0.009
	Absolute Error	0.092	0.093	0.067	0.084
ME	Sample Bias	0.073	0.055	0.002	-0.012
	Squared Error	0.006	0.003	0.001	0.001
	Absolute Error	0.072	0.055	0.035	0.031
MD	Sample Bias	0.021	0.020	-0.016	-0.016
	Squared Error	0.001	0.001	0.000	0.000
	Absolute Error	0.021	0.020	0.016	0.016
MS	Sample Bias	0.037	0.025	0.008	-0.021
	Squared Error	0.001	0.001	0.002	0.002
	Absolute Error	0.037	0.025	0.036	0.043
MO	Sample Bias	0.012	-0.009	-0.021	-0.036
	Squared Error	0.000	0.000	0.000	0.001
	Absolute Error	0.012	0.009	0.021	0.036
MT	Sample Bias	0.074	0.059	0.041	0.022
	Squared Error	0.007	0.004	0.002	0.000
	Absolute Error	0.074	0.059	0.041	0.022

Notes: 1. KYVO is Kentucky Voluntary.
2. Differences are expressed in loss ratio points.

TEST STATISTICS BY STATE – LINEAR VS. EXPONENTIAL
39 State Sample

		Indemnity		Medical	
		Exponential	Linear	Exponential	Linear
NE	Sample Bias	0.006	-0.007	-0.021	-0.032
	Squared Error	0.001	0.000	0.001	0.001
	Absolute Error	0.018	0.019	0.021	0.032
NH	Sample Bias	0.028	0.003	-0.001	-0.019
	Squared Error	0.005	0.003	0.002	0.001
	Absolute Error	0.072	0.053	0.038	0.028
NM	Sample Bias	0.042	-0.028	0.012	-0.053
	Squared Error	0.009	0.007	0.002	0.005
	Absolute Error	0.084	0.082	0.039	0.066
OKPC	Sample Bias	-0.034	-0.042	-0.015	-0.028
	Squared Error	0.006	0.006	0.003	0.003
	Absolute Error	0.061	0.063	0.041	0.042
RI	Sample Bias	-0.048	-0.105	-0.016	-0.027
	Squared Error	0.008	0.016	0.001	0.001
	Absolute Error	0.090	0.105	0.024	0.026
SC	Sample Bias	0.045	0.022	-0.011	-0.023
	Squared Error	0.003	0.001	0.000	0.001
	Absolute Error	0.049	0.034	0.018	0.023
SD	Sample Bias	0.006	-0.007	0.023	-0.003
	Squared Error	0.000	0.000	0.001	0.000
	Absolute Error	0.011	0.008	0.025	0.018
TN	Sample Bias	-0.047	-0.053	-0.034	-0.049
	Squared Error	0.003	0.003	0.002	0.003
	Absolute Error	0.047	0.053	0.034	0.049
TX	Sample Bias	-0.027	-0.073	-0.051	-0.096
	Squared Error	0.001	0.006	0.003	0.010
	Absolute Error	0.027	0.073	0.051	0.096

Notes: 1. OKPC is Oklahoma Private Companies.
2. Differences are expressed in loss ratio points.

TEST STATISTICS BY STATE – LINEAR VS. EXPONENTIAL
39 State Sample

		Indemnity		Medical	
		Exponential	Linear	Exponential	Linear
UTPC	Sample Bias	-0.055	-0.058	-0.156	-0.156
	Squared Error	0.005	0.006	0.028	0.028
	Absolute Error	0.060	0.061	0.155	0.156
VT	Sample Bias	0.046	0.020	-0.032	-0.038
	Squared Error	0.002	0.000	0.001	0.002
	Absolute Error	0.046	0.021	0.032	0.037
VA	Sample Bias	0.000	-0.001	-0.009	-0.016
	Squared Error	0.000	0.000	0.000	0.000
	Absolute Error	0.004	0.003	0.009	0.015

Notes: 1. UTPC is Utah Private Companies.
2. Differences are expressed in loss ratio points.

POLICY YEAR 1988 ON-LEVEL EARNED PREMIUM
39 State Sample

State	Premium
Alabama	\$402,358,355
Alaska	170,491,922
Arizona PC	308,073,161
Arizona SF	296,684,017
Arkansas	249,335,554
Colorado PC	373,451,844
Connecticut	762,523,387
Dist. of Col.	145,479,235
Florida	2,206,988,222
Hawaii	223,872,191
Idaho	127,610,369
Illinois	1,799,951,784
Indiana	484,451,497
Iowa	311,467,257
Kansas	282,295,060
Kentucky	203,018,829
Louisiana	363,708,173
Maine	339,380,765
Maryland	315,012,599
Michigan	1,331,259,280
Mississippi	248,218,929
Missouri	596,963,848
Montana	54,756,987
Nebraska	174,091,734
New Hampshire	266,528,425
New Mexico	147,313,751
North Carolina	512,532,687
Oklahoma PC	256,680,996
Oregon PC	351,193,196
Oregon SF	283,263,312
Rhode Island	213,799,317
South Carolina	276,223,886
South Dakota	76,769,188
Tennessee	578,050,595
Texas	3,681,834,211
Utah PC	49,390,237
Vermont	91,022,702
Virginia	558,443,768
Wisconsin	755,361,895
Total	\$19,869,853,165

TEST STATISTICS BY STATE – LINEAR VS. EXPONENTIAL
Three State Sample

		Indemnity		Medical	
		Exponential	Linear	Exponential	Linear
CT	Bias	-0.025	-0.028	-0.004	-0.012
	Squared Error	0.004	0.004	0.000	0.000
	Absolute Error	0.056	0.054	0.011	0.012
LA	Bias	0.029	-0.032	0.027	-0.028
	Squared Error	0.060	0.030	0.012	0.005
	Absolute Error	0.203	0.148	0.087	0.055
WI	Bias	0.005	0.004	-0.002	-0.009
	Squared Error	0.001	0.001	0.000	0.000
	Absolute Error	0.027	0.026	0.010	0.011

Note: 1. Differences are expressed in loss ratio points.

COMPARISON OF LOSS RATIO PROJECTIONS

Annual Trend Assumptions:

	<u>M&R</u>	<u>NCCI</u>
(A) Texas Indicated Trend:	0.099	0.099
(B) Countrywide Fee Trend ¹ :	0.044	0.004
(C) Countrywide Non-Fee Trend:	0.077	0.077
(D) Texas Loss Ratio at 1/89	0.371	0.371
(E) Countrywide Fee Loss Ratio at 1/92 (D) x [1 + 3(B)]	0.420	0.375
(F) Texas Non-Fee Loss Ratio at 1/92 (D) x [1 + 3(A)]	0.481	0.481
(G) Countrywide Non-Fee Loss Ratio at 1/92 (D) x [1 + 3(C)]	0.457	0.457
(H) Texas Fee Loss Ratio at 1/92 (E) x (F)/(G)	0.442	0.395

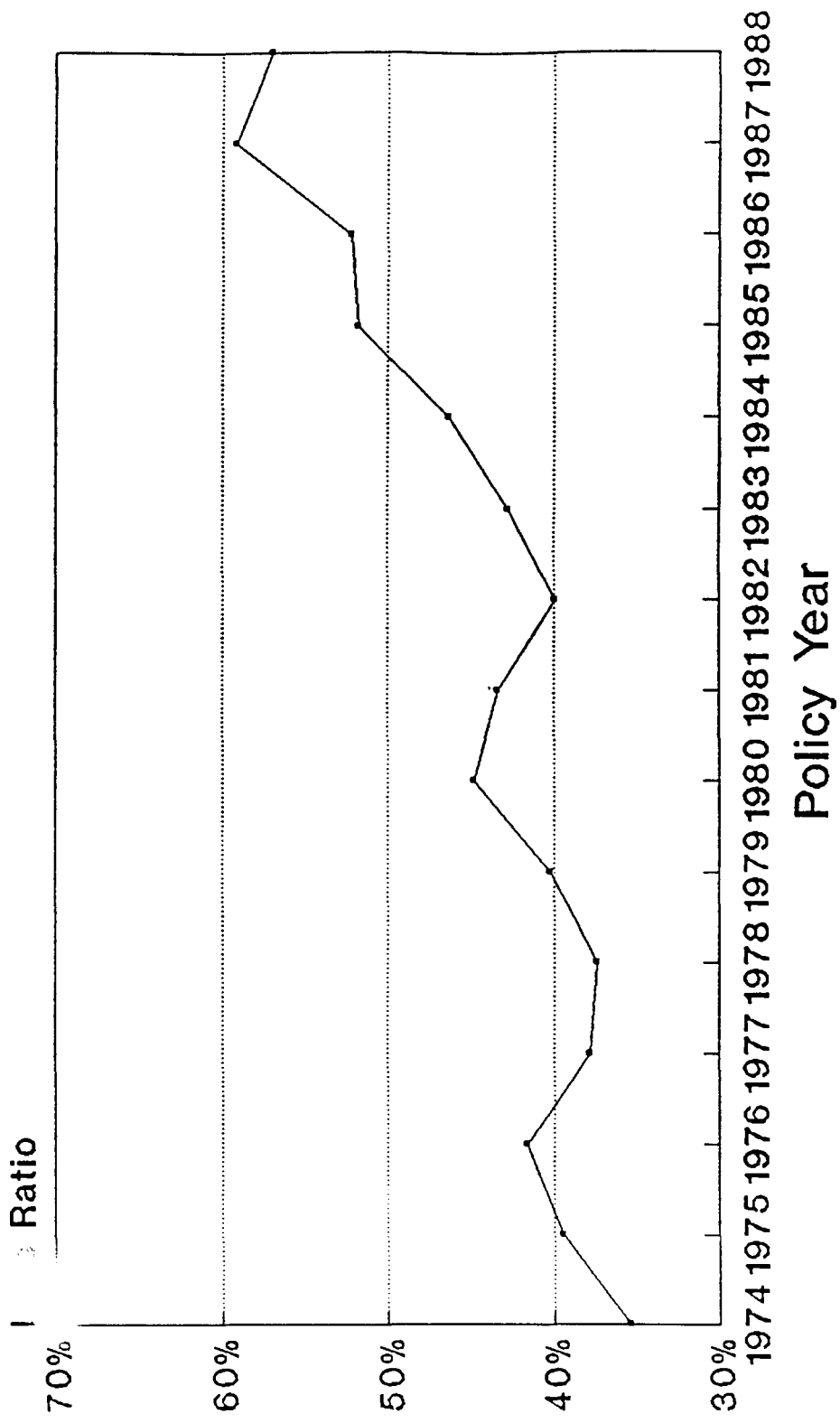
¹In M&R column, "pure" fee trend is shown, whereas in NCCI column, "effective" fee trend is shown.

LOCATION OF BEND IN LINE

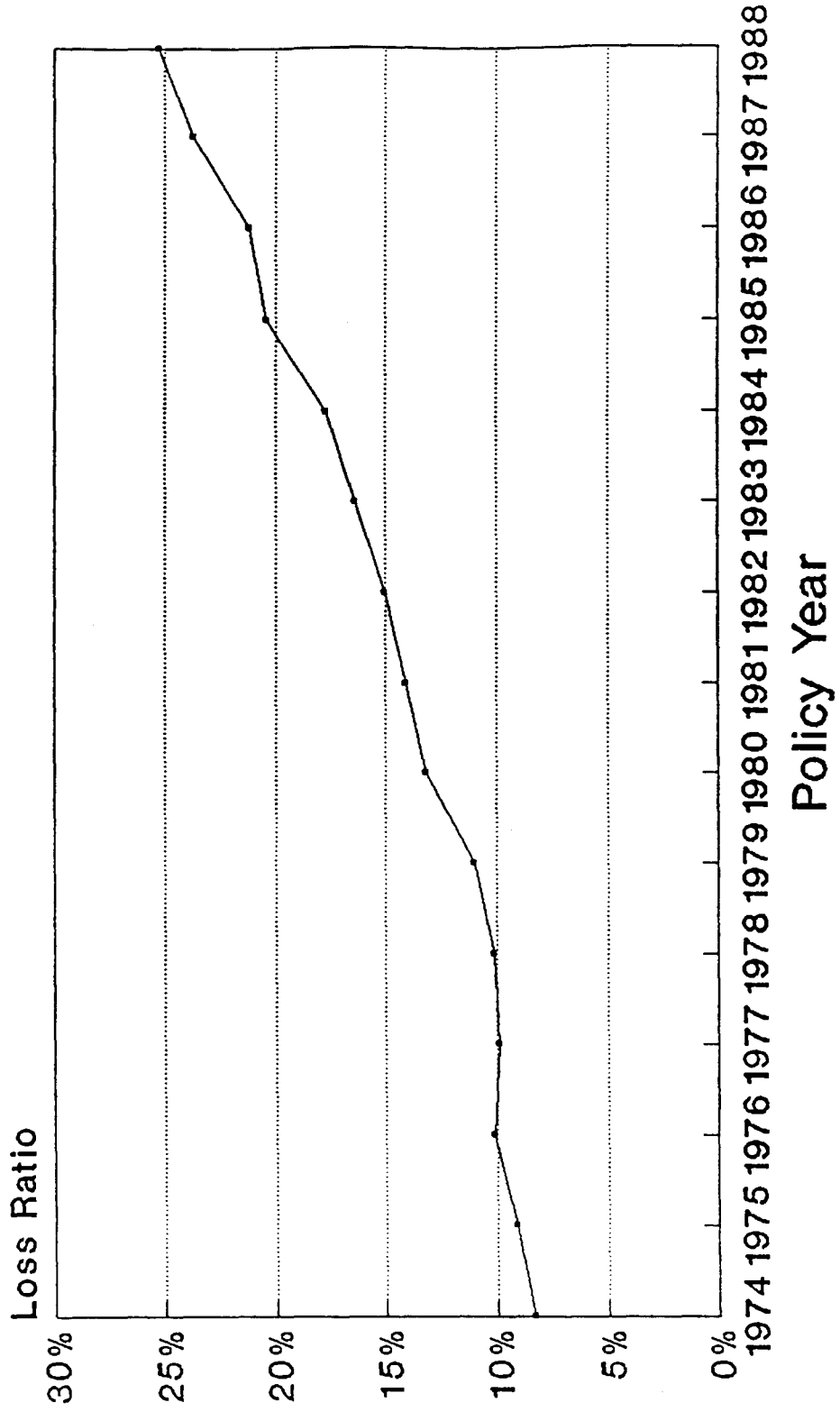
Annual Trend Assumptions:

(A) State X Indicated Trend	0.085
(B) Countrywide Pure Fee Trend	0.044
(C) Countrywide Non-Fee Trend	0.077
(D) State X Loss Ratio at 1/89	0.400
(E) Countrywide Fee Loss Ratio at 1/92 (D) x [1 + 3(B)]	0.453
(F) State X Non-Fee Loss Ratio at 1/92 (D) x [1 + 3(A)]	0.502
(G) Countrywide Non-Fee Loss Ratio at 1/92 (D) x [1 + 3(C)]	0.492
(H) State X Fee Loss Ratio at 1/92 (E) x (F)/(G)	0.462
(I) Indicated Annual Trend [(H)/(D) - 1]/3	0.052
(J) Adjusted State X Fee Loss Ratio at 1/92 [1.5(I) + 1.5(A) + 1] x (D)	0.482

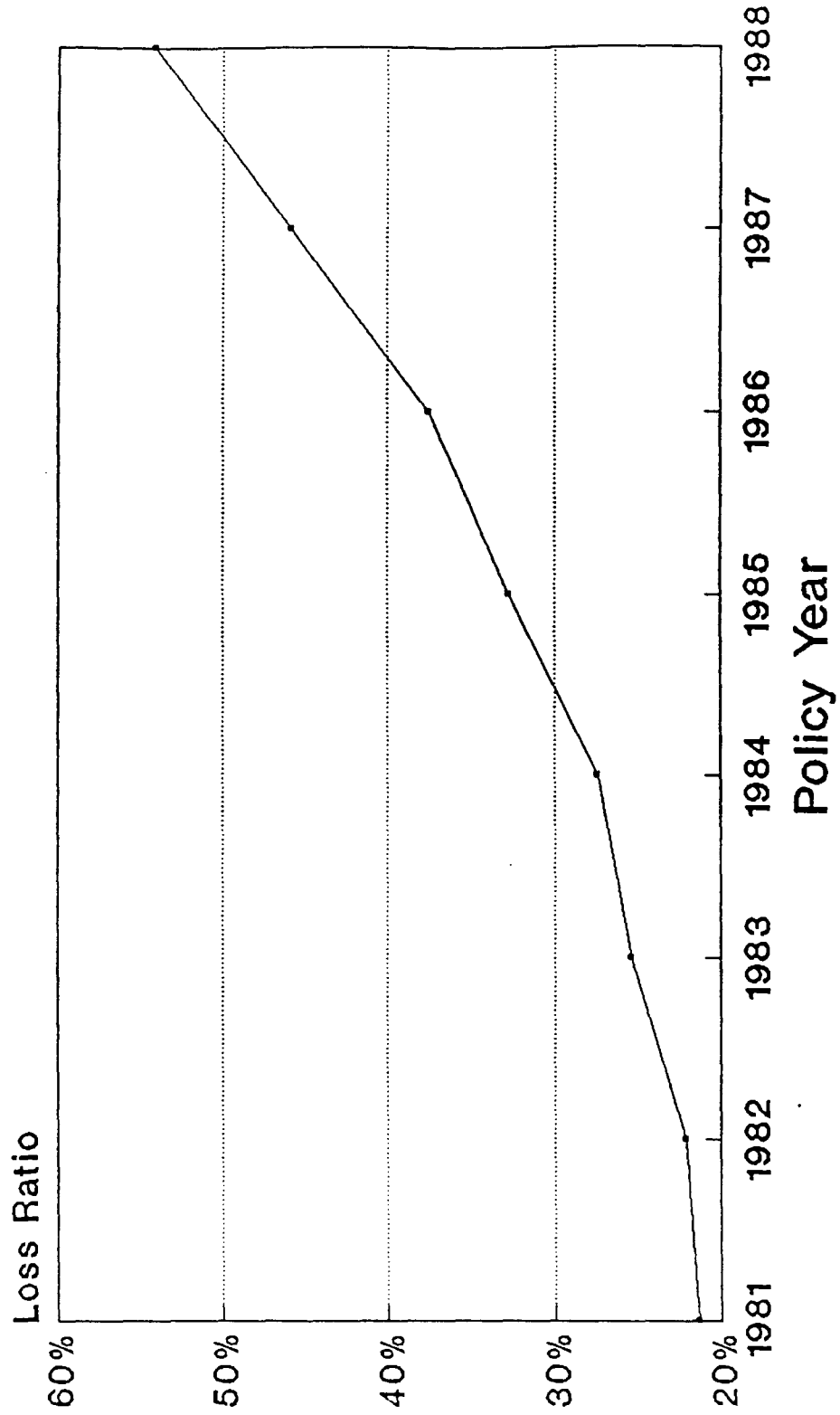
Connecticut On-Level Indemnity Loss Ratios



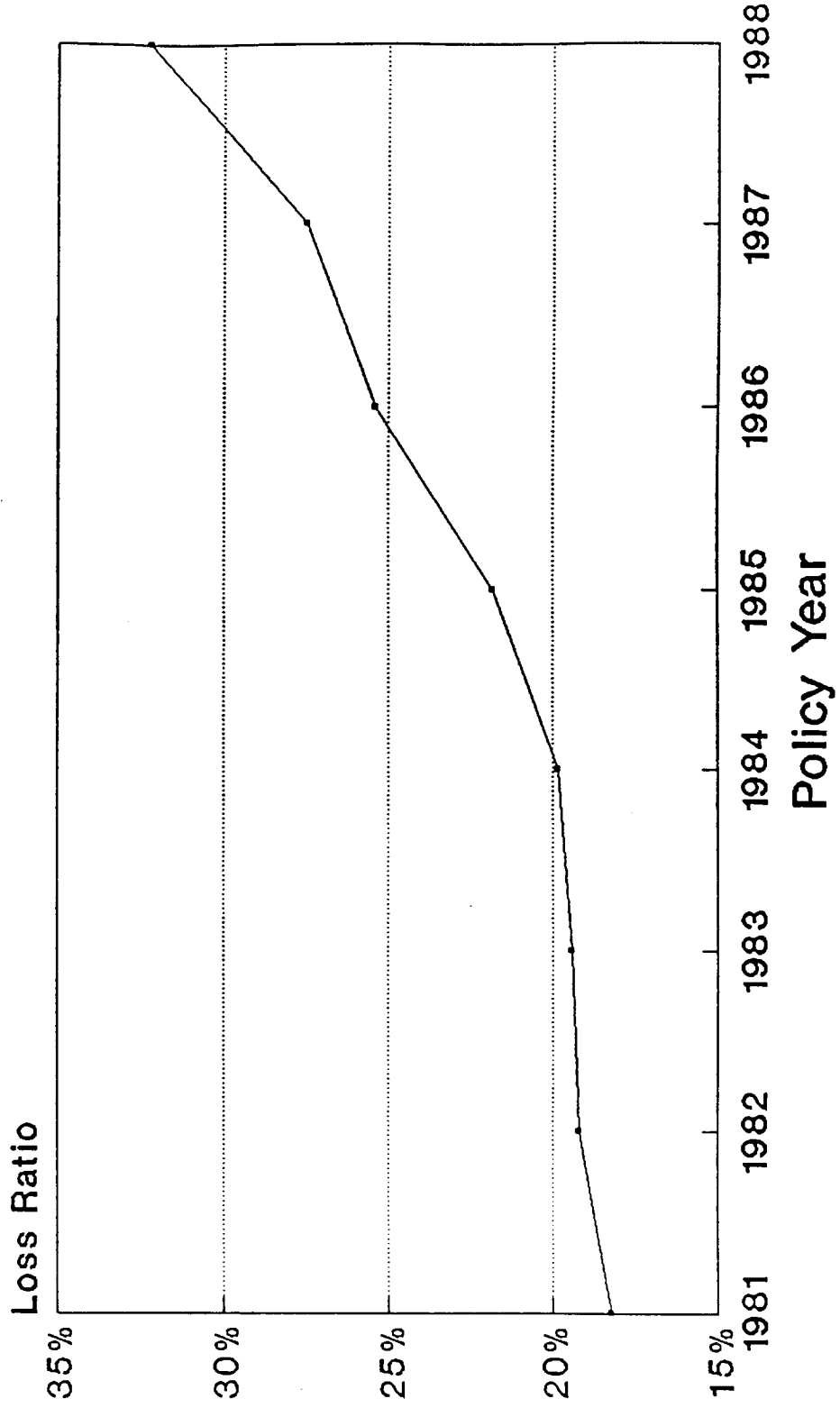
Connecticut On-Level Medical Loss Ratios



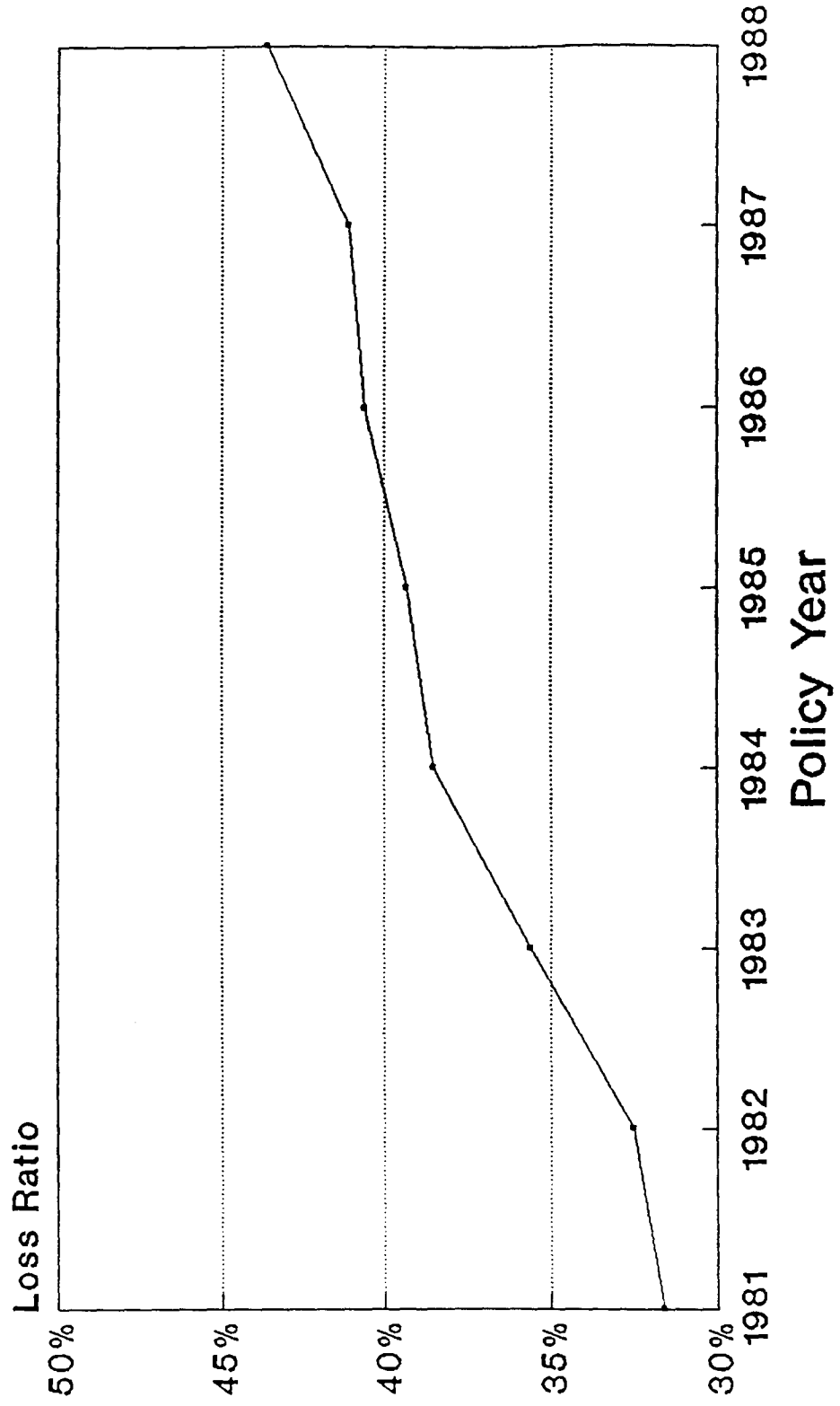
Florida On-Level Indemnity Loss Ratios



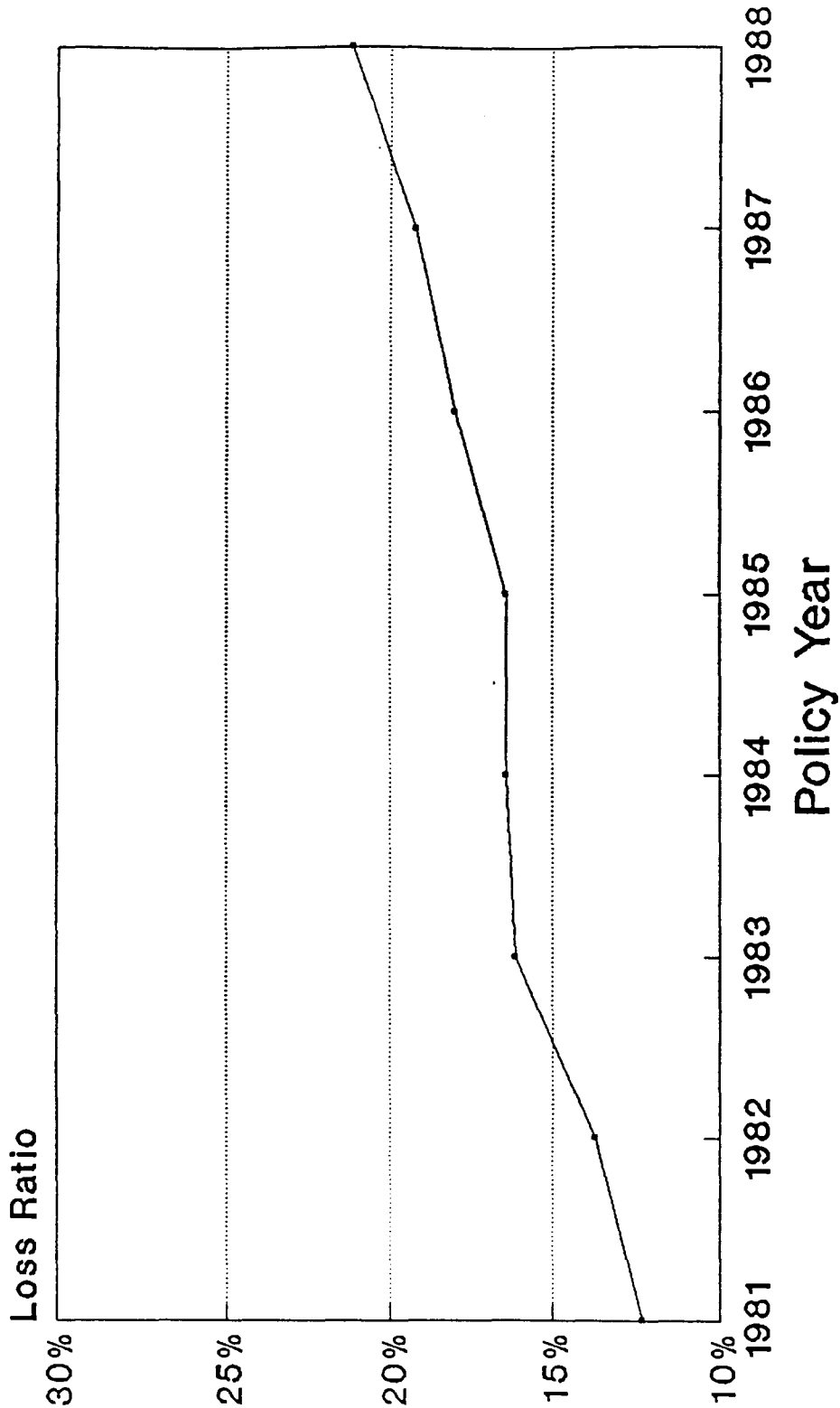
Florida On-Level Medical Loss Ratios



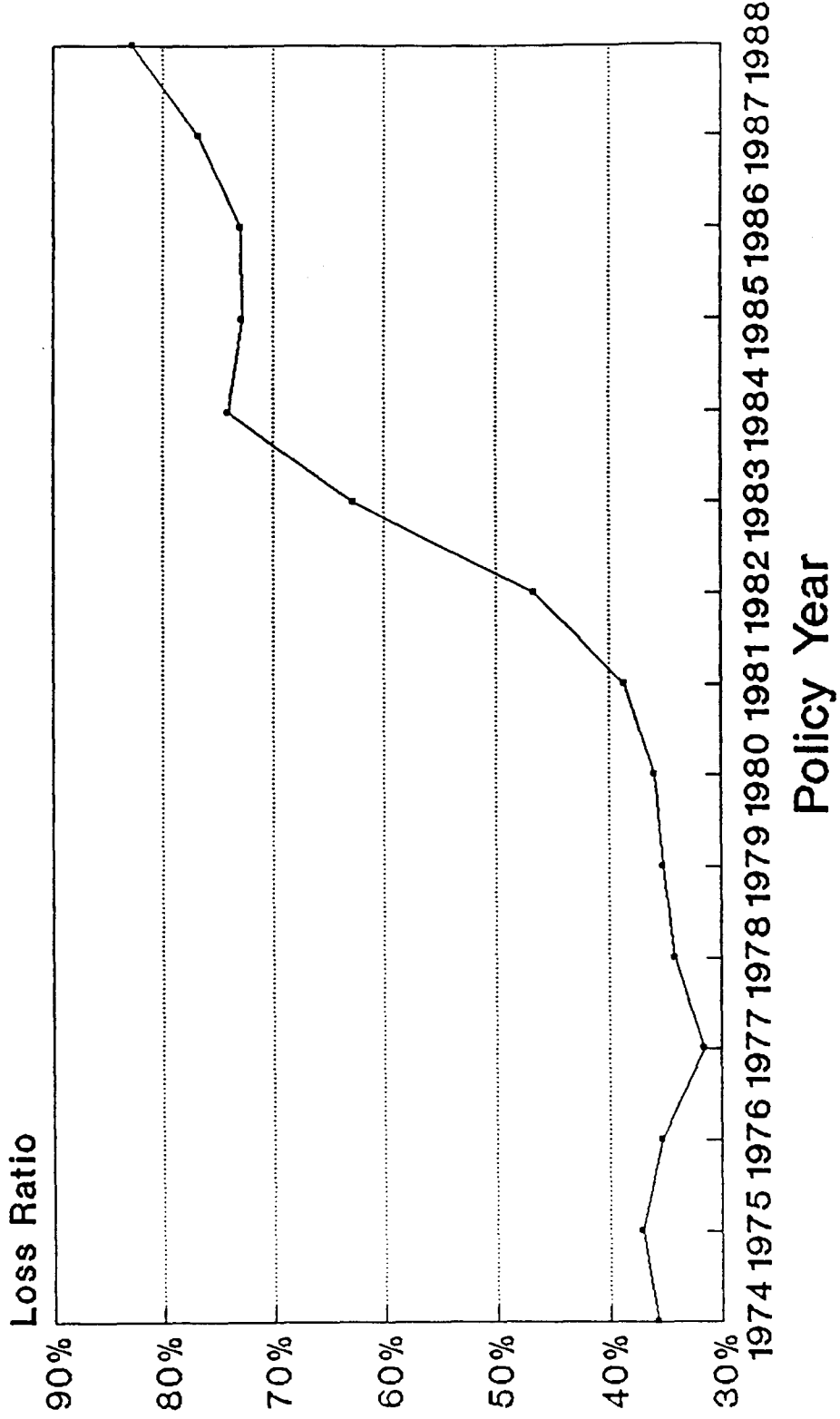
Illinois On-Level Indemnity Loss Ratios



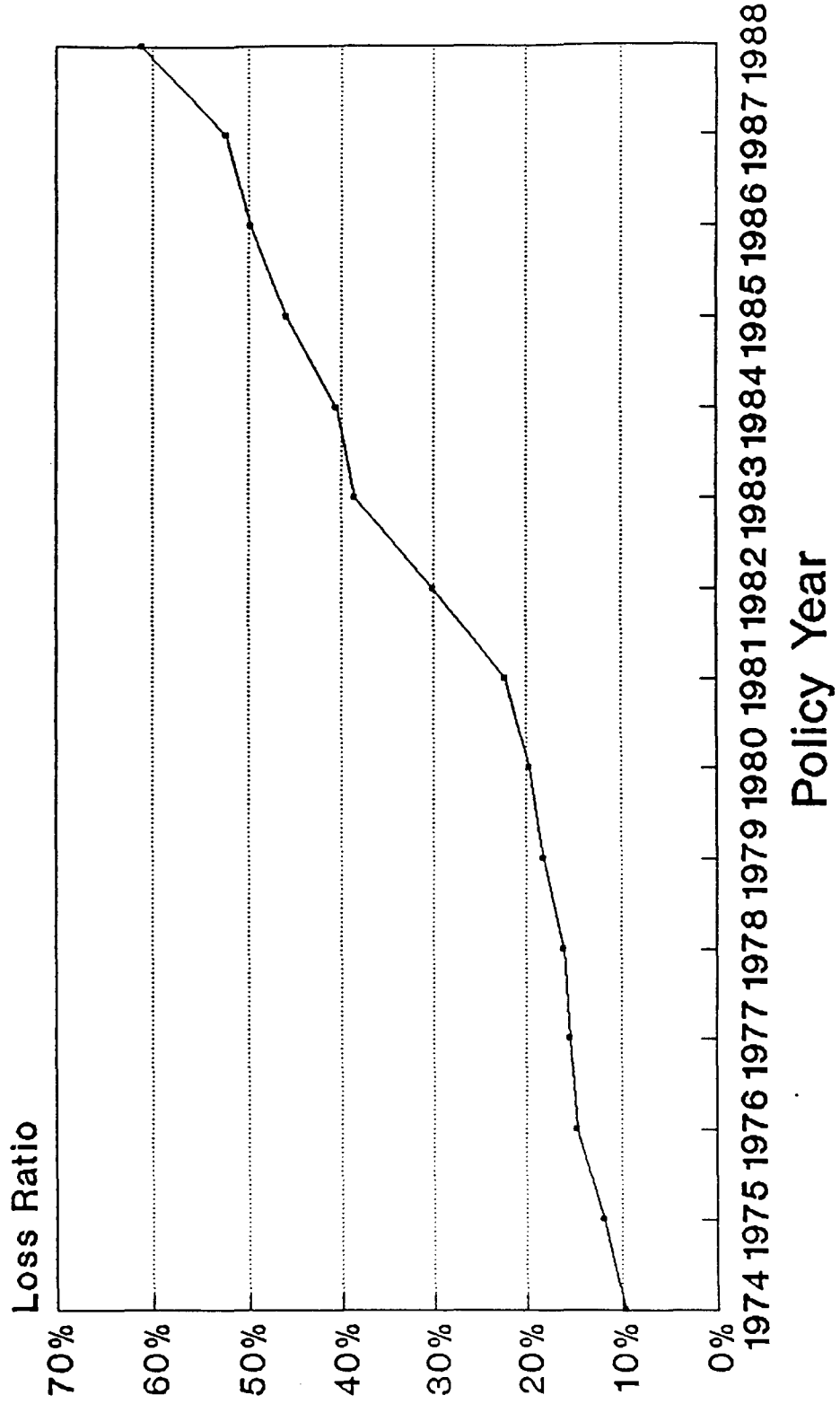
Illinois On-Level Medical Loss Ratios



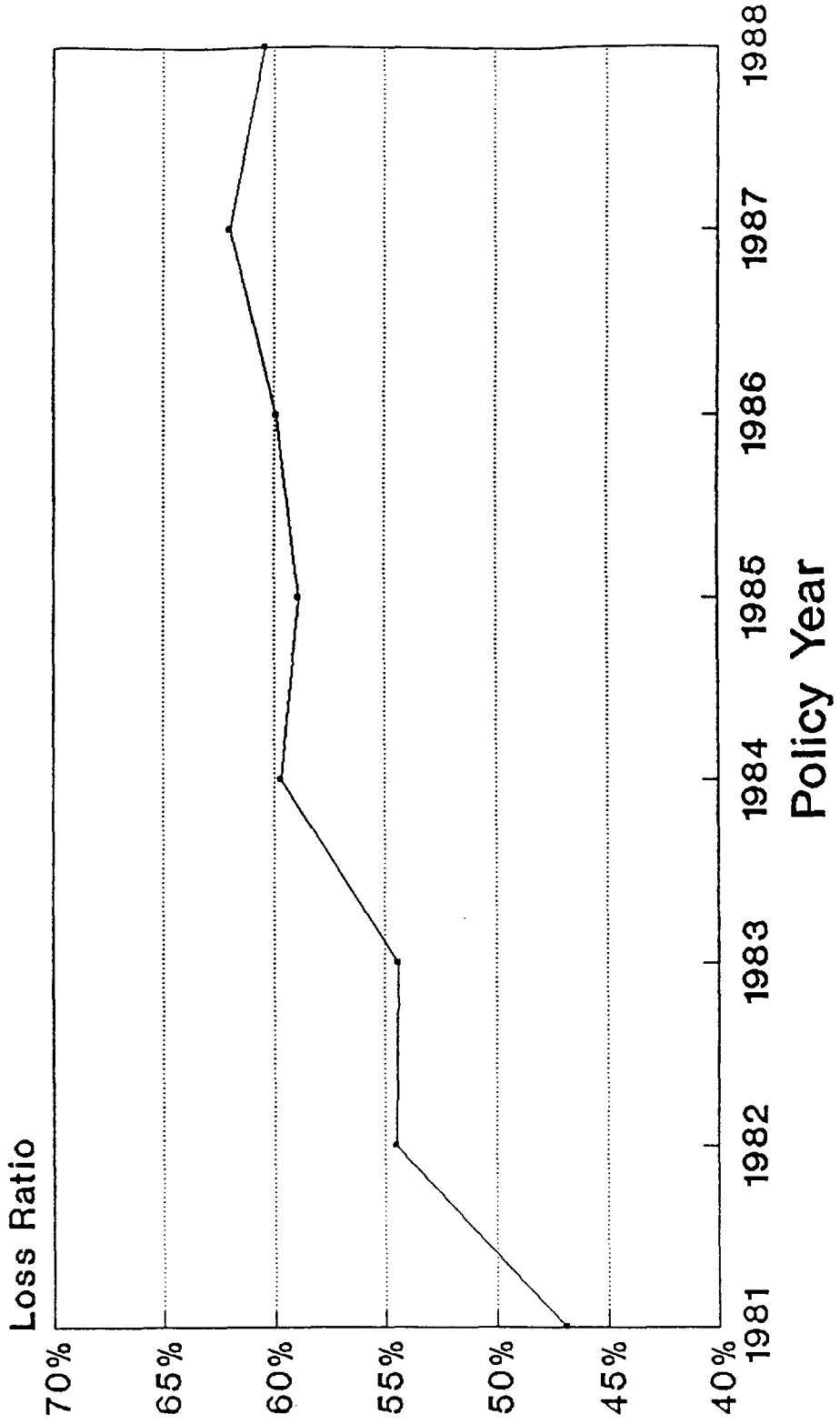
Louisiana On-Level Indemnity Loss Ratios



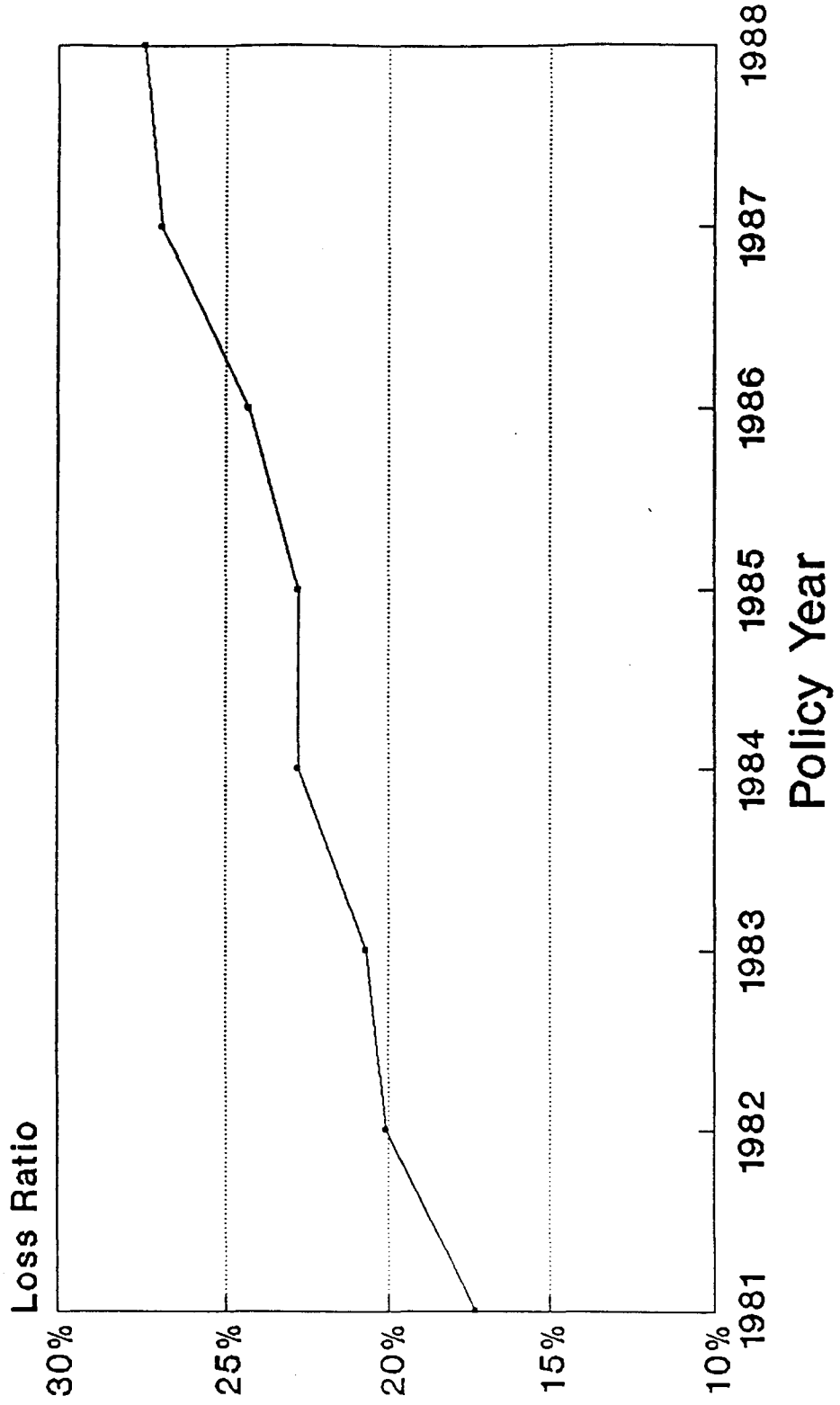
Louisiana On-Level Medical Loss Ratios



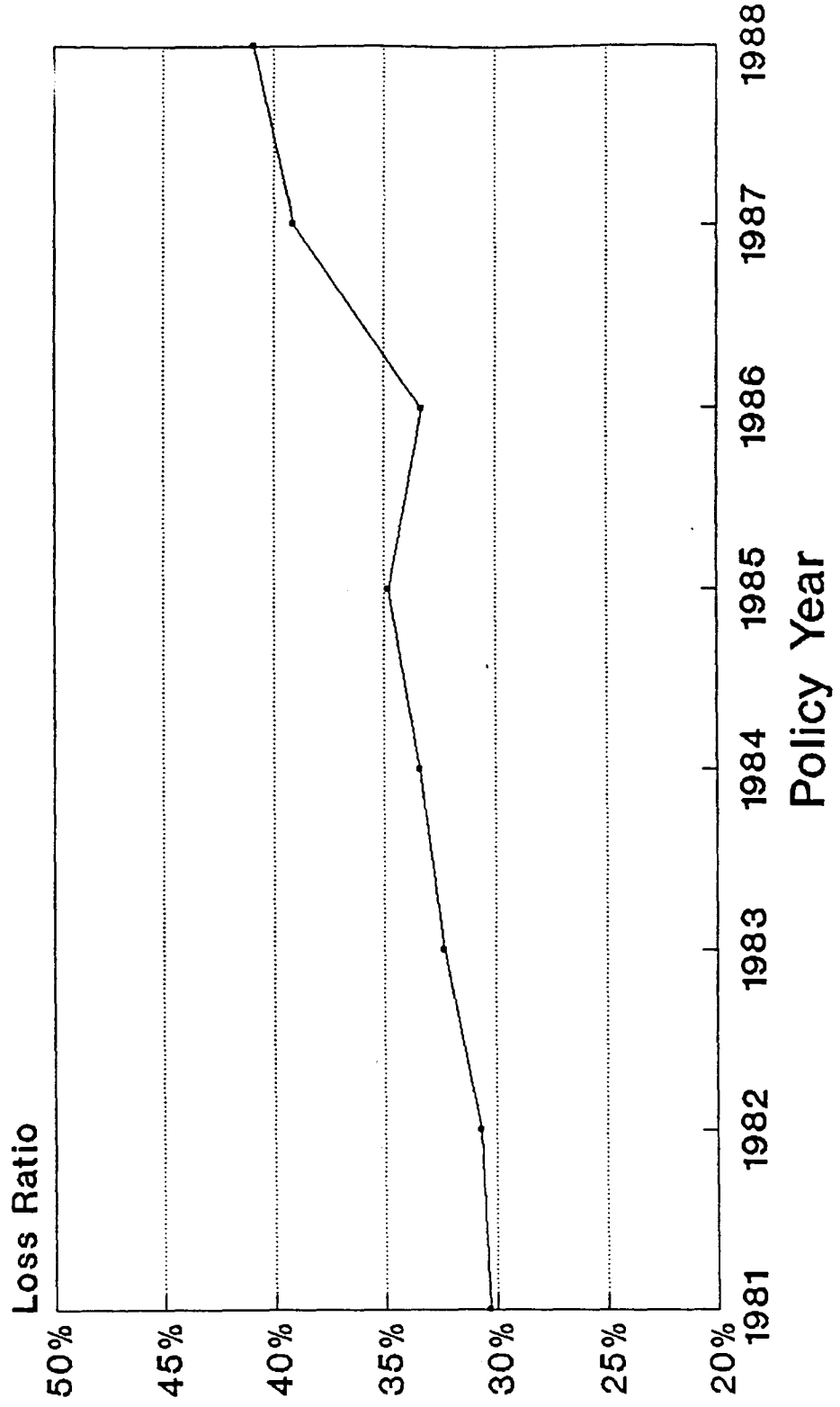
Michigan On-Level Indemnity Loss Ratios



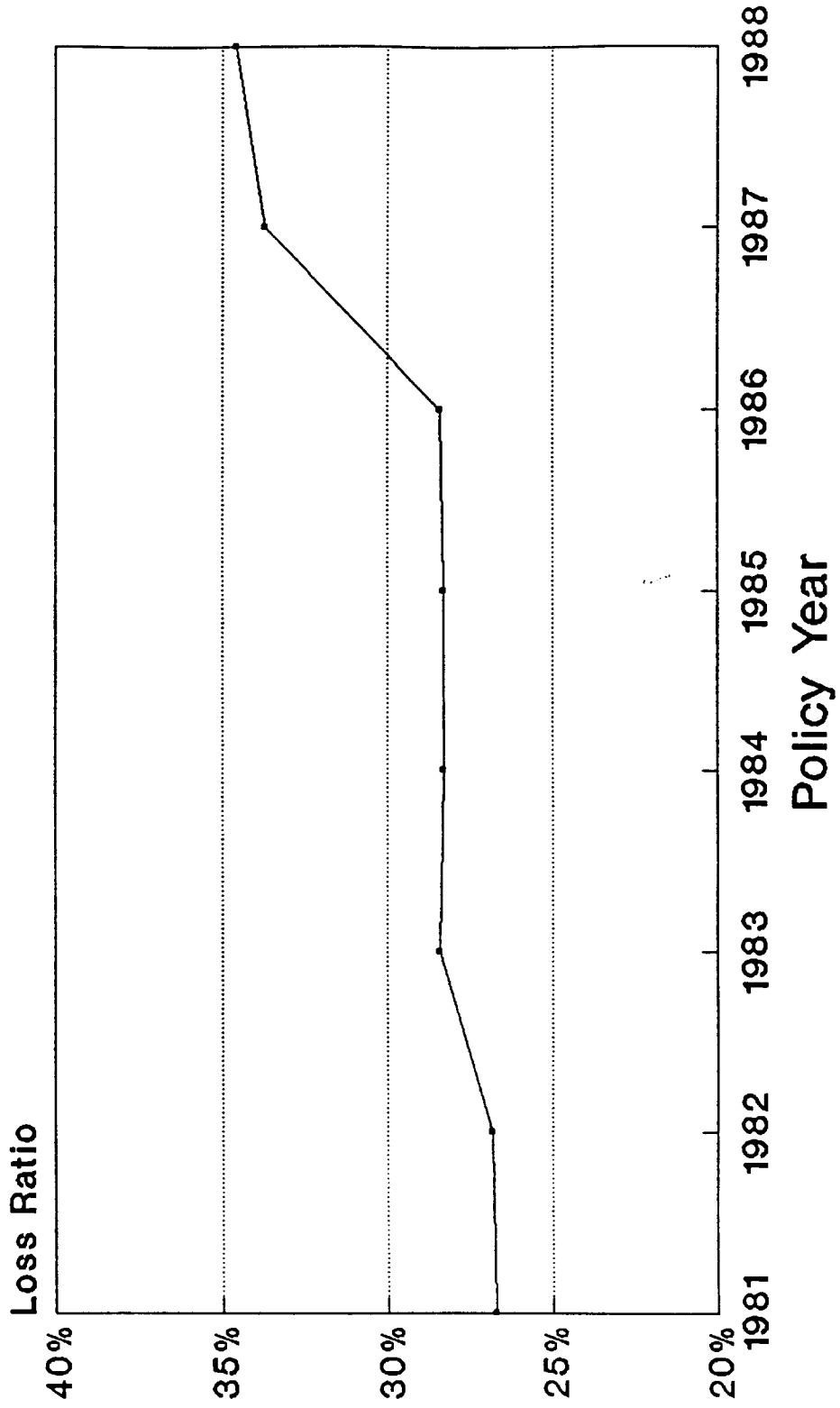
Michigan On-Level Medical Loss Ratios



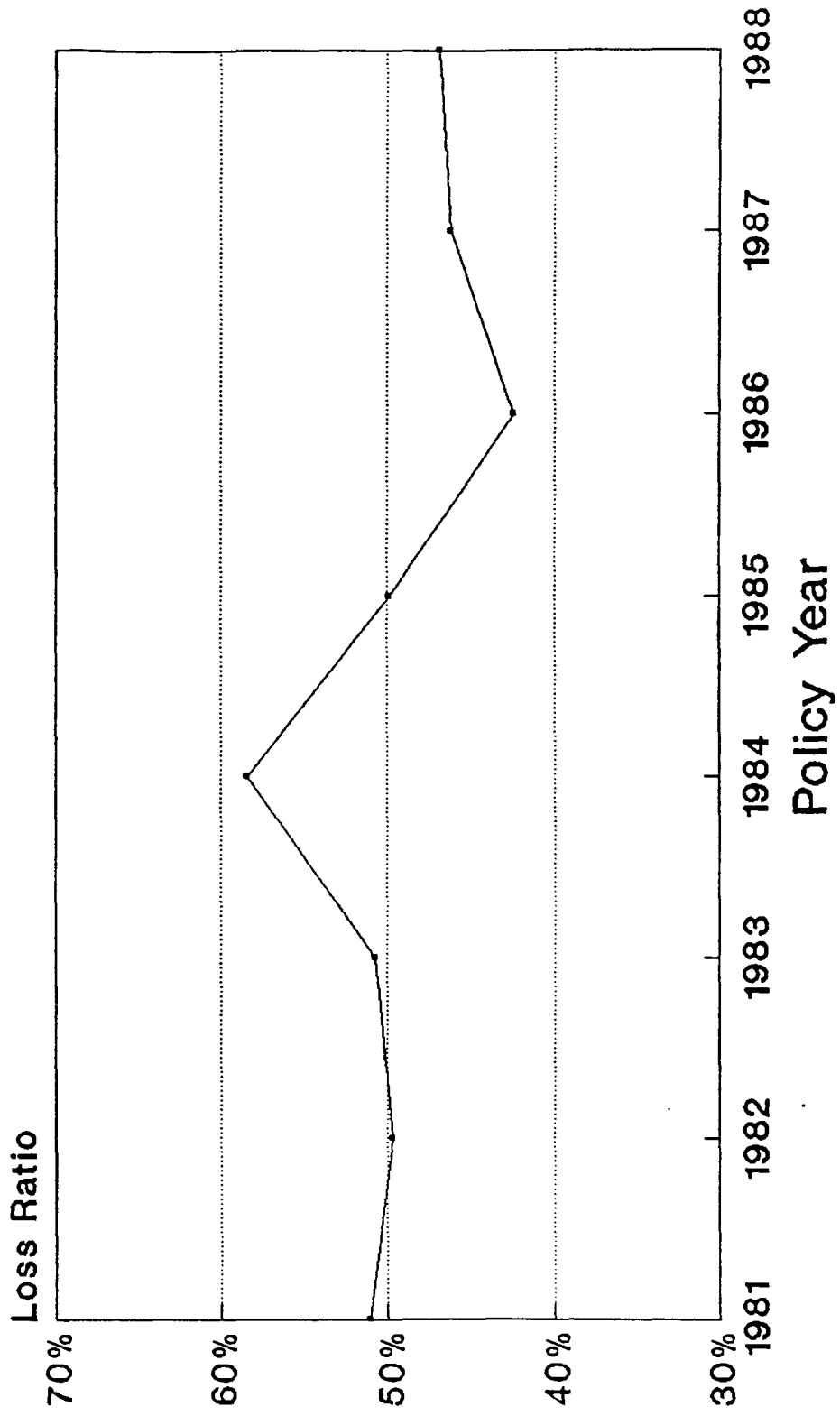
North Carolina On-Level Indemnity Loss Ratios



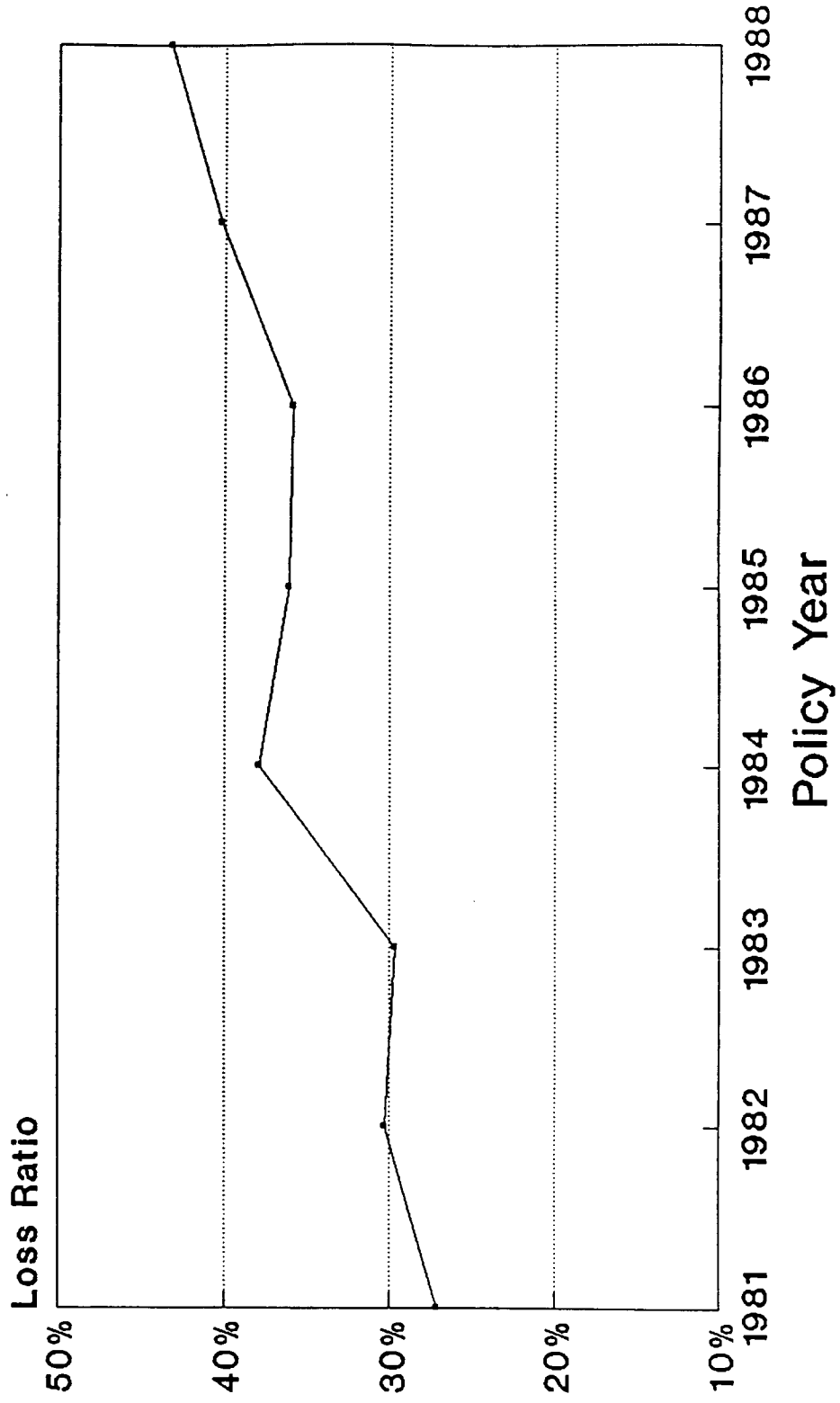
North Carolina On-Level Medical Loss Ratios



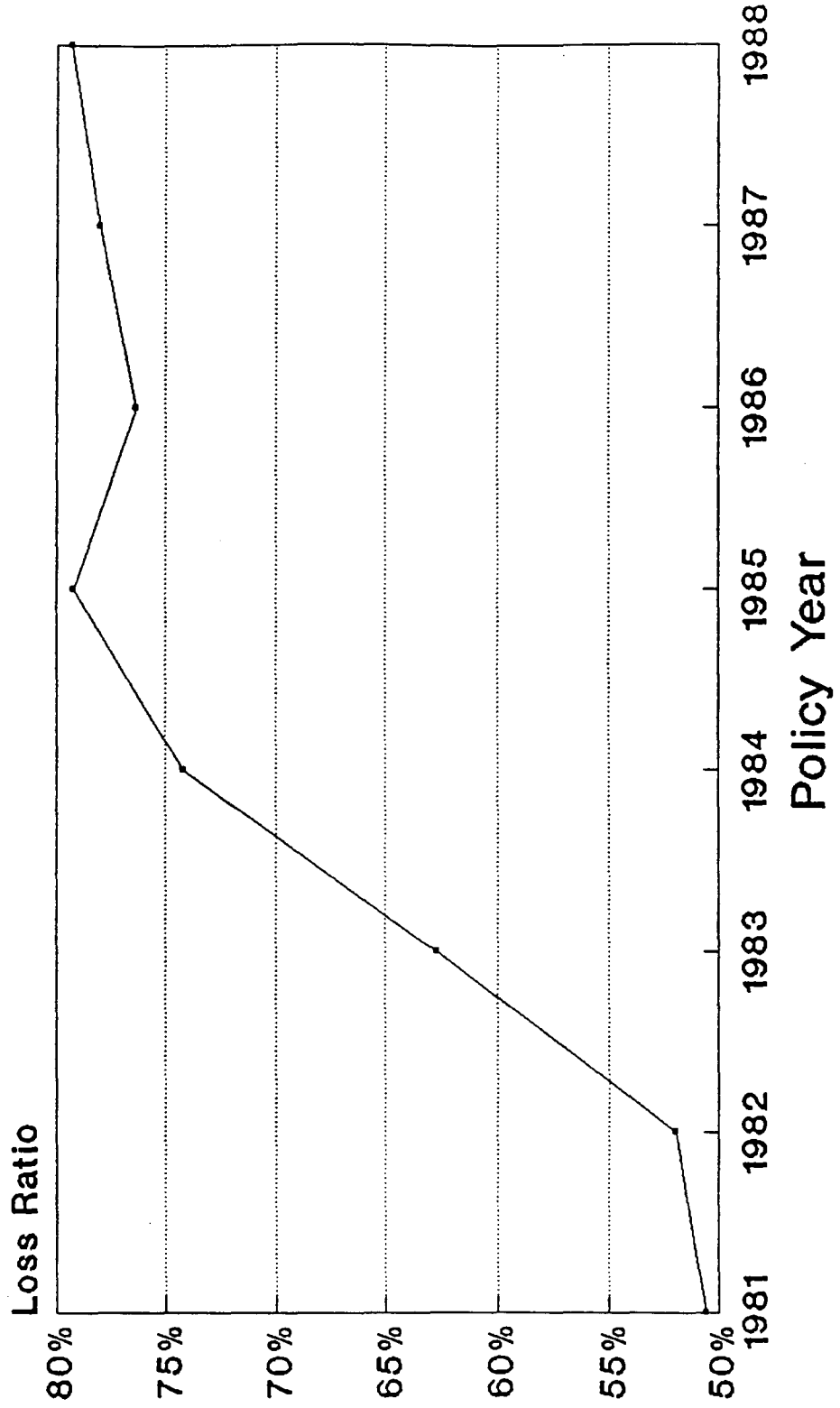
Oregon Private Carriers On-Level Indemnity Loss Ratios



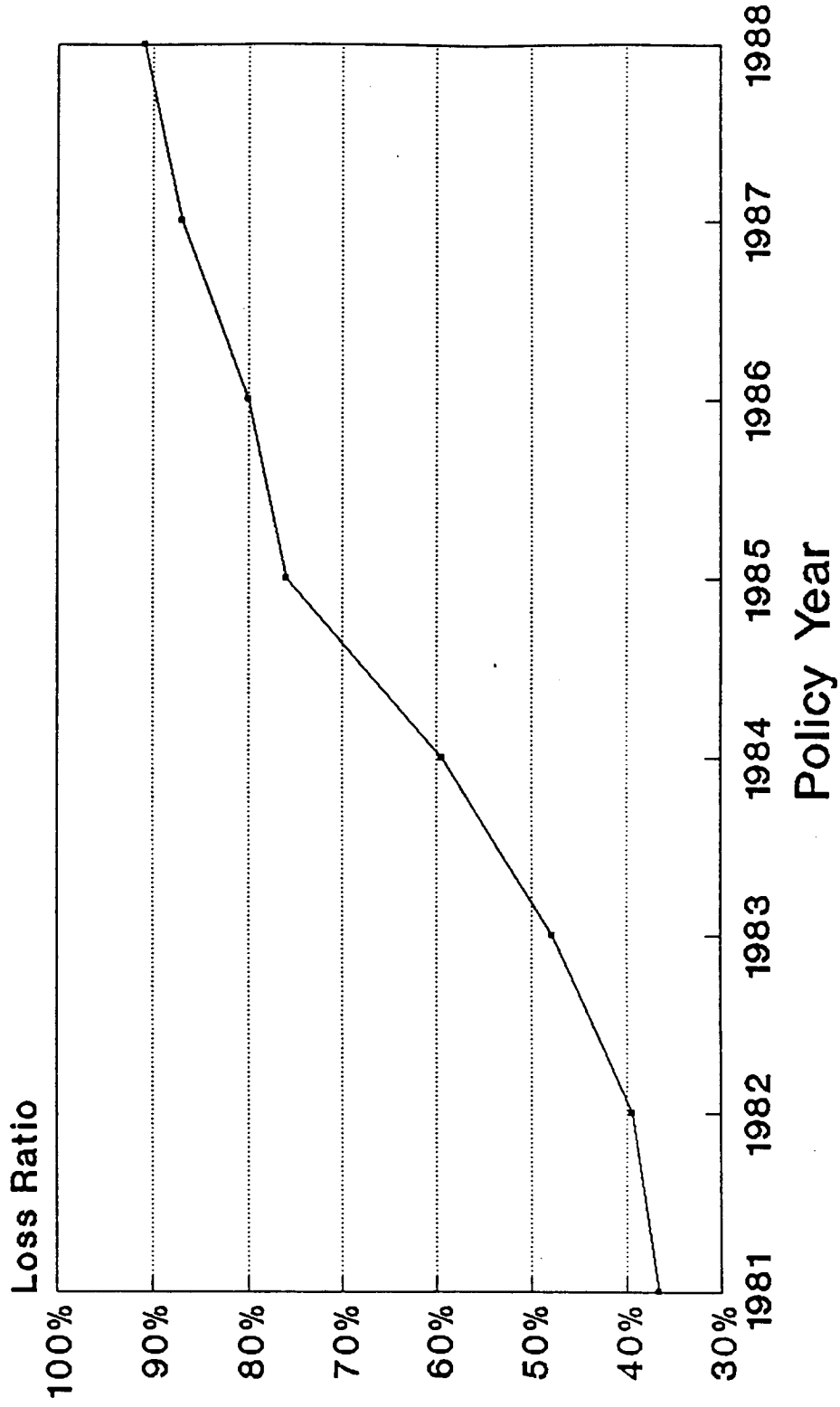
Oregon Private Carriers On-Level Medical Loss Ratios



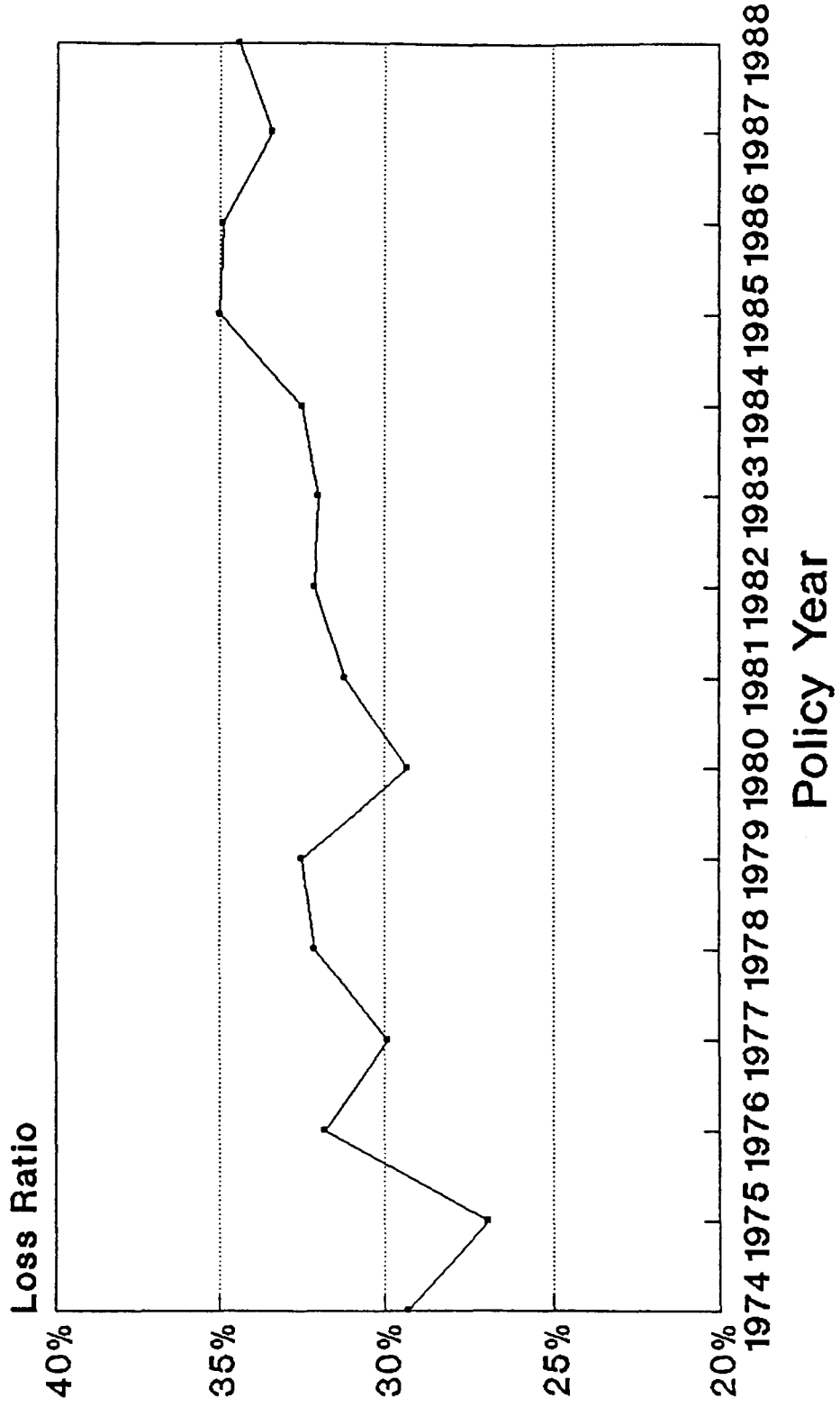
Oregon State Fund On-Level Indemnity Loss Ratios



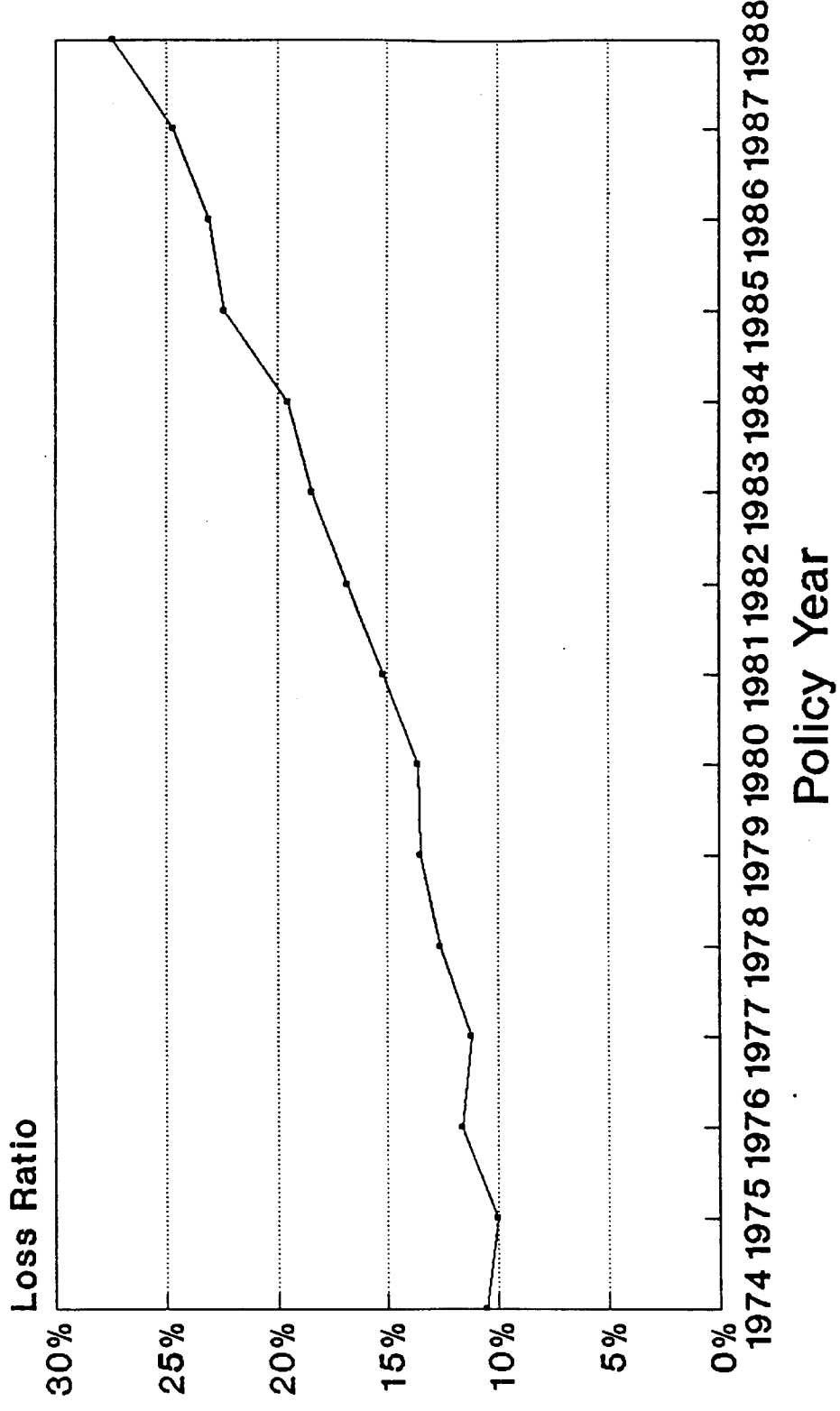
Oregon State Fund On-Level Medical Loss Ratios



Wisconsin On-Level Indemnity Loss Ratios



Wisconsin On-Level Medical Loss Ratios



Connecticut - Indemnity
 CALCULATION OF LINEAR TREND
 Law Amendment Factors Calculated Using NCCI Approach

(1)	(2)	(3)	(4)	(5)	(6)	(5)	(6)
Policy Year	Time Index	Ultimate On-Level Premium	Ultimate Indemnity	NCCI On-Level Factor	On-Level Ultimate Indemnity (4)x(5)	Indemnity Loss Ratio (6)/(3)	Fitted Indemnity Loss Ratio
1984	1	\$554,245,614	\$226,729,007	1.133	\$256,883,965	46.3%	47.6%
1985	2	604,332,175	279,433,406	1.119	312,685,981	51.7%	50.5%
1986	3	629,308,738	295,782,294	1.111	328,614,129	52.2%	53.4%
1987	4	700,789,312	394,450,878	1.051	414,567,872	59.2%	56.3%
1988	5	762,422,598	428,295,734	1.014	434,291,875	57.0%	59.2%
(10) Annual Increment in Loss Ratio (slope in linear fit)						0.029	
(11) Loss Ratio at Base (constant in linear fit)						0.447	
(12) Midpoint of Experience Period: 4/1/89						5.250	
(13) Midpoint of Rate Projection Period: 1/1/92						8.000	
(14) Trend Factor prior to Credibility $[(10)*(13)+(11)]/[(10)*(12)+(11)]$						1.133	0.048
(15) Sum of Squared Residuals						0.0018	
(16) Credibility (Limited to 100%) $(.0011/[(15)/((11)+(10)*3.0)**2])**0.5$						42%	
(17) Annual Expected Linear Trend						0.050	
(18) Expected Trend Factor from 4/1/89 to 1/1/92						1.138	
(19) Credibility-Weighted Trend Factor						1.136	0.049

Illinois - Indemnity
 CALCULATION OF LINEAR TREND
 Law Amendment Factors Calculated Using NCCI Approach

(1) Policy Year	(2) Time Index	(3) Ultimate On-Level Premium	(4) Ultimate Indemnity	(5) NCCI On-Level Factor	(6) On-Level Ultimate Indemnity (4)x(5)	(5) Indemnity Loss Ratio (6)/(3)	(6) Fitted Indemnity Loss Ratio
1984	1	\$1,249,647,432	\$470,581,145	1.023	\$481,404,512	38.5%	38.2%
1985	2	1,387,836,997	529,780,792	1.029	545,144,435	39.3%	39.4%
1986	3	1,569,715,634	621,334,038	1.025	636,867,389	40.6%	40.6%
1987	4	1,753,776,653	706,668,459	1.020	720,801,828	41.1%	41.8%
1988	5	1,800,339,840	773,002,542	1.015	784,597,580	43.6%	43.0%

(10) Annual Increment in Loss Ratio (slope in linear fit)	0.012	
(11) Loss Ratio at Base (constant in linear fit)	0.370	
(12) Midpoint of Experience Period:	4/1/89	5.250
(13) Midpoint of Rate Projection Period:	1/1/92	8.000
(14) Trend Factor prior to Credibility $\frac{[(10)*(13)+(11)]}{[(10)*(12)+(11)]}$	1.076	0.028
(15) Sum of Squared Residuals	0.0001	
(16) Credibility (Limited to 100%) $.0011 / [(15) / \{ (11) + (10) * 3.0 \} ** 2] ** 0.5$	100%	
(17) Annual Expected Linear Trend	0.050	
(18) Expected Trend Factor from 4/1/89 to 1/1/92	1.138	
(19) Credibility-Weighted Trend Factor	1.076	0.028

Connecticut - Indemnity
 CALCULATION OF LINEAR TREND

Law Amendment Factors Calculated Using Alternate Approach

(1) Policy Year	(2) Time Index	(3) Ultimate On-Level Premium	(4) Ultimate Indemnity	(5) Alternate On-Level Factor	(6) On-Level Ultimate Indemnity (4)x(5)	(5) Indemnity Loss Ratio (6)/(3)	(6) Fitted Indemnity Loss Ratio
1984	1	\$554,245,614	\$226,729,007	1.084	\$245,774,244	44.3%	45.4%
1985	2	604,332,175	279,433,406	1.076	300,670,345	49.8%	48.6%
1986	3	629,308,738	295,782,294	1.075	317,965,966	50.5%	51.8%
1987	4	700,789,312	394,450,878	1.027	405,101,051	57.8%	55.0%
1988	5	762,422,598	428,295,734	1.000	428,295,734	56.2%	58.2%

(10) Annual Increment in Loss Ratio (slope in linear fit)	0.032	
(11) Loss Ratio at Base (constant in linear fit)	0.422	
(12) Midpoint of Experience Period:	4/1/89	5.250
(13) Midpoint of Rate Projection Period:	1/1/92	8.000
(14) Trend Factor prior to Credibility $[(10)*(13)+(11)]/[(10)*(12)+(11)]$	1.149	0.054
(15) Sum of Squared Residuals	0.0016	
(16) Credibility (Limited to 100%) $(.0011/[(15)/((11)+(10)*3.0)**2])**0.5$	43%	
(17) Annual Expected Linear Trend	0.050	
(18) Expected Trend Factor from 4/1/89 to 1/1/92	1.138	
(19) Credibility-Weighted Trend Factor	1.143	0.052

Illinois - Indemnity
 CALCULATION OF LINEAR TREND
 Law Amendment Factors Calculated Using Alternate Approach

(1) Policy Year	(2) Time Index	(3) Ultimate On-Level Premium	(4) Ultimate Indemnity	(5) Alternate On-Level Factor	(6) On-Level Ultimate Indemnity (4)x(5)	(5) Indemnity Loss Ratio (6)/(3)	(6) Fitted Indemnity Loss Ratio
1984	1	\$1,249,647,432	\$470,581,145	0.991	\$466,345,915	37.3%	37.0%
1985	2	1,387,836,997	529,780,792	1.000	529,780,792	38.2%	38.3%
1986	3	1,569,715,634	621,334,038	1.000	621,334,038	39.6%	39.6%
1987	4	1,753,776,653	706,668,459	1.000	706,668,459	40.3%	40.9%
1988	5	1,800,339,840	773,002,542	1.000	773,002,542	42.9%	42.2%

(10) Annual Increment in Loss Ratio (slope in linear fit)	0.013	
(11) Loss Ratio at Base (constant in linear fit)	0.357	
(12) Midpoint of Experience Period:	4/1/89	5.250
(13) Midpoint of Rate Projection Period:	1/1/92	8.000
(14) Trend Factor prior to Credibility $[(10)*(13)+(11)]/[(10)*(12)+(11)]$	1.084	0.031
(15) Sum of Squared Residuals	0.0001	
(16) Credibility (Limited to 100%) $(.0011/[(15)/{(11)+(10)*3.0}^{**2}])**0.5$	100%	
(17) Annual Expected Linear Trend	0.050	
(18) Expected Trend Factor from 4/1/89 to 1/1/92	1.138	
(19) Credibility-Weighted Trend Factor	1.084	0.031

TECHNICAL APPENDICES

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ALTERNATE TREND TECHNIQUES

I. INTRODUCTION

The first section of this appendix outlines the criteria considered for evaluating the alternate statistical techniques tested in our analysis, including quantitative measures of goodness-of-fit and projection accuracy as well as qualitative and intuitive considerations. The remainder of the appendix presents technical descriptions of the statistical techniques considered for determining the trend in each state and on a countrywide basis. These techniques were selected after a review of actuarial and other relevant literature. These techniques are:

- least squares regression,
- weighted least squares regression,
- non-parametric curve fitting,
- minimum absolute deviation trend line,
- least trimmed squares line fitting,
- exponential smoothing, and
- econometric modelling.

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II. EVALUATION CRITERIA

Two types of criteria were considered for evaluating the statistical techniques: qualitative and quantitative.

A. Qualitative

Each of the methods identified was reviewed for reasonableness in estimating trends in workers' compensation loss ratios. These reviews included the appropriateness of the underlying assumptions, as well as the strengths and weaknesses of each method. If one method had serious drawbacks and another method included in our analysis had similar strengths, but less significant drawbacks, the former method was rejected. As will be discussed later, two techniques, minimum absolute deviation trend lines and least trimmed squares line fitting, were rejected based on these considerations.

1. Resistance

Resistance is the ability of a method to discard the impact of outliers in an objective manner. If a method is particularly sensitive to outliers, or points that are far from the true underlying trend line due to random variability, it can provide misleading results. There are no common measures of resistance comparable to such measures of goodness-of-fit as R^2 .

In this application, concerns regarding resistance are mitigated by the credibility procedures. To the extent that the loss ratios for a particular state do not follow a common trend line, the state's indicated trend will have lower credibility. NCCI has done some sensitivity testing in which they compare the indicated trend under three scenarios: (1) the next loss ratio is on the fitted trend line, (2) the next loss ratio is 10% above the fitted trend line, and (3) the next loss ratio is 10% below the fitted trend line. An analysis of those calculations indicates that the credibility-weighted trend under the second scenario is only 0.007 greater than under the first scenario. If the average projection period is 2.5 years, the distortion in the projected loss ratio, if the latest loss ratio is randomly high by 10%, is about 0.018 loss ratio points.

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2. Responsiveness

In many actuarial matters, the balance between responsiveness and resistance is a delicate one. It is particularly desirable, in projecting trend, that any changes in the direction or magnitude of the trend line be predicted. If methods that can predict changes in trend can not be identified, methods that respond quickly to such changes are preferred. On the other hand, it is equally important that the trend not be significantly overstated or understated as the result of a single outlier.

The states whose experience was used for testing the various trend techniques were selected carefully to provide a range of situations. In particular, Wisconsin, Illinois, and North Carolina were chosen for their stability. These states' experience were used to test the statistical techniques under "optimal" conditions. At the other extreme, Louisiana and Connecticut were chosen because of the presence of significant economic and benefit changes, respectively. By including these states in our sample, we were able to test each method's ability to respond to changes in trend rates and their resistance.

B. Quantitative

Each of the remaining approaches, i.e., other than the two rejected based on our qualitative evaluation, were applied to the indemnity and medical experience for our sample of states (Connecticut, Florida, Illinois, Louisiana, Michigan, North Carolina, Oregon and Wisconsin) to evaluate their statistical validity. Several measures were considered for evaluating the appropriateness of each model, including:

- accuracy of the forecasts,
- goodness-of-fit to the points in the experience period,
- statistical significance of the trend coefficient, and
- autocorrelation.

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In making the final selection of methods, we relied primarily on the accuracy of the forecasts made in the sample states.

1. Accuracy

To measure projection errors, we reviewed the average absolute deviation, average mean deviation (sample bias) and average squared deviation of all of the fits performed. These deviations were calculated for forecasts that were two and three years after the end of the experience period used for trend. This represents the general range of prediction periods used in most of the NCCI trend calculations. These deviations are summarized on Exhibit A-1.

2. Goodness-of-fit

Goodness-of-fit was calculated for each technique using R^2 . This quantity was calculated as one minus the unexplained variation divided by the total variation. Unexplained variation is determined as the sum of the squares of the differences between the projections and raw data at each point in the experience period. Total variation is the sum of the squares of the differences between the raw data points and their mean. The formula is as follows:

$$R^2 = 1 - \frac{\text{Unexplained Variation}}{\text{Total Variation}} = 1 - \frac{\sum (\hat{Y}_t - Y_t)^2}{\sum (Y_t - \bar{Y})^2},$$

where \hat{Y}_t is the fitted value at time t , Y_t is the actual value at time t , and \bar{Y} is the mean of the actual values during the experience period used to determine trend. A negative R^2 indicates that the projected values vary more from the raw data than the raw data do from their mean. In other words, the projection technique increases variability around the forecasts.

In order to make the R^2 values more closely comparable, we did not include any weights in the formula, even for those techniques that relied on weighting schemes to determine the trend coefficient. This will tend to make the R^2 values for these techniques slightly lower than the theoretically correct values. Because of the

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method used to include weights in the estimation of the coefficients, the R^2 values would be overstated if the weights were reflected in the calculation of R^2 . The average R^2 value and the range for each technique are shown on Exhibit A-2.

R^2 is commonly used to measure the quality of a projection method. It does not, however, measure the ability of a method to make accurate forecasts. Rather, it measures the ability of the independent variable to explain variations in the dependent variable during the historical experience period. Because past correlation does not necessarily imply causation or future correlation, a high R^2 does not necessarily imply good prediction accuracy.

3. Statistical Significance

The statistical significance of the trend estimate was measured using a t-statistic. This measures the magnitude of the coefficient relative to its standard error. The formula for standard error is:

$$s = \sqrt{\frac{\frac{1}{n-2} \sum (Y_t - \hat{Y}_t)^2}{\sum (t - \bar{t})^2}}$$

where Y_t is the actual value at time t , \hat{Y}_t is the projected value at time t and

\bar{t} is the mean time index. The t-statistic is distributed according to the Student's t-distribution with $n-2$ degrees of freedom, where n is the number of raw data points.

For the non-parametric method, the assumptions underlying the t-statistic do not apply. We therefore calculated a statistic which also measures statistical significance, referred to as Kendall's K statistic¹.

1 Myles Hollander and Douglas A. Wolfe, Nonparametric Statistical Methods, (John Wiley & Sons, New York, 1973), p. 201.

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An indication that a trend estimate is statistically significant is an evaluation of the ability of a method to differentiate between an underlying trend and random variability in data that has no (i.e., 0%) underlying trend. The fact that a trend coefficient is statistically significant supports the conclusion that trend exists and indicates the degree of accuracy in measuring that trend during the experience period. While this is often an indication that forecasts are likely to be reasonably accurate, it is not necessarily so.

In our tests, the percentage of fits that produced statistically significant trend indications was generally consistent between methods. For most of the methods tested in our analysis, 89% of the indemnity trend indications and all of the medical indications were significantly different from zero.

4. Autocorrelation

Autocorrelation is the tendency of the errors in the forecasts from a projection technique to be predictable. For example, alternating signs of the errors or negative errors for the early points and positive errors for the later points are indications that additional variability can be explained, either through more refined techniques or a different model.

We used the Durbin-Watson statistic to measure autocorrelation in each model. This statistic is calculated as:

$$D = \frac{\sum (\hat{e}_t - \hat{e}_{t-1})^2}{\sum \hat{e}_t^2}$$

where \hat{e}_t is equal to the difference between the actual and the fitted values at time t . It is generally assumed that autocorrelation is not serious if this statistic is between 1 and 3.

The average Durbin-Watson statistic and its range is shown for each method on Exhibit A-2. If autocorrelation is identified, it is an indication that a more complex model may have better prediction accuracy. Given the limited number of points available for these projections, the coefficients of a more complex model would have lower statistical significance and would, therefore, be subject to higher uncertainty.

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III. STATISTICAL TECHNIQUES

This section will provide a detailed description of each of the techniques considered for determining the trend indication in each state. Included in the discussion will be references for complete documentation of each technique. We will also provide our evaluation of each method from a theoretical perspective, as well as a quantitative one.

Because many facets of claim cost inflation are perceived to occur multiplicatively, we included both linear and exponential models in our analyses. The statistical theory underlying exponential models is the same as underlies linear models. Instead of a linear relationship between the loss ratio and time, loss ratios are assumed to increase exponentially as a function of time, as follows:

$$\text{loss ratio} = ab^t$$

Before performing the calculations, natural logarithms of the loss ratios are taken. The form of the equation used in the statistical calculations then becomes:

$$\ln(\text{loss ratio}) = a + bt + e$$

When using an exponential model, it is important to recognize that it is less likely that the error terms, calculated using the actual and predicted loss ratios, are Normally distributed. The implications of this are most important in evaluating the statistical significance of the trend coefficient and in determining the confidence interval around the coefficient. This confidence interval is currently a key component of NCCI's credibility procedure.

A. Least Squares Regression

The current NCCI approach for estimating trend in each state is least squares linear regression. This technique is described in detail as part of our description of the NCCI approach.

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B. Weighted Least Squares Regression

In order to make the results more sensitive to recent experience, we performed weighted least squares regression. In weighted least squares regression, weights are assigned to each of the observations based on the perceived relevance of each observation to future trends. We arbitrarily selected relative weights of 1, 2, 3, 4, and 5 for each of the points corresponding to time indices 1, 2, 3, 4, and 5, respectively. This will make the estimated trend coefficient more sensitive to the most recent points.

The calculations for this method are the same as for least squares regression with the exception that weights are added to the formulas. The revised formulas are as follows:

$$\hat{c} = \frac{\sum w_i (t_i - \bar{t}) Y_i}{\sum w_i (t_i - \bar{t})^2}$$

$$\bar{t} = \frac{\sum w_i t_i}{\sum w_i}$$

$$\hat{a} = \frac{\sum w_i x_i}{\sum w_i} - \hat{c} \bar{t}$$

where w_i are the weights, $i = 1, \dots, n$, and n is 5 (years). Exhibit A-3 provides an illustration of this technique.

Another interpretation of these formulas is that the number of observations at each time index, each of value equal to the single actual observation, is equal to the weight. For example, the results of the calculations performed herein are the same as those that would be obtained if we had one observation at time index 1, two equal observations at time index 2, three at time index 3, and so on.

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C. Non-Parametric Curve Fitting

"A non-parametric procedure is a statistical procedure that has (certain) desirable properties that hold under relatively mild assumptions regarding the underlying population from which the data are obtained."² One of the techniques included in our analysis is a non-parametric regression procedure.

The estimator of the trend coefficient used for our analysis is attributed to Theil.³ The slope from each of the combinations of points is first calculated as:

$$S_{ij} = \frac{Y_j - Y_i}{t_j - t_i}, \text{ for each } i < j$$

The estimator of the slope coefficient is the median, $\hat{\beta}$, of the S_{ij} . The intercept is calculated as the median of the intercepts implicit in each observation:

$$\text{median of } Y_j - \hat{\beta} t_j$$

Exhibit A-4 illustrates this approach.

The strength of these procedures lies in the mild underlying assumptions and in their resistance to outliers. The assumptions underlying non-parametric regression are that the error terms are mutually independent and that they come from the same continuous population. The assumption of normality of the error terms that underlies least squares regression is eliminated. When performing least squares regression on transformed data, such as for exponential regression, there is strong reason to believe that the error terms of the untransformed data are no longer Normally distributed.

2 Hollander, p. 1.

3 Hollander, p. 205.

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Because of the reliance on statistics related to medians or ranks rather than means, non-parametric methods are much more resistant to extreme outliers. In fact, for the non-parametric regression method performed for our analysis, the estimator of the trend coefficient does not change if any one of the points is moved, other than the ones used to calculate the median of the slope estimators, S_{ij} , or unless the order of the slope estimates changes. This varies significantly from the results for least squares regression in which the movement of a single point will change the entire fit.

Another important property of trend coefficients is their efficiency. Efficiency relates to the variability around the estimate of the coefficient. That is, an estimator of the trend coefficient is said to be relatively more efficient if, under a set of assumptions, the theoretical variance of the coefficient is less than that for another estimate of the coefficient. If it is assumed that the error terms are Normally distributed, non-parametric regression coefficients are only slightly less efficient than least squares coefficients. On the other hand, non-parametric regression coefficients are much more efficient than those estimated using least squares regression if the distribution of the errors differs significantly from the Normal distribution. It should be noted that these nonparametric estimators are unbiased.

Because of their resistance to outliers, non-parametric methods are not expected to quickly identify changes in trend over time. Thus, one of the key drawbacks of these procedures is the lack of responsiveness relative to other procedures, such as least squares regression.

D. Minimum Absolute Deviation Trend Line

In this technique, a line is fit to the available data using the criteria that the sum of the absolute values of the deviations is minimized, subject to the condition that the average deviation is equal to zero. This differs from the more commonly used least squares regression in which the sum of the squares of the deviations is minimized. This technique was detailed by Charles F. Cook in the 1967 Proceedings of the Casualty Actuarial Society. This paper provides a detailed algorithm for calculating the slope coefficient.

One of the key advantages of this method is the ease of calculation. In fact, Cook maintains that with one possible exception requiring division, "All arithmetic . . . may

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be done mentally."⁴ It also is more resistant to outliers than least squares regression, particularly with respect to points at either end of the experience period.

The method has significant drawbacks. It does not always produce a unique result. In addition, it requires equal intervals between measurements. While the latter drawback is not of particular importance in this application, the former raises serious concerns.

In light of this concern and the inclusion of other methods with similar advantageous characteristics as this one, such as non-parametric curve fitting, we have not performed this technique on the data from the sample states and reject it as a viable alternative to the current approach.

E. Least Trimmed Squares Line Fitting

Least trimmed squares line fitting is similar to least squares regression in that the curve is fit to minimize the sum of the squares of the deviations. It differs, however, in that only the smallest 50% of these squares are used in the determination of the minimum. This technique is described in detail in "Resistant Line Fitting in Actuarial Science," by Rousseeuw, Leroy, and Daniels.⁵

The key advantage of this technique is its resistance. In their paper, the authors describe a measure of resistance, known as the breakdown point. It is the smallest fraction of outliers for which the fitted coefficients are maintained regardless of the magnitude of the outliers. For example, the breakdown point for least squares regression is zero because a single outlier will distort the estimates of the coefficients. This is illustrated in Figure A-1, on the next page. This figure shows the line (identified by "x") fit by least squares regression for the data represented by the plus signs. If a single point, such as the one represented by the asterisk is

4 Charles F. Cook, "The Minimum Absolute Deviation Trend Line," Proceedings of the Casualty Actuarial Society LIV, 1967, p. 202.

5 P. Rousseeuw, A. Leroy, and B. Daniels, "Resistant Line Fitting in Actuarial Science," Proceedings of the NATO ASI on Insurance Premiums, July, 1983.

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shifted, the entire nature of the curve will change to the one identified with circles.

At the other extreme, non-parametric curve fitting has a relatively high breakdown point, because only a few points are actually used in determining the coefficients.

According to Rousseeuw, Leroy and Daniels, the highest

possible breakdown point is 50%, because after that point, it is impossible to differentiate between random variability and the underlying trend line. Least trimmed squares fitting has the advantage that its breakdown point is 50%.

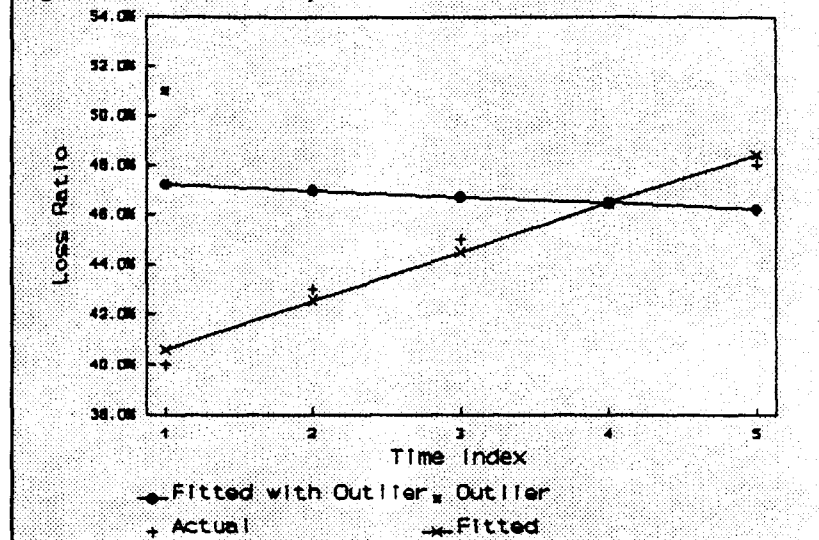
A significant disadvantage of this approach is its computational complexity. Each of combinations of 50% of the raw data observations must be fit and tested to determine the combination with the minimum squared deviation.

Because of the complexity of computation and the characteristics regarding resistance that it has in common with the non-parametric approach, this method was rejected as a viable alternative to the current NCCI trend approach.

F. Exponential Smoothing Methods

Another family of methods used for prediction are referred to as exponential smoothing methods. In these methods, a weighted average of the historical observations is used to make forecasts. The weights used are of the form $\alpha(1-\alpha)^n$, where n measures the time between the observation being weighted and the current

Figure A-1: Sensitivity to Outliers



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observation. The selection of the weighting constant, α , is somewhat arbitrary. The sensitivity of the results to recent experience will increase as α increases.

Two types of exponential smoothing were tested as part of our analysis: double exponential smoothing and linear exponential smoothing. Each method was tested with a variety of values of α , ranging from 0.1 to 0.7.

1. Linear Exponential Smoothing

In linear exponential smoothing, the location and trend parameters are smoothed separately. The location parameter, S_t , is calculated as:

$$S_t = \alpha X_t + (1-\alpha)(S_{t-1} + T_{t-1}),$$

where X_t is the observed value at time t . This represents the weighted average of the observed value at time t and the value projected at time t based on prior data. The formula for the trend parameter, T_t , is:

$$T_t = \alpha(S_t - S_{t-1}) + (1-\alpha)T_{t-1}.$$

The trend parameter at time t is estimated as the weighted average of the prior estimate of the trend parameter and the difference between the location parameter estimates at times t and $t-1$. Exhibit A-5 shows an example of this method.

Different values of α can be selected for each of the trend and location parameters. Since our analysis focused solely on the trend parameter, we used the same value of α for the location parameter as was used for the trend parameter.

2. Double Exponential Smoothing

In double exponential smoothing, the trend and location parameters are calculated as the function of two intermediate values, S_t and S'_t . S_t is the moving average of the observed values and S'_t is the moving average of the S_t . The same smoothing constant, α , underlies both estimators. The formulas for the weighted averages underlying this method are:

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$$S_t = \alpha X_t + (1-\alpha)S_{t-1}$$
$$S'_t = \alpha S_t + (1-\alpha)S'_{t-1}$$

The theoretical error of a moving average, with smoothing constant α for a set of data with an inherent trend of b is equal to $\frac{1-\alpha}{\alpha} b$. Thus, S_t understates the observations by $\frac{1-\alpha}{\alpha} b$ and S'_t understates S_t by the same amount. The estimators of the location and trend parameters can therefore be calculated as functions of S_t and S'_t as follows:

$$\text{location parameter} = 2S_t - S'_t$$
$$\text{trend parameter} = \alpha/(1-\alpha)[S_t - S'_t]$$

This method is illustrated in Exhibit A-6.

3. Comparison of Methods

If the observations follow the theoretical trend line exactly, double exponential smoothing and linear exponential smoothing methods will produce identical results. For a given smoothing constant, the estimates of the trend parameter derived from each of the methods applied to data with a random component will be approximately the same, if a long enough experience period is used so that the parameter estimates have stabilized. The location parameter from double exponential smoothing, however, is more sensitive to recent observations than the location parameter derived from linear exponential smoothing. Because the location parameter from double exponential smoothing is a function of the difference between two smoothed averages, one of which has a greater degree of smoothing, it will tend to reflect recent observations.

The strengths and weaknesses of these methods are similar. In both of these methods, the most weight is given to the most recent data point. This allows the methods to be responsive to changes in trend. The amount of the responsiveness,

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however, is dependent upon the choice of α . The selection of α is arbitrary and is generally made through the use of retrospective tests.

For both methods, the results are very sensitive to the selection of initial values of the location and trend parameters, unless a large number of years of experience is available. This is a serious limitation for this analysis, for which it was difficult to obtain data for more than eight policy years. As the Financial Call experience period lengthens to fifteen years, this concern will be mitigated to some extent. An even longer experience period is needed, however, for the projected results to be insensitive to the selection of the initial values.

Our analyses were performed using a five-policy-years experience period for all of our sample states. They were also performed using longer experience periods for three states.

For our analyses, the initial trend parameter value was selected as the average trend between the first and fifth points. The initial location parameter was calculated as the average of each of the first five observations reduced for t years of trend, where t is the time index for each policy year.

G. Econometrics

Econometric modeling is comprised of systems of equations in which the interdependence between the dependent variables and measures of economic conditions are estimated. Econometric models can range from extremely complex systems which evaluate the interdependence of a large number of variables to relatively simple systems in which the interdependence of a single dependent variable and one or two independent variables is measured.

Econometric models are generally specified through the use of regression models which measure the relationship between the dependent variable and the independent variables. A simple example is a multiple regression model in which medical severity is related to time and the medical component of the Consumer Price Index.

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One of the characteristics of econometric models that separates them from all of the other statistical techniques considered herein is their potential ability to predict turning points in trend lines. In all of the other techniques discussed, the relationship between loss ratios and time is assumed to continue through the rate effective period. To the extent that changes in the rate of trend are related to changes in economic quantities, changes in the rate of trend can be predicted.

A large commitment of time and resources is needed to arrive at a good econometric model. The possible range of economic indices that could be used to project loss ratio changes (or components thereof) is vast. In addition, not all relationships are necessarily intuitively obvious. An example is the dependence of the frequency of workers' compensation claims on unemployment. It can be argued that, during an economic recovery, frequency would be expected to increase due to an influx of untrained workers into the work force. On the other hand, the frequency of claims related to soft tissue injuries may tend to increase during an economic contraction, as unemployed workers seek alternative sources of income.

Often in economic modeling, projections of the independent variable are needed in the equation to project the dependent variable. For example, if medical loss ratio trends were found to be a function of the medical component of the CPI, a projection of the medical component of the CPI would be needed for the rate effective period. It should be noted, however, that, at the time that a rate filing is prepared, more recent data are available for the medical component of the CPI than for historical loss ratios. Also, consumer price indices are not subject to the uncertainty of the more recent projected loss ratios which emanates from the need to estimate development.

An econometric model becomes even more valuable if the independent variable is a leading indicator of changes in the dependent variable. For example, if it were found that the rate of increase in the medical component of the CPI changed a year *before* the change in trend in medical losses, the medical component of the CPI would not need to be projected as far into the future. The projected loss ratio would therefore be subject to less uncertainty.

A full analysis of econometric modeling is beyond the scope of this assignment. We did, however, evaluate a few possible models. Our analysis first focused on

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identifying interrelationships between losses and economic indices. Examples of these include:

Dependent Variable	Independent Variable	Result
Claim frequency by injury type and in total	Unemployment	Some correlation, except Fatal and PP (volatility)
Medical Severity	CPI - Medical	Very high correlation
Medical Severity	Average Hospital Charges	Very high correlation
Indemnity Severity	SAWW	Mixed
Medical Severity by Injury Type (other than medical-only)	Medical-only Severity	Mixed

These analyses were performed using the available Statistical Plan data because of the additional detail found in the Statistical Plan data regarding frequencies and severities by injury type. Additional information regarding these tests are included in the Technical Supplement to this report.

We then used the Financial Call data in the sample states to evaluate the projection accuracy of a few of these relatively simple models. Our analysis focused primarily on medical loss ratios. Further analysis regarding indemnity and the components of loss ratios (exposure, SAWW, frequency, severity and shifts by injury type) are likely to yield reasonable models.

An example of the model for medical loss ratios is shown in Table A-1, on the next page, for Connecticut. The medical on level loss ratio is adjusted for subsequent changes in the medical component of the CPI and the SAWW. That is, the loss ratio is adjusted to reflect the current levels of these quantities by dividing by the index derived from the medical component of the CPI and multiplying by the index constructed from the SAWW. The indexed medical loss ratios were then regressed against the time index.

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Table A-1: Simple Econometric Model

	(1)	(2)	(3)	(4)	(5)
Policy Year	Medical Loss Ratio	CPI-Medical Index	SAWW Index	Indexed Loss Ratio (1)x(3)/(2)	Time
1983	0.141	0.716	0.783	0.148	0
1984	0.150	0.822	0.849	0.155	1
1985	0.164	0.882	0.904	0.168	2
1986	0.177	0.935	0.953	0.180	3
1987	0.204	1.000	1.000	0.204	4

The result of the (exponential) regression is a curve:

$$\text{indexed loss ratio} = .134(1.079)^{\text{time}}$$

This is equivalent to

$$\text{loss ratio} = \frac{.134 (\text{CPI Index}) (1.079)^{\text{time}}}{(\text{SAWW Index})}$$

In words, this equation indicates that medical loss ratios in Connecticut increased at 7.9% faster each year than the excess of the medical component of the CPI over wage inflation. Projections of future loss ratios can be made using estimates of or actual values of each index in the equation above.

PREDICTION ERRORS

Indemnity

Method	Average Squared Deviation	Sample Bias	Average Absolute Deviation
Double Exponential Smoothing, Linear Trend, a = 0.7	0.006	0.008	0.051
Linear Exponential Smoothing, Linear Trend, a = b = 0.7	0.006	0.013	0.055
Double Exponential Smoothing, Linear Trend, a = 0.5	0.006	0.020	0.057
Double Exponential Smoothing, Linear Trend, a = 0.3	0.006	0.022	0.059
Double Exponential Smoothing, Linear Trend, a = 0.1	0.006	0.022	0.059
Linear Exponential Smoothing, Linear Trend, a = b = 0.1	0.006	0.022	0.059
Linear Exponential Smoothing, Linear Trend, a = b = 0.3	0.006	0.023	0.060
Linear Exponential Smoothing, Linear Trend, a = b = 0.5	0.007	0.023	0.060
Weighted Regression, Linear Trend	0.007	0.024	0.061
Non-parametric Linear Fit	0.007	0.028	0.062
Ordinary Least Squares, Linear Trend	0.007	0.027	0.064
Double Exponential Smoothing, Exponential Trend, a = 0.7	0.008	0.027	0.059
Linear Exponential Smoothing, Exponential Trend, a = b = 0.7	0.010	0.033	0.065
Double Exponential Smoothing, Exponential Trend, a = 0.5	0.012	0.044	0.072
Weighted Regression, Exponential Trend	0.014	0.050	0.077
Linear Exponential Smoothing, Exponential Trend, a = b = 0.5	0.014	0.050	0.078
Double Exponential Smoothing, Exponential Trend, a = 0.3	0.014	0.050	0.079
Double Exponential Smoothing, Exponential Trend, a = 0.1	0.014	0.050	0.079
Linear Exponential Smoothing, Exponential Trend, a = b = 0.1	0.014	0.050	0.079
Linear Exponential Smoothing, Exponential Trend, a = b = 0.3	0.015	0.051	0.081
Non-parametric Exponential Fit	0.018	0.059	0.085
Ordinary Least Squares, Exponential Trend	0.018	0.059	0.088

Note: Sample bias is measured as projected minus actual.

PREDICTION ERRORS

Medical

Method	Average Squared Deviation	Sample Bias	Average Absolute Deviation
Linear Exponential Smoothing, Linear Trend, a= b= 0.3	0.003	-0.000	0.034
Ordinary Least Squares, Linear Trend	0.003	-0.000	0.034
Double Exponential Smoothing, Linear Trend, a= 0.3	0.003	-0.000	0.034
Linear Exponential Smoothing, Linear Trend, a= b= 0.1	0.003	-0.001	0.034
Double Exponential Smoothing, Linear Trend, a= 0.1	0.003	-0.001	0.034
Non-parametric Linear Fit	0.003	-0.000	0.035
Weighted Regression, Linear Trend	0.003	0.001	0.036
Linear Exponential Smoothing, Linear Trend, a= b= 0.5	0.003	0.001	0.036
Double Exponential Smoothing, Linear Trend, a= 0.5	0.003	0.000	0.036
Double Exponential Smoothing, Linear Trend, a= 0.7	0.004	0.000	0.041
Linear Exponential Smoothing, Linear Trend, a= b= 0.7	0.005	0.001	0.042
Ordinary Least Squares, Linear Trend, CPI/SAWW-Indexed	0.006	0.018	0.048
Double Exponential Smoothing, Exponential Trend, a= 0.1	0.012	0.035	0.062
Linear Exponential Smoothing, Exponential Trend, a= b= 0.1	0.012	0.035	0.062
Double Exponential Smoothing, Exponential Trend, a= 0.3	0.013	0.035	0.062
Linear Exponential Smoothing, Exponential Trend, a= b= 0.3	0.013	0.035	0.062
Ordinary Least Squares, Exponential Trend, CPI/SAWW-Indexed	0.013	0.037	0.065
Double Exponential Smoothing, Exponential Trend, a= 0.5	0.014	0.033	0.062
Linear Exponential Smoothing, Exponential Trend, a= b= 0.5	0.014	0.035	0.063
Ordinary Least Squares, Exponential Trend	0.014	0.037	0.064
Weighted Regression, Exponential Trend	0.015	0.034	0.063
Non-parametric Exponential Fit	0.016	0.039	0.066
Double Exponential Smoothing, Exponential Trend, a= 0.7	0.017	0.030	0.064
Linear Exponential Smoothing, Exponential Trend, a= b= 0.7	0.018	0.031	0.065

Note: Sample bias is measured as projected minus actual.

GOODNESS OF FIT STATISTICS

Indemnity

Method	Durbin - Watson		R - Squared	
	High	Low Average	High	Low Average
Linear Exponential Smoothing, Exponential Trend, a= b= 0.3	2.791	1.362	0.992	-0.024
Linear Exponential Smoothing, Exponential Trend, a= b= 0.1	2.755	1.343	0.992	-0.088
Ordinary Least Squares, Linear Trend	2.898	1.427	0.976	0.184
Ordinary Least Squares, Exponential Trend	2.853	1.386	0.989	0.074
Linear Exponential Smoothing, Linear Trend, a= b= 0.3	2.816	1.411	0.976	-0.020
Linear Exponential Smoothing, Exponential Trend, a= b= 0.5	2.716	1.197	0.992	-0.004
Double Exponential Smoothing, Linear Trend, a= 0.3	2.784	1.399	0.975	-0.061
Linear Exponential Smoothing, Linear Trend, a= b= 0.1	2.780	1.412	0.975	-0.084
Double Exponential Smoothing, Linear Trend, a= 0.1	2.779	1.412	0.975	-0.086
Double Exponential Smoothing, Exponential Trend, a= 0.3	2.778	1.345	0.990	-0.050
Double Exponential Smoothing, Exponential Trend, a= 0.1	2.745	1.345	0.989	-0.088
Weighted Regression, Exponential Trend	2.715	1.277	0.989	-0.101
Weighted Regression, Linear Trend	2.772	1.191	0.973	-0.008
Linear Exponential Smoothing, Linear Trend, a= b= 0.5	2.721	1.120	0.973	-0.046
Non-parametric Linear Fit	2.794	1.113	0.976	-0.166
Double Exponential Smoothing, Linear Trend, a= 0.5	2.628	1.159	0.975	-0.148
Double Exponential Smoothing, Exponential Trend, a= 0.5	2.593	1.260	0.989	-0.151
Non-parametric Exponential Fit	2.770	0.788	0.988	-0.178
Double Exponential Smoothing, Exponential Trend, a= 0.7	2.361	0.600	0.986	-2.036
Double Exponential Smoothing, Linear Trend, a= 0.7	2.229	0.548	0.965	-1.819
Linear Exponential Smoothing, Exponential Trend, a= b= 0.7	2.526	0.426	0.987	-2.915
Linear Exponential Smoothing, Linear Trend, a= b= 0.7	2.467	0.419	0.953	-2.225

GOODNESS OF FIT STATISTICS

Medical

Method	Durbin - Watson			R - Squared		
	High	Low	Average	High	Low	Average
Ordinary Least Squares, Exponential Trend, CPI/SAWW-Indexed	3.399	1.390	2.388	0.976	0.535	0.879
Ordinary Least Squares, Linear Trend, CPI/SAWW-Indexed	3.413	1.438	2.424	0.975	0.521	0.878
Linear Exponential Smoothing, Exponential Trend, a= b= 0.3	3.364	1.376	2.252	0.983	0.589	0.873
Linear Exponential Smoothing, Exponential Trend, a= b= 0.1	3.364	1.367	2.200	0.982	0.570	0.870
Linear Exponential Smoothing, Exponential Trend, a= b= 0.5	3.362	1.148	2.179	0.983	0.537	0.866
Ordinary Least Squares, Linear Trend	3.424	1.427	2.408	0.976	0.497	0.859
Linear Exponential Smoothing, Linear Trend, a= b= 0.3	3.494	1.409	2.293	0.975	0.479	0.854
Ordinary Least Squares, Exponential Trend	3.395	1.429	2.339	0.982	0.467	0.853
Double Exponential Smoothing, Linear Trend, a= 0.3	3.494	1.393	2.249	0.974	0.467	0.851
Linear Exponential Smoothing, Linear Trend, a= b= 0.1	3.494	1.421	2.235	0.973	0.459	0.850
Double Exponential Smoothing, Linear Trend, a= 0.1	3.494	1.421	2.234	0.973	0.458	0.850
Double Exponential Smoothing, Exponential Trend, a= 0.1	3.383	1.380	2.203	0.985	0.454	0.847
Double Exponential Smoothing, Exponential Trend, a= 0.3	3.383	1.421	2.239	0.983	0.459	0.846
Weighted Regression, Exponential Trend	3.383	1.237	2.255	0.983	0.425	0.842
Weighted Regression, Linear Trend	3.485	1.152	2.234	0.976	0.400	0.840
Double Exponential Smoothing, Exponential Trend, a= 0.5	3.373	1.224	2.163	0.981	0.438	0.840
Linear Exponential Smoothing, Linear Trend, a= b= 0.5	3.484	1.080	2.171	0.976	0.399	0.837
Double Exponential Smoothing, Linear Trend, a= 0.5	3.493	1.152	2.130	0.974	0.476	0.837
Non-parametric Linear Fit	3.412	1.050	2.169	0.973	0.097	0.827
Non-parametric Exponential Fit	3.337	0.713	2.015	0.978	0.105	0.818
Double Exponential Smoothing, Exponential Trend, a= 0.7	3.324	0.602	1.412	0.971	0.180	0.731
Linear Exponential Smoothing, Exponential Trend, a= b= 0.7	3.167	0.441	1.330	0.972	0.083	0.717
Double Exponential Smoothing, Linear Trend, a= 0.7	3.406	0.567	1.380	0.959	0.117	0.687
Linear Exponential Smoothing, Linear Trend, a= b= 0.7	3.460	0.422	1.404	0.973	-0.183	0.623

WEIGHTED REGRESSION

Connecticut - Indemnity

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Year	Time	Loss Ratio	Weight	(1)x(3)	(2)x(3) x(5)	(3)x(5) x(5)	(2)x(3)	Predicted Loss Ratio (11)+(10)*(1)
1981	0	0.433	1	0	-1.155	7.111	0.433	0.380
1982	1	0.399	2	2	-1.330	5.556	0.798	0.411
1983	2	0.427	3	6	-0.854	1.333	1.281	0.443
1984	3	0.463	4	12	0.617	0.444	1.852	0.474
1985	4	0.518	5	20	3.453	8.889	2.590	0.505
TOTAL			15	40	0.732	23.333	6.954	

(10) Estimated Trend Rate
Sum(6)/Sum(7)

0.031

(11) Location Parameter
Sum(8)/Sum(3) - (10)*Sum(4)/Sum(3)

0.381

(12) Policy Year 1985 Loss Ratio

0.518

(13) Predicted Policy Year 1985 Loss Ratio
(11) + 4 * (10)

0.505

(14) Projected Policy Year 1987 Loss Ratio
(12) * [(11) + 6 * (10)] / (13)

0.582

(15) Projected Policy Year 1988 Loss Ratio
(12) * [(11) + 7 * (10)] / (13)

0.613

Note: Development based on incurred, excluding IBNR.

NON-PARAMETRIC FIT
Connecticut - Indemnity

	(1)	(2)	(3)	(4)	(5)	(6)
Year	Time	Loss Ratio	Pairwise Combinations of Time	Differences in (2) Corresponding to (3)	(2) - [(7)*(1)]	Predicted Loss Ratio (8)+[(7)*(1)]
1981	0	0.433	(0,1)	-0.034	0.433	0.373
1982	1	0.399	(0,2)	-0.003	0.369	0.403
1983	2	0.427	(0,3)	0.010	0.367	0.433
1984	3	0.463	(0,4)	0.021	0.373	0.463
1985	4	0.518	(1,2)	0.028	0.398	0.493
			(1,3)	0.032		
			(1,4)	0.040		
			(2,3)	0.036		
			(2,4)	0.046		
			(3,4)	0.055		
						(7) Estimated Annual Trend Median of (4) 0.030
						(8) Location Parameter Median of (5) 0.373
						(9) Policy Year 1985 Loss Ratio 0.518
						(10) Predicted Policy Year 1985 Loss Ratio (8) + 4 * (7) 0.493
						(11) Projected Policy Year 1987 Loss Ratio (9) * [(8) + 6 * (7)] / (10) 0.581
						(12) Projected Policy Year 1988 Loss Ratio (9) * [(8) + 7 * (7)] / (10) 0.613

Note: Development based on incurred, excluding IBNR.

LINEAR EXPONENTIAL SMOOTHING

Connecticut - Indemnity

	(1)	(2)	(3)	(4)	(5)
Year	Time	Loss Ratio	S(t) 0.3*(2)+0.7* Prior[(3)+(4)]	T(t) 0.3*[(3)-Prior(3)] +0.7*Prior(4)	Predicted Loss Ratio (7)+[(6)*(1)]
	-1		0.368	0.0050	
1974	0	0.354	0.367	0.0033	0.318
1975	1	0.394	0.378	0.0054	0.332
1976	2	0.416	0.393	0.0083	0.346
1977	3	0.378	0.394	0.0062	0.360
1978	4	0.374	0.393	0.0038	0.374
1979	5	0.402	0.398	0.0044	0.388
1980	6	0.448	0.416	0.0085	0.402
1981	7	0.433	0.427	0.0092	0.416
1982	8	0.399	0.425	0.0059	0.430
1983	9	0.427	0.430	0.0055	0.444
1984	10	0.463	0.444	0.0080	0.458
1985	11	0.518	0.472	0.0140	0.472
(6)	Estimated Annual Trend T(1985)				0.014
(7)	Location Parameter S(1985) - 11 * (6)				0.318
(8)	Policy Year 1985 Loss Ratio				0.518
(9)	Predicted Policy Year 1985 Loss Ratio (7) + 11 * (6)				0.472
(10)	Projected Policy Year 1987 Loss Ratio (8) * [(7) + 13 * (6)] / (9)				0.549
(11)	Projected Policy Year 1988 Loss Ratio (8) * [(7) + 14 * (6)] / (9)				0.564

Notes: Development based on incurred, excluding IBNR.

DOUBLE EXPONENTIAL SMOOTHING

Connecticut - Indemnity

Year	(1) Time	(2) Loss Ratio	(3) S(t) 0.3*(2)+ 0.7*Prior(3)	(4) S'(t) 0.3*(3)+ 0.7*Prior(4)	(5) Predicted Loss Ratio (7)+(6)*(1)
	-1		0.357	0.345	
1974	0	0.354	0.356	0.348	0.338
1975	1	0.394	0.367	0.354	0.352
1976	2	0.416	0.382	0.362	0.365
1977	3	0.378	0.381	0.368	0.379
1978	4	0.374	0.379	0.371	0.392
1979	5	0.402	0.386	0.375	0.406
1980	6	0.448	0.404	0.384	0.419
1981	7	0.433	0.413	0.393	0.433
1982	8	0.399	0.409	0.398	0.447
1983	9	0.427	0.414	0.403	0.460
1984	10	0.463	0.429	0.410	0.474
1985	11	0.518	0.456	0.424	0.487

(6) Estimated Annual Trend $(0.3/0.7) * [S(1985) - S'(1985)]$	0.014
(7) Location Parameter $[2 * S(1985)] - S'(1985) - 11 * (6)$	0.338
(8) Policy Year 1985 Loss Ratio	0.518
(9) Predicted Policy Year 1987 Loss Ratio $(7) + 11 * (6)$	0.487
(10) Projected Policy Year 1987 Loss Ratio $(8) * [(7) + 13 * (6)] / (9)$	0.547
(11) Projected Policy Year 1988 Loss Ratio $(8) * [(7) + 14 * (6)] / (9)$	0.561

Notes: 1. $\alpha = 0.3$.
2. Development based on incurred, excluding IBNR.

**TREND:
TECHNICAL APPENDIX B**

EMPIRICAL BAYESIAN CREDIBILITY

I. THE BÜHLMANN-STRAUB MODEL APPLIED TO TREND

A. Formulation for Loss Ratios by Class

The following formulation of the model, for loss ratios by class, was provided by Meyers¹. After describing the formulation of the model for loss ratios, we will revise the model to apply it to trends.

The formula requires the following data.

1. T years of experience for N classes.
2. The premium for class i in year t (denoted by P_{it}).
3. The loss ratio for class i in year t (denoted by Y_{it}).

The following assumptions are made.

1. The expected loss ratio for class i, μ_i , is randomly selected from a distribution with mean M and variance γ^2 .
2. Each loss ratio, Y_{it} , is randomly selected from a distribution with mean μ_i and variance $\frac{V_i^2}{P_{it}}$.

In assumption (2), the variance is presumed to be inversely proportional to premium volume. In the trend application, we will be interested in a single parameter, the trend rate, in each state. Anticipating the trend application, it is useful to

1 Glenn Meyers, "Empirical Bayesian Credibility for Workers' Compensation Classification Ratemaking," PCAS LXXI, 1984, p. 96.

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reformulate assumption (2) without the year-to-year variation as follows:

$$\text{Let } P_i = \sum_i P_{ik} \quad (\text{total class premium})$$

$$\bar{Y}_i = \sum_i \frac{P_{ik} Y_{ik}}{P_i} \quad (\text{premium weighted average of } Y_{ik})$$

It follows that the variance of \bar{Y}_i is $\frac{V_i^2}{P_i}$. We can now restate assumption (2) as:

2. Each class total loss ratio, \bar{Y}_i , is randomly selected from a distribution with mean μ_i and variance $\frac{V_i^2}{P_i}$.

The new assumption leaves V_i^2 the same.* It is essentially equivalent except it does not specify the relationship among variances of individual years within a state.

$$\text{Let } \sum^2 = E(V_i^2)$$

* Note that the proportionality constants V_i^2 are allowed to vary by class. This possible variation allows that the postulated relationship between class variance and premium volume may be imperfect. The possible variation in the V_i^2 's is not used in subsequent calculations; rather, the expected value of V_i^2 over all classes is used. To the extent that the V_i^2 's vary, the estimator for $E(V_i^2)$ presented below will still be unbiased, but would have higher variance as an estimator. Variation in the V_i^2 would also reduce the accuracy of individual class credibilities based on premium volume.

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Then the estimator for Σ^2 is

$$\hat{\Sigma}^2 = \frac{\sum_i \sum_t P_{it} (Y_{it} - \bar{Y}_i)^2}{N \cdot T - N}$$

which equals

$$\begin{aligned} & \frac{\sum_i P_i \left(\frac{\sum_t P_{it} (Y_{it} - \bar{Y}_i)^2}{P_i (T-1)} \right)}{N} \\ &= \frac{\sum_i P_i \cdot \hat{\sigma}_{Y_i}^2}{N} \end{aligned}$$

where $\hat{\sigma}_{Y_i}^2$ is the estimated variance of the observed all year class loss ratio \bar{Y}_i .

The estimator of Σ^2 is simply the average of the estimates of V_i^2 in each class.

Next we must estimate γ^2 . The estimate in the class example is as follows:

$$\text{Let } P_{..} = \sum_i \sum_t P_{it} \quad (\text{total premium}),$$

$$P2 = \sum_i P_i^2,$$

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$$\bar{Y}_{..} = \sum_i \sum_t P_{it} \cdot \frac{Y_{it}}{P_{..}} \quad (\text{premium-weighted average of } Y_{it}),$$

$$W = \sum_i P_i \cdot \frac{(\bar{Y}_i - \bar{Y}_{..})^2}{N - 1}$$

$$\text{and } \hat{\gamma}^2 = \frac{(W - \hat{\Sigma}^2) \cdot (N - 1) \cdot P_{..}}{P_{..}^2 - P_2}$$

The problem can be stated more generally as follows: We are attempting to estimate a parameter for each class (in this case, μ_i , the expected loss ratio) and we have an estimator of the parameter in each class (in this case, \bar{Y}_i). Optimal weights are determined by the relationship between γ^2 , the variance of the distribution of

parameters, and $E\left(\frac{V_i^2}{P_i}\right)$, the expected variance of the distribution of estimators.

We can estimate the necessary variances just as easily if the parameter in question is a trend rate rather than an expected loss ratio.

B. Reformulation for Trend Rates by State

In order to introduce notation for the trend case, we restate the assumptions as follows:

1. The expected trend rate for state i , β_i , is randomly selected from a distribution with mean β and variance γ^2 .
2. Each observed state trend rate, b_i , can be considered as a random selection from a distribution with mean β_i and variance $\frac{V_i^2}{P_i}$.

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$\hat{\sigma}_{b_i}^2$, the estimated variance of the observed trend rate, b_i , is given by the formula

$$\hat{\sigma}_{b_i}^2 = \frac{\sum_i (Y_{it} - \hat{Y}_{it})^2}{(T-2) \sum_i (X_{it} - \bar{X}_i)^2}$$

where the X_{it} are the time indices, Y_{it} are the observed loss ratios and \hat{Y}_{it} are the fitted loss ratios. Then,

$$\begin{aligned} \hat{\Sigma}^2 &= \frac{\sum_i P_i \cdot \hat{\sigma}_{b_i}^2}{N} \\ &= \frac{\sum_i P_i \cdot \sum_t (Y_{it} - \hat{Y}_{it})^2}{N \cdot (T-2) \cdot \sum_i (X_{it} - \bar{X}_i)^2} \end{aligned}$$

Note that the state subscript i has been dropped from the X values since we use the same time indices in all states.

The reformulation of the estimator for γ^2 is straightforward. The \bar{Y}_i are replaced with the b_i .

$$\begin{aligned} \bar{b} &= \frac{\sum_i P_i \cdot b_i}{P_{..}} \\ \text{and } W &= \sum_i P_i \cdot \frac{(b_i - \bar{b})^2}{N-1} \end{aligned}$$

The formula for $\hat{\gamma}^2$ is unchanged. Note that the derivation of $\hat{\gamma}^2$ is based on comparing the observed between state variance (W) with the variance that would be expected if all the β_i were equal ($\hat{\Sigma}^2$).

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C. Base for Measuring State Credibility

1. Volume

If premium volume is used as the base for measuring credibility, the credibility is assigned according to the formula:

$$Z_i = \frac{P_i}{P_i + K} \quad \text{where } K = \frac{\Sigma^2}{\gamma^2}$$

The estimator for K is: $\hat{K} = \frac{\hat{\Sigma}^2}{\hat{\gamma}^2}$

2. Volume Plus a Constant

In the model using premium volume plus a constant, the estimator of state variance is changed from $\frac{\Sigma^2}{P_i}$ to $\frac{V^2}{P_i} + C$. The credibility formula becomes

$$Z_i = \frac{P_i}{P_i d + K} \quad \text{where } K = \frac{V^2}{\gamma^2} \quad \text{and } d = 1 + \frac{C}{\gamma^2}.$$

To derive estimates for V^2 and C , consider the equation:

$$\hat{\sigma}_{b_i}^2 = \frac{V^2}{P_i} + C + \epsilon_i \quad (1)$$

where $\hat{\sigma}_{b_i}^2$ is the sample variance associated with the state trend estimate b_i and ϵ_i is an error term. We reformulate this as:

$$P_i \hat{\sigma}_{b_i}^2 = V^2 + P_i C + P_i \epsilon_i \quad (2)$$

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We then derive estimates \hat{V}^2 and \hat{C} via linear regression with the quantities $P_i \cdot \hat{\sigma}_{b_i}^2$ as dependent variables and P_i as independent variables.

We chose formulation (2) over formulation (1) since the expected values of the error terms ϵ_i may vary inversely with volume. In our judgment, the regression assumption of identically distributed error terms is more plausible for the terms $P_i \cdot \epsilon_i$ than for the ϵ_i alone. Furthermore, if the constant C is dropped, equation (2) simplifies to:

$$P_i \cdot \hat{\sigma}_{b_i}^2 = V^2 + P_i \cdot \epsilon_i \quad (3)$$

and the regression solution for \hat{V}^2 in (3) is identical to the previously presented estimator for $\hat{\Sigma}^2$.

Note that using regression to solve for \hat{V}^2 and \hat{C} also gives us measurements of the relative significance of these parameters.

3. Quality of Line Fit

The individual estimates of state variance, $\hat{\sigma}_{b_i}^2$, can be used directly to calculate state credibility using the formula: $Z_i = \frac{\hat{\gamma}^2}{\hat{\sigma}_{b_i}^2 + \hat{\gamma}^2}$

This approach will lead to credibilities based directly on the quality of the line fit in each state, analogous to the approach used in the current NCCI classical credibility procedure. Unlike the NCCI procedure, this approach also takes into account, through $\hat{\gamma}^2$, the relative reliability of overall (multiple state) trend.

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D. Correction for Bias

Consider again the volume based credibility model:

$$\hat{Z}_i = \frac{P_i}{P_i + \hat{K}} \quad \text{where} \quad \hat{K} = \frac{\hat{\Sigma}^2}{\hat{\gamma}^2}$$

The ISO Credibility Subcommittee² and Morris and Van Slyke³ modified the formula for as a correction for bias. Although the estimates of Σ^2 and γ^2 are unbiased, \hat{Z}_i is not. The modified formula, $\hat{Z}'_i = \frac{P_i}{P_i + K} \cdot \frac{N-3}{N} + \frac{3}{N}$ provides an approximate correction based on a number of further simplifying assumptions. It produces a minimum credibility of 3/N and fails when $N \leq 3$. (N is the number of states included in the overall weighted average trend rate.)

The modification always increases the credibility and approaches zero as the credibility approaches one.

We tested the modification in our applications of the volume based model. Since the resulting credibilities were generally very high, the effect of the modification was small.

It is likely that the estimates of Z_i under the alternate credibility bases are biased as well. The extent of such potential biases should be explored if the alternate credibility bases are considered.

-
- 2 Insurance Services Office, Report of the Credibility Subcommittee: Development and Testing of Empirical Bayes Procedures for Classification Ratemaking, September, 1980.
 - 3 C. Morris and O. E. Van Slyke, "Empirical Bayes Methods for Pricing Insurance Classes," Proceedings of the Business and Economics Section, American Statistical Association, 1978.

**TREND:
TECHNICAL APPENDIX B**

E. The Credibility Complement

In the loss ratio formulation, the observed total loss ratio \bar{M} is equal to the premium weighted average of the observed class loss ratios:

$$\bar{M} = \frac{\sum_i P_i \bar{Y}_i}{P_{..}}$$

However, the credibility complement indicated by the Bühlmann-Straub analysis is not \bar{M} , but rather:

$$\hat{M} = \frac{\sum_i z_i \bar{Y}_i}{\sum_i z_i}$$

the credibility weighted average loss ratio.

In making the analogy to the trend problem, we note that the observed countrywide trend rate (call it b) is not necessarily equal to the premium weighted average of the observed state trend rates. Symbolically:

$$b \neq \text{(in general)} \quad \bar{b} = \frac{\sum_i P_i b_i}{P_{..}}$$

However, if we make the simplifying assumption that premium is constant over time in each state (which assumption is consistent with the use of ordinary least squares to determine the trend rate), then it can be proved that the equation $b = \bar{b}$ holds. To the extent that b and \bar{b} differ in practice (in our tests, the difference was always negligible), \bar{b} may be a better estimator of β (the true average countrywide trend), since it is not distorted by shifts in volume from state to state.

TREND:
TECHNICAL APPENDIX B

With the above simplifying assumption, the analogy between the class problem and the trend problem holds. Thus, the appropriate countrywide complement is the credibility weighted average trend rate:

$$\hat{b} = \frac{\sum_i z_i b_i}{\sum_i z_i}$$

**TREND:
TECHNICAL APPENDIX B**

II. USING HISTORICAL PREDICTION ERRORS

This section develops in greater detail an idea discussed in Section V for estimating variances for use in Bayesian credibility formulas. Our analysis did not include testing of this technique. The data base we received from NCCI did not have enough years to apply this method; however, it appears that NCCI could develop an adequate data base.

Under this approach, the relative variances associated with state and countrywide trend projections, α^2 and γ^2 , respectively, would be estimated by measuring actual prediction errors.⁴ The measurement requires a data base longer than the period used for fitting trend. A reasonably long period would be preferable since a longer period produces more readings of prediction errors and provides measurements over a greater range of economic conditions.

A. Measuring Prediction Errors

Let Y_{it} and \hat{Y}_{it} represent the actual and fitted loss ratios for state i in year t . Let the fitting period run from year a to year b and let c represent the number of years after

4 Prediction error, the difference between a predicted loss ratio and an actual loss ratio, consists of two components: (1) the difference between the predicted loss ratio and the true mean loss ratio ("parameter" error); and (2) the difference between the actual loss ratio and the true mean loss ratio ("process" error). By definition, the process error cannot be predicted; therefore, the variances used in the credibility formula would ideally be based on parameter error only. Since the method described in this Appendix is based on prediction errors, both state and countrywide variances will be overstated by the same amounts, the process variance. The process variance will act as a "ballast" biasing credibilities toward 50%. If this effect is significant, an independent estimate of the average process variance could be made and subtracted from countrywide and average state mean square prediction errors.

TREND:
TECHNICAL APPENDIX B

year b that we wish to project. The projected loss ratio for year b+c is then:

$${}_i Y_{a,b,c}^* = Y_{ib} \frac{\hat{Y}_{i,b+c}}{\hat{Y}_{ib}}$$

The corresponding prediction error is then

$${}_i ES_{a,b,c} = {}_i Y_{a,b,c}^* - Y_{i,b+c}$$

For countrywide data, let Y_t and \hat{Y}_t represent actual and fitted loss ratios for year t. Again, letting the fitting period run from a to b, the projected loss ratio for state i in year b+c is:

$${}_i Y_{a,b,c}^{**} = Y_{ib} \frac{\hat{Y}_{b+c}}{\hat{Y}_b}$$

where the double asterisk denotes that countrywide data has been used to project state results.

The corresponding prediction error is:

$${}_i EC_{a,b,c} = {}_i Y_{a,b,c}^{**} - Y_{i,b+c}$$

Note that to approximate NCCI ratemaking procedures, the approach for calculating projected loss ratios uses the product of an "experience period" loss ratio (i.e. the loss ratio for the last year of the fitting period) and a "trend factor" (i.e. the ratio of the fitted loss ratio for the projection year to the fitted loss ratio for the experience period).

**TREND:
TECHNICAL APPENDIX B**

B. Mean Square Prediction Errors

Given that the NCCI trend periods are usually between two and three years, we are interested in two and three year prediction errors. We would then calculate the ESs and ECs for all available two and three year projections. The number of two and three year projections should be the same for all states. Let the observed mean square countrywide projection error be denoted \overline{EC}^2 , calculated as the unweighted average of the EC^2 for all available ECs.

For each state, denote the state mean square error \overline{ES}_i^2 , the unweighted average of the ES^2 available for that state.

C. Credibility Formulas

Given an adequate data base, \overline{EC}^2 will be an average of many readings, sufficiently reliable to use in credibility formulas. On the other hand, the \overline{ES}_i^2 in each state will be based on only few readings and will not be sufficiently reliable. To get a better measure of $E(\overline{ES}_i^2)$ in each state, we will need a base which measures the relative variance from state to state. We will consider the three credibility bases discussed earlier: volume, volume plus a constant, and quality of line fit.

1. Volume

Denoting state volume by P_i , we assume that $E(\overline{ES}_i^2) = \frac{C}{P_i}$. We estimate C as:

$\hat{C} = \frac{\sum_i P_i \cdot \overline{ES}_i^2}{N}$, where N is the number of states. We then assign credibility according to the formula:

$$\hat{Z}_i = \frac{P_i}{P_i + \hat{K}}, \quad \text{where } \hat{K} = \frac{\hat{C}}{\overline{EC}^2}$$

**TREND:
TECHNICAL APPENDIX B**

2. Volume plus a Constant

In this alternative approach, we assume that $E(\overline{ES}_i^2) = \frac{C_1}{P_i} + C_2$

Using actual values of \overline{ES}_i^2 and introducing an error term ϵ_i , we have:

$$\overline{ES}_i^2 = \frac{C_1}{P_i} + C_2 + \epsilon_i$$

$$\text{or } P_i \overline{ES}_i^2 = C_1 + P_i C_2 + P_i \epsilon_i \quad (4)$$

Using the formulation in equation (4), estimates \hat{C}_1 and \hat{C}_2 are derived by linear regression. Credibility is then assigned according to the formula:

$$\hat{Z}_i = \frac{P_i}{P_i \hat{d} + \hat{K}}$$

$$\text{where } \hat{K} = \frac{\hat{C}_1}{\overline{EC}^2} \text{ and } \hat{d} = 1 + \frac{\hat{C}_2}{\overline{EC}^2}$$

3. Quality of Line Fit

The residual sum of squares from the line fit for state i (SSR_i) can also be used as a predictor of $E(\overline{ES}_i^2)$. In this case we assume that $E(\overline{ES}_i^2) = C \cdot SSR_i$

$$\text{and we can estimate } C \text{ by } \hat{C} = \frac{\sum_i \left(\frac{\overline{ES}_i^2}{SSR_i} \right)}{N}$$

Credibility would be assigned according to the formula:

$$\hat{Z}_i = \frac{\overline{EC}^2}{\hat{C} \cdot SSR_i + \overline{EC}^2}$$

TREND:
TECHNICAL APPENDIX B

D. Bias in Credibility Estimates

As noted earlier in this Appendix, even if \overline{EC}^2 and the estimates of the various proportionality constants are unbiased, the estimates of Z_i will not, in general, be unbiased. The extent of potential bias and corrections for these biases should be explored further.

**TREND:
TECHNICAL APPENDIX C**

DESIGN OF TEST FOR PREMIUM ON LEVEL FACTORS

This Appendix provides greater detail on our test for distortions in premium on-level factors as discussed in Section VIII.

I. NOTATION

Exposures (payroll) for class i , period j : ${}_jE_i$

Total payroll for period j : ${}_jE = \sum_i {}_jE_i$

Rates for class i , effective date d : ${}_dR_i$

Average rate for effective date d , calculated using exposures for period j :

$${}_jAR_d = \sum_i {}_jE_i \cdot \frac{{}_dR_i}{{}_jE}$$

II. EXPOSURE/RATE DATA

For each state, NCCI provided us with the quantities ${}_jAR_d$ for six or seven policy periods and at least seven years of rates. We also received total payroll for each policy period.

III. FORMULA FOR PREMIUMS AT PRESENT RATES (PPR)

$$PPR_j = {}_jE \cdot {}_jAR_{d'}$$

where d' is the effective date of the current rates.

TREND:
TECHNICAL APPENDIX C

IV. CALCULATION OF OVERALL EFFECTS OF RATE CHANGES

For each effective date, we identified the policy periods which would likely be used to balance the rate change, i.e., those most nearly averaging 4.5 years prior to the rate change (denoted as periods a, b, c).

Then our approximation of NCCI's estimated overall rate change for effective date d is:

$$\frac{{}_aAR_d + {}_bAR_d + {}_cAR_d}{{}_aAR_{d-1} + {}_bAR_{d-1} + {}_cAR_{d-1}}$$

V. CALCULATION OF ON LEVEL PREMIUMS

We calculated on level factors for each policy period (denoted ${}_jOL$) based on the overall rate changes calculated above and standard methodology.

For each policy period, we calculated average rates in effect. For example, if policy period j begins three months before effective date d , then the average rate during policy period j is: ${}_jAR = (0.25) * {}_jAR_{d-1} + (0.75) * {}_jAR_d$.

The on level premium for policy period j is: ${}_jE * {}_jAR * {}_jOL$.

(As part of an NAIC examination of NCCI, Milliman & Robertson, Inc. has completed a study of the trend ratemaking procedures of the NCCI. The purpose of this technical supplement is to provide supporting data and calculations underlying the study).

**RATEMAKING PROCEDURES
EVALUATION OF RATEMAKING METHODOLOGIES**

**NCCI EXAMINATION
VOLUME V - SECTION IIB - PART 3
TREND
TECHNICAL SUPPLEMENT**

November 22, 1991

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TECHNICAL SUPPLEMENT**

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		Report References: Section V-D and Appendix B-I
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		Report References: Section VIII and Appendix C
Exhibit III	-	Test of Benefit On Level Factors
		Report Reference: Section IX
Exhibit IV	-	Summary of Financial Call Data
		Report Reference: Section V
Exhibit V	-	Percentage Distribution of Ultimate Frequency by Injury Type
		Report Reference: Section V-B
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		Report Reference: Section VI-A

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Notes on Exhibit I

Indemnity Pages

1. States included are those included in the "trend data base" provided to us by NCCI.
2. Five year on level premium.
3. Slopes of the fitted lines in each state, corresponding to the values b_i defined on page B-4. For exponential fits, values are the slopes of the lines fit to the natural logarithms of the loss ratios.
4. Values for time have been set to -2, -1, 0, 1, 2 so that these values are fitted loss ratios in the middle year (logs of loss ratios for exponential fits).
5. The standard error of the trend rate, corresponding to the value $\hat{\sigma}_{b_i}$ per page B-5.
6. The credibility calculated using the current NCCI credibility formula.
7. The Bayesian credibilities using the countrywide complement, calculated using one of the formulas for Z_i presented on pages B-6 and B-7.
8. Values in columns (2) through (5) based on countrywide data. Values in columns (6) and (7) are arithmetic averages of the numbers above them.
9. The value $\hat{\Sigma}^2$ per page B-5.
10. The value W per page B-5.
11. The value γ^2 per page B-4.

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Version 1 (Sheets 1-9 plus 49)

12. The value K per top section of page B-6.
13. The value \bar{b} per page B-5 (premium weighted average of the b_i).

Version 2 (Sheets 19-27)

12. The value C per page B-6.
13. t-statistic for C. Values greater than 2.0 are generally considered statistically significant.
14. The value K per bottom section of page B-6.
15. The value d per page B-6.
16. See Version 1, item (13).

Version 3 (Sheets 37-42)

12. See Version 1, item (13).

Medical Pages

- (1) through (7) Same as indemnity pages.
- (8) through (11) The Bayesian credibilities using the listed group of states for the complement. "Fee Group" corresponds to states with "effective" fee schedules per NCCI. The groupings used here are those identified by NCCI in the "trend data base" provided to us. They do not correspond exactly to the groupings identified in Section III-G, Table 2.
- (12) through (16) Values in columns (2) through (5) based on the combined data of the groups of states identified. Values in columns (6) through (11) are

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arithmetic averages of the numbers above them for states in the groups identified.

Version 1 (Sheets 10-18 plus 50)

(17) through (21) Same as Indemnity Version 1, items (9) - (13)

Version 2 (Sheets 28-36)

(17) through (24) Same as Indemnity Version 2, items (9) - (16)

Version 3 (Sheets 43-48)

(17) through (20) Same as Indemnity Version 3, items (9) - (12)

EXHIBIT I
TABLE OF CONTENTS

I. Empirical Bayesian Credibility: The Buhlmann-Straub Formulation
(per Appendix B-I)

i. Exhibit I - Explanatory Notes

Sheet Number	Loss Type	Data	Model	Credibility* Formula
1	Indemnity	Loss excl. IBNR	Linear	Version 1
2	Indemnity	Loss excl. IBNR	Adj. Linear	Version 1
3	Indemnity	Loss excl. IBNR	Exponential	Version 1
4	Indemnity	Incurred Loss	Linear	Version 1
5	Indemnity	Incurred Loss	Adj. Linear	Version 1
6	Indemnity	Incurred Loss	Exponential	Version 1
7	Indemnity	Paid Loss	Linear	Version 1
8	Indemnity	Paid Loss	Adj. Linear	Version 1
9	Indemnity	Paid Loss	Exponential	Version 1
10	Medical	Loss excl. IBNR	Linear	Version 1
11	Medical	Loss excl. IBNR	Adj. Linear	Version 1
12	Medical	Loss excl. IBNR	Exponential	Version 1
13	Medical	Incurred Loss	Linear	Version 1
14	Medical	Incurred Loss	Adj. Linear	Version 1
15	Medical	Incurred Loss	Exponential	Version 1
16	Medical	Paid Loss	Linear	Version 1
17	Medical	Paid Loss	Adj. Linear	Version 1
18	Medical	Paid Loss	Exponential	Version 1
19	Indemnity	Loss excl. IBNR	Linear	Version 2
20	Indemnity	Loss excl. IBNR	Adj. Linear	Version 2
21	Indemnity	Loss excl. IBNR	Exponential	Version 2
22	Indemnity	Incurred Loss	Linear	Version 2
23	Indemnity	Incurred Loss	Adj. Linear	Version 2
24	Indemnity	Incurred Loss	Exponential	Version 2
25	Indemnity	Paid Loss	Linear	Version 2
26	Indemnity	Paid Loss	Adj. Linear	Version 2
27	Indemnity	Paid Loss	Exponential	Version 2
28	Medical	Loss excl. IBNR	Linear	Version 2
29	Medical	Loss excl. IBNR	Adj. Linear	Version 2
30	Medical	Loss excl. IBNR	Exponential	Version 2
31	Medical	Incurred Loss	Linear	Version 2
32	Medical	Incurred Loss	Adj. Linear	Version 2
33	Medical	Incurred Loss	Exponential	Version 2
34	Medical	Paid Loss	Linear	Version 2
35	Medical	Paid Loss	Adj. Linear	Version 2
36	Medical	Paid Loss	Exponential	Version 2

* Version 1 = Volume base
 Version 2 = Volume plus a constant base
 Version 3 = Quality of line fit base

EXHIBIT I
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(continued)

I. Empirical Bayesian Credibility: The Buhlmann-Straub Formulation
(per Appendix B-I)

Sheet Number	Loss Type	Data	Model	Credibility Formula
37	Indemnity	Loss excl. IBNR	Linear	Version 3
38	Indemnity	Loss excl. IBNR	Adj. Linear	Version 3
39	Indemnity	Incurred Loss	Linear	Version 3
40	Indemnity	Incurred Loss	Adj. Linear	Version 3
41	Indemnity	Paid Loss	Linear	Version 3
42	Indemnity	Paid Loss	Adj. Linear	Version 3
43	Medical	Loss excl. IBNR	Linear	Version 3
44	Medical	Loss excl. IBNR	Adj. Linear	Version 3
45	Medical	Incurred Loss	Linear	Version 3
46	Medical	Incurred Loss	Adj. Linear	Version 3
47	Medical	Paid Loss	Linear	Version 3
48	Medical	Paid Loss	Adj. Linear	Version 3
49	Indemnity	Loss excl. IBNR	Linear	Version 1 Bias Adj.
50	Medical	Loss excl. IBNR	Linear	Version 1 Bias Adj.

NCCI -- TREND ANALYSIS

Incurred Losses Excluding IBNR Indemnity

Type of Fit : Linear
Credibility Formula : Version 1
Adjustment for Bias : No

(1)	(2)	(3)	(4)	(5)	(6)	(7)
State	84-88 Premium (000's)	State Estimate of beta	State Estimate of intercp.	State Estimate of sigma for beta	Current Cred Formula	Cred Countrywide Basis
Alabama	1,873,146	0.0419	0.3645	0.0052	0.424	0.947
Alaska	889,515	0.0131	0.3272	0.0024	0.827	0.895
Arizona--Private Carrier	1,450,128	0.0009	0.2268	0.0020	0.677	0.933
Arizona--State Fund	1,236,379	0.0112	0.3298	0.0071	0.282	0.922
Arkansas	1,114,326	0.0198	0.3446	0.0056	0.370	0.914
Connecticut	3,250,884	0.0287	0.5330	0.0077	0.419	0.969
District of Columbia	626,897	0.0213	0.3589	0.0075	0.290	0.857
Florida	10,288,516	0.0664	0.3949	0.0049	0.486	0.990
Hawaii	900,833	0.0075	0.4054	0.0050	0.493	0.896
Idaho	637,341	0.0123	0.3855	0.0106	0.220	0.859
Illinois	7,761,769	0.0120	0.4061	0.0018	1.000	0.987
Indiana	2,142,437	0.0153	0.2452	0.0018	0.804	0.954
Kansas	1,305,342	0.0195	0.3953	0.0026	0.920	0.926
Louisiana	1,967,125	0.0211	0.7585	0.0088	0.519	0.950
Maine	1,482,482	0.0023	0.4908	0.0067	0.447	0.934
Maryland	1,431,587	0.0328	0.7366	0.0075	0.595	0.932
Michigan	4,301,479	0.0046	0.6017	0.0032	1.000	0.976
Mississippi	1,145,165	0.0179	0.3414	0.0031	0.658	0.917
Missouri	2,602,708	0.0285	0.3551	0.0017	1.000	0.961
New Hampshire	1,115,474	0.0044	0.4302	0.0110	0.236	0.914
New Mexico	798,971	0.0971	0.7012	0.0160	0.265	0.885
North Carolina	2,233,048	0.0192	0.3630	0.0061	0.359	0.955
Oregon--Private Carrier	1,545,649	0.0266	0.4877	0.0158	0.187	0.937
Oregon--State Fund	1,191,856	0.0089	0.7740	0.0060	0.778	0.920
Rhode Island	927,250	0.0929	0.8054	0.0100	0.486	0.899
South Carolina	1,061,236	0.0284	0.5933	0.0075	0.478	0.910
South Dakota	343,347	0.0085	0.4019	0.0016	1.000	0.767
Tennessee	2,501,405	0.0228	0.3781	0.0071	0.322	0.960
Texas	20,151,313	0.0563	0.3638	0.0042	0.522	0.995
Utah--Private Carrier	292,232	0.0060	0.2743	0.0157	0.106	0.737
Vermont	357,258	0.0124	0.4025	0.0063	0.386	0.774
Virginia	2,386,958	0.0129	0.4033	0.0031	0.789	0.958
Wisconsin	3,295,468	0.0023	0.3402	0.0037	0.554	0.969
8. Country-wide	84,609,524	0.0316	0.4202	0.0024	0.542	0.918

9. Group Sigma-squared :	84.2638
10. Group M :	2,019.96
11. 1000! Group Gamma-squared :	0.80773
12. Group K :	104.322
13. Group Mean beta :	0.0306

NCCI -- TREND ANALYSIS

Incurred Losses Excluding IBNR Indemnity

Type of Fit : Adjusted Linear
Credibility Formula : Version 1
Adjustment for Bias : No

(1)	(2)	(3)	(4)	(5)	(6)	(7)
State	84-88 Premium (000's)	State Estimate of beta	State Estimate of intercp.	State Estimate of sigma for beta	Current Cred Formula	Cred Countrywide Basis
Alabama	1,873,146	0.0483	0.4202	0.0060	0.424	0.954
Alaska	889,515	0.0168	0.4202	0.0031	0.827	0.908
Arizona--Private Carrier	1,450,128	0.0016	0.4202	0.0038	0.677	0.941
Arizona--State Fund	1,236,379	0.0142	0.4202	0.0090	0.282	0.932
Arkansas	1,114,326	0.0241	0.4202	0.0068	0.370	0.925
Connecticut	3,250,884	0.0226	0.4202	0.0061	0.419	0.973
District of Columbia	626,897	0.0249	0.4202	0.0088	0.290	0.874
Florida	10,288,516	0.0706	0.4202	0.0052	0.486	0.991
Hawaii	900,833	0.0078	0.4202	0.0052	0.493	0.909
Idaho	637,341	0.0134	0.4202	0.0115	0.220	0.876
Illinois	7,761,769	0.0124	0.4202	0.0018	1.000	0.988
Indiana	2,142,437	0.0262	0.4202	0.0032	0.804	0.960
Kansas	1,305,342	0.0207	0.4202	0.0028	0.920	0.935
Louisiana	1,967,125	0.0117	0.4202	0.0049	0.519	0.956
Maine	1,482,482	0.0020	0.4202	0.0057	0.447	0.943
Maryland	1,431,587	0.0187	0.4202	0.0043	0.595	0.941
Michigan	4,301,479	0.0032	0.4202	0.0023	1.000	0.979
Mississippi	1,145,165	0.0220	0.4202	0.0039	0.658	0.927
Missouri	2,602,708	0.0338	0.4202	0.0020	1.000	0.966
New Hampshire	1,115,474	0.0043	0.4202	0.0108	0.236	0.925
New Mexico	798,971	0.0582	0.4202	0.0096	0.265	0.898
North Carolina	2,233,048	0.0223	0.4202	0.0071	0.359	0.961
Oregon--Private Carrier	1,545,649	0.0230	0.4202	0.0136	0.187	0.945
Oregon--State Fund	1,191,856	0.0048	0.4202	0.0033	0.778	0.929
Rhode Island	927,250	0.0485	0.4202	0.0052	0.486	0.911
South Carolina	1,061,236	0.0201	0.4202	0.0053	0.478	0.921
South Dakota	343,347	0.0089	0.4202	0.0016	1.000	0.792
Tennessee	2,501,405	0.0253	0.4202	0.0079	0.322	0.965
Texas	20,151,313	0.0650	0.4202	0.0049	0.522	0.996
Utah--Private Carrier	292,232	0.0091	0.4202	0.0240	0.106	0.764
Vermont	357,258	0.0130	0.4202	0.0066	0.386	0.798
Virginia	2,386,958	0.0134	0.4202	0.0032	0.789	0.964
Wisconsin	3,295,468	0.0028	0.4202	0.0046	0.554	0.973
8. Country-wide	84,609,524	0.0316	0.4202	0.0024	0.542	0.928
9. Group Sigma-squared :						79.3947
10. Group W :						2,183.96
11. 1000!Group Gamma-squared :						0.87820
12. Group K :						90,406
13. Group Mean beta :						0.0328

NCCI -- TREND ANALYSIS

Incurred Losses Excluding IBNR Indemnity

Type of Fit : Exponential
Credibility Formula : Version 1
Adjustment for Bias : No

(1)	(2)	(3)	(4)	(5)	(6)	(7)
State	84-88 Premium (000's)	State Estimate of beta	State Estimate of intercp.	State Estimate of sigma for beta	Current Cred Formula	Cred Countrywide Basis
Alabama	1,873,146	0.1141	-1.0227	0.0106	0.534	0.966
Alaska	889,515	-0.0401	-1.1189	0.0074	0.810	0.931
Arizona--Private Carrier	1,450,128	-0.0039	-1.4839	0.0091	0.677	0.957
Arizona--State Fund	1,236,379	0.0330	-1.1119	0.0214	0.286	0.950
Arkansas	1,114,326	0.0561	-1.0695	0.0160	0.387	0.944
Connecticut	3,250,884	0.0547	-0.6328	0.0145	0.401	0.980
District of Columbia	626,897	-0.0575	-1.0291	0.0193	0.297	0.905
Florida	10,288,516	0.1695	-0.9578	0.0049	1.000	0.994
Hawaii	900,833	0.0183	-0.9037	0.0125	0.495	0.932
Idaho	637,341	0.0297	-0.9563	0.0265	0.222	0.907
Illinois	7,781,769	0.0293	-0.9021	0.0040	1.000	0.992
Indiana	2,142,437	0.0636	-1.4099	0.0091	0.698	0.970
Kansas	1,305,342	0.0489	-0.9306	0.0061	1.000	0.952
Louisiana	1,967,125	0.0272	-0.2775	0.0114	0.530	0.968
Maine	1,482,482	-0.0050	-0.7122	0.0136	0.446	0.958
Maryland	1,431,587	-0.0448	-0.3080	0.0104	0.593	0.956
Michigan	4,301,479	0.0078	-0.5081	0.0053	1.000	0.985
Mississippi	1,145,165	0.0524	-1.0778	0.0090	0.656	0.946
Missouri	2,602,708	0.0809	-1.0418	0.0050	1.000	0.975
New Hampshire	1,115,474	0.0096	-0.8456	0.0264	0.235	0.944
New Mexico	798,971	0.1386	-0.3759	0.0242	0.286	0.924
North Carolina	2,233,048	0.0520	-1.0168	0.0168	0.370	0.971
Oregon--Private Carrier	1,545,649	-0.0514	-0.7239	0.0320	0.191	0.959
Oregon--State Fund	1,191,856	0.0117	-0.2565	0.0078	0.777	0.948
Rhode Island	927,250	0.1189	-0.2309	0.0152	0.370	0.934
South Carolina	1,081,236	0.0472	-0.5247	0.0125	0.494	0.942
South Dakota	343,347	0.0212	-0.9119	0.0040	1.000	0.839
Tennessee	2,501,405	0.0585	-0.9772	0.0179	0.341	0.974
Texas	20,151,313	0.1553	-1.0353	0.0048	1.000	0.997
Utah--Private Carrier	292,232	0.0187	-1.3034	0.0556	0.105	0.816
Vermont	357,258	0.0315	-0.9117	0.0155	0.381	0.845
Virginia	2,386,958	0.0325	-0.9092	0.0081	0.753	0.973
Wisconsin	3,295,468	0.0069	-1.0785	0.0110	0.553	0.980
8. Country-wide	84,609,524	0.0750	-0.8728	0.0042	0.572	0.946

9. Group Sigma-squared :	333.6630
10. Group W :	12,498.50
11. 10001 Group Gamma-squared :	5.07616
12. Group K :	65,731
13. Group Mean beta :	0.0785

NCCI -- TREND ANALYSIS

Incurred Losses Indemnity

Type of Fit : Linear
Credibility Formula : Version 1
Adjustment for Bias : No

(1)	(2)	(3)	(4)	(5)	(6)	(7)
State	84-88 Premium (000's)	State Estimate of beta	State Estimate of intercp.	State Estimate of sigma for beta	Current Cred Formula	Cred Countrywide Basis
Alabama	1,873,146	0.0467	0.3794	0.0047	0.494	0.950
Alaska	889,515	0.0003	0.3489	0.0032	0.650	0.899
Arizona--Private Carrier	1,450,128	0.0028	0.2395	0.0018	0.794	0.936
Arizona--State Fund	1,236,379	0.0108	0.3291	0.0069	0.290	0.926
Arkansas	1,114,326	0.0197	0.3491	0.0051	0.417	0.918
Connecticut	3,250,884	0.0489	0.5814	0.0067	0.524	0.970
District of Columbia	626,897	0.0149	0.3804	0.0064	0.359	0.863
Florida	10,288,516	0.0764	0.4162	0.0069	0.364	0.990
Hawaii	900,833	0.0018	0.3828	0.0045	0.520	0.901
Idaho	637,341	0.0137	0.3900	0.0107	0.222	0.865
Illinois	7,761,769	0.0164	0.4182	0.0023	1.000	0.987
Indiana	2,142,437	0.0185	0.2523	0.0017	0.894	0.956
Kansas	1,305,342	0.0273	0.4152	0.0032	0.794	0.929
Louisiana	1,967,125	0.0310	0.7800	0.0107	0.441	0.952
Maine	1,482,482	0.0115	0.5164	0.0036	0.877	0.937
Maryland	1,431,587	0.0248	0.7739	0.0060	0.787	0.935
Michigan	4,301,479	0.0034	0.6069	0.0031	1.000	0.977
Mississippi	1,145,165	0.0197	0.3480	0.0029	0.730	0.920
Missouri	2,602,708	0.0339	0.3671	0.0019	1.000	0.963
New Hampshire	1,115,474	0.0119	0.4438	0.0103	0.261	0.918
New Mexico	798,971	0.1088	0.7327	0.0170	0.260	0.889
North Carolina	2,233,048	0.0258	0.3853	0.0063	0.370	0.957
Oregon--Private Carrier	1,545,649	0.0164	0.5011	0.0172	0.177	0.940
Oregon--State Fund	1,191,856	0.0170	0.6386	0.0046	0.832	0.923
Rhode Island	927,250	0.1181	0.8584	0.0080	0.650	0.903
South Carolina	1,061,236	0.0369	0.6203	0.0080	0.472	0.914
South Dakota	343,347	0.0190	0.4222	0.0018	1.000	0.775
Tennessee	2,501,405	0.0252	0.3905	0.0072	0.330	0.962
Texas	20,151,313	0.0610	0.3737	0.0049	0.466	0.995
Utah--Private Carrier	292,232	0.0042	0.2740	0.0146	0.114	0.746
Vermont	357,258	0.0203	0.4250	0.0068	0.376	0.782
Virginia	2,386,958	0.0122	0.4112	0.0041	0.604	0.960
Wisconsin	3,295,468	0.0081	0.3526	0.0031	0.688	0.971
8. Country-wide	84,609,524	0.0373	0.4332	0.0030	0.568	0.922
9. Group Sigma-squared :						94.4593
10. Group W :						2,369.67
11. 1000*Group Gamma-squared :						0.94940
12. Group K :						99,494
13. Group Mean beta :						0.0362

NCCI -- TREND ANALYSIS

Incurred Losses Indemnity

Type of Fit : Adjusted Linear
Credibility Formula : Version 1
Adjustment for Bias : No

(1) State	(2) 84-88 Premium (000's)	(3) State Estimate of beta	(4) State Estimate of intercp.	(5) State Estimate of sigma for beta	(6) Current Cred Formula	(7) Cred Countrywide Basis
Alabama	1,873,146	0.0533	0.4332	0.0053	0.494	0.952
Alaska	889,515	-0.0004	0.4332	0.0040	0.650	0.904
Arizona--Private Carrier	1,450,128	0.0051	0.4332	0.0033	0.794	0.939
Arizona--State Fund	1,236,379	0.0142	0.4332	0.0090	0.290	0.929
Arkansas	1,114,326	0.0244	0.4332	0.0063	0.417	0.922
Connecticut	3,250,884	0.0384	0.4332	0.0050	0.524	0.972
District of Columbia	626,897	-0.0170	0.4332	0.0073	0.359	0.869
Florida	10,298,516	0.0795	0.4332	0.0072	0.364	0.991
Hawaii	900,833	-0.0021	0.4332	0.0050	0.520	0.905
Idaho	637,341	0.0152	0.4332	0.0118	0.222	0.871
Illinois	7,761,769	0.0170	0.4332	0.0023	1.000	0.988
Indiana	2,142,437	0.0317	0.4332	0.0029	0.894	0.958
Kansas	1,305,342	0.0284	0.4332	0.0033	0.794	0.933
Louisiana	1,967,125	0.0172	0.4332	0.0060	0.441	0.954
Maine	1,482,482	0.0097	0.4332	0.0030	0.877	0.940
Maryland	1,431,587	-0.0139	0.4332	0.0033	0.787	0.938
Michigan	4,301,479	0.0024	0.4332	0.0022	1.000	0.979
Mississippi	1,145,165	0.0245	0.4332	0.0036	0.730	0.924
Missouri	2,602,708	0.0400	0.4332	0.0023	1.000	0.965
New Hampshire	1,115,474	0.0116	0.4332	0.0101	0.261	0.922
New Mexico	798,971	0.0649	0.4332	0.0101	0.260	0.895
North Carolina	2,233,048	0.0290	0.4332	0.0071	0.370	0.960
Oregon--Private Carrier	1,545,649	-0.0142	0.4332	0.0148	0.177	0.943
Oregon--State Fund	1,191,856	-0.0115	0.4332	0.0032	0.832	0.927
Rhode Island	927,250	0.0596	0.4332	0.0040	0.650	0.908
South Carolina	1,061,236	0.0258	0.4332	0.0056	0.472	0.918
South Dakota	343,347	0.0195	0.4332	0.0019	1.000	0.785
Tennessee	2,501,405	0.0279	0.4332	0.0079	0.330	0.964
Texas	20,151,313	0.0707	0.4332	0.0056	0.466	0.995
Utah--Private Carrier	292,232	0.0066	0.4332	0.0231	0.114	0.756
Vermont	357,258	0.0207	0.4332	0.0070	0.376	0.791
Virginia	2,386,958	0.0129	0.4332	0.0043	0.604	0.962
Wisconsin	3,295,468	0.0100	0.4332	0.0038	0.688	0.972
8. Country-wide	84,609,524	0.0373	0.4332	0.0030	0.568	0.925

9. Group Sigma-squared :	90.4313
10. Group W :	2,390.44
11. 1000!Group Gamma-squared :	0.95975
12. Group K :	94,224
13. Group Mean beta :	0.0383

NCCI -- TREND ANALYSIS

Incurred Losses Indemnity

Type of Fit : Exponential
Credibility Formula : Version 1
Adjustment for Bias : No

(1)	(2)	(3)	(4)	(5)	(6)	(7)
State	84-88 Premium (000's)	State Estimate of beta	State Estimate of intercp.	State Estimate of sigma for beta	Current Cred Formula	Cred Countrywide Basis
Alabama	1,873,148	0.1228	-0.9845	0.0081	0.702	0.969
Alaska	889,515	-0.0010	-1.0531	0.0094	0.650	0.937
Arizona--Private Carrier	1,450,128	0.0118	-1.4295	0.0077	0.796	0.961
Arizona--State Fund	1,236,379	0.0319	-1.1136	0.0209	0.294	0.954
Arkansas	1,114,326	0.0554	-1.0580	0.0142	0.437	0.949
Connecticut	3,250,884	0.0851	-0.5500	0.0117	0.480	0.982
District of Columbia	626,897	-0.0384	-0.9689	0.0164	0.362	0.913
Florida	10,288,516	0.1845	-0.9108	0.0059	0.969	0.994
Hawaii	900,833	-0.0047	-0.9607	0.0119	0.520	0.938
Idaho	637,341	0.0329	-0.9448	0.0263	0.223	0.915
Illinois	7,761,769	0.0388	-0.8735	0.0048	1.000	0.992
Indiana	2,142,437	0.0746	-1.3826	0.0088	0.724	0.973
Kansas	1,305,342	0.0652	-0.8835	0.0071	0.918	0.957
Louisiana	1,967,125	0.0387	-0.2506	0.0131	0.456	0.971
Maine	1,482,482	0.0225	-0.6615	0.0069	0.863	0.961
Maryland	1,431,587	-0.0322	-0.2575	0.0078	0.786	0.960
Michigan	4,301,479	0.0056	-0.4996	0.0051	1.000	0.986
Mississippi	1,145,165	0.0566	-1.0591	0.0080	0.733	0.951
Missouri	2,602,708	0.0931	-1.0109	0.0053	1.000	0.978
New Hampshire	1,115,474	0.0257	-0.8146	0.0237	0.262	0.949
New Mexico	798,971	0.1503	-0.3353	0.0244	0.284	0.931
North Carolina	2,233,048	0.0658	-0.9590	0.0158	0.392	0.974
Oregon--Private Carrier	1,545,649	-0.0305	-0.6955	0.0343	0.177	0.963
Oregon--State Fund	1,191,856	-0.0266	-0.4493	0.0071	0.831	0.953
Rhode Island	927,250	0.1412	-0.1727	0.0125	0.450	0.940
South Carolina	1,061,236	0.0587	-0.4815	0.0124	0.499	0.947
South Dakota	343,347	0.0451	-0.8644	0.0042	1.000	0.853
Tennessee	2,501,405	0.0625	-0.9452	0.0173	0.353	0.977
Texas	20,151,313	0.1639	-1.0113	0.0050	1.000	0.997
Utah--Private Carrier	292,232	0.0132	-1.3033	0.0521	0.112	0.831
Vermont	357,258	0.0488	-0.8589	0.0163	0.365	0.858
Virginia	2,386,958	0.0304	-0.8899	0.0103	0.585	0.976
Wisconsin	3,295,468	0.0233	-1.0432	0.0090	0.682	0.982
8. Country-wide	84,609,524	0.0856	-0.8440	0.0048	0.603	0.951
9. Group Sigma-squared :						311.2645
10. Group W :						12,876.73
11. 1000*Group Gamma-squared :						5,24334
12. Group K :						59,364
13. Group Mean beta :						0.0888

NCCI -- TREND ANALYSIS

Paid Losses Indemnity

Type of Fit : Linear
Credibility Formula : Version 1
Adjustment for Bias : No

(1) State	(2) 84-88 Premium (000's)	(3) State Estimate of beta	(4) State Estimate of intercp.	(5) State Estimate of sigma for beta	(6) Current Cred Formula	(7) Cred Countrywide Basis
Alabama	1,873,146	0.0208	0.3319	0.0025	0.792	0.959
Alaska	889,515	0.0119	0.3587	0.0038	0.578	0.917
Arizona--Private Carrier	1,450,128	0.0028	0.2499	0.0029	0.522	0.947
Arizona--State Fund	1,236,379	0.0098	0.3062	0.0064	0.288	0.939
Arkansas	1,114,326	0.0146	0.3338	0.0058	0.348	0.932
Connecticut	3,250,884	0.0304	0.5584	0.0047	0.724	0.976
District of Columbia	626,897	0.0180	0.3772	0.0070	0.327	0.886
Florida	10,288,516	0.0522	0.3826	0.0025	0.919	0.992
Hawaii	900,833	0.0054	0.4153	0.0060	0.417	0.918
Idaho	637,341	0.0123	0.3738	0.0072	0.315	0.888
Illinois	7,781,769	0.0140	0.4062	0.0016	1.000	0.990
Indiana	2,142,437	0.0144	0.2406	0.0014	1.000	0.964
Kansas	1,305,342	0.0186	0.4020	0.0050	0.483	0.942
Louisiana	1,967,125	0.0183	0.7279	0.0069	0.636	0.961
Maine	1,482,482	0.0056	0.5200	0.0049	0.649	0.948
Maryland	1,431,587	0.0495	0.7321	0.0035	1.000	0.947
Michigan	4,301,479	0.0015	0.6082	0.0063	0.584	0.982
Mississippi	1,145,165	0.0104	0.3229	0.0021	0.948	0.934
Missouri	2,602,708	0.0260	0.3535	0.0032	0.673	0.970
New Hampshire	1,115,474	0.0028	0.4108	0.0082	0.302	0.932
New Mexico	798,971	0.0596	0.6484	0.0143	0.274	0.908
North Carolina	2,233,048	0.0112	0.3420	0.0052	0.402	0.965
Oregon--Private Carrier	1,545,649	0.0314	0.5037	0.0179	0.170	0.950
Oregon--State Fund	1,191,856	0.0312	0.6165	0.0067	0.555	0.937
Rhode Island	927,250	0.1100	0.8537	0.0117	0.442	0.920
South Carolina	1,061,236	0.0187	0.5699	0.0053	0.647	0.929
South Dakota	343,347	0.0102	0.3853	0.0021	1.000	0.810
Tennessee	2,501,405	0.0147	0.3613	0.0058	0.374	0.969
Texas	20,151,313	0.0583	0.3788	0.0033	0.686	0.996
Utah--Private Carrier	292,232	0.0067	0.2833	0.0150	0.114	0.783
Vermont	357,258	0.0112	0.3860	0.0031	0.765	0.816
Virginia	2,386,958	0.0065	0.3941	0.0049	0.491	0.967
Wisconsin	3,295,468	0.0005	0.3415	0.0040	0.518	0.976
8. Country-wide	84,609,524	0.0275	0.4186	0.0017	0.574	0.935

9. Group Sigma-squared :	68.4704
10. Group W :	2,100.23
11. 1000!Group Gamma-squared :	0.84781
12. Group K :	80,761
13. Group Mean beta :	0.0267

NCCI -- TREND ANALYSIS

Paid Losses Indemnity

Type of Fit : Adjusted Linear
Credibility Formula : Version 1
Adjustment for Bias : No

(1) State	(2) 84-88 Premium (000's)	(3) State Estimate of beta	(4) State Estimate of intercp.	(5) State Estimate of sigma for beta	(6) Current Cred Formula	(7) Cred Countrywide Basis
Alabama	1,873,146	0.0263	0.4186	0.0032	0.792	0.961
Alaska	889,515	0.0139	0.4186	0.0044	0.578	0.922
Arizona--Private Carrier	1,450,128	0.0047	0.4186	0.0049	0.522	0.951
Arizona--State Fund	1,236,379	0.0134	0.4186	0.0088	0.288	0.943
Arkansas	1,114,326	0.0184	0.4186	0.0073	0.348	0.937
Connecticut	3,250,884	0.0228	0.4186	0.0035	0.724	0.977
District of Columbia	626,897	0.0177	0.4186	0.0077	0.327	0.893
Florida	10,288,516	0.0571	0.4186	0.0028	0.919	0.993
Hawaii	900,833	0.0054	0.4186	0.0061	0.417	0.923
Idaho	637,341	0.0138	0.4186	0.0081	0.315	0.895
Illinois	7,761,769	0.0144	0.4186	0.0017	1.000	0.990
Indiana	2,142,437	0.0251	0.4186	0.0024	1.000	0.966
Kansas	1,305,342	0.0194	0.4186	0.0052	0.483	0.946
Louisiana	1,967,125	0.0105	0.4186	0.0040	0.636	0.963
Maine	1,482,482	0.0045	0.4186	0.0039	0.649	0.952
Maryland	1,431,587	0.0283	0.4186	0.0020	1.000	0.950
Michigan	4,301,479	0.0011	0.4186	0.0043	0.584	0.983
Mississippi	1,145,165	0.0135	0.4186	0.0027	0.948	0.938
Missouri	2,602,708	0.0308	0.4186	0.0038	0.673	0.972
New Hampshire	1,115,474	0.0028	0.4186	0.0084	0.302	0.937
New Mexico	798,971	0.0386	0.4186	0.0092	0.274	0.914
North Carolina	2,233,048	0.0138	0.4186	0.0063	0.402	0.967
Oregon--Private Carrier	1,545,649	0.0261	0.4186	0.0149	0.170	0.954
Oregon--State Fund	1,191,856	0.0212	0.4186	0.0046	0.555	0.941
Rhode Island	927,250	0.0539	0.4186	0.0057	0.442	0.925
South Carolina	1,061,236	0.0123	0.4186	0.0039	0.647	0.934
South Dakota	343,347	0.0111	0.4186	0.0023	1.000	0.820
Tennessee	2,501,405	0.0170	0.4186	0.0068	0.374	0.971
Texas	20,151,313	0.0644	0.4186	0.0037	0.686	0.996
Utah--Private Carrier	292,232	0.0099	0.4186	0.0222	0.114	0.795
Vermont	357,258	0.0121	0.4186	0.0033	0.765	0.826
Virginia	2,386,958	0.0069	0.4186	0.0052	0.491	0.969
Wisconsin	3,295,468	0.0006	0.4186	0.0049	0.518	0.978
8. Country-wide	84,609,524	0.0275	0.4186	0.0017	0.574	0.939

9. Group Sigma-squared :	61.9113
10. Group W :	2,036.40
11. 1000!Group Gamma-squared :	0.82392
12. Group K :	75,142
13. Group Mean beta :	0.0289

NCCI -- TREND ANALYSIS

Paid Losses Indemnity

Type of Fit : Exponential
Credibility Formula : Version 1
Adjustment for Bias : No

(1)	(2)	(3)	(4)	(5)	(6)	(7)
State	84-88 Premium (000's)	State Estimate of beta	State Estimate of Intercep.	State Estimate of sigma for beta	Current Cred Formula	Cred Countrywide Basis
Alabama	1,873,146	0.0630	-1.1071	0.0080	0.792	0.965
Alaska	889,515	-0.0334	-1.0287	0.0103	0.568	0.929
Arizona--Private Carrier	1,450,128	0.0111	-1.3872	0.0118	0.522	0.955
Arizona--State Fund	1,236,379	0.0315	-1.1858	0.0212	0.292	0.948
Arkansas	1,114,326	0.0429	-1.1000	0.0176	0.356	0.943
Connecticut	3,250,884	0.0550	-0.5880	0.0085	0.672	0.980
District of Columbia	628,897	-0.0415	-0.9778	0.0179	0.331	0.903
Florida	10,288,516	0.1385	-0.9799	0.0064	0.823	0.993
Hawaii	900,833	0.0127	-0.8796	0.0147	0.418	0.930
Idaho	637,341	0.0317	-0.9882	0.0187	0.319	0.904
Illinois	7,781,789	0.0343	-0.9022	0.0036	1.000	0.991
Indiana	2,142,437	0.0609	-1.4284	0.0070	0.880	0.969
Kansas	1,305,342	0.0453	-0.9139	0.0117	0.509	0.951
Louisiana	1,967,125	0.0247	-0.3185	0.0095	0.648	0.967
Maine	1,482,482	0.0109	-0.6543	0.0094	0.647	0.956
Maryland	1,431,587	-0.0686	-0.3187	0.0065	0.972	0.955
Michigan	4,301,479	0.0024	-0.4976	0.0102	0.584	0.985
Mississippi	1,145,165	0.0321	-1.1314	0.0062	0.956	0.944
Missouri	2,602,708	0.0741	-1.0456	0.0088	0.634	0.975
New Hampshire	1,115,474	-0.0067	-0.8910	0.0205	0.301	0.943
New Mexico	798,971	0.0923	-0.4484	0.0228	0.277	0.922
North Carolina	2,233,048	0.0324	-1.0747	0.0152	0.408	0.971
Oregon--Private Carrier	1,545,649	-0.0586	-0.6932	0.0358	0.173	0.958
Oregon--State Fund	1,191,856	-0.0512	-0.4867	0.0108	0.528	0.946
Rhode Island	927,250	0.1333	-0.1763	0.0171	0.330	0.932
South Carolina	1,061,236	0.0291	-0.5635	0.0094	0.652	0.940
South Dakota	343,347	0.0287	-0.9547	0.0057	1.000	0.835
Tennessee	2,501,405	0.0396	-1.0204	0.0157	0.388	0.974
Texas	20,151,313	0.1558	-0.9948	0.0056	0.924	0.997
Utah--Private Carrier	292,232	0.0213	-1.2701	0.0517	0.113	0.812
Vermont	357,258	0.0294	-0.9530	0.0082	0.737	0.841
Virginia	2,386,958	0.0170	-0.9320	0.0124	0.487	0.972
Wisconsin	3,295,468	-0.0013	-1.0747	0.0116	0.518	0.980
8. Country-wide	84,609,524	0.0657	-0.8751	0.0034	0.568	0.982
9. Group Sigma-squared :						327.2717
10. Group W :						11,924.15
11. 10001Group Gamma-squared :						4.83916
12. Group K :						67.630
13. Group Mean beta :						0.0698

NCCI -- TREND ANALYSIS

Incurred Losses Excluding IBNR Medical

Type of Fit : Linear
Credibility Formula : Version 1
Adjustment for Bias : No

(1) State	(2) 84-88 Premium (000's)	(3) State Estimate of beta	(4) State Estimate of intercp.	(5) State Estimate of sigma for beta	(6) Current Cred Formula	(7) Cred Countrywide Basis	(8) Cred Fee State Basis	(9) Cred Non-Fee State Basis	(10) Cred Fee Group Basis	(11) Cred Non-Fee Group Basis
Alabama	1,873,148	0.0474	0.4112	0.0091	0.274	0.907		0.910		0.893
Alaska	889,515	0.0127	0.2012	0.0026	0.470	0.823		0.828		0.799
Arizona--Private Carrier	1,450,128	0.0005	0.2927	0.0052	0.340	0.883	0.847		0.563	
Arizona--State Fund	1,236,379	0.0081	0.3605	0.0106	0.205	0.866	0.826		0.524	
Arkansas	1,114,326	0.0243	0.3084	0.0079	0.237	0.854		0.858		0.832
Connecticut	3,250,884	0.0184	0.2166	0.0016	0.839	0.944		0.946		0.935
District of Columbia	626,897	0.0094	0.2303	0.0034	0.413	0.766		0.773		0.736
Florida	10,288,516	0.0305	0.2533	0.0025	0.611	0.982	0.975			0.979
Hawaii	900,833	0.0075	0.2536	0.0029	0.521	0.825	0.775		0.445	
Idaho	637,341	0.0276	0.2595	0.0086	0.183	0.769	0.709		0.362	
Illinois	7,761,769	0.0124	0.1824	0.0020	0.541	0.976	0.967		0.873	
Indiana	2,142,437	0.0311	0.2724	0.0055	0.298	0.918		0.921		0.905
Kansas	1,305,342	0.0274	0.2903	0.0057	0.309	0.872		0.876		0.853
Louisiana	1,967,125	0.0473	0.4990	0.0055	0.549	0.911		0.914		0.898
Maine	1,482,482	0.0107	0.2056	0.0039	0.319	0.886		0.889		0.869
Maryland	1,431,587	0.0089	0.4227	0.0071	0.361	0.882		0.886		0.864
Michigan	4,301,479	0.0132	0.2482	0.0024	0.624	0.957	0.943		0.793	
Mississippi	1,145,165	0.0285	0.3591	0.0059	0.369	0.857		0.861		0.836
Missouri	2,602,708	0.0329	0.2670	0.0026	0.618	0.932		0.934		0.921
New Hampshire	1,115,474	0.0051	0.2271	0.0099	0.139	0.854	0.810			0.833
New Mexico	798,971	0.0720	0.4601	0.0092	0.302	0.807		0.813		0.791
North Carolina	2,233,048	0.0179	0.3065	0.0054	0.341	0.921		0.924		0.842
Oregon--Private Carrier	1,545,649	0.0147	0.3866	0.0074	0.318	0.890		0.894		0.805
Oregon--State Fund	1,191,856	0.0738	0.7859	0.0131	0.363	0.862	0.820			0.842
Rhode Island	927,250	0.0220	0.1992	0.0027	0.446	0.829	0.780			0.805
South Carolina	1,061,236	0.0158	0.3450	0.0083	0.251	0.847	0.803		0.486	
South Dakota	343,347	0.0175	0.2721	0.0034	0.483	0.642		0.651		0.605
Tennessee	2,501,405	0.0239	0.2745	0.0061	0.272	0.929		0.931		0.918
Texas	20,151,313	0.0515	0.2650	0.0043	0.375	0.991		0.991		0.989
Utah--Private Carrier	292,232	0.0268	0.2990	0.0154	0.117	0.604	0.528			0.566
Vermont	357,258	0.0182	0.2134	0.0043	0.301	0.651		0.660		0.614
Virginia	2,386,958	0.0223	0.3327	0.0024	0.836	0.926		0.928		0.914
Wisconsin	3,295,468	0.0182	0.2341	0.0020	0.715	0.945		0.947		0.936
Aggregate Fits :										
12. Country-wide	84,609,524	0.0290	0.2784	0.0025	0.404	0.864	0.815	0.873	0.578	0.842
13. All Fee States	31,164,493	0.0201	0.2620	0.0023	0.362					
14. All Non-Fee States	53,445,031	0.0346	0.2885	0.0028	0.429					
15. Fee Group States	17,349,165	0.0106	0.2369	0.0030	0.381					
16. Non-Fee Group States	67,260,359	0.0343	0.2897	0.0026	0.411					
17. Group Sigma-squared :					63.7031	68.3366	61.0554	52.1278	66.8195	
18. Group W :					861.86	661.43	799.23	148.44	764.13	
19. 1000*Group Gamma-squared :					0.33306	0.26166	0.33150	0.04636	0.29772	
20. Group K :					191,268	261,170	184,181	1,124,512	224,434	
21. Group Mean beta :					0.0292	0.0199	0.0347	0.0106	0.0340	

NCCI -- TREND ANALYSIS

Incurred Losses Excluding IBNR Medical

Type of Fit : Adjusted Linear
Credibility Formula : Version 1
Adjustment for Bias : No

(1) State	(2) 84-88 Premium (000's)	(3) State Estimate of beta	(4) State Estimate of intercp.	(5) State Estimate of sigma for beta	(6) Current Cred Formula	(7) Cred Countrywide Basis	(8) Cred Fee State Basis	(9) Cred Non-Fee State Basis	(10) Cred Fee Group Basis	(11) Cred Non-Fee Group Basis
Alabama	1,873,146	0.0321	0.2784	0.0075	0.274	0.907		0.922		0.899
Alaska	889,515	0.0176	0.2784	0.0030	0.470	0.822		0.850		0.808
Arizona--Private Carrier	1,450,128	0.0005	0.2784	0.0051	0.340	0.883	0.778		0.687	
Arizona--State Fund	1,236,379	0.0063	0.2784	0.0093	0.205	0.866	0.749		0.651	
Arkansas	1,114,326	0.0219	0.2784	0.0075	0.237	0.853		0.876		0.841
Connecticut	3,250,884	0.0236	0.2784	0.0018	0.839	0.944		0.954		0.939
District of Columbia	826,897	0.0113	0.2784	0.0037	0.413	0.766		0.799		0.748
Florida	10,288,516	0.0335	0.2784	0.0026	0.611	0.982	0.961			0.980
Hawaii	900,833	0.0082	0.2784	0.0031	0.521	0.824	0.685		0.577	
Idaho	637,341	0.0296	0.2784	0.0089	0.183	0.768	0.606		0.491	
Illinois	7,761,769	0.0190	0.2784	0.0025	0.541	0.976	0.949		0.921	
Indiana	2,142,437	0.0318	0.2784	0.0056	0.298	0.918		0.932		0.910
Kansas	1,305,342	0.0263	0.2784	0.0056	0.309	0.872		0.892		0.861
Louisiana	1,967,125	0.0264	0.2784	0.0041	0.549	0.911		0.926		0.903
Maine	1,482,482	0.0145	0.2784	0.0045	0.319	0.885		0.904		0.875
Maryland	1,431,587	0.0059	0.2784	0.0058	0.361	0.882		0.901		0.871
Michigan	4,301,479	0.0148	0.2784	0.0026	0.624	0.957	0.912		0.867	
Mississippi	1,145,165	0.0221	0.2784	0.0052	0.369	0.856		0.879		0.844
Missouri	2,602,708	0.0343	0.2784	0.0027	0.618	0.931		0.943		0.925
New Hampshire	1,115,474	0.0062	0.2784	0.0110	0.139	0.853	0.729			0.841
New Mexico	798,971	0.0436	0.2784	0.0072	0.302	0.806		0.835		0.791
North Carolina	2,233,048	0.0162	0.2784	0.0052	0.341	0.921		0.934		0.914
Oregon--Private Carrier	1,545,649	0.0106	0.2784	0.0062	0.318	0.890		0.908		0.880
Oregon--State Fund	1,191,856	0.0261	0.2784	0.0078	0.363	0.861	0.742			0.849
Rhode Island	927,250	0.0308	0.2784	0.0032	0.446	0.828	0.691			0.814
South Carolina	1,061,236	0.0127	0.2784	0.0075	0.251	0.847	0.719		0.616	
South Dakota	343,347	0.0179	0.2784	0.0034	0.483	0.641		0.686		0.619
Tennessee	2,501,405	0.0242	0.2784	0.0062	0.272	0.929		0.941		0.922
Texas	20,151,313	0.0541	0.2784	0.0044	0.375	0.991		0.992		0.990
Utah--Private Carrier	292,232	0.0249	0.2784	0.0149	0.117	0.603	0.414			0.580
Vermont	357,258	0.0238	0.2784	0.0049	0.301	0.650		0.694		0.628
Virginia	2,386,958	0.0186	0.2784	0.0022	0.836	0.926		0.938		0.919
Wisconsin	3,295,468	0.0217	0.2784	0.0022	0.715	0.945		0.954		0.940
Aggregate Fits :										
12. Country-wide	84,609,524	0.0290	0.2784	0.0025	0.404	0.863	0.745	0.889	0.687	0.850
13. All Fee States	31,164,493	0.0201	0.2620	0.0023	0.362					
14. All Non-Fee States	53,445,031	0.0348	0.2885	0.0028	0.429					
15. Fee Group States	17,349,165	0.0106	0.2369	0.0030	0.381					
16. Non-Fee Group States	67,260,359	0.0343	0.2897	0.0026	0.411					
17. Group Sigma-squared :					53.1406	50.1354	54.9168	34.8878	58.9640	
18. Group W :					716.41	324.71	831.94	144.43	712.57	
19. 1000 ² Group Sigma-squared :					0.27677	0.12114	0.34894	0.05273	0.27906	
20. Group K :					192,002	413,874	157,380	661,690	211,293	
21. Group Mean beta :					0.0295	0.0200	0.0356	0.0119	0.0349	

NCCI -- TREND ANALYSIS

Incurred Losses Excluding IBNR Medical

Type of Fit : Exponential
Credibility Formula : Version 1
Adjustment for Bias : No

(1) State	(2) 84-88 Premium (000's)	(3) State Estimate of beta	(4) State Estimate of Intercep.	(5) State Estimate of sigma for beta	(6) Current Cred Formula	(7) Cred Countrywide Basis	(8) Cred Fee State Basis	(9) Cred Non-Fee State Basis	(10) Cred Fee Group Basis	(11) Cred Non-Fee Group Basis
Alabama	1,873,146	0.1126	-0.9027	0.0078	0.317	0.935		0.956		0.935
Alaska	889,515	0.0638	-1.6082	0.0026	0.468	0.872		0.912		0.872
Arizona--Private Carrier	1,450,128	-0.0018	-1.2295	0.0052	0.339	0.917	0.793		0.678	
Arizona--State Fund	1,236,379	-0.0209	-1.0235	0.0106	0.205	0.904	0.766		0.642	
Arkansas	1,114,326	0.0758	-1.1842	0.0074	0.251	0.895		0.928		0.895
Connecticut	3,250,884	0.0857	-1.5371	0.0017	0.760	0.961		0.974		0.961
District of Columbia	626,897	0.0416	-1.4708	0.0035	0.399	0.827		0.879		0.827
Florida	10,288,516	0.1205	-1.3878	0.0017	0.867	0.987	0.965			0.987
Hawaii	900,833	0.0291	-1.3733	0.0029	0.529	0.873	0.704		0.567	
Idaho	637,341	0.1012	-1.3624	0.0078	0.198	0.830	0.628		0.481	
Illinois	7,761,769	0.0673	-1.7062	0.0018	0.809	0.983	0.954		0.919	
Indiana	2,142,437	0.1116	-1.3140	0.0046	0.355	0.942		0.961		0.942
Kansas	1,305,342	0.0930	-1.2469	0.0051	0.340	0.909		0.938		0.909
Louisiana	1,967,125	0.0947	-0.7045	0.0049	0.615	0.938		0.958		0.938
Maine	1,482,482	0.0505	-1.5854	0.0038	0.330	0.919		0.945		0.919
Maryland	1,431,587	-0.0202	-0.8623	0.0071	0.362	0.916		0.943		0.916
Michigan	4,301,479	0.0530	-1.3965	0.0023	0.645	0.970	0.919		0.862	
Mississippi	1,145,165	0.0786	-1.0312	0.0054	0.398	0.897		0.930		0.897
Missouri	2,602,708	0.1250	-1.3364	0.0029	0.556	0.952		0.968		0.952
New Hampshire	1,115,474	0.0210	-1.4889	0.0099	0.138	0.895	0.747			0.895
New Mexico	798,971	0.1562	-0.8019	0.0069	0.392	0.859		0.903		0.859
North Carolina	2,233,048	0.0572	-1.1867	0.0052	0.353	0.945		0.963		
Oregon--Private Carrier	1,545,649	0.0369	-0.9529	0.0072	0.324	0.922		0.947		
Oregon--State Fund	1,191,856	0.0984	-0.2514	0.0154	0.306	0.901	0.759			0.901
Rhode Island	927,250	0.1140	-1.6269	0.0033	0.356	0.876	0.710			0.876
South Carolina	1,061,236	0.0449	-1.0680	0.0082	0.254	0.890	0.737		0.607	
South Dakota	343,347	0.0642	-1.3063	0.0033	0.498	0.724		0.800		0.724
Tennessee	2,501,405	0.0844	-1.3014	0.0055	0.298	0.950		0.967		0.950
Texas	20,151,313	0.1964	-1.3665	0.0013	1.000	0.994		0.996		0.994
Utah--Private Carrier	292,232	0.0829	-1.2220	0.0149	0.120	0.691	0.436			0.690
Vermont	357,258	0.0876	-1.5533	0.0046	0.280	0.732		0.806		0.732
Virginia	2,386,958	0.0670	-1.1052	0.0024	0.852	0.948		0.965		0.948
Wisconsin	3,295,468	0.0785	-1.4582	0.0020	0.712	0.962		0.975		0.962
Aggregate Fits :										
12. Country-wide	84,609,524	0.1035	-1.2895	0.0015	0.437	0.900	0.760	0.934	0.679	0.898
13. All Fee States	31,164,493	0.0758	-1.3455	0.0019	0.381					
14. All Non-Fee States	53,445,031	0.1197	-1.2576	0.0015	0.470					
15. Fee Group States	17,349,165	0.0439	-1.4424	0.0028	0.397					
16. Non-Fee Group States	67,280,359	0.1182	-1.2532	0.0012	0.448					
17. Group Sigma-squared :					492.5103	680.7830	384.9259	577.1776		469.7153
18. Group W :					9,503.90	4760.67	10345.77	2423.11		8782.43
19. 1000!Group Gamma-squared :					3.76029	1.79994	4.47317	0.83861		3.58538
20. Group K :					130,977	378,225	86,052	688,252		131,008
21. Group Mean beta :					0.1082	0.0761	0.1238	0.0496		0.1208

NCCI -- TREND ANALYSIS

Incurred Losses Medical

Type of Fit : Linear
Credibility Formula : Version 1
Adjustment for Bias : No

(1) State	(2) 84-88 Premium (000's)	(3) State Estimate of beta	(4) State Estimate of Intercep.	(5) State Estimate of sigma for beta	(6) Current Cred Formula	(7) Cred Countrywide Basis	(8) Cred Fee State Basis	(9) Cred Non-Fee State Basis	(10) Cred Fee Group Basis	(11) Cred Non-Fee Group Basis
Alabama	1,873,146	0.0570	0.4329	0.0103	0.254	0.888		0.879		0.849
Alaska	889,515	0.0218	0.2137	0.0036	0.355	0.791		0.775		0.727
Arizona--Private Carrier	1,450,128	0.0052	0.3036	0.0060	0.307	0.860	0.802		0.543	
Arizona--State Fund	1,236,379	0.0081	0.3605	0.0106	0.205	0.840	0.776		0.504	
Arkansas	1,114,326	0.0259	0.3111	0.0080	0.235	0.826		0.812		0.769
Connecticut	3,250,884	0.0260	0.2353	0.0018	0.785	0.933		0.927		0.907
District of Columbia	626,897	0.0243	0.2761	0.0043	0.391	0.727		0.709		0.652
Florida	10,288,516	0.0387	0.2723	0.0039	0.422	0.978	0.988			0.969
Hawaii	900,833	0.0054	0.2475	0.0031	0.481	0.793	0.716		0.425	
Idaho	637,341	0.0291	0.2624	0.0087	0.182	0.730	0.641		0.343	
Illinois	7,761,769	0.0139	0.1859	0.0023	0.496	0.971	0.956		0.864	
Indiana	2,142,437	0.0341	0.2771	0.0060	0.281	0.901		0.893		0.865
Kansas	1,305,342	0.0322	0.3001	0.0062	0.291	0.847		0.835		0.796
Louisiana	1,967,125	0.0561	0.5159	0.0078	0.398	0.893		0.884		0.855
Maine	1,482,482	0.0135	0.2151	0.0043	0.306	0.863		0.852		0.816
Maryland	1,431,587	0.0026	0.4473	0.0066	0.412	0.859		0.847		0.811
Michigan	4,301,479	0.0106	0.2466	0.0024	0.614	0.948	0.923		0.779	
Mississippi	1,145,165	0.0326	0.3671	0.0064	0.345	0.830		0.816		0.774
Missouri	2,602,708	0.0366	0.2743	0.0028	0.603	0.917		0.910		0.886
New Hampshire	1,115,474	0.0090	0.2360	0.0099	0.144	0.826	0.758			0.769
New Mexico	798,971	0.0847	0.4860	0.0111	0.264	0.773		0.756		0.705
North Carolina	2,233,048	0.0244	0.3247	0.0059	0.335	0.905		0.897		0.870
Oregon--Private Carrier	1,545,649	0.0271	0.4086	0.0089	0.277	0.868		0.857		0.822
Oregon--State Fund	1,191,856	0.0252	0.5886	0.0114	0.313	0.835	0.769			0.781
Rhode Island	927,250	0.0298	0.2177	0.0022	0.613	0.798	0.722			0.735
South Carolina	1,061,236	0.0213	0.3591	0.0086	0.253	0.819	0.748		0.465	
South Dakota	343,347	0.0254	0.2866	0.0037	0.467	0.593		0.571		0.507
Tennessee	2,501,405	0.0272	0.2825	0.0065	0.262	0.914		0.907		0.882
Texas	20,151,313	0.0554	0.2706	0.0052	0.315	0.988		0.987		0.984
Utah--Private Carrier	292,232	0.0330	0.3118	0.0163	0.116	0.554	0.450			0.466
Vermont	357,258	0.0236	0.2267	0.0042	0.331	0.603		0.581		0.517
Virginia	2,386,958	0.0258	0.3496	0.0025	0.853	0.910		0.903		0.877
Wisconsin	3,295,468	0.0213	0.2402	0.0021	0.698	0.933		0.927		0.908
Aggregate Fits :										
12. Country-wide	84,609,524	0.0327	0.2855	0.0031	0.382	0.840	0.769	0.835	0.561	0.788
13. All Fee States	31,164,493	0.0214	0.2630	0.0028	0.346					
14. All Non-Fee States	53,445,031	0.0399	0.2993	0.0036	0.403					
15. Fee Group States	17,349,165	0.0113	0.2396	0.0030	0.363					
16. Non-Fee Group States	67,260,359	0.0388	0.2980	0.0034	0.387					
17. Group Sigma-squared :					78.6827	74.6477	80.9885	56.1213	84.7570	
18. Group W :					880.32	548.51	780.74	151.79	678.55	
19. 10001 Group Gamma-squared :					0.33451	0.20905	0.31424	0.04605	0.25352	
20. Group K :					235,219	357,073	257,726	1,218,769	334,316	
21. Group Mean beta :					0.0331	0.0216	0.0398	0.0114	0.0387	

NCCI -- TREND ANALYSIS

Incurred Losses Medical

Type of Fit : Adjusted Linear
Credibility Formula : Version 1
Adjustment for Bias : No

(1) State	(2) 84-88 Premium (000's)	(3) State Estimate of beta	(4) State Estimate of intercp.	(5) State Estimate of sigma for beta	(6) Current Cred Formula	(7) Cred Countrywide Basis	(8) Cred Fee State Basis	(9) Cred Non-Fee State Basis	(10) Cred Fee Group Basis	(11) Cred Non-Fee Group Basis
Alabama	1,873,146	0.0376	0.2855	0.0084	0.254	0.894		0.896		0.871
Alaska	889,515	0.0291	0.2855	0.0042	0.355	0.801		0.803		0.762
Arizona--Private Carrier	1,450,128	0.0049	0.2855	0.0058	0.307	0.867	0.819		0.677	
Arizona--State Fund	1,238,379	0.0064	0.2855	0.0095	0.205	0.848	0.794		0.641	
Arkansas	1,114,326	0.0237	0.2855	0.0077	0.235	0.834		0.837		0.801
Connecticut	3,250,884	0.0316	0.2855	0.0020	0.785	0.936		0.937		0.921
District of Columbia	626,897	0.0252	0.2855	0.0043	0.391	0.739		0.742		0.693
Florida	10,288,516	0.0406	0.2855	0.0040	0.422	0.979	0.970			0.974
Hawaii	900,833	0.0063	0.2855	0.0033	0.481	0.803	0.738		0.565	
Idaho	637,341	0.0316	0.2855	0.0091	0.182	0.742	0.666		0.479	
Illinois	7,761,769	0.0213	0.2855	0.0028	0.496	0.972	0.960		0.918	
Indiana	2,142,437	0.0351	0.2855	0.0061	0.281	0.906		0.908		0.885
Kansas	1,305,342	0.0306	0.2855	0.0061	0.291	0.855		0.857		0.825
Louisiana	1,967,125	0.0311	0.2855	0.0058	0.398	0.899		0.900		0.876
Maine	1,482,482	0.0179	0.2855	0.0049	0.306	0.870		0.872		0.842
Maryland	1,431,587	0.0016	0.2855	0.0053	0.412	0.866		0.868		0.838
Michigan	4,301,479	0.0123	0.2855	0.0026	0.614	0.951	0.931		0.861	
Mississippi	1,145,165	0.0253	0.2855	0.0057	0.345	0.838		0.840		0.805
Missouri	2,602,708	0.0381	0.2855	0.0028	0.603	0.922		0.923		0.904
New Hampshire	1,115,474	0.0109	0.2855	0.0109	0.144	0.834	0.777			0.801
New Mexico	798,971	0.0498	0.2855	0.0085	0.264	0.783		0.786		0.742
North Carolina	2,233,048	0.0215	0.2855	0.0055	0.335	0.910		0.911		
Oregon--Private Carrier	1,545,649	0.0190	0.2855	0.0075	0.277	0.875		0.877		
Oregon--State Fund	1,191,856	0.0122	0.2855	0.0079	0.313	0.843	0.788			0.811
Rhode Island	927,250	0.0391	0.2855	0.0025	0.613	0.807	0.744			0.770
South Carolina	1,061,236	0.0169	0.2855	0.0077	0.253	0.827	0.768		0.605	
South Dakota	343,347	0.0253	0.2855	0.0037	0.467	0.608		0.612		0.553
Tennessee	2,501,405	0.0275	0.2855	0.0066	0.262	0.919		0.920		0.900
Texas	20,151,313	0.0584	0.2855	0.0053	0.315	0.989		0.989		0.986
Utah--Private Carrier	292,232	0.0302	0.2855	0.0156	0.116	0.569	0.477			0.513
Vermont	357,258	0.0297	0.2855	0.0047	0.331	0.617		0.621		0.563
Virginia	2,386,958	0.0211	0.2855	0.0022	0.853	0.915		0.916		0.896
Wisconsin	3,295,468	0.0253	0.2855	0.0023	0.698	0.937		0.938		0.922
Aggregate Fits :										
12. Country-wide	84,609,524	0.0327	0.2855	0.0031	0.382	0.847	0.786	0.855	0.678	0.815
13. All Fee States	31,164,493	0.0214	0.2630	0.0028	0.346					
14. All Non-Fee States	53,445,031	0.0399	0.2993	0.0036	0.403					
15. Fee Group States	17,349,165	0.0113	0.2396	0.0030	0.363					
16. Non-Fee Group States	67,260,359	0.0388	0.2980	0.0034	0.387					
17. Group Sigma-squared :						67.2998	58.1688	73.1445	38.3022	77.0901
18. Group W :						795.24	470.40	821.36	153.18	727.87
19. 1000*Group Gamma-squared :						0.30376	0.18186	0.33601	0.05529	0.27786
20. Group K :						221,558	319,846	217,688	692,711	277,447
21. Group Mean beta :						0.0335	0.0222	0.0409	0.0126	0.0400

NCCI -- TREND ANALYSIS

Incurred Losses Medical

Type of Fit : Exponential
Credibility Formula : Version 1
Adjustment for Bias : No

(1) State	(2) 84-88 Premium (000's)	(3) State Estimate of beta	(4) State Estimate of intercp.	(5) State Estimate of sigma for beta	(6) Current Cred Formula	(7) Cred Countrywide Basis	(8) Cred Fee State Basis	(9) Cred Non-Fee State Basis	(10) Cred Fee Group Basis	(11) Cred Non-Fee Group Basis
Alabama	1,873,146	0.1286	-0.8552	0.0084	0.308	0.935		0.949		0.929
Alaska	889,515	0.1012	-1.5542	0.0032	0.394	0.872		0.898		0.861
Arizona--Private Carrier	1,450,128	0.0165	-1.1936	0.0060	0.308	0.917	0.847		0.673	
Arizona--State Fund	1,236,379	-0.0209	-1.0235	0.0106	0.205	0.904	0.825		0.637	
Arkansas	1,114,326	0.0801	-1.1762	0.0074	0.251	0.895		0.917		0.886
Connecticut	3,250,884	0.1115	-1.4594	0.0017	0.851	0.961		0.970		0.958
District of Columbia	626,897	0.0911	-1.2961	0.0049	0.336	0.827		0.861		0.914
Florida	10,288,516	0.1418	-1.3213	0.0025	0.639	0.987	0.975			0.986
Hawaii	900,833	0.0217	-1.3975	0.0031	0.486	0.873	0.775		0.562	
Idaho	637,341	0.1053	-1.3520	0.0079	0.198	0.830	0.709		0.475	
Illinois	7,761,769	0.0736	-1.6886	0.0020	0.568	0.983	0.967		0.917	
Indiana	2,142,437	0.1201	-1.2989	0.0048	0.343	0.942		0.955		0.937
Kansas	1,305,342	0.1055	-1.2162	0.0054	0.330	0.909		0.928		0.901
Louisiana	1,967,125	0.1080	-0.6740	0.0067	0.463	0.938		0.951		0.932
Maine	1,482,482	0.0608	-1.5415	0.0040	0.322	0.919		0.936		0.912
Maryland	1,431,587	-0.0052	-0.8052	0.0066	0.411	0.916		0.934		0.909
Michigan	4,301,479	0.0431	-1.4020	0.0024	0.618	0.970	0.943		0.859	
Mississippi	1,145,165	0.0876	-1.0107	0.0058	0.383	0.897		0.919		0.889
Missouri	2,602,708	0.1351	-1.3119	0.0028	0.587	0.952		0.963		0.948
New Hampshire	1,115,474	0.0358	-1.4507	0.0098	0.144	0.895	0.810			0.886
New Mexico	798,971	0.1735	-0.7531	0.0075	0.382	0.859		0.888		0.848
North Carolina	2,233,048	0.0738	-1.1314	0.0055	0.357	0.945		0.957		0.940
Oregon--Private Carrier	1,545,649	0.0644	-0.9006	0.0084	0.292	0.922		0.939		0.915
Oregon--State Fund	1,191,856	0.0450	-0.5331	0.0117	0.303	0.901	0.820			0.893
Rhode Island	927,250	0.1404	-1.5443	0.0029	0.452	0.876	0.780			0.866
South Carolina	1,061,236	0.0580	-1.0292	0.0083	0.260	0.890	0.802		0.601	
South Dakota	343,347	0.0882	-1.2579	0.0034	0.510	0.724		0.773		0.706
Tennessee	2,501,405	0.0933	-1.2746	0.0058	0.292	0.950		0.961		0.946
Texas	20,151,313	0.2063	-1.3498	0.0016	0.999	0.994		0.995		0.993
Utah--Private Carrier	292,232	0.0979	-1.1831	0.0155	0.120	0.691	0.528			0.571
Vermont	357,258	0.1065	-1.4965	0.0045	0.302	0.732		0.779		0.714
Virginia	2,386,958	0.0742	-1.0585	0.0025	0.832	0.948		0.959		0.943
Wisconsin	3,295,468	0.0889	-1.4343	0.0019	0.746	0.962		0.970		0.958
Aggregate Fits :										
12. Country-wide	84,609,524	0.1136	-1.2666	0.0019	0.424	0.901	0.815	0.924	0.675	0.890
13. All Fee States	31,164,493	0.0803	-1.3423	0.0022	0.358					
14. All Non-Fee States	53,445,031	0.1327	-1.2242	0.0019	0.461					
15. Fee Group States	17,349,165	0.0464	-1.4315	0.0029	0.377					
16. Non-Fee Group States	67,260,359	0.1298	-1.2277	0.0018	0.436					
17. Group Sigma-squared :					517.7598	701.0067	413.0473	610.5901	492.7671	
18. Group W :					9,999.77	6779.86	9509.88	2504.92	8474.97	
19. 1000!Group Gamma-squared :					3.95667	2.68183	4.08517	0.86826	3.44211	
20. Group K :					130,858	261,391	101,109	703,236	143,159	
21. Group Mean beta :					0.1173	0.0839	0.1368	0.0520	0.1342	

NCCI -- TREND ANALYSIS

Paid Losses Medical

Type of Fit : Linear
Credibility Formula : Version 1
Adjustment for Bias : No

(1) State	(2) 84-88 Premium (000's)	(3) State Estimate of beta	(4) State Estimate of intercp.	(5) State Estimate of sigma for beta	(6) Current Cred Formula	(7) Cred Countrywide Basis	(8) Cred Fee State Basis	(9) Cred Non-Fee State Basis	(10) Cred Fee Group Basis	(11) Cred Non-Fee Group Basis
Alabama	1,873,146	0.0366	0.3802	0.0082	0.282	0.886		0.901		0.874
Alaska	889,515	0.0150	0.2073	0.0051	0.406	0.786		0.811		0.767
Arizona--Private Carrier	1,450,128	0.0057	0.3043	0.0042	0.443	0.857	0.530		0.448	
Arizona--State Fund	1,236,379	0.0024	0.3366	0.0092	0.221	0.836	0.490		0.409	
Arkansas	1,114,326	0.0227	0.2917	0.0063	0.281	0.822		0.844		0.805
Connecticut	3,250,884	0.0199	0.2163	0.0010	1.000	0.931		0.940		0.323
District of Columbia	626,897	0.0041	0.2359	0.0037	0.388	0.722		0.752		0.599
Florida	10,288,516	0.0253	0.2383	0.0022	0.649	0.977	0.889			0.974
Hawaii	900,833	0.0161	0.2750	0.0044	0.379	0.788	0.412		0.335	
Idaho	637,341	0.0254	0.2495	0.0073	0.206	0.725	0.331		0.263	
Illinois	7,761,769	0.0156	0.1876	0.0022	0.513	0.970	0.858		0.813	
Indiana	2,142,437	0.0306	0.2694	0.0052	0.315	0.899		0.912		0.888
Kansas	1,305,342	0.0307	0.2857	0.0052	0.333	0.844		0.863		0.828
Louisiana	1,967,125	0.0413	0.4758	0.0067	0.432	0.891		0.905		0.879
Maine	1,482,482	0.0062	0.2048	0.0046	0.270	0.860		0.878		0.846
Maryland	1,431,587	0.0062	0.4135	0.0046	0.542	0.855		0.874		0.841
Michigan	4,301,479	0.0116	0.2431	0.0031	0.475	0.947	0.770		0.706	
Mississippi	1,145,165	0.0286	0.3334	0.0032	0.629	0.826		0.847		0.809
Missouri	2,602,708	0.0317	0.2674	0.0025	0.651	0.915		0.926		0.306
New Hampshire	1,115,474	0.0135	0.2194	0.0064	0.208	0.822	0.465			0.805
New Mexico	798,971	0.0612	0.4734	0.0098	0.292	0.788		0.794		0.747
North Carolina	2,233,048	0.0173	0.3141	0.0048	0.396	0.902		0.915		2
Oregon--Private Carrier	1,545,649	0.0143	0.3888	0.0089	0.265	0.865		0.882		1
Oregon--State Fund	1,191,856	0.0096	0.5458	0.0138	0.239	0.831	0.481			0.815
Rhode Island	927,250	0.0266	0.2107	0.0030	0.430	0.793	0.419			0.774
South Carolina	1,061,236	0.0166	0.3489	0.0058	0.364	0.814	0.452		0.372	
South Dakota	343,347	0.0157	0.2638	0.0036	0.449	0.587		0.624		0.560
Tennessee	2,501,405	0.0252	0.2833	0.0065	0.282	0.912		0.924		0.902
Texas	20,151,313	0.0498	0.2619	0.0041	0.383	0.988		0.990		0.987
Utah--Private Carrier	292,232	0.0361	0.3284	0.0168	0.119	0.547	0.185			0.520
Vermont	357,258	0.0195	0.2214	0.0020	0.675	0.596		0.633		0.569
Virginia	2,386,958	0.0208	0.3359	0.0014	1.000	0.908		0.920		0.898
Wisconsin	3,295,468	0.0217	0.2395	0.0028	0.522	0.932		0.941		0.924
Aggregate Fits :										
12. Country-wide	84,609,524	0.0272	0.2718	0.0026	0.425	0.836	0.523	0.861	0.478	0.819
13. All Fee States	31,164,493	0.0176	0.2490	0.0022	0.354					
14. All Non-Fee States	53,445,031	0.0335	0.2857	0.0030	0.465					
15. Fee Group States	17,349,165	0.0129	0.2383	0.0030	0.371					
16. Non-Fee Group States	67,260,359	0.0314	0.2809	0.0026	0.439					
17. Group Sigma-squared :					57.8278	59.2694	57.0040	42.4812		61.9595
18. Group W :					630.79	163.74	671.00	91.83		598.96
19. 1000!Group Sigma-squared :					0.23909	0.04608	0.27573	0.02375		0.22927
20. Group K :					241,870	1,285,913	208,738	1,788,343		270,241
21. Group Mean beta :					0.0276	0.0175	0.0334	0.0130		0.0313

NCCI -- TREND ANALYSIS

Paid Losses Medical

Type of Fit : Adjusted Linear
Credibility Formula : Version 1
Adjustment for Bias : No

(1) State	(2) 84-88 Premium (000's)	(3) State Estimate of beta	(4) State Estimate of intercp.	(5) State Estimate of sigma for beta	(6) Current Cred Formula	(7) Cred Countrywide Basis	(8) Cred Fee State Basis	(9) Cred Non-Fee State Basis	(10) Cred Fee Group Basis	(11) Cred Non-Fee Group Basis
Alabama	1,873,146	0.0262	0.2718	0.0069	0.282	0.904		0.922		0.904
Alaska	889,515	0.0197	0.2718	0.0035	0.406	0.817		0.848		0.817
Arizona--Private Carrier	1,450,128	0.0051	0.2718	0.0039	0.443	0.879	0.720		0.681	
Arizona--State Fund	1,236,379	0.0019	0.2718	0.0083	0.221	0.861	0.686		0.646	
Arkansas	1,114,326	0.0212	0.2718	0.0061	0.281	0.849		0.875		0.849
Connecticut	3,250,884	0.0251	0.2718	0.0011	1.000	0.942		0.953		0.942
District of Columbia	626,897	0.0047	0.2718	0.0040	0.388	0.759		0.798		0.759
Florida	10,288,516	0.0288	0.2718	0.0024	0.649	0.981	0.948			0.981
Hawaii	900,833	0.0159	0.2718	0.0044	0.379	0.819	0.615		0.571	
Idaho	637,341	0.0277	0.2718	0.0078	0.206	0.762	0.530		0.485	
Illinois	7,761,769	0.0226	0.2718	0.0027	0.513	0.975	0.932		0.920	
Indiana	2,142,437	0.0308	0.2718	0.0052	0.315	0.915		0.931		0.915
Kansas	1,305,342	0.0292	0.2718	0.0051	0.333	0.868		0.891		0.868
Louisiana	1,967,125	0.0236	0.2718	0.0050	0.432	0.906		0.925		0.906
Maine	1,482,482	0.0082	0.2718	0.0053	0.270	0.882		0.903		0.882
Maryland	1,431,587	0.0041	0.2718	0.0037	0.542	0.878		0.900		0.878
Michigan	4,301,479	0.0130	0.2718	0.0033	0.475	0.956	0.884		0.864	
Mississippi	1,145,165	0.0233	0.2718	0.0029	0.629	0.852		0.878		0.852
Missouri	2,602,708	0.0322	0.2718	0.0025	0.651	0.929		0.942		0.929
New Hampshire	1,115,474	0.0168	0.2718	0.0071	0.208	0.849	0.664			0.849
New Mexico	798,971	0.0352	0.2718	0.0074	0.292	0.801		0.834		0.801
North Carolina	2,233,048	0.0150	0.2718	0.0045	0.396	0.918		0.934		0.918
Oregon--Private Carrier	1,545,649	0.0100	0.2718	0.0074	0.265	0.886		0.907		0.886
Oregon--State Fund	1,191,856	0.0048	0.2718	0.0097	0.239	0.857	0.679			0.857
Rhode Island	927,250	0.0343	0.2718	0.0034	0.430	0.823	0.621			0.824
South Carolina	1,061,236	0.0129	0.2718	0.0051	0.364	0.842	0.653		0.610	
South Dakota	343,347	0.0162	0.2718	0.0036	0.449	0.633		0.683		0.634
Tennessee	2,501,405	0.0242	0.2718	0.0064	0.262	0.926		0.940		0.926
Texas	20,151,313	0.0516	0.2718	0.0042	0.383	0.990		0.992		0.990
Utah--Private Carrier	292,232	0.0298	0.2718	0.0152	0.119	0.595	0.341			0.595
Vermont	357,258	0.0240	0.2718	0.0022	0.675	0.642		0.692		0.643
Virginia	2,386,958	0.0168	0.2718	0.0012	1.000	0.923		0.938		0.923
Wisconsin	3,295,468	0.0247	0.2718	0.0030	0.522	0.943		0.954		0.943
Aggregate Fits :										
12. Country-wide	84,609,524	0.0272	0.2718	0.0026	0.425	0.860	0.689	0.888	0.682	0.857
13. All Fee States	31,164,493	0.0178	0.2490	0.0022	0.354					
14. All Non-Fee States	53,445,031	0.0335	0.2857	0.0030	0.465					
15. Fee Group States	17,349,165	0.0129	0.2383	0.0030	0.371					
16. Non-Fee Group States	67,280,359	0.0314	0.2809	0.0026	0.439					
17. Group Sigma-squared :						46.7591	39.2828	51.6037	32.8983	51.0660
18. Group W :						610.33	196.95	774.11	133.73	653.23
19. 1000*Group Gamma-squared :						0.23517	0.06956	0.32446	0.04853	0.25710
20. Group K :						198.833	564.735	159,048	677,866	198.625
21. Group Mean beta :						0.0284	0.0189	0.0345	0.0143	0.0325

NCCI -- TREND ANALYSIS

Paid Losses Medical

Type of Fit : Exponential
Credibility Formula : Version 1
Adjustment for Bias : No

(1) State	(2) 84-88 Premium (000's)	(3) State Estimate of beta	(4) State Estimate of intercp.	(5) State Estimate of sigma for beta	(6) Current Cred Formula	(7) Cred Countrywide Basis	(8) Cred Fee State Basis	(9) Cred Non-Fee State Basis	(10) Cred Fee Group Basis	(11) Cred Non-Fee Group Basis
Alabama	1,873,146	0.0936	~0.9771	0.0073	0.313	0.936		0.956		0.941
Alaska	889,515	0.0721	~1.5796	0.0030	0.419	0.874		0.911		0.883
Arizona--Private Carrier	1,450,128	0.0183	~1.1905	0.0041	0.446	0.919	0.754		0.703	
Arizona--State Fund	1,236,379	~0.0059	~1.0912	0.0092	0.220	0.906	0.724		0.669	
Arkansas	1,114,326	0.0756	~1.2390	0.0058	0.300	0.897		0.928		0.904
Connecticut	3,250,884	0.0928	~1.5399	0.0010	1.000	0.962		0.974		0.965
District of Columbia	626,897	0.0176	~1.4453	0.0037	0.386	0.831		0.878		0.842
Florida	10,288,516	0.1054	~1.4453	0.0014	1.000	0.988	0.956			0.989
Hawaii	900,833	0.0573	~1.2952	0.0041	0.402	0.876	0.656		0.595	
Idaho	637,341	0.0972	~1.4003	0.0066	0.226	0.833	0.575		0.510	
Illinois	7,761,769	0.0819	~1.6806	0.0018	0.625	0.984	0.943		0.927	
Indiana	2,142,437	0.1112	~1.3247	0.0043	0.378	0.944		0.961		0.948
Kansas	1,305,342	0.1053	~1.2649	0.0042	0.407	0.911		0.938		0.917
Louisiana	1,967,125	0.0855	~0.7507	0.0059	0.488	0.939		0.958		0.943
Maine	1,482,482	0.0286	~1.5878	0.0046	0.272	0.921		0.945		0.926
Maryland	1,431,587	~0.0146	~0.8838	0.0046	0.543	0.918		0.943		0.924
Michigan	4,301,479	0.0474	~1.4171	0.0030	0.484	0.971	0.901		0.875	
Mississippi	1,145,165	0.0857	~1.1059	0.0029	0.686	0.900		0.930		0.907
Missouri	2,602,708	0.1188	~1.3334	0.0020	0.814	0.953		0.968		0.957
New Hampshire	1,115,474	0.0590	~1.5231	0.0062	0.213	0.897	0.703			0.904
New Mexico	798,971	0.1277	~0.7655	0.0081	0.350	0.862		0.902		0.871
North Carolina	2,233,048	0.0539	~1.1617	0.0046	0.413	0.946		0.963		~
Oregon--Private Carrier	1,545,649	0.0356	~0.9477	0.0087	0.269	0.924		0.947		~
Oregon--State Fund	1,191,856	0.0190	~0.6078	0.0139	0.237	0.903	0.716			0.310
Rhode Island	927,250	0.1300	~1.5749	0.0036	0.344	0.879	0.663			0.887
South Carolina	1,061,236	0.0469	~1.0560	0.0057	0.372	0.893	0.692		0.634	
South Dakota	343,347	0.0586	~1.3364	0.0033	0.479	0.729		0.798		0.745
Tennessee	2,501,405	0.0860	~1.2703	0.0059	0.288	0.951		0.966		0.955
Texas	20,151,313	0.1919	~1.3768	0.0018	0.858	0.994		0.996		0.994
Utah--Private Carrier	292,232	0.1017	~1.1316	0.0158	0.124	0.696	0.382			0.713
Vermont	357,258	0.0888	~1.5161	0.0020	0.675	0.737		0.805		0.752
Virginia	2,386,958	0.0621	~1.0948	0.0013	1.000	0.949		0.985		0.953
Wisconsin	3,295,468	0.0904	~1.4375	0.0024	0.595	0.963		0.974		0.965
Aggregate Fits :										
12. Country-wide	84,609,524	0.0994	~1.3127	0.0017	0.474	0.903	0.722	0.934	0.702	0.907
13. All Fee States	31,164,493	0.0697	~1.3954	0.0018	0.391					
14. All Non-Fee States	53,445,031	0.1187	~1.2668	0.0017	0.521					
15. Fee Group States	17,349,165	0.0531	~1.4377	0.0028	0.397					
16. Non-Fee Group States	67,260,359	0.1112	~1.2823	0.0015	0.494					
17. Group Sigma-squared :					431.4541	538.9651	370.0193	497.0824	413.7850	
18. Group W :					8,528.64	3128.03	9865.84	2226.37	8595.54	
19. 1000!Group Sigma-squared :					3.37880	1.14223	4.26426	0.81218	3.51196	
20. Group K :					127.694	471.855	86,772	612,033	117,822	
21. Group Mean beta :					0.1041	0.0752	0.1210	0.0589	0.1158	

NCCI -- TREND ANALYSIS

Incurred Losses Excluding IBNR Indemnity

Type of Fit : Linear
Credibility Formula : Version 2
Adjustment for Bias : No

(1) State	(2) 84-88 Premium (000's)	(3) State Estimate of beta	(4) State Estimate of intercp.	(5) State Estimate of sigma for beta	(6) Current Cred Formula	(7) Cred Countrywide Basis
Alabama	1,873,146	0.0419	0.3645	0.0052	0.424	0.953
Alaska	889,515	0.0131	0.3272	0.0024	0.827	0.922
Arizona--Private Carrier	1,450,128	0.0009	0.2268	0.0020	0.677	0.945
Arizona--State Fund	1,236,379	0.0112	0.3298	0.0071	0.282	0.938
Arkansas	1,114,326	0.0198	0.3446	0.0056	0.370	0.934
Connecticut	3,250,884	0.0287	0.5330	0.0077	0.419	0.965
District of Columbia	626,897	0.0213	0.3589	0.0075	0.290	0.899
Florida	10,288,516	0.0664	0.3949	0.0049	0.486	0.977
Hawaii	900,833	0.0075	0.4054	0.0050	0.493	0.923
Idaho	637,341	0.0123	0.3855	0.0106	0.220	0.900
Illinois	7,761,769	0.0120	0.4061	0.0018	1.000	0.975
Indiana	2,142,437	0.0153	0.2452	0.0018	0.804	0.957
Kansas	1,305,342	0.0195	0.3953	0.0026	0.920	0.941
Louisiana	1,967,125	0.0211	0.7585	0.0088	0.519	0.954
Maine	1,482,482	0.0023	0.4908	0.0067	0.447	0.946
Maryland	1,431,587	0.0328	0.7366	0.0075	0.595	0.944
Michigan	4,301,479	0.0046	0.6017	0.0032	1.000	0.970
Mississippi	1,145,165	0.0179	0.3414	0.0031	0.658	0.935
Missouri	2,602,708	0.0285	0.3551	0.0017	1.000	0.961
New Hampshire	1,115,474	0.0044	0.4302	0.0110	0.236	0.934
New Mexico	798,971	0.0971	0.7012	0.0180	0.265	0.916
North Carolina	2,233,048	0.0192	0.3630	0.0061	0.359	0.958
Oregon--Private Carrier	1,545,649	0.0266	0.4877	0.0158	0.187	0.947
Oregon--State Fund	1,191,856	0.0089	0.7740	0.0060	0.778	0.937
Rhode Island	927,250	0.0929	0.8054	0.0100	0.486	0.925
South Carolina	1,061,236	0.0284	0.5933	0.0075	0.478	0.932
South Dakota	343,347	0.0085	0.4019	0.0016	1.000	0.840
Tennessee	2,501,405	0.0228	0.3781	0.0071	0.322	0.960
Texas	20,151,313	0.0563	0.3638	0.0042	0.522	0.980
Utah--Private Carrier	292,232	0.0060	0.2743	0.0157	0.106	0.819
Vermont	357,258	0.0124	0.4025	0.0063	0.386	0.845
Virginia	2,386,958	0.0129	0.4033	0.0031	0.789	0.959
Wisconsin	3,295,468	0.0023	0.3402	0.0037	0.554	0.966
8. Country-wide	84,609,524	0.0316	0.4202	0.0024	0.542	0.935
9. Group V-squared :						47.9789
10. Group W :						2,019.96
11. 1000!Group Gamma-squared :						0.80773
12. 1000!Group C :						0.01415
13. t-statistic for Group C :						3.67561
14. Group K :						59,400
15. Group d :						1.0175
16. Group Mean beta :						0.0306

NCCI -- TREND ANALYSIS

Incurred Losses Excluding IBNR Indemnity

Type of Fit : Adjusted Linear
Credibility Formula : Version 2
Adjustment for Bias : No

(1)	(2)	(3)	(4)	(5)	(6)	(7)
State	84-88 Premium (000's)	State Estimate of beta	State Estimate of Intercep.	State Estimate of sigma for beta	Current Cred Formula	Cred Countrywide Basis
Alabama	1,873,145	0.0483	0.4202	0.0060	0.424	0.962
Alaska	889,515	0.0168	0.4202	0.0031	0.827	0.944
Arizona--Private Carrier	1,450,128	0.0018	0.4202	0.0038	0.677	0.957
Arizona--State Fund	1,236,379	0.0142	0.4202	0.0090	0.282	0.953
Arkansas	1,114,326	0.0241	0.4202	0.0069	0.370	0.951
Connecticut	3,250,884	0.0226	0.4202	0.0061	0.419	0.968
District of Columbia	626,897	0.0249	0.4202	0.0088	0.290	0.931
Florida	10,288,516	0.0706	0.4202	0.0052	0.486	0.975
Hawaii	900,833	0.0078	0.4202	0.0052	0.493	0.945
Idaho	637,341	0.0134	0.4202	0.0115	0.220	0.931
Illinois	7,761,769	0.0124	0.4202	0.0018	1.000	0.974
Indiana	2,142,437	0.0262	0.4202	0.0032	0.804	0.964
Kansas	1,305,342	0.0207	0.4202	0.0028	0.920	0.955
Louisiana	1,967,125	0.0117	0.4202	0.0049	0.519	0.962
Maine	1,482,482	0.0020	0.4202	0.0057	0.447	0.957
Maryland	1,431,587	0.0187	0.4202	0.0043	0.595	0.957
Michigan	4,301,479	0.0032	0.4202	0.0023	1.000	0.971
Mississippi	1,145,165	0.0220	0.4202	0.0039	0.658	0.951
Missouri	2,602,708	0.0338	0.4202	0.0020	1.000	0.966
New Hampshire	1,115,474	0.0043	0.4202	0.0108	0.236	0.951
New Mexico	798,971	0.0582	0.4202	0.0096	0.265	0.940
North Carolina	2,233,048	0.0223	0.4202	0.0071	0.359	0.964
Oregon--Private Carrier	1,545,649	0.0230	0.4202	0.0136	0.187	0.958
Oregon--State Fund	1,191,856	0.0048	0.4202	0.0033	0.778	0.953
Rhode Island	927,250	0.0485	0.4202	0.0052	0.486	0.945
South Carolina	1,061,236	0.0201	0.4202	0.0053	0.478	0.949
South Dakota	343,347	0.0089	0.4202	0.0016	1.000	0.895
Tennessee	2,501,405	0.0253	0.4202	0.0079	0.322	0.966
Texas	20,151,313	0.0650	0.4202	0.0049	0.522	0.976
Utah--Private Carrier	292,232	0.0091	0.4202	0.0240	0.106	0.882
Vermont	357,258	0.0130	0.4202	0.0066	0.386	0.898
Virginia	2,386,958	0.0134	0.4202	0.0032	0.789	0.965
Wisconsin	3,295,468	0.0028	0.4202	0.0046	0.554	0.969
8. Country-wide	84,609,524	0.0316	0.4202	0.0024	0.542	0.951
9. Group V-squared :						28.5599
10. Group W :						2,183.96
11. 1000*Group Gamma-squared :						0.87820
12. 1000*Group C :						0.01983
13. t-statistic for Group C :						6.09061
14. Group K :						32,521
15. Group d :						1.0226
16. Group Mean beta :						0.0328

NCCI -- TREND ANALYSIS

Incurred Losses Excluding IBNR Indemnity

Type of Fit : Exponential
Credibility Formula : Version 2
Adjustment for Bias : No

(1)	(2)	(3)	(4)	(5)	(6)	(7)
State	84-88 Premium (000's)	State Estimate of beta	State Estimate of intercp.	State Estimate of sigma for beta	Current Cred Formula	Cred Countrywide Basis
Alabama	1,873,146	0.1141	-1.0227	0.0106	0.534	0.966
Alaska	889,515	-0.0401	-1.1189	0.0074	0.810	0.932
Arizona--Private Carrier	1,450,128	-0.0039	-1.4839	0.0091	0.677	0.957
Arizona--State Fund	1,236,379	0.0330	-1.1119	0.0214	0.286	0.950
Arkansas	1,114,326	0.0561	-1.0695	0.0160	0.387	0.945
Connecticut	3,250,884	0.0547	-0.6328	0.0145	0.401	0.980
District of Columbia	626,897	-0.0575	-1.0291	0.0193	0.297	0.906
Florida	10,288,516	0.1695	-0.9578	0.0049	1.000	0.993
Hawaii	900,833	0.0183	-0.9037	0.0125	0.495	0.933
Idaho	637,341	0.0297	-0.9563	0.0265	0.222	0.907
Illinois	7,761,769	0.0293	-0.9021	0.0040	1.000	0.991
Indiana	2,142,437	0.0636	-1.4099	0.0091	0.698	0.970
Kansas	1,305,342	0.0489	-0.9306	0.0061	1.000	0.952
Louisiana	1,967,125	0.0272	-0.2775	0.0114	0.530	0.968
Maine	1,482,482	-0.0050	-0.7122	0.0136	0.448	0.958
Maryland	1,431,587	-0.0448	-0.3080	0.0104	0.593	0.956
Michigan	4,301,479	0.0076	-0.5081	0.0053	1.000	0.985
Mississippi	1,145,165	0.0524	-1.0778	0.0090	0.656	0.946
Missouri	2,602,708	0.0809	-1.0418	0.0050	1.000	0.975
New Hampshire	1,115,474	0.0096	-0.8456	0.0264	0.235	0.945
New Mexico	798,971	0.1386	-0.3759	0.0242	0.286	0.925
North Carolina	2,233,048	0.0520	-1.0168	0.0168	0.370	0.971
Oregon--Private Carrier	1,545,649	-0.0514	-0.7239	0.0320	0.191	0.959
Oregon--State Fund	1,191,856	0.0117	-0.2565	0.0078	0.777	0.948
Rhode Island	927,250	0.1189	-0.2309	0.0152	0.370	0.934
South Carolina	1,061,236	0.0472	-0.5247	0.0125	0.494	0.942
South Dakota	343,347	0.0212	-0.9119	0.0040	1.000	0.841
Tennessee	2,501,405	0.0585	-0.9772	0.0179	0.341	0.974
Texas	20,151,313	0.1553	-1.0353	0.0048	1.000	0.996
Utah--Private Carrier	292,232	0.0187	-1.3034	0.0556	0.105	0.818
Vermont	357,258	0.0315	-0.9117	0.0155	0.381	0.846
Virginia	2,386,958	0.0325	-0.9092	0.0081	0.753	0.973
Wisconsin	3,295,468	0.0069	-1.0785	0.0110	0.553	0.980
8. Country-wide	84,609,524	0.0750	-0.8728	0.0042	0.572	0.946

9. Group V-squared :	328.5606
10. Group W :	12,498.50
11. 1000!Group Gamma-squared :	5.07616
12. 1000!Group C :	0.00199
13. t-statistic for Group C :	0.12642
14. Group K :	64,726
15. Group d :	1.0004
16. Group Mean beta :	0.0785

NCCI -- TREND ANALYSIS

Incurred Losses Indemnity

Type of Fit : Linear
Credibility Formula : Version 2
Adjustment for Bias : No

(1)	(2)	(3)	(4)	(5)	(6)	(7)
State	84-88 Premium (000's)	State Estimate of beta	State Estimate of interc.	State Estimate of sigma for beta	Current Cred Formula	Cred Countrywide Basis
Alabama	1,873,146	0.0467	0.3794	0.0047	0.494	0.958
Alaska	889,515	0.0003	0.3489	0.0032	0.650	0.938
Arizona--Private Carrier	1,450,128	0.0028	0.2395	0.0018	0.794	0.952
Arizona--State Fund	1,236,379	0.0108	0.3291	0.0069	0.290	0.948
Arkansas	1,114,326	0.0197	0.3491	0.0051	0.417	0.945
Connecticut	3,250,884	0.0489	0.5814	0.0067	0.524	0.966
District of Columbia	626,897	0.0149	0.3804	0.0064	0.359	0.923
Florida	10,288,516	0.0764	0.4182	0.0069	0.364	0.973
Hawaii	900,833	0.0018	0.3828	0.0045	0.520	0.938
Idaho	637,341	0.0137	0.3900	0.0107	0.222	0.924
Illinois	7,761,769	0.0164	0.4182	0.0023	1.000	0.972
Indiana	2,142,437	0.0185	0.2523	0.0017	0.894	0.960
Kansas	1,305,342	0.0273	0.4152	0.0032	0.794	0.950
Louisiana	1,967,125	0.0310	0.7800	0.0107	0.441	0.959
Maine	1,482,482	0.0115	0.5164	0.0036	0.877	0.953
Maryland	1,431,587	0.0248	0.7739	0.0060	0.787	0.952
Michigan	4,301,479	0.0034	0.6069	0.0031	1.000	0.968
Mississippi	1,145,165	0.0197	0.3480	0.0029	0.730	0.946
Missouri	2,602,708	0.0339	0.3671	0.0019	1.000	0.963
New Hampshire	1,115,474	0.0119	0.4438	0.0103	0.261	0.945
New Mexico	798,971	0.1098	0.7327	0.0170	0.260	0.934
North Carolina	2,233,048	0.0258	0.3853	0.0063	0.370	0.961
Oregon--Private Carrier	1,545,649	0.0164	0.5011	0.0172	0.177	0.954
Oregon--State Fund	1,191,856	0.0170	0.6386	0.0046	0.832	0.947
Rhode Island	927,250	0.1181	0.8584	0.0080	0.650	0.939
South Carolina	1,061,236	0.0369	0.6203	0.0080	0.472	0.944
South Dakota	343,347	0.0190	0.4222	0.0018	1.000	0.883
Tennessee	2,501,405	0.0252	0.3905	0.0072	0.330	0.962
Texas	20,151,313	0.0610	0.3737	0.0049	0.466	0.975
Utah--Private Carrier	292,232	0.0042	0.2740	0.0146	0.114	0.868
Vermont	357,258	0.0203	0.4250	0.0068	0.376	0.886
Virginia	2,386,958	0.0122	0.4112	0.0041	0.604	0.962
Wisconsin	3,295,468	0.0081	0.3526	0.0031	0.688	0.966
8. Country-wide	84,609,524	0.0373	0.4332	0.0030	0.568	0.946

9. Group V-squared :	35.3989
10. Group W :	2,369.67
11. 1000*Group Gamma-squared :	0.94940
12. 1000*Group C :	0.02304
13. t-statistic for Group C :	4.67193
14. Group K :	37,285
15. Group d :	1.0243
16. Group Mean beta :	0.0362

NCCI -- TREND ANALYSIS

Incurred Losses Indemnity

Type of Fit : Adjusted Linear
Credibility Formula : Version 2
Adjustment for Bias : No

(1)	(2)	(3)	(4)	(5)	(6)	(7)
State	84-88 Premium (000's)	State Estimate of beta	State Estimate of intercp.	State Estimate of sigma for beta	Current Cred Formula	Cred Countrywide Basis
Alabama	1,873,148	0.0533	0.4332	0.0053	0.494	0.963
Alaska	889,515	0.0004	0.4332	0.0040	0.650	0.956
Arizona--Private Carrier	1,450,128	0.0051	0.4332	0.0033	0.794	0.961
Arizona--State Fund	1,236,379	0.0142	0.4332	0.0090	0.290	0.960
Arkansas	1,114,326	0.0244	0.4332	0.0063	0.417	0.959
Connecticut	3,250,884	0.0364	0.4332	0.0050	0.524	0.966
District of Columbia	626,897	0.0170	0.4332	0.0073	0.359	0.951
Florida	10,288,516	0.0795	0.4332	0.0072	0.364	0.968
Hawaii	900,833	0.0021	0.4332	0.0050	0.520	0.956
Idaho	637,341	0.0152	0.4332	0.0118	0.222	0.951
Illinois	7,761,769	0.0170	0.4332	0.0023	1.000	0.968
Indiana	2,142,437	0.0317	0.4332	0.0029	0.894	0.964
Kansas	1,305,342	0.0284	0.4332	0.0033	0.794	0.960
Louisiana	1,967,125	0.0172	0.4332	0.0060	0.441	0.963
Maine	1,482,482	0.0097	0.4332	0.0030	0.877	0.961
Maryland	1,431,587	0.0139	0.4332	0.0033	0.787	0.961
Michigan	4,301,479	0.0024	0.4332	0.0022	1.000	0.966
Mississippi	1,145,165	0.0245	0.4332	0.0036	0.730	0.959
Missouri	2,602,708	0.0400	0.4332	0.0023	1.000	0.965
New Hampshire	1,115,474	0.0116	0.4332	0.0101	0.261	0.959
New Mexico	798,971	0.0649	0.4332	0.0101	0.260	0.955
North Carolina	2,233,048	0.0290	0.4332	0.0071	0.370	0.964
Oregon--Private Carrier	1,545,649	0.0142	0.4332	0.0148	0.177	0.962
Oregon--State Fund	1,191,856	0.0115	0.4332	0.0032	0.832	0.959
Rhode Island	927,250	0.0596	0.4332	0.0040	0.650	0.957
South Carolina	1,061,236	0.0258	0.4332	0.0056	0.472	0.958
South Dakota	343,347	0.0195	0.4332	0.0019	1.000	0.936
Tennessee	2,501,405	0.0279	0.4332	0.0079	0.330	0.964
Texas	20,151,313	0.0707	0.4332	0.0056	0.466	0.969
Utah--Private Carrier	292,232	0.0066	0.4332	0.0231	0.114	0.930
Vermont	357,258	0.0207	0.4332	0.0070	0.376	0.937
Virginia	2,386,958	0.0129	0.4332	0.0043	0.604	0.964
Wisconsin	3,295,468	0.0100	0.4332	0.0038	0.688	0.966
8. Country-wide	84,609,524	0.0373	0.4332	0.0030	0.568	0.959

9. Group V-squared :	12.0835
10. Group W :	2,390.44
11. 1000!Group Gamma-squared :	0.95975
12. 1000!Group C :	0.03056
13. t-statistic for Group C :	7.32762
14. Group K :	12.590
15. Group d :	1.0318
16. Group Mean beta :	0.0383

NCCI -- TREND ANALYSIS

Incurred Losses Indemnity

Type of Fit : Exponential
Credibility Formula : Version 2
Adjustment for Bias : No

(1)	(2)	(3)	(4)	(5)	(6)	(7)
State	84-88 Premium (000's)	State Estimate of beta	State Estimate of intercp.	State Estimate of sigma for beta	Current Cred Formula	Cred Countrywide Basis
Alabama	1,873,146	0.1226	-0.9845	0.0081	0.702	0.970
Alaska	889,515	-0.0010	-1.0531	0.0094	0.650	0.940
Arizona--Private Carrier	1,450,128	0.0118	-1.4295	0.0077	0.796	0.962
Arizona--State Fund	1,236,379	0.0319	-1.1136	0.0209	0.294	0.956
Arkansas	1,114,326	0.0554	-1.0560	0.0142	0.437	0.951
Connecticut	3,250,884	0.0851	-0.5500	0.0117	0.480	0.982
District of Columbia	626,897	-0.0384	-0.9689	0.0164	0.362	0.917
Florida	10,288,516	0.1845	-0.9108	0.0059	0.969	0.993
Hawaii	900,833	-0.0047	-0.9607	0.0119	0.520	0.941
Idaho	637,341	0.0329	-0.9448	0.0263	0.223	0.919
Illinois	7,761,769	0.0388	-0.8735	0.0048	1.000	0.991
Indiana	2,142,437	0.0746	-1.3826	0.0088	0.724	0.973
Kansas	1,305,342	0.0652	-0.8835	0.0071	0.918	0.958
Louisiana	1,967,125	0.0387	-0.2506	0.0131	0.456	0.971
Maine	1,482,482	0.0225	-0.6615	0.0069	0.863	0.963
Maryland	1,431,587	-0.0322	-0.2575	0.0078	0.786	0.961
Michigan	4,301,479	0.0056	-0.4996	0.0051	1.000	0.986
Mississippi	1,145,165	0.0566	-1.0591	0.0080	0.733	0.952
Missouri	2,602,708	0.0931	-1.0109	0.0053	1.000	0.978
New Hampshire	1,115,474	0.0257	-0.8146	0.0237	0.262	0.951
New Mexico	798,971	0.1503	-0.3353	0.0244	0.284	0.934
North Carolina	2,233,048	0.0658	-0.9590	0.0158	0.392	0.974
Oregon--Private Carrier	1,545,649	-0.0305	-0.6955	0.0343	0.177	0.964
Oregon--State Fund	1,191,856	-0.0266	-0.4493	0.0071	0.831	0.954
Rhode Island	927,250	0.1412	-0.1727	0.0125	0.450	0.942
South Carolina	1,081,236	0.0587	-0.4815	0.0124	0.499	0.949
South Dakota	343,347	0.0451	-0.8644	0.0042	1.000	0.860
Tennessee	2,501,405	0.0625	-0.9452	0.0173	0.353	0.977
Texas	20,151,313	0.1639	-1.0113	0.0050	1.000	0.996
Utah--Private Carrier	292,232	0.0132	-1.3033	0.0521	0.112	0.839
Vermont	357,258	0.0488	-0.8589	0.0163	0.365	0.864
Virginia	2,386,958	0.0304	-0.8899	0.0103	0.585	0.976
Wisconsin	3,295,468	0.0233	-1.0432	0.0090	0.682	0.982
8. Country-wide	84,609,524	0.0856	-0.8440	0.0048	0.603	0.952

9. Group V-squared :	291.1849
10. Group W :	12,876.73
11. 1000!Group Gamma-squared :	5.24334
12. 1000!Group C :	0.00783
13. t-statistic for Group C :	0.47601
14. Group K :	55.534
15. Group d :	1.0015
16. Group Mean beta :	0.0888

MCCI -- TREND ANALYSIS

Paid Losses Indemnity

Type of Fit : Linear
Credibility Formula : Version 2
Adjustment for Bias : No

(1)	(2)	(3)	(4)	(5)	(6)	(7)
State	84-88 Premium (000's)	State Estimate of beta	State Estimate of intercp.	State Estimate of sigma for beta	Current Cred Formula	Cred Countrywide Basis
Alabama	1,873,146	0.0208	0.3319	0.0025	0.792	0.961
Alaska	889,515	-0.0119	0.3587	0.0038	0.578	0.929
Arizona--Private Carrier	1,450,128	0.0028	0.2499	0.0029	0.522	0.953
Arizona--State Fund	1,236,379	0.0098	0.3062	0.0064	0.288	0.946
Arkansas	1,114,326	0.0146	0.3338	0.0058	0.348	0.941
Connecticut	3,250,884	0.0304	0.5584	0.0047	0.724	0.974
District of Columbia	626,897	-0.0160	0.3772	0.0070	0.327	0.905
Florida	10,288,516	0.0522	0.3826	0.0025	0.919	0.986
Hawaii	900,833	0.0054	0.4153	0.0060	0.417	0.930
Idaho	637,341	0.0123	0.3738	0.0072	0.315	0.907
Illinois	7,781,769	0.0140	0.4062	0.0016	1.000	0.985
Indiana	2,142,437	0.0144	0.2406	0.0014	1.000	0.965
Kansas	1,305,342	0.0186	0.4020	0.0050	0.483	0.949
Louisiana	1,967,125	0.0183	0.7279	0.0069	0.636	0.963
Maine	1,482,482	0.0056	0.5200	0.0049	0.649	0.954
Maryland	1,431,587	-0.0495	0.7321	0.0035	1.000	0.952
Michigan	4,301,479	0.0015	0.8082	0.0063	0.584	0.979
Mississippi	1,145,165	0.0104	0.3229	0.0021	0.948	0.943
Missouri	2,602,708	0.0260	0.3535	0.0032	0.673	0.970
New Hampshire	1,115,474	-0.0028	0.4108	0.0082	0.302	0.941
New Mexico	798,971	0.0596	0.6464	0.0143	0.274	0.923
North Carolina	2,233,048	0.0112	0.3420	0.0052	0.402	0.966
Oregon--Private Carrier	1,545,649	-0.0314	0.5037	0.0179	0.170	0.955
Oregon--State Fund	1,191,856	-0.0312	0.8165	0.0067	0.555	0.945
Rhode Island	927,250	0.1100	0.8537	0.0117	0.442	0.932
South Carolina	1,061,236	0.0167	0.5699	0.0053	0.847	0.939
South Dakota	343,347	0.0102	0.3853	0.0021	1.000	0.844
Tennessee	2,501,405	0.0147	0.3613	0.0058	0.374	0.969
Texas	20,151,313	0.0583	0.3788	0.0033	0.686	0.989
Utah--Private Carrier	292,232	0.0067	0.2833	0.0150	0.114	0.823
Vermont	357,258	0.0112	0.3860	0.0031	0.765	0.849
Virginia	2,386,958	0.0065	0.3941	0.0049	0.491	0.968
Wisconsin	3,295,468	-0.0005	0.3415	0.0040	0.518	0.974
8. Country-wide	84,609,524	0.0275	0.4186	0.0017	0.574	0.943

9. Group V-squared :	51.3387
10. Group W :	2,100.23
11. 1000!Group Gamma-squared :	0.84781
12. 1000!Group C :	0.00668
13. t-statistic for Group C :	1.57133
14. Group K :	60,554
15. Group d :	1.0079
16. Group Mean beta :	0.0267

NCCI -- TREND ANALYSIS

Paid Losses Indemnity

Type of Fit : Adjusted Linear
Credibility Formula : Version 2
Adjustment for Bias : No

(1) State	(2) 84-88 Premium (000's)	(3) State Estimate of beta	(4) State Estimate of intercp.	(5) State Estimate of sigma for beta	(6) Current Cred Formula	(7) Cred Countrywide Basis
Alabama	1,873,146	0.0263	0.4186	0.0032	0.792	0.965
Alaska	889,515	0.0139	0.4186	0.0044	0.578	0.940
Arizona--Private Carrier	1,450,128	0.0047	0.4186	0.0049	0.522	0.958
Arizona--State Fund	1,236,379	0.0134	0.4186	0.0088	0.288	0.953
Arkansas	1,114,326	0.0184	0.4186	0.0073	0.348	0.950
Connecticut	3,250,884	0.0228	0.4186	0.0035	0.724	0.975
District of Columbia	626,897	0.0177	0.4186	0.0077	0.327	0.921
Florida	10,288,516	0.0571	0.4186	0.0028	0.919	0.985
Hawaii	900,833	0.0054	0.4186	0.0061	0.417	0.941
Idaho	637,341	0.0138	0.4186	0.0081	0.315	0.922
Illinois	7,781,769	0.0144	0.4186	0.0017	1.000	0.983
Indiana	2,142,437	0.0251	0.4186	0.0024	1.000	0.968
Kansas	1,305,342	0.0194	0.4186	0.0052	0.483	0.955
Louisiana	1,967,125	0.0105	0.4186	0.0040	0.636	0.966
Maine	1,482,482	0.0045	0.4186	0.0039	0.649	0.959
Maryland	1,431,587	0.0283	0.4186	0.0020	1.000	0.958
Michigan	4,301,479	0.0011	0.4186	0.0043	0.584	0.979
Mississippi	1,145,165	0.0135	0.4186	0.0027	0.948	0.951
Missouri	2,602,708	0.0308	0.4186	0.0038	0.673	0.972
New Hampshire	1,115,474	0.0028	0.4186	0.0084	0.302	0.950
New Mexico	798,971	0.0386	0.4186	0.0092	0.274	0.935
North Carolina	2,233,048	0.0138	0.4186	0.0063	0.402	0.969
Oregon--Private Carrier	1,545,649	0.0261	0.4186	0.0149	0.170	0.960
Oregon--State Fund	1,191,856	0.0212	0.4186	0.0046	0.555	0.952
Rhode Island	927,250	0.0539	0.4186	0.0057	0.442	0.942
South Carolina	1,061,236	0.0123	0.4186	0.0039	0.647	0.948
South Dakota	343,347	0.0111	0.4186	0.0023	1.000	0.871
Tennessee	2,501,405	0.0170	0.4186	0.0068	0.374	0.971
Texas	20,151,313	0.0644	0.4186	0.0037	0.686	0.987
Utah--Private Carrier	292,232	0.0099	0.4186	0.0222	0.114	0.853
Vermont	357,258	0.0121	0.4186	0.0033	0.765	0.875
Virginia	2,386,958	0.0069	0.4186	0.0052	0.491	0.970
Wisconsin	3,295,468	0.0006	0.4186	0.0049	0.518	0.975
8. Country-wide	84,609,524	0.0275	0.4186	0.0017	0.574	0.950

9. Group V-squared :	38.7621
10. Group W :	2,036.40
11. 1000!Group Gamma-squared :	0.82392
12. 1000!Group C :	0.00903
13. t-statistic for Group C :	2.94257
14. Group K :	47,046
15. Group d :	1.0110
16. Group Mean beta :	0.0289

NCCI -- TREND ANALYSIS

Paid Losses Indemnity

Type of Fit : Exponential
Credibility Formula : Version 2
Adjustment for Bias : No

(1) State	(2) 84-88 Premium (000's)	(3) State Estimate of beta	(4) State Estimate of intercp.	(5) State Estimate of sigma for beta	(6) Current Cred Formula	(7) Cred Countrywide Basis
Alabama	1,873,146	0.0630	-1.1071	0.0080	0.792	0.966
Alaska	889,515	0.0334	-1.0267	0.0103	0.568	0.934
Arizona--Private Carrier	1,450,128	0.0111	-1.3872	0.0118	0.522	0.957
Arizona--State Fund	1,236,379	0.0315	-1.1858	0.0212	0.292	0.951
Arkansas	1,114,326	0.0429	-1.1000	0.0176	0.356	0.946
Connecticut	3,250,884	0.0550	-0.5860	0.0085	0.672	0.979
District of Columbia	626,897	0.0415	-0.9778	0.0179	0.331	0.910
Florida	10,288,516	0.1385	-0.9799	0.0064	0.823	0.991
Hawaii	900,833	0.0127	-0.8796	0.0147	0.418	0.935
Idaho	637,341	0.0317	-0.9862	0.0187	0.319	0.911
Illinois	7,781,769	0.0343	-0.9022	0.0036	1.000	0.989
Indiana	2,142,437	0.0609	-1.4284	0.0070	0.880	0.970
Kansas	1,305,342	0.0453	-0.9139	0.0117	0.509	0.953
Louisiana	1,967,125	0.0247	-0.3185	0.0095	0.648	0.968
Maine	1,482,482	0.0109	-0.6543	0.0094	0.647	0.958
Maryland	1,431,587	0.0686	-0.3167	0.0065	0.972	0.957
Michigan	4,301,479	0.0024	-0.4976	0.0102	0.584	0.983
Mississippi	1,145,165	0.0321	-1.1314	0.0062	0.956	0.947
Missouri	2,602,708	0.0741	-1.0456	0.0088	0.634	0.975
New Hampshire	1,115,474	0.0067	-0.8910	0.0205	0.301	0.946
New Mexico	798,971	0.0923	-0.4464	0.0228	0.277	0.927
North Carolina	2,233,048	0.0324	-1.0747	0.0152	0.406	0.971
Oregon--Private Carrier	1,545,649	0.0586	-0.6932	0.0358	0.173	0.960
Oregon--State Fund	1,191,856	0.0512	-0.4867	0.0108	0.528	0.949
Rhode Island	927,250	0.1333	-0.1763	0.0171	0.330	0.937
South Carolina	1,061,236	0.0291	-0.5635	0.0094	0.652	0.944
South Dakota	343,347	0.0267	-0.9547	0.0057	1.000	0.849
Tennessee	2,501,405	0.0396	-1.0204	0.0157	0.386	0.974
Texas	20,151,313	0.1558	-0.9948	0.0056	0.924	0.994
Utah--Private Carrier	292,232	0.0213	-1.2701	0.0517	0.113	0.827
Vermont	357,258	0.0294	-0.9530	0.0082	0.737	0.854
Virginia	2,386,958	0.0170	-0.9320	0.0124	0.487	0.973
Wisconsin	3,295,468	0.0013	-1.0747	0.0116	0.518	0.979
8. Country-wide	84,609,524	0.0657	-0.8751	0.0034	0.568	0.947

9. Group V-squared :	291.1786
10. Group W :	11,924.15
11. 1000!Group Gamma-squared :	4.83916
12. 1000!Group C :	0.01408
13. t-statistic for Group C :	0.83650
14. Group K :	60,171
15. Group d :	1.0029
16. Group Mean beta :	0.0698

NCCI -- TREND ANALYSIS

Incurred Losses Excluding IBNR Medical

Type of Fit : Linear
Credibility Formula : Version 2
Adjustment for Bias : No

(1) State	(2) 84-88 Premium (000's)	(3) State Estimate of beta	(4) State Estimate of Interp.	(5) State Estimate of sigma for beta	(6) Current Cred Formula	(7) Cred Countrywide Basis	(8) Cred Fee State Basis	(9) Cred Non-Fee State Basis	(10) Cred Fee Group Basis	(11) Cred Non-Fee Group Basis
Alabama	1,873,146	0.0474	0.4112	0.0091	0.274	0.918		0.926		0.907
Alaska	889,515	0.0127	0.2012	0.0026	0.470	0.871		0.899		0.858
Arizona--Private Carrier	1,450,128	0.0005	0.2927	0.0052	0.340	0.905	0.840		0.541	
Arizona--State Fund	1,236,379	0.0081	0.3605	0.0106	0.205	0.896	0.816		0.497	
Arkansas	1,114,326	0.0243	0.3084	0.0079	0.237	0.889		0.909		0.876
Connecticut	3,250,884	0.0184	0.2166	0.0016	0.839	0.938		0.937		0.927
District of Columbia	626,897	0.0094	0.2303	0.0034	0.413	0.837		0.879		0.823
Florida	10,288,516	0.0305	0.2533	0.0025	0.611	0.957	0.984			0.947
Hawaii	900,833	0.0075	0.2536	0.0029	0.521	0.872	0.761		0.412	
Idaho	637,341	0.0276	0.2595	0.0086	0.183	0.839	0.691		0.326	
Illinois	7,761,769	0.0124	0.1824	0.0020	0.541	0.954	0.975		0.931	
Indiana	2,142,437	0.0311	0.2724	0.0055	0.298	0.924		0.929		0.913
Kansas	1,305,342	0.0274	0.2903	0.0057	0.309	0.899		0.915		0.887
Louisiana	1,967,125	0.0473	0.4990	0.0055	0.549	0.920		0.927		0.909
Maine	1,482,482	0.0107	0.2056	0.0039	0.319	0.907		0.919		0.895
Maryland	1,431,587	0.0089	0.4227	0.0071	0.361	0.905		0.918		0.893
Michigan	4,301,479	0.0132	0.2482	0.0024	0.624	0.944	0.947		0.821	
Mississippi	1,145,165	0.0285	0.3591	0.0059	0.369	0.891		0.910		0.878
Missouri	2,602,708	0.0329	0.2670	0.0026	0.618	0.931		0.933		0.920
New Hampshire	1,115,474	0.0051	0.2271	0.0099	0.139	0.889	0.800			0.876
New Mexico	798,971	0.0720	0.4601	0.0092	0.302	0.862		0.894		0.848
North Carolina	2,233,048	0.0179	0.3065	0.0054	0.341	0.926		0.930		
Oregon--Private Carrier	1,545,649	0.0147	0.3866	0.0074	0.318	0.909		0.921		
Oregon--State Fund	1,191,856	0.0738	0.7859	0.0131	0.363	0.893	0.811			0.881
Rhode Island	927,250	0.0220	0.1992	0.0027	0.446	0.875	0.767			0.862
South Carolina	1,061,236	0.0158	0.3450	0.0083	0.251	0.885	0.791		0.455	
South Dakota	343,347	0.0175	0.2721	0.0034	0.483	0.754		0.827		0.738
Tennessee	2,501,405	0.0239	0.2745	0.0061	0.272	0.930		0.932		0.919
Texas	20,151,313	0.0515	0.2650	0.0043	0.375	0.961		0.949		0.952
Utah--Private Carrier	292,232	0.0268	0.2990	0.0154	0.117	0.727	0.502			0.709
Vermont	357,258	0.0182	0.2134	0.0043	0.301	0.761		0.832		0.744
Virginia	2,386,958	0.0223	0.3327	0.0024	0.836	0.928		0.931		0.917
Wisconsin	3,295,468	0.0182	0.2341	0.0020	0.715	0.938		0.937		0.928
Aggregate Fits :										
12. Country-wide	84,609,524	0.0290	0.2784	0.0025	0.404	0.892	0.807	0.912	0.569	0.878
13. All Fee States	31,164,493	0.0201	0.2620	0.0023	0.362					
14. All Non-Fee States	53,445,031	0.0346	0.2885	0.0028	0.429					
15. Fee Group States	17,349,165	0.0106	0.2369	0.0030	0.381					
16. Non-Fee Group States	67,260,359	0.0343	0.2897	0.0026	0.411					
17. Group V-squared :					33.1596	76.7393	17.9206	64.0317		31.6689
18. Group W :					861.86	661.43	799.23	148.44		764.13
19. Group Gamma-squared :					0.00033	0.00026	0.00033	0.00005		0.00030
20. 1000!Group C :					0.01191	0.00324	0.01695	0.00480		0.01359
21. t-statistic for Group C :					4.41086	0.57301	7.68136	0.67844		4.82741
22. Group K :					99,561	293,284	54,060	1,381,305		106,370
23. Group d :					1.0358	0.9876	1.0511	0.8964		1.0456
24. Group Mean beta :					0.0292	0.0199	0.0347	0.0106		0.0340

NCCI -- TREND ANALYSIS

Incurred Losses Excluding IBNR Medical

Type of Fit : Adjusted Linear
Credibility Formula : Version 2
Adjustment for Bias : No

(1) State	(2) 84-88 Premium (000's)	(3) State Estimate of beta	(4) State Estimate of Intercep.	(5) State Estimate of sigma for beta	(6) Current Cred Formula	(7) Cred Countrywide Basis	(8) Cred Fee State Basis	(9) Cred Non-Fee State Basis	(10) Cred Fee Group Basis	(11) Cred Non-Fee Group Basis
Alabama	1,873,148	0.0321	0.2784	0.0061	0.274	0.924		0.952		0.934
Alaska	889,515	0.0176	0.2784	0.0036	0.470	0.900		0.950		0.915
Arizona--Private Carrier	1,450,128	0.0005	0.2784	0.0050	0.340	0.918	0.786		0.641	
Arizona--State Fund	1,236,379	0.0063	0.2784	0.0082	0.205	0.913	0.759		0.607	
Arkansas	1,114,326	0.0219	0.2784	0.0071	0.237	0.909		0.951		0.922
Connecticut	3,250,884	0.0236	0.2784	0.0020	0.839	0.934		0.952		0.941
District of Columbia	626,897	0.0113	0.2784	0.0041	0.413	0.881		0.949		0.901
Florida	10,298,516	0.0335	0.2784	0.0028	0.611	0.943	0.950			0.948
Hawaii	900,833	0.0082	0.2784	0.0032	0.521	0.900	0.700		0.536	
Idaho	637,341	0.0296	0.2784	0.0092	0.183	0.882	0.625		0.455	
Illinois	7,781,769	0.0190	0.2784	0.0031	0.541	0.942	0.940		0.868	
Indiana	2,142,437	0.0318	0.2784	0.0057	0.298	0.927		0.952		0.936
Kansas	1,305,342	0.0263	0.2784	0.0054	0.309	0.914		0.951		0.926
Louisiana	1,967,125	0.0264	0.2784	0.0031	0.549	0.925		0.952		0.934
Maine	1,482,482	0.0145	0.2784	0.0053	0.319	0.918		0.951		0.929
Maryland	1,431,587	0.0059	0.2784	0.0047	0.361	0.917		0.951		0.928
Michigan	4,301,479	0.0148	0.2784	0.0027	0.624	0.937	0.907		0.815	
Mississippi	1,145,165	0.0221	0.2784	0.0046	0.369	0.910		0.951		0.923
Missouri	2,602,708	0.0343	0.2784	0.0027	0.618	0.931		0.952		0.938
New Hampshire	1,115,474	0.0062	0.2784	0.0122	0.139	0.909	0.741			0.922
New Mexico	798,971	0.0436	0.2784	0.0056	0.302	0.894		0.950		0.911
North Carolina	2,233,048	0.0162	0.2784	0.0049	0.341	0.928		0.952		0.936
Oregon--Private Carrier	1,545,649	0.0106	0.2784	0.0053	0.318	0.919		0.951		0.930
Oregon--State Fund	1,191,856	0.0261	0.2784	0.0046	0.363	0.911	0.753			0.924
Rhode Island	927,250	0.0308	0.2784	0.0038	0.446	0.901	0.706			0.917
South Carolina	1,061,236	0.0127	0.2784	0.0067	0.251	0.907	0.732		0.574	
South Dakota	343,347	0.0179	0.2784	0.0035	0.483	0.832		0.946		0.864
Tennessee	2,501,405	0.0242	0.2784	0.0062	0.272	0.930		0.952		0.938
Texas	20,151,313	0.0541	0.2784	0.0045	0.375	0.945		0.953		0.949
Utah--Private Carrier	292,232	0.0249	0.2784	0.0144	0.117	0.815	0.437			0.850
Vermont	357,258	0.0238	0.2784	0.0056	0.301	0.836		0.946		0.867
Virginia	2,386,958	0.0186	0.2784	0.0020	0.836	0.929		0.952		0.937
Wisconsin	3,295,468	0.0217	0.2784	0.0024	0.715	0.934		0.952		0.941
Aggregate Fits :										
12. Country-wide	84,609,524	0.0290	0.2784	0.0025	0.404	0.910	0.753	0.951	0.642	0.922
13. All Fee States	31,164,493	0.0201	0.2620	0.0023	0.362					
14. All Non-Fee States	53,445,031	0.0346	0.2885	0.0028	0.429					
15. Fee Group States	17,349,165	0.0106	0.2369	0.0030	0.381					
16. Non-Fee Group States	67,260,359	0.0343	0.2897	0.0026	0.411					
17. Group V-squared :					53.1406	50.1354	54.9168	34.8878	58.9640	
18. Group H :					716.41	324.71	831.94	144.43	712.57	
19. Group Gamma-squared :					0.00028	0.00012	0.00035	0.00005	0.00028	
Group C :					0.01532	0.00199	0.01741	0.00283	0.01464	
21. t-statistic for Group C :					7.50552	0.54947	13.51447	0.77800	7.49116	
22. Group K :					192,002	413,874	157,380	661,690	211,293	
23. Group d :					1.0553	1.0184	1.0483	1.0578	1.0516	
24. Group Mean beta :					0.0295	0.0200	0.0356	0.0119	0.0349	

NCCI -- TREND ANALYSIS

Incurred Losses Excluding IBNR Medical

Type of Fit : Exponential
Credibility Formula : Version 2
Adjustment for Bias : No

(1) State	(2) 84-88 Premium (000's)	(3) State Estimate of beta	(4) State Estimate of Intercep.	(5) State Estimate of sigma for beta	(6) Current Cred Formula	(7) Cred Countrywide Basis	(8) Cred Fee State Basis	(9) Cred Non-Fee State Basis	(10) Cred Fee Group Basis	(11) Cred Non-Fee Group Basis
Alabama	1,873,148	0.1126	-0.9027	0.0169	0.317	0.995		0.996		0.995
Alaska	889,515	0.0638	-1.6082	0.0133	0.468	0.989		0.994		0.990
Arizona--Private Carrier	1,450,128	-0.0018	-1.2295	0.0177	0.339	0.993	0.980		0.922	
Arizona--State Fund	1,236,379	-0.0209	-1.0235	0.0298	0.205	0.992	0.978		0.915	
Arkansas	1,114,326	0.0758	-1.1842	0.0249	0.251	0.991		0.994		0.992
Connecticut	3,250,884	0.0857	-1.5371	0.0085	0.760	0.997		0.997		0.997
District of Columbia	626,897	0.0416	-1.4708	0.0147	0.399	0.985		0.992		0.986
Florida	10,288,516	0.1205	-1.3878	0.0065	0.867	0.998	1.005			0.999
Hawaii	900,833	0.0291	-1.3733	0.0117	0.529	0.990	0.963		0.897	
Idaho	637,341	0.1012	-1.3624	0.0288	0.198	0.986	0.946		0.871	
Illinois	7,761,769	0.0673	-1.7062	0.0104	0.609	0.998	1.004		0.958	
Indiana	2,142,437	0.1116	-1.3140	0.0151	0.355	0.995		0.996		0.996
Kansas	1,305,342	0.0930	-1.2469	0.0195	0.340	0.993		0.995		0.993
Louisiana	1,967,125	0.0947	-0.7045	0.0092	0.615	0.995		0.996		0.995
Maine	1,482,482	0.0505	-1.5854	0.0183	0.330	0.993		0.995		0.994
Maryland	1,431,587	-0.0202	-0.8623	0.0165	0.362	0.993		0.995		0.994
Michigan	4,301,479	0.0530	-1.3985	0.0095	0.645	0.997	1.000		0.951	
Mississippi	1,145,165	0.0786	-1.0312	0.0170	0.398	0.992		0.995		0.992
Missouri	2,602,708	0.1250	-1.3364	0.0095	0.556	0.996		0.996		0.997
New Hampshire	1,115,474	0.0210	-1.4889	0.0445	0.138	0.991	0.972			0.992
New Mexico	798,971	0.1582	-0.8019	0.0190	0.392	0.988		0.993		0.992
North Carolina	2,233,048	0.0572	-1.1867	0.0175	0.353	0.995		0.996		0.992
Oregon--Private Carrier	1,545,649	0.0369	-0.9529	0.0190	0.324	0.994		0.995		0.992
Oregon--State Fund	1,191,856	0.0984	-0.2514	0.0213	0.306	0.992	0.974			0.993
Rhode Island	927,250	0.1140	-1.6269	0.0181	0.356	0.990	0.965			0.990
South Carolina	1,061,236	0.0449	-1.0680	0.0243	0.254	0.991	0.970		0.907	
South Dakota	343,347	0.0642	-1.3063	0.0128	0.498	0.974		0.987		0.975
Tennessee	2,501,405	0.0844	-1.3014	0.0211	0.298	0.996		0.996		0.996
Texas	20,151,313	0.1964	-1.3685	0.0049	1.000	0.999		0.998		1.000
Utah--Private Carrier	292,232	0.0829	-1.2220	0.0492	0.120	0.970	0.880			0.970
Vermont	357,258	0.0876	-1.5533	0.0208	0.280	0.975		0.987		0.976
Virginia	2,388,958	0.0670	-1.1052	0.0069	0.852	0.996		0.996		0.996
Wisconsin	3,295,468	0.0785	-1.4582	0.0089	0.712	0.997		0.997		0.997
Aggregate Fits :										
12. Country-wide	84,609,524	0.1035	-1.2895	0.0055	0.437	0.991	0.970	0.995	0.917	0.992
13. All Fee States	31,164,493	0.0758	-1.3455	0.0074	0.381					
14. All Non-Fee States	53,445,031	0.1197	-1.2576	0.0051	0.470					
15. Fee Group States	17,349,165	0.0439	-1.4424	0.0124	0.397					
16. Non-Fee Group States	67,260,359	0.1182	-1.2532	0.0042	0.448					
17. Group V-squared :						33.1598	76.7393	17.9206	64.0317	31.6689
18. Group W :						9,503.90	4760.67	10345.77	2423.11	8782.43
19. Group Gamma-squared :						0.00376	0.00180	0.00447	0.00089	0.00355
20. 1000*Group C :						0.00275	-0.01698	0.00897	0.03073	0.00007
21. t-statistic for Group C :						0.14267	-0.31777	0.64373	0.59902	0.00318
22. Group K :						8,818	42,634	4,006	72,069	8,923
23. Group d :						1.0007	0.9906	1.0020	1.0346	1.0000
24. Group Mean beta :						0.1062	0.0761	0.1238	0.0496	0.1208

NCCI -- TREND ANALYSIS

Incurred Losses Medical

Type of Fit : Linear
Credibility Formula : Version 2
Adjustment for Bias : No

(1) State	(2) 84-88 Premium (000's)	(3) State Estimate of beta	(4) State Estimate of Intercep.	(5) State Estimate of sigma for beta	(6) Current Cred Formula	(7) Cred Countrywide Basis	(8) Cred Fee State Basis	(9) Cred Non-Fee State Basis	(10) Cred Fee Group Basis	(11) Cred Non-Fee Group Basis
Alabama	1,873,146	0.0570	0.4329	0.0103	0.254	0.906		0.902		0.874
Alaska	889,515	0.0218	0.2137	0.0036	0.355	0.868		0.878		0.829
Arizona--Private Carrier	1,450,128	0.0052	0.3036	0.0060	0.307	0.896	0.811		0.524	
Arizona--State Fund	1,236,379	0.0081	0.3605	0.0106	0.205	0.888	0.788		0.480	
Arkansas	1,114,326	0.0259	0.3111	0.0080	0.235	0.883		0.887		0.845
Connecticut	3,250,884	0.0260	0.2353	0.0018	0.785	0.922		0.912		0.892
District of Columbia	626,897	0.0243	0.2761	0.0043	0.391	0.840		0.860		0.796
Florida	10,288,516	0.0387	0.2723	0.0039	0.422	0.936	0.954			0.910
Hawaii	900,833	0.0054	0.2475	0.0031	0.481	0.869	0.733		0.397	
Idaho	637,341	0.0291	0.2624	0.0087	0.182	0.842	0.664		0.314	
Illinois	7,781,769	0.0139	0.1859	0.0023	0.496	0.934	0.945		0.916	
Indiana	2,142,437	0.0341	0.2771	0.0060	0.281	0.911		0.905		0.879
Kansas	1,305,342	0.0322	0.3001	0.0062	0.291	0.891		0.893		0.855
Louisiana	1,967,125	0.0561	0.5159	0.0078	0.398	0.908		0.903		0.876
Maine	1,482,482	0.0135	0.2151	0.0043	0.306	0.897		0.898		0.862
Maryland	1,431,587	0.0026	0.4473	0.0066	0.412	0.895		0.895		0.861
Michigan	4,301,479	0.0106	0.2466	0.0024	0.614	0.927	0.917		0.805	
Mississippi	1,145,165	0.0326	0.3671	0.0064	0.345	0.884		0.888		0.847
Missouri	2,602,708	0.0366	0.2743	0.0028	0.603	0.916		0.908		0.886
New Hampshire	1,115,474	0.0090	0.2360	0.0099	0.144	0.883	0.771			0.846
New Mexico	798,971	0.0847	0.4860	0.0111	0.264	0.861		0.873		0.820
North Carolina	2,233,048	0.0244	0.3247	0.0059	0.335	0.912		0.906		0.881
Oregon--Private Carrier	1,545,649	0.0271	0.4086	0.0089	0.277	0.899		0.897		0.865
Oregon--State Fund	1,191,856	0.0252	0.5886	0.0114	0.313	0.886	0.782			0.850
Rhode Island	927,250	0.0298	0.2177	0.0022	0.613	0.871	0.739			0.832
South Carolina	1,061,236	0.0213	0.3591	0.0066	0.253	0.880	0.763		0.439	
South Dakota	343,347	0.0254	0.2866	0.0037	0.467	0.771		0.813		0.717
Tennessee	2,501,405	0.0272	0.2825	0.0065	0.262	0.915		0.908		0.884
Texas	20,151,313	0.0554	0.2706	0.0052	0.315	0.940		0.923		0.914
Utah--Private Carrier	292,232	0.0330	0.3118	0.0163	0.116	0.747	0.480			0.691
Vermont	357,258	0.0238	0.2267	0.0042	0.331	0.776		0.817		0.723
Virginia	2,386,958	0.0258	0.3496	0.0025	0.853	0.914		0.907		0.883
Wisconsin	3,295,468	0.0213	0.2402	0.0021	0.698	0.922		0.912		0.892
Aggregate Fits :										
12. Country-wide	84,609,524	0.0327	0.2855	0.0031	0.382	0.885	0.779	0.890	0.554	0.847
13. All Fee States	31,164,493	0.0214	0.2630	0.0028	0.346					
14. All Non-Fee States	53,445,031	0.0399	0.2993	0.0036	0.403					
15. Fee Group States	17,349,165	0.0113	0.2396	0.0030	0.363					
16. Non-Fee Group States	67,260,359	0.0388	0.2980	0.0034	0.387					
17. Group V-squared :					27.2949	65.1312	16.0791	67.0426	26.5961	
18. Group W :					880.32	548.51	780.74	151.79	678.55	
19. Group Gamma-squared :					0.00033	0.00021	0.00031	0.00005	0.00025	
20. 1000*Group C :					0.02004	0.00368	0.02550	0.00441	0.02248	
21. t-statistic for Group C :					6.60565	0.69757	8.57253	0.63025	7.53506	
22. Group K :					81.597	311.552	51.168	1,455.943	104.906	
23. Group d :					1.0599	1.0175	1.0812	0.9043	1.0887	
24. Group Mean beta :					0.0331	0.0216	0.0398	0.0114	0.0387	

NCCI -- TREND ANALYSIS

Incurred Losses Medical

Type of Fit : Adjusted Linear
Credibility Formula : Version 2
Adjustment for Bias : No

(1) State	(2) 84-88 Premium (000's)	(3) State Estimate of beta	(4) State Estimate of intercp.	(5) State Estimate of sigma for beta	(6) Current Cred Formula	(7) Cred Countrywide Basis	(8) Cred Fee State Basis	(9) Cred Non-Fee State Basis	(10) Cred Fee Group Basis	(11) Cred Non-Fee Group Basis
Alabama	1,873,146	0.0376	0.2855	0.0068	0.254	0.919		0.942		0.924
Alaska	889,515	0.0291	0.2855	0.0049	0.355	0.912		0.954		0.921
Arizona--Private Carrier	1,450,128	0.0049	0.2855	0.0056	0.307	0.917	0.843		0.641	
Arizona--State Fund	1,236,379	0.0084	0.2855	0.0084	0.205	0.918	0.826		0.609	
Arkansas	1,114,326	0.0237	0.2855	0.0074	0.235	0.915		0.949		0.922
Connecticut	3,250,884	0.0316	0.2855	0.0022	0.785	0.921		0.938		0.925
District of Columbia	626,897	0.0252	0.2855	0.0044	0.391	0.907		0.964		0.919
Florida	10,288,516	0.0406	0.2855	0.0041	0.422	0.924	0.941			0.926
Hawaii	900,833	0.0063	0.2855	0.0036	0.481	0.912	0.785		0.541	
Idaho	637,341	0.0316	0.2855	0.0095	0.182	0.907	0.730		0.461	
Illinois	7,761,769	0.0213	0.2855	0.0035	0.496	0.924	0.935		0.853	
Indiana	2,142,437	0.0351	0.2855	0.0061	0.281	0.920		0.941		0.924
Kansas	1,305,342	0.0306	0.2855	0.0059	0.291	0.916		0.947		0.923
Louisiana	1,967,125	0.0311	0.2855	0.0043	0.398	0.919		0.942		0.924
Maine	1,482,482	0.0179	0.2855	0.0056	0.306	0.917		0.945		0.923
Maryland	1,431,587	0.0016	0.2855	0.0042	0.412	0.917		0.945		0.923
Michigan	4,301,479	0.0123	0.2855	0.0028	0.614	0.922	0.916		0.804	
Mississippi	1,145,165	0.0253	0.2855	0.0050	0.345	0.915		0.949		0.922
Missouri	2,602,708	0.0381	0.2855	0.0029	0.603	0.921		0.939		0.925
New Hampshire	1,115,474	0.0109	0.2855	0.0120	0.144	0.915	0.813			0.922
New Mexico	798,971	0.0498	0.2855	0.0065	0.264	0.911		0.957		0.920
North Carolina	2,233,048	0.0215	0.2855	0.0052	0.335	0.920		0.940		0.922
Oregon--Private Carrier	1,545,649	0.0190	0.2855	0.0062	0.277	0.917		0.944		0.922
Oregon--State Fund	1,191,856	0.0122	0.2855	0.0055	0.313	0.915	0.821			0.922
Rhode Island	927,250	0.0391	0.2855	0.0028	0.613	0.913	0.788			0.921
South Carolina	1,061,236	0.0169	0.2855	0.0068	0.253	0.914	0.807		0.577	
South Dakota	343,347	0.0253	0.2855	0.0037	0.467	0.892		0.992		0.912
Tennessee	2,501,405	0.0275	0.2855	0.0066	0.262	0.920		0.939		0.925
Texas	20,151,313	0.0584	0.2855	0.0055	0.315	0.924		0.933		0.926
Utah--Private Carrier	292,232	0.0302	0.2855	0.0149	0.116	0.887	0.570			0.910
Vermont	357,258	0.0297	0.2855	0.0052	0.331	0.893		0.990		0.913
Virginia	2,386,958	0.0211	0.2855	0.0020	0.853	0.920		0.940		0.925
Wisconsin	3,295,468	0.0253	0.2855	0.0025	0.698	0.921		0.938		0.925
Aggregate Fits :										
12. Country-wide	84,609,524	0.0327	0.2855	0.0031	0.382	0.915	0.815	0.949	0.641	0.922
13. All Fee States	31,164,493	0.0214	0.2630	0.0028	0.346					
14. All Non-Fee States	53,445,031	0.0399	0.2993	0.0036	0.403					
15. Fee Group States	17,349,185	0.0113	0.2396	0.0030	0.363					
16. Non-Fee Group States	67,260,359	0.0388	0.2980	0.0034	0.387					
17. Group V-squared :						67.2998	58.1688	73.1445	38.3022	77.0901
18. Group W :						795.24	470.40	821.36	153.18	727.87
19. Group Gamma-squared :						0.00030	0.00018	0.00034	0.00006	0.00028
20. Group C :						0.02463	0.00783	0.02524	0.00426	0.02256
21. t-statistic for Group C :						10.38583	2.14664	16.01705	1.14839	11.13253
22. Group K :						221,558	319,846	217,688	692,711	277,447
23. Group d :						1.0811	1.0430	1.0735	1.0827	1.0791
24. Group Mean beta :						0.0335	0.0222	0.0409	0.0126	0.0400

NCCI -- TREND ANALYSIS

Incurred Losses Medical

Type of Fit : Exponential
Credibility Formula : Version 2
Adjustment for Bias : No

(1) State	(2) 84-88 Premium (000's)	(3) State Estimate of beta	(4) State Estimate of intercp.	(5) State Estimate of sigma for beta	(6) Current Cred Formula	(7) Cred Countrywide Basis	(8) Cred Fee State Basis	(9) Cred Non-Fee State Basis	(10) Cred Fee Group Basis	(11) Cred Non-Fee Group Basis
Alabama	1,873,146	0.1286	-0.8552	0.0171	0.308	0.992		0.993		0.991
Alaska	889,515	0.1012	-1.5542	0.0148	0.394	0.988		0.990		0.986
Arizona--Private Carrier	1,450,128	0.0165	-1.1936	0.0195	0.308	0.991	0.979		0.910	
Arizona--State Fund	1,236,379	-0.0209	-1.0235	0.0296	0.205	0.990	0.977		0.903	
Arkansas	1,114,326	0.0801	-1.1762	0.0249	0.251	0.989		0.991		0.988
Connecticut	3,250,884	0.1115	-1.4594	0.0077	0.851	0.993		0.994		0.993
District of Columbia	626,897	0.0911	-1.2961	0.0171	0.336	0.984		0.989		0.983
Florida	10,288,516	0.1418	-1.3213	0.0084	0.639	0.995	0.993			0.994
Hawaii	900,833	0.0217	-1.3975	0.0127	0.486	0.988	0.970		0.885	
Idaho	637,341	0.1053	-1.3520	0.0285	0.198	0.985	0.959		0.860	
Illinois	7,761,769	0.0736	-1.6886	0.0111	0.568	0.994	0.993		0.946	
Indiana	2,142,437	0.1201	-1.2989	0.0155	0.343	0.992		0.993		0.992
Kansas	1,305,342	0.1055	-1.2162	0.0203	0.330	0.990		0.992		0.989
Louisiana	1,967,125	0.1080	-0.6740	0.0116	0.463	0.992		0.993		0.991
Maine	1,482,482	0.0608	-1.5415	0.0185	0.322	0.991		0.992		0.990
Maryland	1,431,587	-0.0052	-0.8052	0.0148	0.411	0.990		0.992		0.990
Michigan	4,301,479	0.0431	-1.4020	0.0097	0.616	0.994	0.990		0.939	
Mississippi	1,145,165	0.0876	-1.0107	0.0176	0.383	0.989		0.991		0.988
Missouri	2,602,708	0.1351	-1.3119	0.0090	0.587	0.993		0.993		0.992
New Hampshire	1,115,474	0.0358	-1.4507	0.0427	0.144	0.989	0.975			0.988
New Mexico	798,971	0.1735	-0.7531	0.0196	0.382	0.987		0.990		0.986
North Carolina	2,233,048	0.0738	-1.1314	0.0175	0.357	0.992		0.993		0.992
Oregon--Private Carrier	1,545,649	0.0644	-0.9006	0.0215	0.292	0.991		0.992		0.990
Oregon--State Fund	1,191,856	0.0450	-0.5331	0.0208	0.303	0.990	0.976			0.989
Rhode Island	927,250	0.1404	-1.5443	0.0129	0.452	0.988	0.970			0.987
South Carolina	1,061,236	0.0580	-1.0292	0.0241	0.260	0.989	0.974		0.895	
South Dakota	343,347	0.0882	-1.2579	0.0131	0.510	0.976		0.984		0.973
Tennessee	2,501,405	0.0933	-1.2746	0.0215	0.292	0.992		0.993		0.992
Texas	20,151,313	0.2063	-1.3498	0.0061	0.999	0.995		0.995		0.995
Utah--Private Carrier	292,232	0.0979	-1.1831	0.0491	0.120	0.972	0.920			0.969
Vermont	357,258	0.1065	-1.4965	0.0195	0.302	0.976		0.984		0.974
Virginia	2,386,958	0.0742	-1.0565	0.0071	0.832	0.992		0.993		0.992
Wisconsin	3,295,468	0.0889	-1.4343	0.0084	0.746	0.993		0.994		0.993
Aggregate Fits :										
12. Country-wide	84,609,524	0.1136	-1.2666	0.0068	0.424	0.989	0.973	0.992	0.906	0.988
13. All Fee States	31,164,493	0.0803	-1.3423	0.0087	0.358					
14. All Non-Fee States	53,445,031	0.1327	-1.2242	0.0063	0.461					
15. Fee Group States	17,349,165	0.0464	-1.4315	0.0124	0.377					
16. Non-Fee Group States	67,280,359	0.1298	-1.2277	0.0058	0.436					
17. Group V-squared :						27.2949	65.1312	16.0791	67.0426	26.5961
18. Group W :						9,999.77	6779.86	9509.88	2504.92	8474.97
19. Group Gamma-squared :						0.00396	0.00268	0.00409	0.00091	0.00341
20. 1000!@Group C :						0.01906	0.01157	0.02122	0.04358	0.01675
21. t-statistic for Group C :						1.03461	0.23396	1.46047	0.85937	0.81942
22. Group K :						6,898	24,286	3,936	73,530	7,804
23. Group d :						1.0048	1.0043	1.0052	1.0478	1.0049
24. Group Mean beta :						0.1173	0.0839	0.1368	0.0520	0.1342

NCCI -- TREND ANALYSIS

Paid Losses Medical

Type of Fit : Linear
Credibility Formula : Version 2
Adjustment for Bias : No

(1) State	(2) 84-88 Premium (000's)	(3) State Estimate of beta	(4) State Estimate of intercp.	(5) State Estimate of sigma for beta	(6) Current Cred Formula	(7) Cred Countrywide Basis	(8) Cred Fee State Basis	(9) Cred Non-Fee State Basis	(10) Cred Fee Group Basis	(11) Cred Non-Fee Group Basis
Alabama	1,873,146	0.0366	0.3802	0.0082	0.282	0.900		0.918		0.890
Alaska	889,515	0.0150	0.2073	0.0031	0.406	0.846		0.889		0.834
Arizona--Private Carrier	1,450,128	0.0057	0.3043	0.0042	0.443	0.885	0.519		0.445	
Arizona--State Fund	1,236,379	0.0024	0.3386	0.0092	0.221	0.874	0.478		0.405	
Arkansas	1,114,326	0.0227	0.2917	0.0063	0.281	0.866		0.900		0.855
Connecticut	3,250,884	0.0199	0.2163	0.0010	1.000	0.922		0.929		0.914
District of Columbia	626,897	0.0041	0.2359	0.0037	0.388	0.807		0.867		0.794
Florida	10,288,516	0.0253	0.2383	0.0022	0.649	0.944	0.919			0.937
Hawaii	900,833	0.0161	0.2750	0.0044	0.379	0.847	0.397		0.331	
Idaho	637,341	0.0254	0.2495	0.0073	0.206	0.810	0.316		0.259	
Illinois	7,761,769	0.0156	0.1876	0.0022	0.513	0.941	0.883		0.823	
Indiana	2,142,437	0.0306	0.2694	0.0052	0.315	0.906		0.921		0.897
Kansas	1,305,342	0.0307	0.2857	0.0052	0.333	0.878		0.906		0.867
Louisiana	1,967,125	0.0413	0.4758	0.0067	0.432	0.902		0.919		0.893
Maine	1,482,482	0.0062	0.2048	0.0046	0.270	0.886		0.911		0.876
Maryland	1,431,587	0.0062	0.4135	0.0046	0.542	0.884		0.910		0.874
Michigan	4,301,479	0.0116	0.2431	0.0031	0.475	0.930	0.782		0.711	
Mississippi	1,145,165	0.0286	0.3334	0.0032	0.629	0.888		0.901		0.857
Missouri	2,602,708	0.0317	0.2674	0.0025	0.651	0.914		0.925		0.906
New Hampshire	1,115,474	0.0135	0.2194	0.0064	0.208	0.866	0.451			0.855
New Mexico	798,971	0.0612	0.4734	0.0098	0.292	0.835		0.883		0.823
North Carolina	2,233,048	0.0173	0.3141	0.0048	0.396	0.908		0.922		0
Oregon--Private Carrier	1,545,849	0.0143	0.3888	0.0089	0.265	0.889		0.912		0
Oregon--State Fund	1,191,856	0.0096	0.5458	0.0138	0.239	0.871	0.468			0.860
Rhode Island	927,250	0.0266	0.2107	0.0030	0.430	0.850	0.404			0.838
South Carolina	1,061,236	0.0166	0.3489	0.0058	0.364	0.862	0.438		0.368	
South Dakota	343,347	0.0157	0.2638	0.0036	0.449	0.716		0.812		0.700
Tennessee	2,501,405	0.0252	0.2833	0.0065	0.262	0.913		0.925		0.904
Texas	20,151,313	0.0498	0.2619	0.0041	0.383	0.949		0.943		0.942
Utah--Private Carrier	292,232	0.0361	0.3284	0.0168	0.119	0.686	0.173			0.669
Vermont	357,258	0.0195	0.2214	0.0020	0.675	0.723		0.817		0.707
Virginia	2,386,958	0.0208	0.3359	0.0014	1.000	0.911		0.924		0.902
Wisconsin	3,295,468	0.0217	0.2395	0.0028	0.522	0.923		0.929		0.914
Aggregate Fits :										
12. Country-wide	84,609,524	0.0272	0.2718	0.0026	0.425	0.870	0.519	0.903	0.477	0.857
13. All Fee States	31,164,493	0.0176	0.2490	0.0022	0.354					
14. All Non-Fee States	53,445,031	0.0335	0.2857	0.0030	0.465					
15. Fee Group States	17,349,165	0.0129	0.2383	0.0030	0.371					
16. Non-Fee Group States	67,260,359	0.0314	0.2809	0.0026	0.439					
17. Group V-squared :					28.5903	65.1280	16.4126	43.7536	29.4033	
18. Group W :					630.79	163.74	671.00	91.83	598.96	
19. Group Gamma-squared :					0.00024	0.00005	0.00028	0.00002	0.00023	
20. 1000*Group C :					0.01140	0.00226	0.01595	0.00051	0.01258	
21. t-statistic for Group C :					4.31414	0.38877	7.17977	0.10455	4.29441	
22. Group K :					119,582	1,413,022	59,524	1,841,909	128,245	
23. Group d :					1.0477	0.9511	1.0578	0.9784	1.0549	
24. Group Mean beta :					0.0276	0.0175	0.0334	0.0130	0.0313	

NCCI -- TREND ANALYSIS

Paid Losses Medical

Type of Fit : Adjusted Linear
Credibility Formula : Version 2
Adjustment for Bias : No

(1) State	(2) 84-88 Premium (000's)	(3) State Estimate of beta	(4) State Estimate of intercp.	(5) State Estimate of sigma for beta	(6) Current Cred Formula	(7) Cred Countrywide Basis	(8) Cred Fee State Basis	(9) Cred Non-Fee State Basis	(10) Cred Fee Group Basis	(11) Cred Non-Fee Group Basis
Alabama	1,873,146	0.0262	0.2718	0.0058	0.282	0.923		0.955		0.941
Alaska	889,515	0.0197	0.2718	0.0041	0.406	0.903		0.954		0.927
Arizona--Private Carrier	1,450,128	0.0051	0.2718	0.0037	0.443	0.917	0.738		0.693	
Arizona--State Fund	1,236,379	0.0019	0.2718	0.0075	0.221	0.913	0.710		0.668	
Arkansas	1,114,326	0.0212	0.2718	0.0059	0.281	0.910		0.954		0.932
Connecticut	3,250,884	0.0251	0.2718	0.0013	1.000	0.931		0.956		0.946
District of Columbia	626,897	0.0047	0.2718	0.0042	0.388	0.887		0.953		0.916
Florida	10,288,516	0.0288	0.2718	0.0025	0.649	0.939	0.919			0.951
Hawaii	900,833	0.0159	0.2718	0.0043	0.379	0.903	0.648		0.610	
Idaho	637,341	0.0277	0.2718	0.0080	0.206	0.888	0.572		0.539	
Illinois	7,761,769	0.0226	0.2718	0.0032	0.513	0.937	0.907		0.848	
Indiana	2,142,437	0.0308	0.2718	0.0052	0.315	0.925		0.955		0.942
Kansas	1,305,342	0.0292	0.2718	0.0049	0.333	0.915		0.955		0.935
Louisiana	1,967,125	0.0236	0.2718	0.0038	0.432	0.924		0.955		0.941
Maine	1,482,482	0.0082	0.2718	0.0061	0.270	0.918		0.955		0.937
Maryland	1,431,587	0.0041	0.2718	0.0030	0.542	0.917		0.955		0.937
Michigan	4,301,479	0.0130	0.2718	0.0035	0.475	0.934	0.870		0.814	
Mississippi	1,145,165	0.0233	0.2718	0.0026	0.629	0.911		0.954		0.932
Missouri	2,602,708	0.0322	0.2718	0.0025	0.651	0.928		0.955		0.944
New Hampshire	1,115,474	0.0168	0.2718	0.0079	0.208	0.910	0.691			0.932
New Mexico	798,971	0.0352	0.2718	0.0056	0.292	0.898		0.954		0.924
North Carolina	2,233,048	0.0150	0.2718	0.0042	0.396	0.926		0.955		0.943
Oregon--Private Carrier	1,545,649	0.0100	0.2718	0.0062	0.265	0.919		0.955		0.938
Oregon--State Fund	1,191,856	0.0048	0.2718	0.0069	0.239	0.912	0.703			0.933
Rhode Island	927,250	0.0343	0.2718	0.0038	0.430	0.904	0.654			0.928
South Carolina	1,061,236	0.0129	0.2718	0.0045	0.364	0.909	0.681		0.641	
South Dakota	343,347	0.0182	0.2718	0.0037	0.449	0.846		0.950		0.887
Tennessee	2,501,405	0.0242	0.2718	0.0063	0.262	0.928		0.955		0.944
Texas	20,151,313	0.0516	0.2718	0.0043	0.385	0.940		0.956		0.952
Utah--Private Carrier	292,232	0.0298	0.2718	0.0139	0.119	0.831	0.387			0.876
Vermont	357,258	0.0240	0.2718	0.0024	0.675	0.849		0.951		0.889
Virginia	2,386,958	0.0168	0.2718	0.0011	1.000	0.927		0.955		0.943
Wisconsin	3,295,468	0.0247	0.2718	0.0032	0.522	0.931		0.956		0.946
Aggregate Fits :										
12. Country-wide	84,609,524	0.0272	0.2718	0.0026	0.425	0.911	0.707	0.954	0.688	0.931
13. All Fee States	31,164,493	0.0176	0.2490	0.0022	0.354					
14. All Non-Fee States	53,445,031	0.0335	0.2857	0.0030	0.465					
15. Fee Group States	17,349,165	0.0129	0.2383	0.0030	0.371					
16. Non-Fee Group States	67,260,359	0.0314	0.2809	0.0026	0.439					
17. Group V-squared :					46.7591	39.2828	51.6037	32.8983	51.0660	
18. Group W :					610.33	196.95	774.11	133.73	653.23	
19. Group Gamma-squared :					0.00024	0.00007	0.00032	0.00005	0.00026	
20. Group C :					0.01443	0.00309	0.01512	0.00560	0.01277	
21. t-statistic for Group C :					9.14150	1.83853	12.88389	2.20267	8.88837	
22. Group K :					198.833	564.735	159.046	677.886	198.625	
23. Group d :					1.0614	1.0444	1.0458	1.1190	1.0488	
24. Group Mean beta :					0.0284	0.0189	0.0345	0.0143	0.0325	

NCCI -- TREND ANALYSIS

Paid Losses Medical

Type of Fit : Exponential
Credibility Formula : Version 2
Adjustment for Bias : No

(1) State	(2) 84-88 Premium (000's)	(3) State Estimate of beta	(4) State Estimate of intercp.	(5) State Estimate of sigma for beta	(6) Current Cred Formula	(7) Cred Countrywide Basis	(8) Cred Fee State Basis	(9) Cred Non-Fee State Basis	(10) Cred Fee Group Basis	(11) Cred Non-Fee Group Basis
Alabama	1,873,146	0.0936	-0.9771	0.0174	0.313	0.988		0.990		0.988
Alaska	889,515	0.0721	-1.5796	0.0145	0.419	0.983		0.987		0.984
Arizona--Private Carrier	1,450,128	0.0183	-1.1905	0.0136	0.446	0.986	0.964		0.916	
Arizona--State Fund	1,236,379	-0.0059	-1.0912	0.0273	0.220	0.985	0.958		0.911	
Arkansas	1,114,326	0.0756	-1.2390	0.0207	0.300	0.985		0.988		0.985
Connecticut	3,250,884	0.0928	-1.5399	0.0048	1.000	0.990		0.990		0.990
District of Columbia	626,897	0.0176	-1.4453	0.0157	0.386	0.979		0.986		0.980
Florida	10,288,516	0.1054	-1.4453	0.0059	1.000	0.991	0.996			0.992
Hawaii	900,833	0.0573	-1.2952	0.0155	0.402	0.983	0.942		0.898	
Idaho	637,341	0.0972	-1.4003	0.0257	0.226	0.979	0.919		0.879	
Illinois	7,761,769	0.0819	-1.6806	0.0094	0.625	0.991	0.994		0.942	
Indiana	2,142,437	0.1112	-1.3247	0.0142	0.378	0.988		0.990		0.989
Kansas	1,305,342	0.1053	-1.2649	0.0158	0.407	0.986		0.989		0.987
Louisiana	1,967,125	0.0855	-0.7507	0.0112	0.488	0.988		0.990		0.989
Maine	1,482,482	0.0286	-1.5878	0.0218	0.272	0.987		0.989		0.987
Maryland	1,431,587	-0.0146	-0.8838	0.0111	0.543	0.986		0.989		0.987
Michigan	4,301,479	0.0474	-1.4171	0.0124	0.484	0.990	0.989		0.937	
Mississippi	1,145,165	0.0857	-1.1059	0.0087	0.686	0.985		0.988		0.986
Missouri	2,602,708	0.1188	-1.3334	0.0071	0.814	0.989		0.990		0.990
New Hampshire	1,115,474	0.0590	-1.5231	0.0286	0.213	0.985	0.953			0.985
New Mexico	798,971	0.1277	-0.7855	0.0191	0.350	0.982		0.987		0.983
North Carolina	2,233,048	0.0539	-1.1617	0.0150	0.413	0.988		0.990		0.988
Oregon--Private Carrier	1,545,649	0.0356	-0.9477	0.0232	0.269	0.987		0.989		0.988
Oregon--State Fund	1,191,856	0.0190	-0.6078	0.0259	0.237	0.985	0.956			0.988
Rhode Island	927,250	0.1300	-1.5749	0.0169	0.344	0.983	0.944			0.984
South Carolina	1,061,236	0.0469	-1.0560	0.0166	0.372	0.984	0.951		0.905	
South Dakota	343,347	0.0586	-1.3364	0.0128	0.479	0.968		0.981		0.969
Tennessee	2,501,405	0.0860	-1.2703	0.0215	0.288	0.989		0.990		0.990
Texas	20,151,313	0.1919	-1.3768	0.0070	0.858	0.992		0.991		0.992
Utah--Private Carrier	292,232	0.1017	-1.1316	0.0475	0.124	0.964	0.838			0.965
Vermont	357,258	0.0888	-1.5161	0.0090	0.675	0.969		0.981		0.970
Virginia	2,386,958	0.0621	-1.0948	0.0039	1.000	0.989		0.990		0.989
Wisconsin	3,295,468	0.0904	-1.4375	0.0099	0.595	0.990		0.990		0.990
Aggregate Fits :										
12. Country-wide	84,609,524	0.0994	-1.3127	0.0065	0.474	0.985	0.950	0.988	0.913	0.985
13. All Fee States	31,164,493	0.0697	-1.3954	0.0076	0.391					
14. All Non-Fee States	53,445,031	0.1167	-1.2668	0.0062	0.521					
15. Fee Group States	17,349,165	0.0531	-1.4377	0.0121	0.397					
16. Non-Fee Group States	67,260,359	0.1112	-1.2823	0.0054	0.494					
17. Group V-squared :					28.5903	65.1280	16.4126	43.7536	29.4033	
18. Group W :					8,528.64	3128.03	9865.64	2226.37	8595.54	
19. Group Gamma-squared :					0.00338	0.00114	0.00426	0.00083	0.00349	
20. 1000!Group C :					0.02690	-0.00206	0.03634	0.04572	0.02511	
21. t-statistic for Group C :					1.92451	-0.07895	2.28304	1.13611	1.62813	
22. Group K :					8,482	57,018	3,849	52,567	8,417	
23. Group d :					1.0080	0.9982	1.0085	1.0549	1.0072	
24. Group Mean beta :					0.1041	0.0752	0.1210	0.0589	0.1158	

NCCI -- TREND ANALYSIS

Incurred Losses Excluding IBNR Indemnity

Type of Fit : Linear
Credibility Formula : Version 3
Adjustment for Bias : No

(1)	(2)	(3)	(4)	(5)	(6)	(7)
State	84-88 Premium (000's)	State Estimate of beta	State Estimate of intercp.	State Estimate of sigma for beta	Current Cred Formula	Cred Countrywide Basis
Alabama	1,873,146	0.0419	0.3645	0.0052	0.424	0.968
Alaska	889,515	0.0131	0.3272	0.0024	0.827	0.993
Arizona--Private Carrier	1,450,128	0.0009	0.2268	0.0020	0.677	0.995
Arizona--State Fund	1,236,379	0.0112	0.3298	0.0071	0.282	0.942
Arkansas	1,114,326	0.0198	0.3448	0.0056	0.370	0.962
Connecticut	3,250,884	0.0287	0.5330	0.0077	0.419	0.932
District of Columbia	626,897	0.0213	0.3589	0.0075	0.290	0.935
Florida	10,288,516	0.0664	0.3949	0.0049	0.486	0.971
Hawaii	900,833	0.0075	0.4054	0.0050	0.493	0.970
Idaho	637,341	0.0123	0.3855	0.0106	0.220	0.878
Illinois	7,761,769	0.0120	0.4061	0.0018	1.000	0.996
Indiana	2,142,437	0.0153	0.2452	0.0018	0.804	0.996
Kansas	1,305,342	0.0195	0.3953	0.0026	0.920	0.992
Louisiana	1,967,125	0.0211	0.7585	0.0088	0.519	0.912
Maine	1,482,482	0.0023	0.4908	0.0067	0.447	0.948
Maryland	1,431,587	0.0328	0.7368	0.0075	0.595	0.935
Michigan	4,301,479	0.0046	0.6017	0.0032	1.000	0.987
Mississippi	1,145,165	0.0179	0.3414	0.0031	0.658	0.988
Missouri	2,602,708	0.0285	0.3551	0.0017	1.000	0.996
New Hampshire	1,115,474	0.0044	0.4302	0.0110	0.236	0.869
New Mexico	798,971	0.0971	0.7012	0.0160	0.265	0.758
North Carolina	2,233,048	0.0192	0.3630	0.0061	0.359	0.956
Oregon--Private Carrier	1,545,649	0.0266	0.4877	0.0158	0.187	0.765
Oregon--State Fund	1,191,856	0.0089	0.7740	0.0060	0.778	0.957
Rhode Island	927,250	0.0929	0.8054	0.0100	0.486	0.889
South Carolina	1,061,236	0.0284	0.5933	0.0075	0.478	0.935
South Dakota	343,347	0.0085	0.4019	0.0016	1.000	0.997
Tennessee	2,501,405	0.0228	0.3781	0.0071	0.322	0.941
Texas	20,151,313	0.0563	0.3638	0.0042	0.522	0.978
Utah--Private Carrier	292,232	0.0060	0.2743	0.0157	0.106	0.767
Vermont	357,258	0.0124	0.4025	0.0063	0.386	0.953
Virginia	2,386,958	0.0129	0.4033	0.0031	0.789	0.988
Wisconsin	3,295,468	0.0023	0.3402	0.0037	0.554	0.983
8. Country-wide	84,609,524	0.0316	0.4202	0.0024	1	0.9403

9. Group Sigma-squared : 84.2638
 10. Group W : 2,019.96
 11. 1000!Group Gamma-squared : 0.80773
 12. Group Mean beta : 0.0306

NCCI -- TREND ANALYSIS

Incurred Losses Excluding IBNR Indemnity

Type of Fit : Adjusted Linear
Credibility Formula : Version 3
Adjustment for Bias : No

(1)	(2)	(3)	(4)	(5)	(6)	(7)
State	84-88 Premium (000's)	State Estimate of beta	State Estimate of intercp.	State Estimate of sigma for beta	Current Cred Formula	Cred Countrywide Basis
Alabama	1,873,146	0.0483	0.4202	0.0060	0.424	0.961
Alaska	889,515	0.0168	0.4202	0.0031	0.827	0.989
Arizona--Private Carrier	1,450,128	0.0016	0.4202	0.0038	0.677	0.984
Arizona--State Fund	1,236,379	0.0142	0.4202	0.0090	0.282	0.915
Arkansas	1,114,326	0.0241	0.4202	0.0069	0.370	0.949
Connecticut	3,250,884	0.0226	0.4202	0.0061	0.419	0.960
District of Columbia	626,897	0.0249	0.4202	0.0088	0.290	0.919
Florida	10,288,516	0.0706	0.4202	0.0052	0.486	0.970
Hawaii	900,833	0.0078	0.4202	0.0052	0.493	0.971
Idaho	637,341	0.0134	0.4202	0.0115	0.220	0.868
Illinois	7,761,769	0.0124	0.4202	0.0018	1.000	0.996
Indiana	2,142,437	0.0262	0.4202	0.0032	0.804	0.989
Kansas	1,305,342	0.0207	0.4202	0.0028	0.920	0.991
Louisiana	1,967,125	0.0117	0.4202	0.0049	0.519	0.973
Maine	1,482,482	0.0020	0.4202	0.0057	0.447	0.964
Maryland	1,431,587	0.0187	0.4202	0.0043	0.595	0.980
Michigan	4,301,479	0.0032	0.4202	0.0023	1.000	0.994
Mississippi	1,145,165	0.0220	0.4202	0.0039	0.658	0.983
Missouri	2,602,708	0.0338	0.4202	0.0020	1.000	0.995
New Hampshire	1,115,474	0.0043	0.4202	0.0108	0.236	0.883
New Mexico	798,971	0.0582	0.4202	0.0096	0.265	0.905
North Carolina	2,233,048	0.0223	0.4202	0.0071	0.359	0.946
Oregon--Private Carrier	1,545,649	0.0230	0.4202	0.0136	0.187	0.827
Oregon--State Fund	1,191,856	0.0048	0.4202	0.0033	0.778	0.988
Rhode Island	927,250	0.0485	0.4202	0.0052	0.486	0.970
South Carolina	1,061,236	0.0201	0.4202	0.0053	0.478	0.969
South Dakota	343,347	0.0089	0.4202	0.0016	1.000	0.997
Tennessee	2,501,405	0.0253	0.4202	0.0079	0.322	0.934
Texas	20,151,313	0.0650	0.4202	0.0049	0.522	0.974
Utah--Private Carrier	292,232	0.0091	0.4202	0.0240	0.106	0.804
Vermont	357,258	0.0130	0.4202	0.0066	0.386	0.953
Virginia	2,386,958	0.0134	0.4202	0.0032	0.789	0.988
Wisconsin	3,295,468	0.0028	0.4202	0.0046	0.554	0.977
8. Country-wide	84,609,524	0.0316	0.4202	0.0024	0.542	0.947
9. Group Sigma-squared :						79.3947
10. Group W :						2,183.96
11. 1000!Group Gamma-squared :						0.87820
12. Group Mean beta :						0.0328

NCCI -- TREND ANALYSIS

Incurred Losses Indemnity

Type of Fit : Linear
Credibility Formula : Version 3
Adjustment for Bias : No

(1)	(2)	(3)	(4)	(5)	(6)	(7)
State	84-88 Premium (000's)	State Estimate of beta	State Estimate of intercp.	State Estimate of sigma for beta	Current Cred Formula	Cred Countrywide Basis
Alabama	1,873,146	0.0467	0.3794	0.0047	0.494	0.978
Alaska	889,515	0.0003	0.3489	0.0032	0.650	0.989
Arizona--Private Carrier	1,450,128	0.0028	0.2395	0.0018	0.794	0.996
Arizona--State Fund	1,236,379	0.0108	0.3291	0.0069	0.290	0.953
Arkansas	1,114,326	0.0197	0.3491	0.0051	0.417	0.974
Connecticut	3,250,884	0.0489	0.5814	0.0067	0.524	0.955
District of Columbia	626,897	0.0149	0.3804	0.0064	0.359	0.958
Florida	10,288,516	0.0764	0.4162	0.0069	0.364	0.952
Hawaii	900,833	0.0018	0.3828	0.0045	0.520	0.979
Idaho	637,341	0.0137	0.3900	0.0107	0.222	0.893
Illinois	7,781,769	0.0164	0.4182	0.0023	1.000	0.995
Indiana	2,142,437	0.0185	0.2523	0.0017	0.894	0.997
Kansas	1,305,342	0.0273	0.4152	0.0032	0.794	0.990
Louisiana	1,967,125	0.0310	0.7800	0.0107	0.441	0.892
Maine	1,482,482	0.0115	0.5164	0.0036	0.877	0.987
Maryland	1,431,587	0.0248	0.7739	0.0060	0.787	0.964
Michigan	4,301,479	0.0034	0.6069	0.0031	1.000	0.990
Mississippi	1,145,165	0.0197	0.3480	0.0029	0.730	0.991
Missouri	2,602,708	0.0339	0.3671	0.0019	1.000	0.996
New Hampshire	1,115,474	0.0119	0.4438	0.0103	0.261	0.899
New Mexico	798,971	0.1098	0.7327	0.0170	0.260	0.766
North Carolina	2,233,048	0.0258	0.3853	0.0063	0.370	0.960
Oregon--Private Carrier	1,545,649	0.0164	0.5011	0.0172	0.177	0.763
Oregon--State Fund	1,191,856	0.0170	0.6386	0.0046	0.832	0.978
Rhode Island	927,250	0.1181	0.8584	0.0080	0.650	0.937
South Carolina	1,061,236	0.0369	0.6203	0.0080	0.472	0.938
South Dakota	343,347	0.0190	0.4222	0.0018	1.000	0.997
Tennessee	2,501,405	0.0252	0.3905	0.0072	0.330	0.949
Texas	20,151,313	0.0610	0.3737	0.0049	0.466	0.976
Utah--Private Carrier	292,232	0.0042	0.2740	0.0146	0.114	0.817
Vermont	357,258	0.0203	0.4250	0.0068	0.376	0.953
Virginia	2,386,958	0.0122	0.4112	0.0041	0.604	0.982
Wisconsin	3,295,468	0.0081	0.3526	0.0031	0.688	0.990
8. Country-wide	84,609,524	0.0373	0.4332	0.0095	0.568	0.949

9. Group Sigma-squared :	94.4593
10. Group W :	2,369.67
11. 1000!Group Gamma-squared :	0.94940
12. Group Mean beta :	0.0362

NCCI -- TREND ANALYSIS

Incurred Losses Indemnity

Type of Fit : Adjusted Linear
Credibility Formula : Version 3
Adjustment for Bias : No

(1)	(2)	(3)	(4)	(5)	(6)	(7)
State	84-88 Premium (000's)	State Estimate of beta	State Estimate of interc.	State Estimate of sigma for beta	Current Cred Formula	Cred Countrywide Basis
Alabama	1,873,146	0.0533	0.4332	0.0053	0.494	0.971
Alaska	889,515	0.0004	0.4332	0.0040	0.650	0.983
Arizona--Private Carrier	1,450,128	0.0051	0.4332	0.0033	0.794	0.989
Arizona--State Fund	1,236,379	0.0142	0.4332	0.0090	0.290	0.922
Arkansas	1,114,326	0.0244	0.4332	0.0063	0.417	0.960
Connecticut	3,250,884	0.0364	0.4332	0.0050	0.524	0.975
District of Columbia	626,897	0.0170	0.4332	0.0073	0.359	0.947
Florida	10,288,516	0.0795	0.4332	0.0072	0.364	0.949
Hawaii	900,833	0.0021	0.4332	0.0050	0.520	0.974
Idaho	637,341	0.0152	0.4332	0.0118	0.222	0.873
Illinois	7,761,769	0.0170	0.4332	0.0023	1.000	0.994
Indiana	2,142,437	0.0317	0.4332	0.0029	0.894	0.991
Kansas	1,305,342	0.0284	0.4332	0.0033	0.794	0.989
Louisiana	1,967,125	0.0172	0.4332	0.0060	0.441	0.964
Maine	1,482,482	0.0097	0.4332	0.0030	0.877	0.991
Maryland	1,431,587	0.0139	0.4332	0.0033	0.787	0.989
Michigan	4,301,479	0.0024	0.4332	0.0022	1.000	0.995
Mississippi	1,145,165	0.0245	0.4332	0.0036	0.730	0.987
Missouri	2,602,708	0.0400	0.4332	0.0023	1.000	0.995
New Hampshire	1,115,474	0.0116	0.4332	0.0101	0.261	0.905
New Mexico	798,971	0.0649	0.4332	0.0101	0.260	0.904
North Carolina	2,233,048	0.0290	0.4332	0.0071	0.370	0.950
Oregon--Private Carrier	1,545,649	0.0142	0.4332	0.0148	0.177	0.813
Oregon--State Fund	1,191,856	0.0115	0.4332	0.0032	0.832	0.990
Rhode Island	927,250	0.0596	0.4332	0.0040	0.650	0.983
South Carolina	1,061,236	0.0258	0.4332	0.0056	0.472	0.969
South Dakota	343,347	0.0195	0.4332	0.0019	1.000	0.996
Tennessee	2,501,405	0.0279	0.4332	0.0079	0.330	0.938
Texas	20,151,313	0.0707	0.4332	0.0056	0.466	0.968
Utah--Private Carrier	292,232	0.0068	0.4332	0.0231	0.114	0.643
Vermont	357,258	0.0207	0.4332	0.0070	0.376	0.952
Virginia	2,386,958	0.0129	0.4332	0.0043	0.604	0.981
Wisconsin	3,295,468	0.0100	0.4332	0.0038	0.688	0.985
8. Country-wide	84,609,524	0.0373	0.4332	0.0030	0.568	0.952
9. Group Sigma-squared :						90.4313
10. Group W :						2,390.44
11. 1000!Group Gamma-squared :						0.95975
12. Group Mean beta :						0.0383

NCCI -- TREND ANALYSIS

Paid Losses Indemnity

Type of Fit : Linear
Credibility Formula : Version 3
Adjustment for Bias : No

(1) State	(2) 84-88 Premium (000's)	(3) State Estimate of beta	(4) State Estimate of intercp.	(5) State Estimate of sigma for beta	(6) Current Cred Formula	(7) Cred Countrywide Basis
Alabama	1,873,146	0.0208	0.3319	0.0025	0.792	0.992
Alaska	889,515	0.0119	0.3587	0.0038	0.578	0.984
Arizona--Private Carrier	1,450,128	0.0028	0.2499	0.0029	0.522	0.990
Arizona--State Fund	1,236,379	0.0098	0.3062	0.0064	0.288	0.954
Arkansas	1,114,326	0.0146	0.3338	0.0058	0.348	0.962
Connecticut	3,250,884	0.0304	0.5584	0.0047	0.724	0.975
District of Columbia	626,897	0.0160	0.3772	0.0070	0.327	0.946
Florida	10,288,516	0.0522	0.3826	0.0025	0.919	0.993
Hawaii	900,833	0.0054	0.4153	0.0080	0.417	0.959
Idaho	637,341	0.0123	0.3738	0.0072	0.315	0.942
Illinois	7,761,789	0.0140	0.4062	0.0016	1.000	0.997
Indiana	2,142,437	0.0144	0.2406	0.0014	1.000	0.998
Kansas	1,305,342	0.0186	0.4020	0.0050	0.483	0.971
Louisiana	1,967,125	0.0183	0.7279	0.0069	0.636	0.946
Maine	1,482,482	0.0056	0.5200	0.0049	0.649	0.973
Maryland	1,431,587	0.0495	0.7321	0.0035	1.000	0.986
Michigan	4,301,479	0.0015	0.6082	0.0063	0.584	0.955
Mississippi	1,145,165	0.0104	0.3229	0.0021	0.948	0.995
Missouri	2,602,708	0.0260	0.3535	0.0032	0.673	0.988
New Hampshire	1,115,474	0.0028	0.4108	0.0082	0.302	0.926
New Mexico	798,971	0.0596	0.6464	0.0143	0.274	0.806
North Carolina	2,233,048	0.0112	0.3420	0.0052	0.402	0.970
Oregon--Private Carrier	1,545,649	0.0314	0.5037	0.0179	0.170	0.725
Oregon--State Fund	1,191,856	0.0312	0.6165	0.0067	0.555	0.949
Rhode Island	927,250	0.1100	0.8537	0.0117	0.442	0.861
South Carolina	1,061,236	0.0167	0.5699	0.0053	0.647	0.968
South Dakota	343,347	0.0102	0.3853	0.0021	1.000	0.995
Tennessee	2,501,405	0.0147	0.3613	0.0058	0.374	0.961
Texas	20,151,313	0.0583	0.3788	0.0033	0.686	0.987
Utah--Private Carrier	292,232	0.0067	0.2833	0.0150	0.114	0.790
Vermont	357,258	0.0112	0.3860	0.0031	0.765	0.989
Virginia	2,386,958	0.0065	0.3941	0.0049	0.491	0.973
Wisconsin	3,295,468	0.0005	0.3415	0.0040	0.518	0.982
8. Country-wide	84,609,524	0.0275	0.4186	0.0017	0.574	0.951

9. Group Sigma-squared :	68.4704
10. Group W :	2,100.23
11. 1000!Group Gamma-squared :	0.84781
12. Group Mean beta :	0.0267

NCCI -- TREND ANALYSIS

Paid Losses Indemnity

Type of Fit : Adjusted Linear
Credibility Formula : Version 3
Adjustment for Bias : No

(1) State	(2) 84-88 Premium (000's)	(3) State Estimate of beta	(4) State Estimate of interc.	(5) State Estimate of sigma for beta	(6) Current Cred Formula	(7) Cred Countrywide Basis
Alabama	1,873,146	0.0263	0.4186	0.0032	0.792	0.988
Alaska	889,515	0.0139	0.4186	0.0044	0.578	0.977
Arizona--Private Carrier	1,450,128	0.0047	0.4186	0.0049	0.522	0.972
Arizona--State Fund	1,236,379	0.0134	0.4186	0.0088	0.288	0.914
Arkansas	1,114,326	0.0184	0.4186	0.0073	0.348	0.940
Connecticut	3,250,884	0.0228	0.4186	0.0035	0.724	0.985
District of Columbia	626,897	0.0177	0.4186	0.0077	0.327	0.932
Florida	10,288,516	0.0571	0.4186	0.0028	0.919	0.991
Hawaii	900,833	0.0054	0.4186	0.0061	0.417	0.957
Idaho	637,341	0.0138	0.4186	0.0081	0.315	0.927
Illinois	7,761,769	0.0144	0.4186	0.0017	1.000	0.997
Indiana	2,142,437	0.0251	0.4186	0.0024	1.000	0.993
Kansas	1,305,342	0.0194	0.4186	0.0052	0.483	0.968
Louisiana	1,967,125	0.0105	0.4186	0.0040	0.636	0.981
Maine	1,482,482	0.0045	0.4186	0.0039	0.649	0.982
Maryland	1,431,587	0.0283	0.4186	0.0020	1.000	0.995
Michigan	4,301,479	0.0011	0.4186	0.0043	0.584	0.978
Mississippi	1,145,165	0.0135	0.4186	0.0027	0.948	0.991
Missouri	2,602,708	0.0308	0.4186	0.0038	0.673	0.983
New Hampshire	1,115,474	0.0028	0.4186	0.0084	0.302	0.921
New Mexico	798,971	0.0386	0.4186	0.0092	0.274	0.906
North Carolina	2,233,048	0.0138	0.4186	0.0063	0.402	0.954
Oregon--Private Carrier	1,545,649	0.0261	0.4186	0.0149	0.170	0.788
Oregon--State Fund	1,191,856	0.0212	0.4186	0.0046	0.555	0.975
Rhode Island	927,250	0.0539	0.4186	0.0057	0.442	0.962
South Carolina	1,061,236	0.0123	0.4186	0.0039	0.647	0.982
South Dakota	343,347	0.0111	0.4186	0.0023	1.000	0.994
Tennessee	2,501,405	0.0170	0.4186	0.0068	0.374	0.947
Texas	20,151,313	0.0644	0.4186	0.0037	0.686	0.984
Utah--Private Carrier	292,232	0.0099	0.4186	0.0222	0.114	0.626
Vermont	357,258	0.0121	0.4186	0.0033	0.785	0.987
Virginia	2,386,958	0.0089	0.4186	0.0052	0.491	0.969
Wisconsin	3,295,468	0.0006	0.4186	0.0049	0.518	0.972
8. Country-wide	84,609,524	0.0275	0.4186	0.0017	0.574	0.952
9. Group Sigma-squared :						61.9113
10. Group W :						2,036.40
11. 1000!Group Gamma-squared :						0.82392
12. Group Mean beta :						0.0289

NCCI -- TREND ANALYSIS

Incurred Losses Excluding IBNR Medical

Type of Fit : Linear
Credibility Formula : Version 3
Adjustment for Bias : No

(1) State	(2) 84-88 Premium (000's)	(3) State Estimate of beta	(4) State Estimate of intercp.	(5) State Estimate of sigma for beta	(6) Current Cred Formula	(7) Cred Countrywide Basis	(8) Cred Fee State Basis	(9) Cred Non-Fee State Basis	(10) Cred Fee Group Basis	(11) Cred Non-Fee Group Basis
Alabama	1,873,146	0.0474	0.4112	0.0091	0.274	0.802		0.801		0.783
Alaska	889,515	0.0127	0.2012	0.0026	0.470	0.980		0.980		0.978
Arizona--Private Carrier	1,450,128	0.0005	0.2927	0.0052	0.340	0.924	0.906		0.630	
Arizona--State Fund	1,236,379	0.0081	0.3605	0.0106	0.205	0.747	0.698		0.291	
Arkansas	1,114,326	0.0243	0.3084	0.0079	0.237	0.843		0.842		0.827
Connecticut	3,250,884	0.0184	0.2186	0.0016	0.839	0.993		0.993		0.992
District of Columbia	626,897	0.0094	0.2303	0.0034	0.413	0.967		0.967		0.963
Florida	10,288,516	0.0305	0.2533	0.0025	0.611	0.981	0.976			0.979
Hawaii	900,833	0.0075	0.2536	0.0029	0.521	0.975	0.968		0.842	
Idaho	637,341	0.0276	0.2595	0.0086	0.183	0.819	0.781		0.387	
Illinois	7,761,769	0.0124	0.1824	0.0020	0.541	0.988	0.984		0.917	
Indiana	2,142,437	0.0311	0.2724	0.0055	0.298	0.916		0.915		0.907
Kansas	1,305,342	0.0274	0.2903	0.0057	0.309	0.912		0.911		0.902
Louisiana	1,967,125	0.0473	0.4990	0.0055	0.549	0.917		0.916		0.908
Maine	1,482,482	0.0107	0.2056	0.0039	0.319	0.956		0.956		0.951
Maryland	1,431,587	0.0089	0.4227	0.0071	0.361	0.869		0.868		0.856
Michigan	4,301,479	0.0132	0.2482	0.0024	0.624	0.983	0.978		0.889	
Mississippi	1,145,165	0.0285	0.3591	0.0059	0.369	0.906		0.905		0.895
Missouri	2,602,708	0.0329	0.2670	0.0026	0.618	0.980		0.980		0.978
New Hampshire	1,115,474	0.0051	0.2271	0.0099	0.139	0.772	0.727			0.752
New Mexico	798,971	0.0720	0.4601	0.0092	0.302	0.796		0.796		0.778
North Carolina	2,233,048	0.0179	0.3085	0.0054	0.341	0.918		0.918		0.910
Oregon--Private Carrier	1,545,649	0.0147	0.3866	0.0074	0.318	0.860		0.860		0.846
Oregon--State Fund	1,191,856	0.0738	0.7859	0.0131	0.363	0.660	0.604			0.634
Rhode Island	927,250	0.0220	0.1992	0.0027	0.446	0.979	0.973			0.976
South Carolina	1,061,236	0.0158	0.3450	0.0083	0.251	0.828	0.791		0.401	
South Dakota	343,347	0.0175	0.2721	0.0034	0.483	0.966		0.966		0.962
Tennessee	2,501,405	0.0239	0.2745	0.0061	0.272	0.899		0.898		0.888
Texas	20,151,313	0.0515	0.2650	0.0043	0.375	0.948		0.948		0.942
Utah--Private Carrier	292,232	0.0268	0.2990	0.0154	0.117	0.583	0.524			0.556
Vermont	357,258	0.0182	0.2134	0.0043	0.301	0.947		0.947		0.942
Virginia	2,386,958	0.0223	0.3327	0.0024	0.836	0.983		0.983		0.981
Wisconsin	3,295,468	0.0182	0.2341	0.0020	0.715	0.988		0.988		0.987
Aggregate Fits :										
12. Country-wide	84,609,524	0.0290	0.2784	0.0025	0.404	0.896	0.826	0.921	0.622	0.887
13. All Fee States	31,164,493	0.0201	0.2620	0.0023	0.362					
14. All Non-Fee States	53,445,031	0.0346	0.2885	0.0028	0.429					
15. Fee Group States	17,349,165	0.0106	0.2369	0.0030	0.381					
16. Non-Fee Group States	67,260,359	0.0343	0.2897	0.0026	0.411					
17. Group Sigma-squared :						63.7031	68.3368	61.0554	52.1278	66.8195
18. Group W :						861.86	681.43	799.23	148.44	764.13
19. 1000*Group Gamma-squared :						0.33306	0.26168	0.33150	0.04636	0.29772
20. Group Mean beta :						0.0292	0.0199	0.0347	0.0106	0.0340

NCCI -- TREND ANALYSIS

Incurred Losses Excluding IBNR Medical

Type of Fit : Adjusted Linear
Credibility Formula : Version 3
Adjustment for Bias : No

(1) State	(2) 84-88 Premium (000's)	(3) State Estimate of beta	(4) State Estimate of intercp.	(5) State Estimate of sigma for beta	(6) Current Cred Formula	(7) Cred Countrywide Basis	(8) Cred Fee State Basis	(9) Cred Non-Fee State Basis	(10) Cred Fee Group Basis	(11) Cred Non-Fee Group Basis
Alabama	1,873,146	0.0313	0.2718	0.0060	0.274	0.880		0.896		0.872
Alaska	889,515	0.0172	0.2718	0.0035	0.470	0.956		0.962		0.953
Arizona--Private Carrier	1,450,128	0.0005	0.2718	0.0048	0.340	0.918	0.847		0.747	
Arizona--State Fund	1,236,379	0.0061	0.2718	0.0080	0.205	0.804	0.670		0.519	
Arkansas	1,114,326	0.0214	0.2718	0.0070	0.237	0.845		0.865		0.836
Connecticut	3,250,884	0.0230	0.2718	0.0020	0.839	0.986		0.988		0.985
District of Columbia	626,897	0.0111	0.2718	0.0040	0.413	0.943		0.951		0.939
Florida	10,288,516	0.0327	0.2718	0.0027	0.611	0.973	0.947			0.971
Hawaii	900,833	0.0080	0.2718	0.0032	0.521	0.963	0.929		0.874	
Idaho	637,341	0.0289	0.2718	0.0090	0.183	0.766	0.618		0.463	
Illinois	7,761,769	0.0185	0.2718	0.0030	0.541	0.966	0.934		0.882	
Indiana	2,142,437	0.0311	0.2718	0.0055	0.298	0.896		0.910		0.890
Kansas	1,305,342	0.0257	0.2718	0.0053	0.309	0.903		0.916		0.897
Louisiana	1,967,125	0.0258	0.2718	0.0030	0.549	0.967		0.972		0.965
Maine	1,482,482	0.0142	0.2718	0.0052	0.319	0.908		0.921		0.902
Maryland	1,431,587	0.0057	0.2718	0.0046	0.361	0.927		0.937		0.922
Michigan	4,301,479	0.0145	0.2718	0.0028	0.624	0.974	0.949		0.909	
Mississippi	1,145,165	0.0216	0.2718	0.0045	0.369	0.930		0.940		0.925
Missouri	2,602,708	0.0335	0.2718	0.0027	0.618	0.974		0.978		0.972
New Hampshire	1,115,474	0.0061	0.2718	0.0119	0.139	0.652	0.481			0.636
New Mexico	798,971	0.0426	0.2718	0.0055	0.302	0.899		0.912		0.892
North Carolina	2,233,048	0.0158	0.2718	0.0048	0.341	0.919		0.930		
Oregon--Private Carrier	1,545,649	0.0103	0.2718	0.0052	0.318	0.908		0.920		
Oregon--State Fund	1,191,856	0.0255	0.2718	0.0045	0.363	0.928	0.864			0.923
Rhode Island	927,250	0.0300	0.2718	0.0037	0.446	0.951	0.905			0.947
South Carolina	1,061,236	0.0124	0.2718	0.0066	0.251	0.860	0.752		0.617	
South Dakota	343,347	0.0175	0.2718	0.0034	0.483	0.958		0.964		0.955
Tennessee	2,501,405	0.0237	0.2718	0.0061	0.272	0.878		0.894		0.870
Texas	20,151,313	0.0528	0.2718	0.0044	0.375	0.932		0.941		0.927
Utah--Private Carrier	292,232	0.0244	0.2718	0.0140	0.117	0.573	0.399			0.556
Vermont	357,258	0.0232	0.2718	0.0055	0.301	0.898		0.912		0.891
Virginia	2,386,958	0.0182	0.2718	0.0020	0.836	0.986		0.988		0.984
Wisconsin	3,295,468	0.0212	0.2718	0.0023	0.715	0.980		0.983		0.979
Aggregate Fits :										
12. Country-wide	84,609,524	0.0290	0.2784	0.0025	0.404	0.903	0.775	0.937	0.718	1
13. All Fee States	31,164,493	0.0201	0.2620	0.0023	0.362					
14. All Non-Fee States	53,445,031	0.0346	0.2885	0.0028	0.429					
15. Fee Group States	17,349,165	0.0106	0.2369	0.0030	0.381					
16. Non-Fee Group States	67,260,359	0.0343	0.2897	0.0026	0.411					
17. Group Sigma-squared :						53.1406	50.1354	54.9168	34.8878	58.9640
18. Group W :						716.41	324.71	831.94	144.43	712.57
19. Group Gamma-squared :						0.00028	0.00012	0.00035	0.00005	0.00028
20. Group Mean beta :						0.0295	0.0200	0.0356	0.0119	0.0349

NCCI -- TREND ANALYSIS

Incurred Losses Medical

Type of Fit : Linear
Credibility Formula : Version 3
Adjustment for Bias : No

(1) State	(2) 84-88 Premium (000's)	(3) State Estimate of beta	(4) State Estimate of intercp.	(5) State Estimate of sigma for beta	(6) Current Cred Formula	(7) Cred Countrywide Basis	(8) Cred Fee State Basis	(9) Cred Non-Fee State Basis	(10) Cred Fee Group Basis	(11) Cred Non-Fee Group Basis
Alabama	1,873,146	0.0570	0.4329	0.0103	0.254	0.759		0.748		0.705
Alaska	889,515	0.0218	0.2137	0.0036	0.355	0.962		0.959		0.950
Arizona--Private Carrier	1,450,128	0.0052	0.3036	0.0060	0.307	0.903	0.853		0.562	
Arizona--State Fund	1,236,379	0.0081	0.3605	0.0108	0.205	0.747	0.649		0.289	
Arkansas	1,114,326	0.0259	0.3111	0.0080	0.235	0.839		0.830		0.798
Connecticut	3,250,884	0.0280	0.2353	0.0018	0.785	0.990		0.990		0.987
District of Columbia	626,897	0.0243	0.2761	0.0043	0.391	0.948		0.945		0.933
Florida	10,288,516	0.0387	0.2723	0.0039	0.422	0.956	0.932			0.943
Hawaii	900,833	0.0054	0.2475	0.0031	0.481	0.972	0.956		0.826	
Idaho	637,341	0.0291	0.2624	0.0087	0.182	0.814	0.733		0.376	
Illinois	7,761,769	0.0139	0.1859	0.0023	0.496	0.985	0.976		0.899	
Indiana	2,142,437	0.0341	0.2771	0.0060	0.281	0.904		0.898		0.877
Kansas	1,305,342	0.0322	0.3001	0.0062	0.291	0.896		0.890		0.867
Louisiana	1,967,125	0.0561	0.5159	0.0078	0.398	0.845		0.836		0.805
Maine	1,482,482	0.0135	0.2151	0.0043	0.306	0.949		0.946		0.933
Maryland	1,431,587	0.0026	0.4473	0.0066	0.412	0.885		0.879		0.854
Michigan	4,301,479	0.0106	0.2466	0.0024	0.614	0.983	0.972		0.886	
Mississippi	1,145,165	0.0326	0.3671	0.0064	0.345	0.890		0.883		0.859
Missouri	2,602,708	0.0366	0.2743	0.0028	0.603	0.978		0.976		0.971
New Hampshire	1,115,474	0.0090	0.2360	0.0099	0.144	0.773	0.681			0.721
New Mexico	798,971	0.0847	0.4860	0.0111	0.264	0.729		0.717		0.671
North Carolina	2,233,048	0.0244	0.3247	0.0059	0.335	0.906		0.901		0.880
Oregon--Private Carrier	1,545,649	0.0271	0.4086	0.0089	0.277	0.808		0.798		0.761
Oregon--State Fund	1,191,856	0.0252	0.5886	0.0114	0.313	0.721	0.617			0.662
Rhode Island	927,250	0.0298	0.2177	0.0022	0.613	0.986	0.978			0.982
South Carolina	1,061,236	0.0213	0.3591	0.0086	0.253	0.819	0.739		0.385	
South Dakota	343,347	0.0254	0.2866	0.0037	0.467	0.960		0.958		0.948
Tennessee	2,501,405	0.0272	0.2825	0.0065	0.282	0.887		0.880		0.856
Texas	20,151,313	0.0554	0.2706	0.0052	0.315	0.925		0.921		0.903
Utah--Private Carrier	292,232	0.0330	0.3118	0.0163	0.116	0.558	0.441			0.489
Vermont	357,258	0.0236	0.2267	0.0042	0.331	0.951		0.948		0.936
Virginia	2,386,958	0.0258	0.3496	0.0025	0.853	0.982		0.981		0.976
Wisconsin	3,295,468	0.0213	0.2402	0.0021	0.698	0.987		0.986		0.983
Aggregate Fits :										
12. Country-wide	84,609,524	0.0327	0.2855	0.0051	0.382	0.885	0.794	0.899	0.603	0.856
13. All Fee States	31,164,493	0.0214	0.2630	0.0028	0.346					
14. All Non-Fee States	53,445,031	0.0399	0.2993	0.0036	0.403					
15. Fee Group States	17,349,165	0.0113	0.2396	0.0030	0.363					
16. Non-Fee Group States	67,260,359	0.0388	0.2980	0.0034	0.387					
17. Group Sigma-squared :						78.6827	74.6477	80.9885	56.1213	84.7570
18. Group W :						880.32	548.51	780.74	151.79	678.55
19. 1000 Group Sigma-squared :						0.33451	0.20905	0.31424	0.04605	0.25352
20. Group Mean beta :						0.0331	0.0216	0.0398	0.0114	0.0387

NCCI -- TREND ANALYSIS

Incurred Medical

Type of Fit : Adjusted Linear
Credibility Formula : Version 3
Adjustment for Bias : No

(1) State	(2) 84-88 Premium (000's)	(3) State Estimate of beta	(4) State Estimate of intercp.	(5) State Estimate of sigma for beta	(6) Current Cred Formula	(7) Cred Countrywide Basis	(8) Cred Fee State Basis	(9) Cred Non-Fee State Basis	(10) Cred Fee Group Basis	(11) Cred Non-Fee Group Basis
Alabama	1,873,146	0.0358	0.2718	0.0065	0.254	0.868		0.869		0.847
Alaska	889,515	0.0277	0.2718	0.0046	0.355	0.928		0.928		0.915
Arizona--Private Carrier	1,450,128	0.0047	0.2718	0.0054	0.307	0.905	0.871		0.712	
Arizona--State Fund	1,236,379	0.0061	0.2718	0.0080	0.205	0.811	0.751		0.525	
Arkansas	1,114,326	0.0226	0.2718	0.0070	0.235	0.849		0.850		0.825
Connecticut	3,250,884	0.0301	0.2718	0.0021	0.785	0.984		0.984		0.981
District of Columbia	626,897	0.0240	0.2718	0.0042	0.391	0.939		0.940		0.929
Florida	10,288,516	0.0386	0.2718	0.0039	0.422	0.948	0.927			0.938
Hawaii	900,833	0.0060	0.2718	0.0034	0.481	0.959	0.943		0.859	
Idaho	637,341	0.0301	0.2718	0.0090	0.182	0.771	0.704		0.465	
Illinois	7,781,769	0.0203	0.2718	0.0033	0.496	0.962	0.946		0.866	
Indiana	2,142,437	0.0334	0.2718	0.0059	0.281	0.889		0.890		0.871
Kansas	1,305,342	0.0292	0.2718	0.0057	0.291	0.896		0.897		0.879
Louisiana	1,967,125	0.0296	0.2718	0.0041	0.398	0.942		0.942		0.931
Maine	1,482,482	0.0171	0.2718	0.0054	0.306	0.905		0.906		0.889
Maryland	1,431,587	0.0016	0.2718	0.0040	0.412	0.945		0.945		0.935
Michigan	4,301,479	0.0117	0.2718	0.0027	0.614	0.975	0.964		0.908	
Mississippi	1,145,165	0.0241	0.2718	0.0048	0.345	0.924		0.924		0.910
Missouri	2,602,708	0.0363	0.2718	0.0027	0.603	0.974		0.974		0.969
New Hampshire	1,115,474	0.0104	0.2718	0.0114	0.144	0.679	0.599			0.640
New Mexico	798,971	0.0474	0.2718	0.0062	0.264	0.876		0.877		0.856
North Carolina	2,233,048	0.0205	0.2718	0.0049	0.335	0.919		0.920		0.905
Oregon--Private Carrier	1,545,649	0.0180	0.2718	0.0059	0.277	0.886		0.887		
Oregon--State Fund	1,191,856	0.0116	0.2718	0.0053	0.313	0.909	0.876			
Rhode Island	927,250	0.0372	0.2718	0.0027	0.613	0.974	0.964			0.970
South Carolina	1,061,236	0.0161	0.2718	0.0065	0.253	0.867	0.821		0.628	
South Dakota	343,347	0.0240	0.2718	0.0035	0.467	0.957		0.957		0.949
Tennessee	2,501,405	0.0262	0.2718	0.0063	0.262	0.874		0.875		0.854
Texas	20,151,313	0.0556	0.2718	0.0052	0.315	0.910		0.910		0.894
Utah--Private Carrier	292,232	0.0288	0.2718	0.0142	0.116	0.577	0.491			0.534
Vermont	357,258	0.0283	0.2718	0.0050	0.331	0.917		0.918		0.903
Virginia	2,386,958	0.0201	0.2718	0.0019	0.853	0.987		0.987		0.984
Wisconsin	3,295,468	0.0241	0.2718	0.0024	0.698	0.980		0.980		0.977
Aggregate Fits :										
12. Country-wide	84,609,524	0.0327	0.2855	0.0031	0.382	0.900	0.821	0.922	0.709	1
13. All Fee States	31,164,493	0.0214	0.2630	0.0028	0.346					
14. All Non-Fee States	53,445,031	0.0399	0.2993	0.0036	0.403					
15. Fee Group States	17,349,165	0.0113	0.2396	0.0030	0.363					
16. Non-Fee Group States	67,260,359	0.0388	0.2980	0.0034	0.387					
17. Group Sigma-squared :					67.2998	58.1688	73.1445	38.3022	77.0901	
18. Group W :					795.24	470.40	821.36	153.18	727.87	
19. Group Gamma-squared :					0.00030	0.00018	0.00034	0.00006	0.00028	
20. Group Mean beta :					0.0335	0.0222	0.0409	0.0126	0.0400	

NCCI -- TREND ANALYSIS

Paid Losses Medical

Type of Fit : Linear
Credibility Formula : Version 3
Adjustment for Bias : No

(1) State	(2) 84-88 Premium (000's)	(3) State Estimate of beta	(4) State Estimate of intercp.	(5) State Estimate of sigma for beta	(6) Current Cred Formula	(7) Cred Countrywide Basis	(8) Cred Fee State Basis	(9) Cred Non-Fee State Basis	(10) Cred Fee Group Basis	(11) Cred Non-Fee Group Basis
Alabama	1,873,146	0.0366	0.3802	0.0082	0.282	0.782		0.805		0.775
Alaska	889,515	0.0150	0.2073	0.0031	0.406	0.962		0.966		0.960
Arizona--Private Carrier	1,450,128	0.0057	0.3043	0.0042	0.443	0.933	0.727		0.579	
Arizona--State Fund	1,236,379	0.0024	0.3366	0.0092	0.221	0.737	0.351		0.218	
Arkansas	1,114,326	0.0227	0.2917	0.0063	0.281	0.858		0.874		0.853
Connecticut	3,250,884	0.0199	0.2163	0.0010	1.000	0.996		0.996		0.996
District of Columbia	626,897	0.0041	0.2359	0.0037	0.388	0.946		0.953		0.944
Florida	10,288,516	0.0253	0.2383	0.0022	0.649	0.980	0.903			0.979
Hawaii	900,833	0.0161	0.2750	0.0044	0.379	0.925	0.705		0.551	
Idaho	637,341	0.0254	0.2495	0.0073	0.206	0.817	0.462		0.307	
Illinois	7,761,769	0.0156	0.1876	0.0022	0.513	0.980	0.904		0.829	
Indiana	2,142,437	0.0306	0.2694	0.0052	0.315	0.899		0.911		0.895
Kansas	1,305,342	0.0307	0.2857	0.0052	0.333	0.899		0.911		0.895
Louisiana	1,967,125	0.0413	0.4758	0.0067	0.432	0.843		0.861		0.838
Maine	1,482,482	0.0062	0.2048	0.0046	0.270	0.919		0.929		0.916
Maryland	1,431,587	0.0062	0.4135	0.0046	0.542	0.918		0.928		0.915
Michigan	4,301,479	0.0116	0.2431	0.0031	0.475	0.961	0.828		0.712	
Mississippi	1,145,165	0.0286	0.3334	0.0032	0.629	0.959		0.964		0.957
Missouri	2,602,708	0.0317	0.2674	0.0025	0.651	0.975		0.978		0.974
New Hampshire	1,115,474	0.0135	0.2194	0.0064	0.208	0.855	0.531			0.849
New Mexico	798,971	0.0612	0.4734	0.0098	0.292	0.713		0.741		0.704
North Carolina	2,233,048	0.0173	0.3141	0.0048	0.396	0.912		0.923		0.908
Oregon--Private Carrier	1,545,849	0.0143	0.3888	0.0089	0.265	0.752		0.778		0.744
Oregon--State Fund	1,191,856	0.0096	0.5458	0.0138	0.239	0.556	0.195			0.546
Rhode Island	927,250	0.0266	0.2107	0.0030	0.430	0.964	0.839			0.963
South Carolina	1,061,236	0.0166	0.3489	0.0058	0.364	0.876	0.577		0.413	
South Dakota	343,347	0.0157	0.2638	0.0036	0.448	0.950		0.956		0.948
Tennessee	2,501,405	0.0252	0.2833	0.0065	0.262	0.848		0.865		0.842
Texas	20,151,313	0.0498	0.2619	0.0041	0.383	0.933		0.942		0.931
Utah--Private Carrier	292,232	0.0361	0.3284	0.0168	0.119	0.460	0.141			0.450
Vermont	357,258	0.0195	0.2214	0.0020	0.675	0.984		0.986		0.983
Virginia	2,386,958	0.0208	0.3359	0.0014	1.000	0.992		0.993		0.992
Wisconsin	3,295,468	0.0217	0.2395	0.0028	0.522	0.969		0.973		0.967
Aggregate Fits :										
12. Country-wide	84,609,524	0.0272	0.2718	0.0026	0.425	0.880	0.597	0.916	0.516	0.874
13. All Fee States	31,164,493	0.0176	0.2490	0.0022	0.354					
14. All Non-Fee States	53,445,031	0.0335	0.2857	0.0030	0.465					
15. Fee Group States	17,349,165	0.0129	0.2385	0.0030	0.371					
16. Non-Fee Group States	67,260,359	0.0314	0.2808	0.0026	0.439					
17. Group Sigma-squared :					57.8278	59.2694	57.0040	42.4812		61.9595
18. Group W :					630.79	163.74	671.00	91.83		598.96
19. 1000!Group Sigma-squared :					0.23909	0.04609	0.27573	0.02375		0.22927
20. Group Mean beta :					0.0276	0.0175	0.0334	0.0130		0.0313

NCCI -- TREND ANALYSIS

Paid Lossee Medical

Type of Fit : Adjusted Linear
Credibility Formula : Version 3
Adjustment for Bias : No

(1) State	(2) 84-88 Premium (000's)	(3) State Estimate of beta	(4) State Estimate of intercp.	(5) State Estimate of sigma for beta	(6) Current Cred Formula	(7) Cred Countrywide Basis	(8) Cred Fee State Basis	(9) Cred Non-Fee State Basis	(10) Cred Fee Group Basis	(11) Cred Non-Fee Group Basis
Alabama	1,873,146	0.0262	0.2718	0.0058	0.282	0.873		0.896		0.876
Alaska	889,515	0.0197	0.2718	0.0041	0.406	0.935		0.947		0.936
Arizona--Private Carrier	1,450,128	0.0051	0.2718	0.0037	0.443	0.945	0.857		0.821	
Arizona--State Fund	1,238,379	0.0019	0.2718	0.0075	0.221	0.809	0.598		0.532	
Arkansas	1,114,326	0.0212	0.2718	0.0059	0.281	0.872		0.895		0.875
Connecticut	3,250,884	0.0251	0.2718	0.0013	1.000	0.993		0.995		0.993
District of Columbia	626,897	0.0047	0.2718	0.0042	0.388	0.929		0.942		0.930
Florida	10,288,516	0.0288	0.2718	0.0025	0.649	0.973	0.928			0.974
Hawaii	900,833	0.0159	0.2718	0.0043	0.379	0.926	0.814		0.770	
Idaho	637,341	0.0277	0.2718	0.0080	0.206	0.787	0.566		0.498	
Illinois	7,761,769	0.0226	0.2718	0.0032	0.513	0.958	0.889		0.860	
Indiana	2,142,437	0.0308	0.2718	0.0052	0.315	0.898		0.915		0.898
Kansas	1,305,342	0.0292	0.2718	0.0049	0.333	0.906		0.923		0.908
Louisiana	1,967,125	0.0236	0.2718	0.0038	0.432	0.942		0.953		0.943
Maine	1,482,482	0.0082	0.2718	0.0061	0.270	0.863		0.888		0.866
Maryland	1,431,587	0.0041	0.2718	0.0030	0.542	0.962		0.970		0.963
Michigan	4,301,479	0.0130	0.2718	0.0035	0.475	0.951	0.874		0.840	
Mississippi	1,145,165	0.0233	0.2718	0.0026	0.629	0.972		0.977		0.972
Missouri	2,602,708	0.0322	0.2718	0.0025	0.851	0.974		0.979		0.974
New Hampshire	1,115,474	0.0168	0.2718	0.0079	0.208	0.790	0.570			0.794
New Mexico	798,971	0.0352	0.2718	0.0056	0.292	0.881		0.902		0.883
North Carolina	2,233,048	0.0150	0.2718	0.0042	0.396	0.931		0.944		0
Oregon--Private Carrier	1,545,849	0.0100	0.2718	0.0062	0.265	0.859		0.884		0
Oregon--State Fund	1,191,856	0.0048	0.2718	0.0069	0.239	0.832	0.636			0.830
Rhode Island	927,250	0.0343	0.2718	0.0038	0.430	0.941	0.850			0.943
South Carolina	1,061,236	0.0129	0.2718	0.0045	0.364	0.920	0.802		0.755	
South Dakota	343,347	0.0162	0.2718	0.0037	0.449	0.946		0.956		0.947
Tennessee	2,501,405	0.0242	0.2718	0.0063	0.282	0.856		0.882		0.859
Texas	20,151,313	0.0516	0.2718	0.0043	0.383	0.927		0.941		0.929
Utah--Private Carrier	292,232	0.0298	0.2718	0.0139	0.119	0.550	0.301			0.556
Vermont	357,258	0.0240	0.2718	0.0024	0.675	0.975		0.980		0.976
Virginia	2,386,958	0.0168	0.2718	0.0011	1.000	0.995		0.996		0.995
Wisconsin	3,295,468	0.0247	0.2718	0.0032	0.522	0.959		0.967		0.960
Aggregate Fits :										
12. Country-wide	84,609,524	0.0272	0.2718	0.0026	0.425	0.904	0.724	0.940	0.725	1
13. All Fee States	31,164,493	0.0176	0.2490	0.0022	0.354					
14. All Non-Fee States	53,445,031	0.0335	0.2857	0.0030	0.465					
15. Fee Group States	17,349,185	0.0129	0.2383	0.0030	0.371					
16. Non-Fee Group States	67,260,359	0.0314	0.2809	0.0026	0.439					
17. Group Sigma-squared :						46.7591	39.2828	51.6037	32.8983	51.0660
18. Group W :						610.33	196.95	774.11	133.73	653.23
19. Group Gamma-squared :						0.00024	0.00007	0.00032	0.00005	0.00026
20. Group Mean beta :						0.0284	0.0189	0.0345	0.0143	0.0325

NCCI -- TREND ANALYSIS

Incurred Losses Excluding IBNR Indemnity

Type of Fit : Linear
Credibility Formula : Version 1
Adjustment for Bias : Yes

(1) State	(2) 84-88 Premium (000's)	(3) State Estimate of beta	(4) State Estimate of intercp.	(5) State Estimate of sigma for beta	(6) Current Cred Formula	(7) Cred Countrywide Basis
Alabama	1,873,146	0.0419	0.3645	0.0052	0.424	0.952
Alaska	889,515	0.0131	0.3272	0.0024	0.827	0.905
Arizona--Private Carrier	1,450,128	0.0009	0.2268	0.0020	0.877	0.939
Arizona--State Fund	1,236,379	0.0112	0.3298	0.0071	0.282	0.929
Arkansas	1,114,326	0.0198	0.3446	0.0056	0.370	0.922
Connecticut	3,250,884	0.0287	0.5330	0.0077	0.419	0.972
District of Columbia	626,897	0.0213	0.3589	0.0075	0.290	0.870
Florida	10,288,518	0.0664	0.3949	0.0049	0.486	0.991
Hawaii	900,833	0.0075	0.4054	0.0050	0.493	0.908
Idaho	637,341	0.0123	0.3855	0.0106	0.220	0.872
Illinois	7,761,789	0.0120	0.4061	0.0018	1.000	0.988
Indiana	2,142,437	0.0153	0.2452	0.0018	0.804	0.958
Kansas	1,305,342	0.0195	0.3953	0.0026	0.920	0.933
Louisiana	1,967,125	0.0211	0.7585	0.0088	0.519	0.954
Maine	1,482,482	0.0023	0.4908	0.0087	0.447	0.940
Maryland	1,431,587	0.0328	0.7366	0.0075	0.595	0.938
Michigan	4,301,479	0.0046	0.6017	0.0032	1.000	0.978
Mississippi	1,145,165	0.0179	0.3414	0.0031	0.858	0.924
Missouri	2,602,708	0.0285	0.3551	0.0017	1.000	0.965
New Hampshire	1,115,474	0.0044	0.4302	0.0110	0.236	0.922
New Mexico	798,971	0.0971	0.7012	0.0160	0.265	0.895
North Carolina	2,233,048	0.0192	0.3630	0.0061	0.359	0.959
Oregon--Private Carrier	1,545,849	0.0266	0.4877	0.0158	0.187	0.943
Oregon--State Fund	1,191,856	0.0089	0.7740	0.0060	0.778	0.927
Rhode Island	927,250	0.0929	0.8054	0.0100	0.486	0.908
South Carolina	1,061,236	0.0284	0.5933	0.0075	0.478	0.919
South Dakota	343,347	0.0065	0.4019	0.0016	1.000	0.788
Tennessee	2,501,405	0.0228	0.3781	0.0071	0.322	0.964
Texas	20,151,313	0.0563	0.3638	0.0042	0.522	0.995
Utah--Private Carrier	292,232	0.0060	0.2743	0.0157	0.106	0.761
Vermont	357,258	0.0124	0.4025	0.0063	0.386	0.795
Virginia	2,386,958	0.0129	0.4033	0.0031	0.789	0.962
Wisconsin	3,295,468	0.0023	0.3402	0.0037	0.554	0.972
8. Country-wide	84,609,524	0.0316	0.4202	0.0024	0.542	0.926

9. Group Sigma-squared :	84.2638
10. Group W :	2,019.96
11. 1000!Group Gamma-squared :	0.80773
12. Group K :	104,322
13. Group Mean beta :	0.0306

NCCI -- TREND ANALYSIS

Incurred Losses Excluding IBNR Medical

Type of Fit : Linear
Credibility Formula : Version 1
Adjustment for Bias : Yes

(1) State	(2) 84-88 Premium (000's)	(3) State Estimate of beta	(4) State Estimate of intercp.	(5) State Estimate of sigma for beta	(6) Current Cred Formula	(7) Cred Countrywide Basis	(8) Cred Fee State Basis	(9) Cred Non-Fee State Basis	(10) Cred Fee Group Basis	(11) Cred Non-Fee Group Basis
Alabama	1,873,146	0.0474	0.4112	0.0091	0.274	0.916		0.923		0.905
Alaska	889,515	0.0127	0.2012	0.0026	0.470	0.839		0.853		0.822
Arizona--Private Carrier	1,450,128	0.0005	0.2927	0.0052	0.340	0.894	0.886		0.750	
Arizona--State Fund	1,236,379	0.0081	0.3605	0.0106	0.205	0.878	0.869		0.728	
Arkansas	1,114,326	0.0243	0.3084	0.0079	0.237	0.867		0.878		0.852
Connecticut	3,250,884	0.0184	0.2166	0.0016	0.839	0.949		0.954		0.943
District of Columbia	626,897	0.0094	0.2303	0.0034	0.413	0.787		0.805		0.767
Florida	10,288,516	0.0305	0.2533	0.0025	0.611	0.983	0.981			0.981
Hawaii	900,833	0.0075	0.2536	0.0029	0.521	0.841	0.831		0.683	
Idaho	637,341	0.0276	0.2595	0.0086	0.183	0.790	0.782		0.635	
Illinois	7,761,769	0.0124	0.1824	0.0020	0.541	0.978	0.976		0.928	
Indiana	2,142,437	0.0311	0.2724	0.0055	0.298	0.925		0.932		0.916
Kansas	1,305,342	0.0274	0.2903	0.0074	0.309	0.884		0.894		0.870
Louisiana	1,967,125	0.0473	0.4990	0.0055	0.549	0.919		0.927		0.909
Maine	1,482,482	0.0107	0.2056	0.0039	0.319	0.896		0.905		0.884
Maryland	1,431,587	0.0089	0.4227	0.0071	0.361	0.893		0.902		0.880
Michigan	4,301,479	0.0132	0.2482	0.0024	0.624	0.961	0.957		0.882	
Mississippi	1,145,165	0.0285	0.3591	0.0059	0.389	0.870		0.881		0.855
Missouri	2,602,708	0.0329	0.2670	0.0026	0.618	0.938		0.943		0.930
New Hampshire	1,115,474	0.0051	0.2271	0.0099	0.139	0.867	0.858			0.852
New Mexico	798,971	0.0720	0.4601	0.0092	0.302	0.824		0.839		0.806
North Carolina	2,233,048	0.0179	0.3065	0.0054	0.341	0.928		0.935		0.919
Oregon--Private Carrier	1,545,649	0.0147	0.3866	0.0074	0.318	0.900		0.909		
Oregon--State Fund	1,191,856	0.0738	0.7859	0.0131	0.363	0.874	0.865			
Rhode Island	927,250	0.0220	0.1992	0.0027	0.446	0.845	0.835			0.828
South Carolina	1,061,236	0.0158	0.3450	0.0083	0.251	0.861	0.852		0.706	
South Dakota	343,347	0.0175	0.2721	0.0034	0.483	0.875		0.701		0.650
Tennessee	2,501,405	0.0239	0.2745	0.0061	0.272	0.935		0.941		0.927
Texas	20,151,313	0.0515	0.2650	0.0043	0.375	0.991		0.992		0.990
Utah--Private Carrier	292,232	0.0268	0.2990	0.0154	0.117	0.840	0.846			0.616
Vermont	357,258	0.0182	0.2134	0.0043	0.301	0.683		0.708		0.659
Virginia	2,386,958	0.0223	0.3327	0.0024	0.836	0.933		0.939		0.924
Wisconsin	3,295,468	0.0182	0.2341	0.0020	0.715	0.950		0.955		0.944
Aggregate Fits :										
12. Country-wide	84,609,524	0.0290	0.2784	0.0025	0.404	0.876	0.862	0.891	0.759	0.861
13. All Fee States	31,164,493	0.0201	0.2620	0.0023	0.362					
14. All Non-Fee States	53,445,031	0.0346	0.2885	0.0028	0.429					
15. Fee Group States	17,349,165	0.0106	0.2369	0.0030	0.381					
16. Non-Fee Group States	67,260,359	0.0343	0.2897	0.0026	0.411					
17. Group Sigma-squared :						63.7031	68.3368	61.0554	52.1278	66.8195
18. Group W :						861.88	861.43	799.23	148.44	764.13
19. 1000*Group Sigma-squared :						0.33306	0.26166	0.33150	0.04636	0.29772
20. Group K :						191,268	261,170	184,181	1,124,512	224,434
21. Group Mean beta :						0.0292	0.0199	0.0347	0.0106	0.0340

EXHIBIT II
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II. Test of Premium On Level Factors (Appendix C)

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NCCI -- ANALYSIS OF TREND
Comparison of On Level Premium and Premium at Present Rates
State of Connecticut

NCCI Rate Level History -- Average Rates									
Policy Period	Effective Date	Rate Change	10/01/87	10/01/86	10/01/85	10/01/84	10/01/83		
1/87-12/87	3.08871	3.03994	2.96602	2.52315	2.34769	2.22160	2.29749		
1/86-12/86	3.11547	3.03958	2.93381	2.50484	2.33679	2.20278	2.28087		
1/85-12/85	3.12144	3.03688	2.93227	2.50715	2.34764	2.20673	2.27729		
3/84-2/85	3.16836	3.07620	2.97479	2.54850	2.38914	2.24238	2.31261		
3/83-2/84	3.19799	3.08580	2.97342	2.54819	2.39294	2.24559	2.30806		
3/82-2/83	3.16194	3.03569	2.97336	2.61574	2.46319	2.30518	2.37524		
1. Overall Effect of Rate Change	1.02295	0.90151	1.14932	1.06338	1.06855	0.97050	1.00000		
2. Period used for calculating (1).	1/85-12/87	3/84-12/86	3/83-12/85	3/82-2/84	3/82-2/83	3/82-2/83	3/82-2/83		
3. Cumulative Rate Level Index	1.35206	1.32173	1.27565	1.10276	1.03703	0.97050	1.00000		
Policy Period	(4) Payroll in 000's	(5) Avg. Level Index for Policy Period	(6) On Level Factor	(7) Average Rate for Policy Period	(8) Manual Premium (000's)	(9) On Level Premium (000's)	(10) Premium at Present Rates (000's)		
1/87-12/87	26,304,809	1.14598	1.17983	2.63387	69,283,382	81,742,744	81,247,927		
1/86-12/86	24,847,574	1.05346	1.28345	2.37880	59,107,470	75,861,520	77,411,870		
1/85-12/85	23,240,573	0.98713	1.36969	2.24196	52,104,376	71,366,615	72,544,054		
3/84-2/85	21,434,105	0.98771	1.36889	2.28335	48,941,510	66,995,456	67,910,961		
3/83-2/84	19,698,667	1.00000	1.35206	2.30806	45,465,705	61,472,570	62,996,140		
3/82-2/83	17,743,456	1.00000	1.35206	2.37524	42,144,967	56,982,717	56,103,744		

- Notes : (1) Ratio of sum of average rates for time period noted in (2) divided by sum of corresponding elements for previous rate change.
- (2) Policy period used for overall effect of rate change.
- (5) Average for policy period from (3).
- (6) Latest (3) divided by (5).
- (7) Average effective average rate during policy period from above table.
- (8) (4)x(7) (9) (6)x(8) (10) (4) x Rates Eff. 9/1/90

NCCI -- Analysis of Trend
Using On Level Premium

State : Connecticut

(1) Policy Year	(2) Time Index	(3) On Level Premium (00's)	(4) Ultimate Indemnity * Losses	(5) Indemnity Pure Premium	(6) (2):(2)	(7) (2):(5)	(8) Fitted Indemnity Pure Premium
1982	1	569,827,170	136,956,542	0.240	1	0.240	0.239
1983	2	614,725,700	170,002,426	0.277	4	0.553	0.266
1984	3	669,954,560	191,062,783	0.285	9	0.856	0.294
1985	4	713,666,150	229,282,844	0.321	16	1.285	0.321
1986	5	758,615,200	245,345,963	0.323	25	1.617	0.348
1987	6	817,427,440	324,306,248	0.397	36	2.380	0.376
Totals	21			1.844	91	6.932	

(1) Policy Year	(2) Time Index	(3) On Level Premium (00's)	(4) Ultimate Medical * Losses	(5) Medical Pure Premium	(6) (2):(2)	(7) (2):(10)	(8) Fitted Medical Pure Premium
1982	1	569,827,170	67,390,814	0.118	1	0.118	0.118
1983	2	614,725,700	79,442,735	0.129	4	0.258	0.131
1984	3	669,954,560	95,781,806	0.143	9	0.429	0.144
1985	4	713,666,150	113,712,121	0.159	16	0.637	0.157
1986	5	758,615,200	127,096,722	0.168	25	0.838	0.170
1987	6	817,427,440	149,579,231	0.183	36	1.098	0.183
Totals	21			0.900	91	3.379	

	Indemnity	Medical
Slope :	0.027	0.013
Intercept :	0.211	0.105
R-squared :	0.913	0.995
Durbin-Watson:	2.617	3.088
T-statistic :	6.499	28.475

* Losses not on current benefit level.

NCCI -- Analysis of Trend
Using Premium at Present Rates

State : Connecticut

(1) Policy Year	(2) Time Index	(3) Premium at Present Rates (00's)	(4) Ultimate Indemnity * Losses	(5) Indemnity Pure Premium	(6) (2)÷(2)	(7) (2)÷(5)	(8) Fitted Indemnity Pure Premium
1982	1	561,037,440	136,956,542	0.244	1	0.244	0.237
1983	2	629,961,400	170,002,426	0.270	4	0.540	0.264
1984	3	679,109,610	191,062,783	0.281	9	0.844	0.291
1985	4	725,440,540	229,282,844	0.316	16	1.264	0.318
1986	5	774,118,700	245,345,963	0.317	25	1.585	0.345
1987	6	812,479,270	324,306,248	0.399	36	2.395	0.373
Totals	21			1.827	91	6.872	

(1) Policy Year	(2) Time Index	(3) Premium at Present Rates (00's)	(4) Ultimate Medical * Losses	(5) Medical Pure Premium	(6) (2)÷(2)	(7) (2)÷(10)	(8) Fitted Medical Pure Premium
1982	1	561,037,440	67,390,814	0.120	1	0.120	0.117
1983	2	629,961,400	79,442,735	0.126	4	0.252	0.129
1984	3	679,109,610	95,781,806	0.141	9	0.423	0.142
1985	4	725,440,540	113,712,121	0.157	16	0.627	0.155
1986	5	774,118,700	127,096,722	0.164	25	0.821	0.168
1987	6	812,479,270	149,579,231	0.184	36	1.105	0.181
Totals	21			0.892	91	3.348	

	Indemnity	Medical
Slope :	0.027	0.013
Intercept :	0.209	0.104
R-squared :	0.883	0.982
Durbin-Watson:	2.360	2.629
T-statistic :	5.504	14.793

* Losses not on current benefit level.

NCCI -- ANALYSIS OF TREND
Comparison of On Level Premium and Premium at Present Rates
State of Florida

NCCI Rate Level History -- Average Rates									
Policy Period	Effective Date	01/01/89	01/01/88	01/01/87	01/01/86	01/01/85	03/01/84	12/01/82	
10/86-9/87	3.64729	3.71478	2.99100	2.56600	2.50600	2.31200	1.99800	1.83800	
10/85-9/86	3.80522	3.87151	3.12200	2.67900	2.61100	2.39600	2.06800	1.89600	
10/84-9/85	4.05968	4.13072	3.33000	2.86200	2.78300	2.54300	2.19300	2.00700	
10/83-9/84	4.33593	4.41933	3.55200	3.04200	2.95400	2.68900	2.31600	2.11500	
10/82-9/83	4.26397	4.32758	3.47000	3.06400	2.97900	2.72000	2.34400	2.14000	
12/81-11/82	4.26498	4.33338	3.47600	3.07600	2.99100	2.73000	2.35200	2.15100	
12/80-11/81	4.60172	4.66396	3.73000	3.29500	3.19400	2.89200	2.48900	2.27000	
1. Overall Effect of Rate Change	0.98223	1.24398	1.14332	1.02957	1.10014	1.16191	1.09648	1.00000	
2. Period used for calculating (1).	10/83-9/86	10/82-9/85	12/81-9/84	12/80-9/83	12/80-11/82	12/80-11/81	12/80-11/81	1.00000	
3. Cumulative Rate Level Index	2.01592	2.05239	1.64986	1.44304	1.40159	1.27401	1.09648	1.00000	
Policy Period	(4) Payroll in 000's	(5) Avg. Rate Level Index for Policy Period	(6) On level Factor	(7) Average Rate for Policy Period	(8) Manual Premium (000's)	(9) On level Premium (000's)	(10) Premium at Present Rates (000's)		
10/86-9/87	43,168,943	1.43268	1.40710	2.55100	110,123,973	154,955,095	157,449,654		
10/85-9/86	41,037,079	1.36970	1.47180	2.55725	104,942,069	154,453,561	156,155,112		
10/84-9/85	39,265,933	1.22963	1.63945	2.45550	96,417,499	158,072,126	159,407,123		
10/83-9/84	36,406,388	1.05628	1.90851	2.23225	81,268,160	155,101,035	157,855,550		
10/82-9/83	31,564,818	1.00000	2.01592	2.14000	67,548,711	136,172,490	134,591,438		
12/81-11/82	28,982,629	1.00000	2.01592	2.15100	62,341,635	125,675,465	123,610,333		
12/80-11/81	28,261,122	1.00000	2.01592	2.27000	64,152,747	129,326,514	130,049,771		

Notes : (1) Ratio of sum of average rates for time period noted in (2) divided by sum of corresponding elements for previous rate change.
 (2) Policy period used for overall effect of rate change.
 (5) Average for policy period from (3).
 (6) Latest (3) divided by (5).
 (7) Average effective average rate during policy period from above table.
 (8) (4)x(7) (9) (6)x(8) (10) (4) x Rates Eff. 9/1/90

NCCI -- Analysis of Trend
Using On Level Premium

State : Florida

(1) Policy Year	(2) Time Index	(3) On Level Premium (00's)	(4) Ultimate Indemnity Losses	(5) Indemnity Pure Premium	(6) (2)÷(2)	(7) (2)÷(5)	(8) Fitted Indemnity Pure Premium
1980	1	1,293,265,140	292,111,111	0.226	1	0.226	0.189
1981	2	1,256,754,650	294,059,042	0.234	4	0.468	0.232
1982	3	1,361,724,900	342,775,963	0.252	9	0.755	0.274
1983	4	1,551,010,350	454,862,291	0.293	16	1.173	0.317
1984	5	1,580,721,260	519,103,487	0.328	25	1.642	0.359
1985	6	1,544,535,610	602,819,904	0.390	36	2.342	0.401
1986	7	1,549,550,950	762,980,231	0.492	49	3.447	0.444
Totals	28			2.216	140	10.053	

(1) Policy Year	(2) Time Index	(3) On Level Premium (00's)	(4) Ultimate Medical Losses	(5) Medical Pure Premium	(6) (2)÷(2)	(7) (2)÷(10)	(8) Fitted Medical Pure Premium
1980	1	1,293,265,140	265,035,958	0.205	1	0.205	0.187
1981	2	1,256,754,650	254,951,857	0.203	4	0.406	0.200
1982	3	1,361,724,900	272,618,648	0.200	9	0.601	0.214
1983	4	1,551,010,350	329,978,273	0.213	16	0.851	0.227
1984	5	1,580,721,260	359,030,948	0.227	25	1.136	0.240
1985	6	1,544,535,610	397,032,756	0.257	36	1.542	0.254
1986	7	1,549,550,950	440,373,519	0.284	49	1.989	0.267
Totals	28			1.589	140	6.730	

	Indemnity	Medical
Slope :	0.042	0.013
Intercept :	0.147	0.174
R-squared :	0.897	0.806
Durbin-Watson:	0.996	0.805
T-statistic :	6.594	4.563

NCCI -- Analysis of Trend
Using Premium at Present Rates

State : Florida

(1) Policy Year	(2) Time Index	(3) Premium at Present Rates (00's)	(4) Ultimate Indemnity Losses	(5) Indemnity Pure Premium	(6) (2)÷(2)	(7) (2)÷(5)	(8) Fitted Indemnity Pure Premium
1980	1	1,300,497,710	292,111,111	0.225	1	0.225	0.192
1981	2	1,236,103,330	294,059,042	0.238	4	0.476	0.233
1982	3	1,345,914,380	342,775,963	0.255	9	0.764	0.274
1983	4	1,578,555,500	454,862,291	0.288	16	1.153	0.315
1984	5	1,594,071,230	519,103,487	0.326	25	1.628	0.355
1985	6	1,561,551,120	602,819,904	0.386	36	2.316	0.396
1986	7	1,574,496,540	762,980,231	0.485	49	3.392	0.437
Totals	28			2.202	140	9.954	

(1) Policy Year	(2) Time Index	(3) Premium at Present Rates (00's)	(4) Ultimate Medical Losses	(5) Medical Pure Premium	(6) (2)÷(2)	(7) (2)÷(10)	(8) Fitted Medical Pure Premium
1980	1	1,300,497,710	265,035,958	0.204	1	0.204	0.189
1981	2	1,236,103,330	254,951,857	0.206	4	0.413	0.201
1982	3	1,345,914,380	272,618,648	0.203	9	0.608	0.213
1983	4	1,578,555,500	329,978,273	0.209	16	0.836	0.226
1984	5	1,594,071,230	359,030,948	0.225	25	1.126	0.238
1985	6	1,561,551,120	397,032,756	0.254	36	1.526	0.251
1986	7	1,574,496,540	440,373,519	0.280	49	1.958	0.263
Totals	28			1.581	140	6.670	

	Indemnity	Medical
Slope :	0.041	0.012
Intercept :	0.151	0.176
R-squared :	0.897	0.793
Durbin-Watson:	0.948	0.764
T-statistic :	6.602	4.379

NCCI -- ANALYSIS OF TREND
Comparison of On Level Premium and Premium at Present Rates
State of Illinois

NCCI Rate Level History -- Average Rates									
Policy Period	Effective Date 01/01/91	01/01/90	01/01/89	01/01/88	01/01/87	01/01/86	01/01/85	01/01/84	
4/87-3/88	3.20157	2.96139	2.68100	2.59200	2.18400	2.13000	1.79300	1.81500	
4/86-3/87	3.21915	2.97517	2.70300	2.62000	2.21100	2.15200	1.80800	1.83600	
4/85-3/86	3.27303	3.02783	2.75200	2.66800	2.25300	2.19700	1.84900	1.87500	
4/84-3/85	3.35616	3.09815	2.81500	2.73500	2.31700	2.25700	1.90100	1.92500	
4/83-3/84	3.37207	3.11465	2.83200	2.75400	2.33000	2.27100	1.91300	1.94500	
4/82-3/83	3.35738	3.09966	2.81200	2.73400	2.37900	2.32000	1.95600	1.98500	
6/81-3/82	3.39808	3.13486	2.85100	2.77800	2.41200	2.34900	1.98000	2.02200	
1. Overall Effect of Rate Change	1.08210	1.10021	1.02870	1.16079	1.02613	1.18636	0.97923	1.00000	
2. Period used for calculating (1).	4/84-3/87	4/83-3/86	4/82-3/85	6/81-3/84	6/81-3/83	6/81-3/82	6/81-3/82	6/81-3/82	
3. Cumulative Rate Level Index	1.69468	1.56611	1.42347	1.38375	1.19208	1.16172	0.97923	1.00000	

Policy Period	(4) Payroll in 000's	(5) Avg. Level Index for Policy Period	(6) On level Factor	(7) Average Rate for Policy Period	(8) Manual Premium (000's)	(9) On level Premium (000's)	(10) Premium at Present Rates (000's)
4/87-3/88	67,207,399	1.24000	1.36668	2.28600	153,636,114	209,971,915	215,169,193
4/86-3/87	64,168,164	1.16931	1.44930	2.16675	139,036,369	201,505,473	206,566,945
4/85-3/86	60,822,051	1.02485	1.65359	1.93600	117,751,491	194,712,347	199,072,398
4/84-3/85	57,083,889	0.99481	1.70353	1.91900	109,543,983	186,611,204	191,582,664
4/83-3/84	52,096,746	1.00000	1.69468	1.94500	101,328,171	171,718,971	175,673,875
4/82-3/83	47,814,061	1.00000	1.69468	1.98500	94,910,911	160,843,759	160,529,972
6/81-3/82	39,540,332	1.00000	1.69468	2.02200	79,950,551	135,490,715	134,361,211

Notes : (1) Ratio of sum of average rates for time period noted in (2) divided by sum of corresponding elements for previous rate change.
 (2) Policy period used for overall effect of rate change.
 (5) Average for policy period from (3).
 (6) Latest (3) divided by (5).
 (7) Average effective average rate during policy period from above table.
 (8) (4)x(7) (9) (6)x(8) (10) (4) x Rates Eff. 1/1/91

NCCI -- Analysis of Trend
Using On Level Premium

State : Illinois

(1) Policy Year	(2) Time Index	(3) On Level Premium (00's)	(4) Ultimate Indemnity Losses	(5) Indemnity Pure Premium	(6) (2) x (2)	(7) (2) x (5)	(8) Fitted Indemnity Pure Premium
1981	1	1,354,907,150	360,137,546	0.266	1	0.266	0.263
1982	2	1,608,437,590	437,662,936	0.272	4	0.544	0.276
1983	3	1,717,189,710	498,946,414	0.291	9	0.872	0.289
1984	4	1,866,112,040	553,925,795	0.297	16	1.187	0.302
1985	5	1,947,123,470	614,635,381	0.316	25	1.578	0.315
1986	6	2,015,054,730	679,717,193	0.337	36	2.024	0.328
1987	7	2,099,719,150	703,737,579	0.335	49	2.346	0.341
Totals	28			2.113	140	8.817	

(1) Policy Year	(2) Time Index	(3) On Level Premium (00's)	(4) Ultimate Medical Losses	(5) Medical Pure Premium	(6) (2) x (2)	(7) (2) x (10)	(8) Fitted Medical Pure Premium
1981	1	1,354,907,150	150,688,732	0.111	1	0.111	0.110
1982	2	1,608,437,590	195,345,346	0.121	4	0.243	0.120
1983	3	1,717,189,710	228,133,787	0.133	9	0.399	0.129
1984	4	1,866,112,040	248,217,966	0.133	16	0.532	0.139
1985	5	1,947,123,470	273,012,188	0.140	25	0.701	0.148
1986	6	2,015,054,730	326,149,476	0.162	36	0.971	0.158
1987	7	2,099,719,150	356,901,062	0.170	49	1.190	0.167
Totals	28			0.971	140	4.147	

	Indemnity	Medical
Slope :	0.013	0.009
Intercept :	0.250	0.101
R-squared :	0.965	0.947
Durbin-Watson:	2.642	1.779
T-statistic :	11.664	9.497

NCCI -- Analysis of Trend
Using Premium at Present Rates

State : Illinois

(1) Policy Year	(2) Time Index	(3) Premium at Present Rates (00's)	(4) Ultimate Indemnity Losses	(5) Indemnity Pure Premium	(6) (2)÷(2)	(7) (2)÷(5)	(8) Fitted Indemnity Pure Premium
1981	1	1,343,612,110	360,137,546	0.268	1	0.268	0.263
1982	2	1,605,299,720	437,662,936	0.273	4	0.545	0.274
1983	3	1,756,738,750	498,946,414	0.284	9	0.852	0.286
1984	4	1,915,826,640	553,925,795	0.289	16	1.157	0.297
1985	5	1,990,723,980	614,635,381	0.309	25	1.544	0.308
1986	6	2,065,669,450	679,717,193	0.329	36	1.974	0.319
1987	7	2,151,691,930	703,737,579	0.327	49	2.289	0.331
Totals	28			2.079	140	8.629	

(1) Policy Year	(2) Time Index	(3) Premium at Present Rates (00's)	(4) Ultimate Medical Losses	(5) Medical Pure Premium	(6) (2)÷(2)	(7) (2)÷(10)	(8) Fitted Medical Pure Premium
1981	1	1,343,612,110	150,688,732	0.112	1	0.112	0.111
1982	2	1,605,299,720	195,345,346	0.122	4	0.243	0.119
1983	3	1,756,738,750	228,133,787	0.130	9	0.390	0.128
1984	4	1,915,826,640	248,217,966	0.130	16	0.518	0.136
1985	5	1,990,723,980	273,012,188	0.137	25	0.686	0.145
1986	6	2,065,669,450	326,149,476	0.158	36	0.947	0.154
1987	7	2,151,691,930	356,901,062	0.166	49	1.161	0.162
Totals	28			0.954	140	4.058	

	Indemnity	Medical
Slope :	0.011	0.009
Intercept :	0.252	0.102
R-squared :	0.947	0.931
Durbin-Watson:	2.083	1.497
T-statistic :	9.487	8.223

NCCI -- ANALYSIS OF TREND
Comparison of On Level Premium and Premium at Present Rates
State of Louisiana

NCCI Rate Level History -- Average Rates		Effective Date of Rate Change		07/01/87		01/01/84	
Policy Period	05/01/90	02/01/89	07/01/87	01/01/84			
4/86-3/87	3.20157	2.96139	2.68100	2.59200			
4/85-3/86	3.21915	2.97517	2.70300	2.62000			
4/84-3/85	3.27303	3.02783	2.75200	2.66800			
4/83-3/84	3.35616	3.09815	2.81500	2.73500			
4/82-3/83	3.37207	3.11465	2.83200	2.75400			
4/81-3/82	3.35738	3.09966	2.81200	2.73400			
1. Overall Effect of Rate Change	1.08210	1.10021	1.02870	1.00000			
2. Period used for calculating (1).	4/83-3/86	4/82-3/85	4/81-3/84				
3. Cumulative Rate Level Index	1.22470	1.13178	1.02870	1.00000			
Policy Period	(4) Payroll in 000's	(5) Avg. Rate Level Index for Policy Period	(6) On Level Factor	(7) Average Rate for Policy Period	(8) Manual Premium (000's)	(9) On level Premium (000's)	(10) Premium at Present Rates (000's)
4/86-3/87	13,889,958	1.00000	1.22470	2.59200	36,002,772	44,092,572	44,469,673
4/85-3/86	14,623,060	1.00000	1.22470	2.62000	38,312,417	46,921,193	47,073,823
4/84-3/85	15,192,666	1.00000	1.22470	2.66800	40,534,032	49,642,004	49,726,051
4/83-3/84	13,944,277	1.00000	1.22470	2.73500	38,137,597	46,707,092	46,799,224
4/82-3/83	13,079,504	1.00000	1.22470	2.75400	36,020,954	44,114,840	44,105,003
4/81-3/82	14,247,655	1.00000	1.22470	2.73400	38,953,090	47,705,824	47,834,793

Notes : (1) Ratio of sum of average rates for time period noted in (2) divided by sum of corresponding elements for previous rate change.

(2) Policy period used for overall effect of rate change.

(5) Average for policy period from (3).

(6) Latest (3) divided by (5).

(7) Average effective average rate during policy period from above table.

(8) (4)x(7) (9) (6)x(8) (10) (4) x Rates Eff. 5/1/90

NCCI -- Analysis of Trend
Using On Level Premium

State : Louisiana

(1) Policy Year	(2) Time Index	(3) On Level Premium (00's)	(4) Ultimate Indemnity Losses	(5) Indemnity Pure Premium	(6) (2) x (2)	(7) (2) x (5)	(8) Fitted Indemnity Pure Premium
1981	1	477,058,240	189,989,150	0.398	1	0.398	0.422
1982	2	441,148,400	203,502,812	0.461	4	0.923	0.448
1983	3	467,070,920	226,939,041	0.486	9	1.458	0.474
1984	4	496,420,040	253,905,963	0.511	16	2.046	0.499
1985	5	469,211,930	248,971,388	0.531	25	2.653	0.525
1986	6	440,925,720	234,114,745	0.531	36	3.186	0.550
Totals	21			2.918	91	10.663	

(1) Policy Year	(2) Time Index	(3) On Level Premium (00's)	(4) Ultimate Medical Losses	(5) Medical Pure Premium	(6) (2) x (2)	(7) (2) x (10)	(8) Fitted Medical Pure Premium
1981	1	477,058,240	109,509,712	0.230	1	0.230	0.242
1982	2	441,148,400	129,287,925	0.293	4	0.586	0.271
1983	3	467,070,920	137,488,367	0.294	9	0.883	0.299
1984	4	496,420,040	159,223,332	0.321	16	1.283	0.328
1985	5	469,211,930	167,680,897	0.357	25	1.787	0.356
1986	6	440,925,720	170,216,971	0.386	36	2.316	0.385
Totals	21			1.881	91	7.085	

	Indemnity	Medical
Slope :	0.026	0.029
Intercept :	0.397	0.213
R-squared :	0.886	0.951
Durbin-Watson:	1.414	2.767
T-statistic :	5.587	8.832

NCCI -- Analysis of Trend
Using Premium at Present Rates

State : Louisiana

(1) Policy Year	(2) Time Index	(3) Premium at Present Rates (00's)	(4) Ultimate Indemnity Losses	(5) Indemnity Pure Premium	(6) (2) ÷ (2)	(7) (2) ÷ (5)	(8) Fitted Indemnity Pure Premium
1981	1	478,347,930	189,989,150	0.397	1	0.397	0.422
1982	2	441,050,030	203,502,812	0.461	4	0.923	0.447
1983	3	467,992,240	226,939,041	0.485	9	1.455	0.472
1984	4	497,260,510	253,905,963	0.511	16	2.042	0.497
1985	5	470,738,230	248,971,388	0.529	25	2.644	0.522
1986	6	444,696,730	234,114,745	0.526	36	3.159	0.547
Totals	21			2.909	91	10.620	

(1) Policy Year	(2) Time Index	(3) Premium at Present Rates (00's)	(4) Ultimate Medical Losses	(5) Medical Pure Premium	(6) (2) ÷ (2)	(7) (2) ÷ (10)	(8) Fitted Medical Pure Premium
1981	1	478,347,930	109,509,712	0.229	1	0.229	0.242
1982	2	441,050,030	129,287,925	0.293	4	0.586	0.270
1983	3	467,992,240	137,488,367	0.294	9	0.881	0.298
1984	4	497,260,510	159,223,332	0.320	16	1.281	0.327
1985	5	470,738,230	167,680,897	0.356	25	1.781	0.355
1986	6	444,696,730	170,216,971	0.383	36	2.297	0.383
Totals	21			1.875	91	7.055	

	Indemnity	Medical
Slope :	0.025	0.028
Intercept :	0.397	0.214
R-squared :	0.869	0.948
Durbin-Watson:	1.423	2.791
T-statistic :	5.156	8.534

NCCI -- ANALYSIS OF TREND
Comparison of On Level Premium and Premium at Present Rates
State of Michigan

NCCI Rate Level History -- Average Rates		Comparison of On Level Premium and Premium at Present Rates State of Michigan									
Policy Period	Effective Date of Rate Change	01/01/90	01/01/89	01/01/88	01/01/87	01/01/86	01/01/85	01/01/84	01/01/83	01/01/82	
4/87-3/88	2.42717	2.49967	2.06200	2.18200	2.39200	2.16200	1.87200	2.87000	2.03400	2.55700	
4/86-3/87	2.41973	2.50687	2.06600	2.18500	2.39600	2.16100	1.87500	2.87000	2.03600	2.55800	
4/85-3/86	2.42419	2.50469	2.06000	2.18200	2.38900	2.15100	1.86900	2.86900	2.04200	2.56900	
4/84-3/85	2.52010	2.60747	2.14100	2.26300	2.47300	2.23000	1.94200	2.97000	2.12400	2.67000	
4/83-3/84	2.53278	2.62607	2.14900	2.26500	2.47500	2.23600	1.94900	2.97600	2.13200	2.68600	
4/82-3/83	2.46673	2.56016	2.20900	2.20600	2.38700	2.15800	1.88400	2.88200	2.11100	2.65600	
1. Overall Effect of Rate Change	0.96653	1.21862	0.96510	0.91958	1.10612	1.14544	0.65371	1.36523	0.79480	1.00000	
2. Period used for calculating (1).	4/84-3/87	4/83-3/86	4/82-3/85	4/82-3/84	4/82-3/83	4/82-3/83	4/82-3/83	4/82-3/83	4/82-3/83	4/82-3/83	
3. Cumulative Rate Level Index	0.93944	0.97198	0.79760	0.82645	0.89872	0.81250	0.70934	1.08509	0.79480	1.00000	
Policy Period	(4) Payroll in 000's	(5) Avg. Rate Level Index for Policy Period	(6) On level Factor	(7) Average Rate for Policy Period	(8) Manual Premium (000's)	(9) On Level Premium (000's)	(10) Premium at Present Rates (000's)				
4/87-3/88	35,891,360	0.88065	1.06676	2.33950	83,967,837	89,573,533	87,114,432				
4/86-3/87	35,359,012	0.83405	1.12636	2.21975	78,488,166	88,405,682	85,559,261				
4/85-3/86	32,326,832	0.73513	1.27793	1.93950	62,697,891	80,123,633	78,366,383				
4/84-3/85	29,384,862	0.99115	0.94783	2.71300	79,721,130	75,562,064	74,052,790				
4/83-3/84	27,055,928	0.86738	1.08309	2.71900	73,565,067	79,677,377	68,526,712				
4/82-3/83	24,594,943	0.94870	0.99024	2.63250	64,746,188	64,114,387	60,669,085				

Notes : (1) Ratio of sum of average rates for time period noted in (2) divided by sum of corresponding elements for previous rate change.
 (2) Policy period used for overall effect of rate change.
 (3) Average for policy period from (3).
 (4) Latest (3) divided by (5).
 (5) Average effective average rate during policy period from above table.
 (6) (4)x(7) (9) (6)x(8) (10) (4) x Rates Eff. 1/1/91

NCCI -- Analysis of Trend
Using On Level Premium

State : Michigan

(1) Policy Year	(2) Time Index	(3) On Level Premium (00's)	(4) Ultimate Indemnity Losses	(5) Indemnity Pure Premium	(6) (2)÷(2)	(7) (2)÷(5)	(8) Fitted Indemnity Pure Premium
1982	1	641,143,870	275,449,954	0.430	1	0.430	0.413
1983	2	796,773,770	306,435,520	0.385	4	0.769	0.426
1984	3	755,620,640	353,872,915	0.468	9	1.405	0.440
1985	4	801,236,330	367,178,675	0.458	16	1.833	0.453
1986	5	884,056,820	399,594,297	0.452	25	2.260	0.467
1987	6	895,735,330	435,606,693	0.486	36	2.918	0.480
Totals	21			2.679	91	9.615	

(1) Policy Year	(2) Time Index	(3) On Level Premium (00's)	(4) Ultimate Medical Losses	(5) Medical Pure Premium	(6) (2)÷(2)	(7) (2)÷(10)	(8) Fitted Medical Pure Premium
1982	1	641,143,870	108,165,371	0.169	1	0.169	0.163
1983	2	796,773,770	129,114,942	0.162	4	0.324	0.178
1984	3	755,620,640	157,613,363	0.209	9	0.626	0.192
1985	4	801,236,330	161,792,013	0.202	16	0.808	0.207
1986	5	884,056,820	192,968,335	0.218	25	1.091	0.222
1987	6	895,735,330	213,812,852	0.239	36	1.432	0.236
Totals	21			1.198	91	4.450	

	Indemnity	Medical
Slope :	0.014	0.015
Intercept :	0.399	0.149
R-squared :	0.509	0.865
Durbin-Watson:	3.126	3.361
T-statistic :	2.037	5.067

NCCI -- Analysis of Trend
Using Premium at Present Rates

State : Michigan

(1) Policy Year	(2) Time Index	(3) Premium at Present Rates (00's)	(4) Ultimate Indemnity Losses	(5) Indemnity Pure Premium	(6) (2)÷(2)	(7) (2)÷(5)	(8) Fitted Indemnity Pure Premium
1982	1	606,690,850	275,449,954	0.454	1	0.454	0.449
1983	2	685,267,120	306,435,520	0.447	4	0.894	0.457
1984	3	740,527,900	353,872,915	0.478	9	1.434	0.465
1985	4	783,663,830	367,178,675	0.469	16	1.874	0.473
1986	5	855,592,610	399,594,297	0.467	25	2.335	0.481
1987	6	871,144,320	435,606,693	0.500	36	3.000	0.489
Totals	21			2.815	91	9.992	

(1) Policy Year	(2) Time Index	(3) Premium at Present Rates (00's)	(4) Ultimate Medical Losses	(5) Medical Pure Premium	(6) (2)÷(2)	(7) (2)÷(10)	(8) Fitted Medical Pure Premium
1982	1	606,690,850	108,165,371	0.178	1	0.178	0.178
1983	2	685,267,120	129,114,942	0.188	4	0.377	0.191
1984	3	740,527,900	157,613,363	0.213	9	0.639	0.203
1985	4	783,663,830	161,792,013	0.206	16	0.826	0.216
1986	5	855,592,610	192,968,335	0.226	25	1.128	0.228
1987	6	871,144,320	213,812,852	0.245	36	1.473	0.241
Totals	21			1.257	91	4.620	

	Indemnity	Medical
Slope :	0.008	0.013
Intercept :	0.441	0.165
R-squared :	0.643	0.929
Durbin-Watson:	2.806	2.825
T-statistic :	2.683	7.219

NCCI -- ANALYSIS OF TREND
Comparison of On Level Premium and Premium at Present Rates
State of Nebraska

NCCI Rate Level History -- Average Rates									
Policy Period	Effective Date of Rate Change	09/01/89	10/01/88	05/01/87	05/15/86	01/01/85	03/01/84		
2/87-1/88	2.17531	1.94070	1.69246	1.51204	1.47809	1.38334	1.39187		
2/86-1/87	2.14707	1.91771	1.67312	1.49608	1.46346	1.36399	1.36987		
2/85-1/86	2.19096	1.95579	1.52753	1.49030	1.49030	1.38609	1.38937		
2/84-1/85	2.27926	2.03401	1.77654	1.58479	1.55009	1.44227	1.44594		
2/83-1/84	2.33185	2.07627	1.80937	1.61239	1.57585	1.46845	1.46903		
2/82-1/83	2.32793	2.07142	1.80710	1.60708	1.56879	1.46039	1.46371		
1. Overall Effect of Rate Change	1.12025	1.14580	1.12008	1.02333	1.07368	0.99773	1.00000		
2. Period used for calculating (1).	2/85-1/88	2/84-1/87	2/83-1/86	2/82-1/85	2/82-1/84	2/82-1/83			
3. Cumulative Rate Level Index	1.57607	1.40690	1.22787	1.09624	1.07125	0.99773	1.00000		
	(4)	(5)	(6)	(7)	(8)	(9)	(10)		
Policy Period	Payroll in 000's	Avg. Rate Level Index for Policy Period	On level Factor	Average Rate for Policy Period	Manual Premium (000's)	On level Premium (000's)	Premium at Present Rates (000's)		
2/87-1/88	7,993,046	1.08999	1.44595	1.50355	12,017,964	17,377,380	17,387,352		
2/86-1/87	7,648,524	1.05287	1.49693	1.43859	11,003,109	16,470,918	16,421,916		
2/85-1/86	7,277,942	0.99773	1.57965	1.38609	10,087,882	15,935,371	15,945,679		
2/84-1/85	6,805,689	1.00000	1.57607	1.44227	9,815,641	15,470,154	15,511,934		
2/83-1/84	6,633,728	1.00000	1.57607	1.46903	9,745,146	15,359,049	15,468,859		
2/82-1/83	6,308,683	1.00000	1.57607	1.46371	9,234,082	14,553,577	14,686,172		

Notes : (1) Ratio of sum of average rates for time period noted in (2) divided by sum of corresponding elements for previous rate change.

(2) Policy period used for overall effect of rate change.

(5) Average for policy period from (3).

(6) Latest (3) divided by (5).

(7) Average effective average rate during policy period from above table.

(8) (4)x(7) (9) (6)x(8) (10) (4) x Rates Eff. 9/1/90

NCCI -- Analysis of Trend
Using On Level Premium

State : Nebraska

(1) Policy Year	(2) Time Index	(3) On Level Premium (00's)	(4) Ultimate Indemnity * Losses	(5) Indemnity Pure Premium	(6) (2):(2)	(7) (2):(5)	(8) Fitted Indemnity Pure Premium
1982	1	145,535,770	30,106,486	0.207	1	0.207	0.209
1983	2	153,590,490	34,396,345	0.224	4	0.448	0.230
1984	3	154,701,540	40,592,382	0.262	9	0.787	0.251
1985	4	159,353,710	43,408,251	0.272	16	1.090	0.272
1986	5	164,709,180	48,216,892	0.293	25	1.464	0.294
1987	6	173,773,800	54,283,087	0.312	36	1.874	0.315
Totals	21			1.571	91	5.870	

(1) Policy Year	(2) Time Index	(3) On Level Premium (00's)	(4) Ultimate Medical * Losses	(5) Medical Pure Premium	(6) (2):(2)	(7) (2):(10)	(8) Fitted Medical Pure Premium
1982	1	145,535,770	23,297,321	0.160	1	0.160	0.162
1983	2	153,590,490	28,736,544	0.187	4	0.374	0.179
1984	3	154,701,540	30,046,176	0.194	9	0.583	0.195
1985	4	159,353,710	32,398,170	0.203	16	0.813	0.212
1986	5	164,709,180	36,793,709	0.223	25	1.117	0.229
1987	6	173,773,800	44,050,098	0.253	36	1.521	0.245
Totals	21			1.222	91	4.568	

	Indemnity	Medical
Slope :	0.021	0.017
Intercept :	0.187	0.145
R-squared :	0.979	0.952
Durbin-Watson:	2.572	1.818
T-statistic :	13.553	8.918

* Losses not on current benefit level.

NCCI -- Analysis of Trend
Using Premium at Present Rates

State : Nebraska

(1) Policy Year	(2) Time Index	(3) Premium at Present Rates (00's)	(4) Ultimate Indemnity *Losses	(5) Indemnity Pure Premium	(6) (2)÷(2)	(7) (2)÷(5)	(8) Fitted Indemnity Pure Premium
1982	1	146,861,720	30,106,486	0.205	1	0.205	0.207
1983	2	154,688,590	34,396,345	0.222	4	0.445	0.229
1984	3	155,119,340	40,592,382	0.262	9	0.785	0.250
1985	4	159,456,790	43,408,251	0.272	16	1.089	0.272
1986	5	164,219,160	48,216,892	0.294	25	1.468	0.294
1987	6	173,873,520	54,283,087	0.312	36	1.873	0.315
Totals	21			1.567	91	5.865	

(1) Policy Year	(2) Time Index	(3) Premium at Present Rates (00's)	(4) Ultimate Medical * Losses	(5) Medical Pure Premium	(6) (2)÷(2)	(7) (2)÷(10)	(8) Fitted Medical Pure Premium
1982	1	146,861,720	23,297,321	0.159	1	0.159	0.160
1983	2	154,688,590	28,736,544	0.186	4	0.372	0.177
1984	3	155,119,340	30,046,176	0.194	9	0.581	0.195
1985	4	159,456,790	32,398,170	0.203	16	0.813	0.212
1986	5	164,219,160	36,793,709	0.224	25	1.120	0.229
1987	6	173,873,520	44,050,098	0.253	36	1.520	0.246
Totals	21			1.219	91	4.564	

	Indemnity	Medical
Slope :	0.022	0.017
Intercept :	0.185	0.143
R-squared :	0.978	0.958
Durbin-Watson:	2.542	1.822
T-statistic :	13.454	9.573

* Losses not on current benefit level.

NCCI -- ANALYSIS OF TREND
Comparison of On Level Premium and Premium at Present Rates
State of North Carolina

NCCI Rate Level History -- Average Rates									
Policy Period	Effective Date	01/01/90	01/01/88	01/01/87	01/01/86	08/01/85			
	01/01/91	01/01/90	01/01/88	01/01/87	01/01/86	08/01/85			
1/87-12/87	1.94806	1.63829	1.50657	1.26598	1.19077	1.09370	1.04836		
1/86-12/86	1.95758	1.64645	1.51801	1.27310	1.19696	1.10080	1.05483		
1/85-12/85	2.01576	1.69196	1.55400	1.30630	1.22933	1.12591	1.07852		
1/84-12/84	2.01834	1.69277	1.55531	1.30656	1.23154	1.13269	1.08475		
1/83-12/83	1.99452	1.67183	1.53466	1.28755	1.21766	1.12945	1.08168		
1/82-12/82	1.94638	1.63304	1.48634	1.31526	1.24014	1.14822	1.09945		
1. Overall Effect of Rate Change	1.18982	1.08728	1.19062	1.05964	1.07909	1.04436	1.00000		
2. Period used for calculating (1).	1/85-12/87	1/84-12/86	1/83-12/85	1/82-12/84	1/82-12/83	1/82-12/82			
3. Cumulative Rate Level Index	1.83933	1.54588	1.42179	1.19416	1.12695	1.04436	1.00000		
Policy Period	(4) Payroll in 000's	(5) Avg. Rate Level Index for Policy Period	(6) On level Factor	(7) Average Rate for Policy Period	(8) Manual Premium (000's)	(9) On level Premium (000's)	(10) Premium at Present Rates (000's)		
1/87-12/87	31,065,731	1.19416	1.54027	1.26598	39,328,594	60,576,496	60,517,908		
1/86-12/86	29,233,802	1.38804	1.32512	1.47216	43,036,834	57,029,169	57,227,506		
1/85-12/85	27,494,979	1.01477	1.81255	1.09430	30,087,780	54,535,726	55,423,279		
1/84-12/84	25,195,712	1.00000	1.83933	1.08475	27,331,049	50,270,763	50,853,513		
1/83-12/83	22,642,533	1.00000	1.83933	1.08168	24,491,975	45,048,776	45,160,986		
1/82-12/82	21,229,193	1.00000	1.83933	1.09945	23,340,436	42,930,717	41,320,076		

Notes : (1) Ratio of sum of average rates for time period noted in (2) divided by sum of corresponding elements for previous rate change.

(2) Policy period used for overall effect of rate change.

(5) Average for policy period from (3).

(6) Latest (3) divided by (5).

(7) Average effective average rate during policy period from above table.

(8) (4)x(7) (9) (6)x(8) (10) (4) x Rates Eff. 9/1/90

NCCI -- Analysis of Trend
Using On Level Premium

State : North Carolina

(1) Policy Year	(2) Time Index	(3) On Level Premium (00's)	(4) Ultimate Indemnity * Losses	(5) Indemnity Pure Premium	(6) (2):(2)	(7) (2):(5)	(8) Fitted Indemnity Pure Premium
1982	1	429,307,170	78,633,612	0.183	1	0.183	0.189
1983	2	450,487,760	92,342,769	0.205	4	0.410	0.203
1984	3	502,707,630	114,898,298	0.229	9	0.686	0.218
1985	4	545,357,260	126,232,113	0.231	16	0.926	0.232
1986	5	570,291,690	134,262,391	0.235	25	1.177	0.246
1987	6	605,764,960	160,356,237	0.265	36	1.588	0.261
Totals	21			1.348	91	4.970	

(1) Policy Year	(2) Time Index	(3) On Level Premium (00's)	(4) Ultimate Medical * Losses	(5) Medical Pure Premium	(6) (2):(2)	(7) (2):(10)	(8) Fitted Medical Pure Premium
1982	1	429,307,170	62,769,564	0.146	1	0.146	0.144
1983	2	450,487,760	72,985,399	0.162	4	0.324	0.159
1984	3	502,707,630	87,679,756	0.174	9	0.523	0.174
1985	4	545,357,260	98,910,945	0.181	16	0.725	0.188
1986	5	570,291,690	110,548,353	0.194	25	0.969	0.203
1987	6	605,764,960	138,169,772	0.228	36	1.369	0.218
Totals	21			1.086	91	4.057	

	Indemnity	Medical
Slope :	0.014	0.015
Intercept :	0.175	0.130
R-squared :	0.925	0.936
Durbin-Watson:	2.073	1.790
T-statistic :	7.035	7.675

* Losses not on current benefit level.

NCCI -- Analysis of Trend
Using Premium at Present Rates

State : North Carolina

(1) Policy Year	(2) Time Index	(3) Premium at Present Rates (00's)	(4) Ultimate Indemnity * Losses	(5) Indemnity Pure Premium	(6) (2)÷(2)	(7) (2)÷(5)	(8) Fitted Indemnity Pure Premium
1982	1	413,200,760	78,633,612	0.190	1	0.190	0.191
1983	2	451,609,860	92,342,769	0.204	4	0.409	0.205
1984	3	508,535,130	114,898,298	0.226	9	0.678	0.218
1985	4	554,232,790	126,232,113	0.228	16	0.911	0.231
1986	5	572,275,060	134,262,391	0.235	25	1.173	0.245
1987	6	605,179,080	160,356,237	0.265	36	1.590	0.258
Totals	21			1.348	91	4.951	

(1) Policy Year	(2) Time Index	(3) Premium at Present Rates (00's)	(4) Ultimate Medical * Losses	(5) Medical Pure Premium	(6) (2)÷(2)	(7) (2)÷(10)	(8) Fitted Medical Pure Premium
1982	1	413,200,760	62,769,564	0.152	1	0.152	0.146
1983	2	451,609,860	72,985,399	0.162	4	0.323	0.160
1984	3	508,535,130	87,679,756	0.172	9	0.517	0.174
1985	4	554,232,790	98,910,945	0.178	16	0.714	0.188
1986	5	572,275,060	110,548,353	0.193	25	0.966	0.202
1987	6	605,179,080	138,169,772	0.228	36	1.370	0.215
Totals	21			1.086	91	4.042	

	Indemnity	Medical
Slope :	0.013	0.014
Intercept :	0.178	0.133
R-squared :	0.932	0.902
Durbin-Watson:	2.347	1.507
T-statistic :	7.393	6.084

* Losses not on current benefit level.

MCCI -- ANALYSIS OF TREND
Comparison of On Level Premium and Premium at Present Rates
State of Oregon

MCCI Rate Level History -- Average Rates										
Policy Period	Effective Date of Rate Change	01/01/90	01/01/89	01/01/88	01/01/87	01/01/86	10/01/85	01/01/85	01/01/84	
1/87-12/87	4.10364	4.67146	4.40839	4.21699	4.15155	3.59309	2.84004	2.76467	2.50222	
1/86-12/86	4.07958	4.63366	4.18199	4.14355	3.59079	3.59079	2.84552	2.77020	2.50258	
1/85-12/85	4.07082	4.61228	4.34697	4.16583	3.59349	3.59349	2.84408	2.76901	2.49903	
1/84-12/84	4.01377	4.52977	4.25445	4.07488	3.54471	3.54471	2.80668	2.73263	2.46631	
1/83-12/83	4.01046	4.53267	4.26688	4.08966	3.55681	3.55681	2.81559	2.74131	2.47767	
1/82-12/82	3.88987	4.37022	4.11355	3.92646	3.44795	3.44795	2.75128	2.65928	2.39720	
1. Overall Effect of Rate Change	0.88049	1.06204	1.04363	1.00000	1.14523	1.26239	1.02707	1.10933	1.00000	
2. Period used for calculating (1).	1/85-12/87	1/84-12/86	1/83-12/85	1/82-12/84	1/82-12/83	1/82-12/82	1/82-12/82	1/82-12/82	1/82-12/82	
3. Cumulative Rate Level Index	1.60753	1.82572	1.71907	1.64721	1.64721	1.43832	1.13936	1.10933	1.10933	
Policy Period	(4) Payroll in 000's	(5) Avg. Rate Level Index for Policy Period	(6) On Level Factor	(7) Average Rate for Policy Period	(8) Manual Premium (000's)	(9) On Level Premium (000's)	(10) Premium at Present Rates (000's)			
1/87-12/87	13,642,027	1.64721	0.97591	4.15155	56,635,559	55,271,319	55,981,969			
1/86-12/86	12,959,508	1.43832	1.11764	3.59079	46,534,871	52,009,394	52,870,644			
1/85-12/85	12,535,299	1.11684	1.43936	2.78778	34,945,625	50,299,453	51,028,946			
1/84-12/84	12,124,530	1.00000	1.60753	2.73263	33,131,855	53,260,560	48,665,076			
1/83-12/83	10,349,514	1.00000	1.60753	2.47767	25,642,680	41,221,461	41,506,311			
1/82-12/82	10,245,078	1.00000	1.60753	2.39720	24,559,500	39,480,214	39,852,021			

Notes : (1) Ratio of sum of average rates for time period noted in (2) divided by sum of corresponding elements for previous rate change.

(2) Policy period used for overall effect of rate change.

(5) Average for policy period from (3).

(6) Latest (3) divided by (5).

(7) Average effective average rate during policy period from above table.

(8) (4)x(7) (9) (6)x(8) (10) (4) x Rates Eff. 9/1/90

NCCI -- Analysis of Trend
Using On Level Premium

State : Oregon

(1) Policy Year	(2) Time Index	(3) On Level Premium (00's)	(4) Ultimate Indemnity Losses	(5) Indemnity Pure Premium	(6) (2) x (2)	(7) (2) x (5)	(8) Fitted Indemnity Pure Premium
1982	1	394,802,140	127,313,464	0.322	1	0.322	0.361
1983	2	412,214,610	188,324,793	0.457	4	0.914	0.401
1984	3	532,605,600	222,811,594	0.418	9	1.255	0.441
1985	4	502,994,530	249,672,664	0.496	16	1.985	0.482
1986	5	520,093,940	276,310,348	0.531	25	2.656	0.522
1987	6	552,713,190	300,812,099	0.544	36	3.265	0.562
Totals	21			2.770	91	10.399	

(1) Policy Year	(2) Time Index	(3) On Level Premium (00's)	(4) Ultimate Medical Losses	(5) Medical Pure Premium	(6) (2) x (2)	(7) (2) x (10)	(8) Fitted Medical Pure Premium
1982	1	394,802,140	86,480,689	0.219	1	0.219	0.242
1983	2	412,214,610	119,901,618	0.291	4	0.582	0.268
1984	3	532,605,600	154,688,976	0.290	9	0.871	0.294
1985	4	502,994,530	170,519,401	0.339	16	1.356	0.321
1986	5	520,093,940	179,700,864	0.346	25	1.728	0.347
1987	6	552,713,190	199,679,129	0.361	36	2.168	0.374
Totals	21			1.846	91	6.923	

	Indemnity	Medical
Slope :	0.040	0.026
Intercept :	0.321	0.215
R-squared :	0.832	0.888
Durbin-Watson:	3.009	2.467
T-statistic :	4.450	5.638

NCCI -- Analysis of Trend
Using Premium at Present Rates

State : Oregon

(1) Policy Year	(2) Time Index	(3) Premium at Present Rates (00's)	(4) Ultimate Indemnity * Losses	(5) Indemnity Pure Premium	(6) (2)÷(2)	(7) (2)÷(5)	(8) Fitted Indemnity Pure Premium
1982	1	398,520,210	127,313,464	0.319	1	0.319	0.369
1983	2	415,063,110	188,324,793	0.454	4	0.907	0.406
1984	3	486,650,760	222,811,594	0.458	9	1.374	0.444
1985	4	510,289,460	249,672,664	0.489	16	1.957	0.482
1986	5	528,706,440	276,310,348	0.523	25	2.613	0.520
1987	6	559,819,690	300,812,099	0.537	36	3.224	0.558
Totals	21			2.780	91	10.395	

(1) Policy Year	(2) Time Index	(3) Premium at Present Rates (00's)	(4) Ultimate Medical * Losses	(5) Medical Pure Premium	(6) (2)÷(2)	(7) (2)÷(10)	(8) Fitted Medical Pure Premium
1982	1	398,520,210	86,480,689	0.217	1	0.217	0.247
1983	2	415,063,110	119,901,618	0.289	4	0.578	0.272
1984	3	486,650,760	154,688,976	0.318	9	0.954	0.297
1985	4	510,289,460	170,519,401	0.334	16	1.337	0.321
1986	5	528,706,440	179,700,864	0.340	25	1.699	0.346
1987	6	559,819,690	199,679,129	0.357	36	2.140	0.371
Totals	21			1.854	91	6.925	

	Indemnity	Medical
Slope :	0.038	0.025
Intercept :	0.331	0.222
R-squared :	0.826	0.840
Durbin-Watson:	2.076	1.333
T-statistic :	4.354	4.580

* Losses not on current benefit level.

EXHIBIT III
TABLE OF CONTENTS

III. Test of Benefit On Level Factors

<i>Rate of Compensation</i>	<i>Minimum Weekly Benefit</i>	<i>Maximum Weekly Benefit</i>	<i>Rate of Inflation</i>	<i>Approach</i>	<i>Page</i>
<i>1. Constant</i>	<i>Variable</i>	<i>Variable</i>	<i>5%</i>	<i>NCCI</i> <i>Alternate</i>	<i>1-2</i> <i>3</i>
<i>2. Constant</i>	<i>Variable</i>	<i>Constant</i>	<i>5%</i>		<i>4-6</i>
<i>3. Constant</i>	<i>Constant</i>	<i>Variable</i>	<i>5%</i>		<i>7-9</i>
<i>4. Constant</i>	<i>Variable</i>	<i>Variable</i>	<i>10%</i>		<i>10-12</i>
<i>5. Constant</i>	<i>Variable</i>	<i>Constant</i>	<i>10%</i>		<i>13-15</i>
<i>6. Constant</i>	<i>Constant</i>	<i>Variable</i>	<i>10%</i>		<i>16-18</i>
<i>7. Variable</i>	<i>Variable</i>	<i>Variable</i>	<i>5%</i>		<i>19-21</i>
<i>8. Variable</i>	<i>Variable</i>	<i>Constant</i>	<i>5%</i>		<i>22-24</i>
<i>9. Variable</i>	<i>Constant</i>	<i>Variable</i>	<i>5%</i>		<i>25-27</i>
<i>10. Variable</i>	<i>Variable</i>	<i>Variable</i>	<i>10%</i>		<i>28-30</i>
<i>11. Variable</i>	<i>Variable</i>	<i>Constant</i>	<i>10%</i>		<i>31-33</i>
<i>12. Variable</i>	<i>Constant</i>	<i>Variable</i>	<i>10%</i>		<i>34-36</i>

- Rate of Compensation: Constant
- Minimum Weekly Benefit: Variable
- Maximum Weekly Benefit: Variable
- Rate of Inflation: 5%

Hypothetical Workmen's Compensation Law and Law Amendment:

NCCI Approach

1. Effect of First Amendment

Before First Amendment

(1) - State Average Weekly Wage	\$380.08
(2) - Rate of Compensation - % of Average Weekly Wage	66.67%
(3) - Minimum Weekly Benefit Specified by Act	89.32
(4) - Maximum Weekly Benefit Specified by Act	356.00

Wage Intervals		Ratios to Average		Percent in Wage Bracket Workers		Average Wage in Interval	Average Benefit in Interval
0.00	133.98	0.00	0.35	3.7873	0.8582	86.13	89.32
133.98	534.00	0.35	1.40	80.9369	71.1323	334.04	222.69
534.00		1.40		15.2758	28.0095	696.91	356.00

Average Weekly Benefit: 238.00

After First Amendment

(1) - State Average Weekly Wage	\$380.08
(2) - Rate of Compensation - % of Average Weekly Wage	66.67%
(3) - Minimum Weekly Benefit Specified by Act	98.25
(4) - Maximum Weekly Benefit Specified by Act	391.60

Wage Intervals		Ratios to Average		Percent in Wage Bracket Workers		Average Wage in Interval	Average Benefit in Interval
0.00	147.38	0.00	0.39	4.4890	1.1247	95.23	98.25
147.38	587.40	0.39	1.55	84.5270	77.1776	347.03	231.37
587.40		1.55		10.9841	21.6977	750.80	391.60

Average Weekly Benefit: 242.99

- Rate of Compensation: Constant
- Minimum Weekly Benefit: Variable
- Maximum Weekly Benefit: Variable
- Rate of Inflation: 5%

Hypothetical Workmen's Compensation Law and Law Amendment:
NCCI Approach

2. Effect of Second Amendment

Before Second Amendment

(1) - State Average Weekly Wage	\$399.08
(2) - Rate of Compensation - % of Average Weekly Wage	66.67%
(3) - Minimum Weekly Benefit Specified by Act	98.25
(4) - Maximum Weekly Benefit Specified by Act	391.60

Wage Intervals		Ratios to Average		Percent in Wage Bracket Workers Wages		Average Wage in Interval	Average Benefit in Interval
0.00	147.38	0.00	0.37	4.1214	0.9851	95.39	98.25
147.38	587.40	0.37	1.47	82.9276	74.3614	357.86	238.59
587.40		1.47		12.9510	24.6535	759.70	391.60

Average Weekly Benefit: 252.62

After Second Amendment

(1) - State Average Weekly Wage	\$399.08
(2) - Rate of Compensation - % of Average Weekly Wage	66.67%
(3) - Minimum Weekly Benefit Specified by Act	108.08
(4) - Maximum Weekly Benefit Specified by Act	430.76

Wage Intervals		Ratios to Average		Percent in Wage Bracket Workers Wages		Average Wage in Interval	Average Benefit in Interval
0.00	162.11	0.00	0.41	4.9036	1.2921	105.15	108.08
162.11	646.14	0.41	1.62	85.9798	79.9599	371.14	247.44
646.14		1.62		9.1166	18.7481	820.71	430.76

Average Weekly Benefit: 257.32

	Individual	Cumulative
Effect of First Amendment:	0.0210	0.0210
Effect of Second Amendment:	0.0186	0.0400

- Rate of Compensation: Constant
- Minimum Weekly Benefit: Variable
- Maximum Weekly Benefit: Variable
- Rate of Inflation: 5%

Hypothetical Workmen's Compensation Law and Law Amendment:

Alternative Approach

Effect of First and Second Amendments Simultaneously

Before First Amendment

(1) - State Average Weekly Wage	\$380.08
(2) - Rate of Compensation - % of Average Weekly Wage	66.67%
(3) - Minimum Weekly Benefit Specified by Act	\$89.32
(4) - Maximum Weekly Benefit Specified by Act	\$356.00

Wage Intervals		Ratios to Average		Percent in Wage Bracket Workers		Average Wage in Interval	Average Benefit in Interval
0.00	133.98	0.00	0.35	3.7873	0.8582	86.13	89.32
133.98	534.00	0.35	1.40	80.9369	71.1323	334.04	222.69
534.00		1.40		15.2758	28.0095	696.91	356.00

Average Weekly Benefit: 238.00

After Second Amendment

(1) - State Average Weekly Wage	\$380.08
(2) - Rate of Compensation - % of Average Weekly Wage	66.67%
(3) - Minimum Weekly Benefit Specified by Act	\$108.08
(4) - Maximum Weekly Benefit Specified by Act	\$430.76

Wage Intervals		Ratios to Average		Percent in Wage Bracket Workers		Average Wage in Interval	Average Benefit in Interval
0.00	162.11	0.00	0.43	5.4620	1.5364	106.91	108.08
162.11	646.14	0.43	1.70	86.9879	82.3093	359.64	239.77
646.14		1.70		7.5501	16.1543	813.22	430.76

Average Weekly Benefit: 247.00

Cumulative
Effect of First and Second Amendments: 0.0378

- Rate of Compensation: Constant
- Minimum Weekly Benefit: Variable
- Maximum Weekly Benefit: Constant
- Rate of Inflation: 5%

Hypothetical Workmen's Compensation Law and Law Amendment:

NCCI Approach

1. Effect of First Amendment

Before First Amendment

- (1) - State Average Weekly Wage \$380.08
- (2) - Rate of Compensation - % of Average Weekly Wage 66.67%
- (3) - Minimum Weekly Benefit Specified by Act 89.32
- (4) - Maximum Weekly Benefit Specified by Act 356.00

Wage Intervals		Ratios to Average		Percent in Wage Bracket		Average Wage in Interval	Average Benefit in Interval
0.00	133.98	0.00	0.35	3.7873	0.8582	86.13	89.32
133.98	534.00	0.35	1.40	80.9369	71.1323	334.04	222.69
534.00		1.40		15.2758	28.0095	696.91	356.00

Average Weekly Benefit: 238.00

After First Amendment

- (1) - State Average Weekly Wage \$380.08
- (2) - Rate of Compensation - % of Average Weekly Wage 66.67%
- (3) - Minimum Weekly Benefit Specified by Act 98.25
- (4) - Maximum Weekly Benefit Specified by Act 356.00

Wage Intervals		Ratios to Average		Percent in Wage Bracket		Average Wage in Interval	Average Benefit in Interval
0.00	147.38	0.00	0.39	4.4890	1.1247	95.23	98.25
147.38	534.00	0.39	1.40	80.2352	70.8658	335.70	223.81
534.00		1.40		15.2758	28.0095	696.91	356.00

Average Weekly Benefit: 238.37

- Rate of Compensation: Constant
- Minimum Weekly Benefit: Variable
- Maximum Weekly Benefit: Constant
- Rate of Inflation: 5%

Hypothetical Workmen's Compensation Law and Law Amendment:
NCCI Approach

2. Effect of Second Amendment

Before Second Amendment

- (1) - State Average Weekly Wage \$399.08
- (2) - Rate of Compensation - % of Average Weekly Wage 66.67%
- (3) - Minimum Weekly Benefit Specified by Act 98.25
- (4) - Maximum Weekly Benefit Specified by Act 356.00

	Wage Intervals	Ratios to Average	Percent in Wage Bracket Workers	Wages	Average Wage in Interval	Average Benefit in Interval		
	0.00	147.38	0.00	0.37	4.1214	0.9851	95.39	98.25
	147.38	534.00	0.37	1.34	77.5825	66.8573	343.91	229.29
	534.00		1.34		18.2961	32.1576	701.44	356.00

Average Weekly Benefit: 247.07

After Second Amendment

- (1) - State Average Weekly Wage \$399.08
- (2) - Rate of Compensation - % of Average Weekly Wage 66.67%
- (3) - Minimum Weekly Benefit Specified by Act 108.08
- (4) - Maximum Weekly Benefit Specified by Act 356.00

	Wage Intervals	Ratios to Average	Percent in Wage Bracket Workers	Wages	Average Wage in Interval	Average Benefit in Interval		
	0.00	162.11	0.00	0.41	4.9036	1.2921	105.15	108.08
	162.11	534.00	0.41	1.34	76.8003	66.5504	345.82	230.56
	534.00		1.34		18.2961	32.1576	701.44	356.00

Average Weekly Benefit: 247.50

	Individual	Cumulative
Effect of First Amendment:	0.0015	0.0015
Effect of Second Amendment:	0.0018	0.0033

- Rate of Compensation: Constant
- Minimum Weekly Benefit: Variable
- Maximum Weekly Benefit: Constant
- Rate of Inflation: 5%

**Hypothetical Workmen's Compensation Law and Law Amendment:
Alternative Approach**

Effect of First and Second Amendments Simultaneously

Before First Amendment

- (1) - State Average Weekly Wage \$380.08
- (2) - Rate of Compensation - % of Average Weekly Wage 66.67%
- (3) - Minimum Weekly Benefit Specified by Act \$89.32
- (4) - Maximum Weekly Benefit Specified by Act \$356.00

Wage Intervals		Ratios to Average		Percent in Wage Bracket Workers Wages		Average Wage in Interval	Average Benefit in Interval
0.00	133.98	0.00	0.35	3.7873	0.8582	86.13	89.32
133.98	534.00	0.35	1.40	80.9369	71.1323	334.04	222.69
534.00		1.40		15.2758	28.0095	696.91	356.00

Average Weekly Benefit: 238.00

After Second Amendment

- (1) - State Average Weekly Wage \$380.08
- (2) - Rate of Compensation - % of Average Weekly Wage 66.67%
- (3) - Minimum Weekly Benefit Specified by Act \$108.08
- (4) - Maximum Weekly Benefit Specified by Act \$356.00

Wage Intervals		Ratios to Average		Percent in Wage Bracket Workers Wages		Average Wage in Interval	Average Benefit in Interval
0.00	162.11	0.00	0.43	5.4620	1.5364	106.91	108.08
162.11	534.00	0.43	1.40	79.2622	70.4541	337.84	225.24
534.00		1.40		15.2758	28.0095	696.91	356.00

Average Weekly Benefit: 238.82

	Cumulative
Effect of First and Second Amendments:	0.0034

- Rate of Compensation: Constant
- Minimum Weekly Benefit: Constant
- Maximum Weekly Benefit: Variable
- Rate of Inflation: 5%

Hypothetical Workmen's Compensation Law and Law Amendment:
NCCI Approach

1. Effect of First Amendment

Before First Amendment

(1) - State Average Weekly Wage	\$380.08
(2) - Rate of Compensation - % of Average Weekly Wage	66.67%
(3) - Minimum Weekly Benefit Specified by Act	89.32
(4) - Maximum Weekly Benefit Specified by Act	356.00

Wage Intervals	Ratios to Average	Percent in Wage Bracket Workers	Average Wage in Interval	Average Benefit in Interval
0.00 133.98	0.00 0.35	3.7873	86.13	89.32
133.98 534.00	0.35 1.40	80.9369	334.04	222.69
534.00	1.40	15.2758	696.91	356.00

Average Weekly Benefit: 238.00

After First Amendment

(1) - State Average Weekly Wage	\$380.08
(2) - Rate of Compensation - % of Average Weekly Wage	66.67%
(3) - Minimum Weekly Benefit Specified by Act	89.32
(4) - Maximum Weekly Benefit Specified by Act	391.60

Wage Intervals	Ratios to Average	Percent in Wage Bracket Workers	Average Wage in Interval	Average Benefit in Interval
0.00 133.98	0.00 0.35	3.7873	86.13	89.32
133.98 587.40	0.35 1.55	85.2287	345.36	230.25
587.40	1.55	10.9841	750.80	391.60

Average Weekly Benefit: 242.64

- Rate of Compensation: Constant
- Minimum Weekly Benefit: Constant
- Maximum Weekly Benefit: Variable
- Rate of Inflation: 5%

Hypothetical Workmen's Compensation Law and Law Amendment:
NCCI Approach

2. Effect of Second Amendment

Before Second Amendment

(1) - State Average Weekly Wage	\$399.08
(2) - Rate of Compensation - % of Average Weekly Wage	66.67%
(3) - Minimum Weekly Benefit Specified by Act	89.32
(4) - Maximum Weekly Benefit Specified by Act	391.60

	Wage Intervals	Ratios to Average		Percent in Wage Bracket Workers	Wages	Average Wage in Interval	Average Benefit in Interval	
	0.00	133.98	0.00	0.34	3.4999	0.7603	86.70	89.32
	133.98	587.40	0.34	1.47	83.5491	74.5862	356.27	237.53
	587.40		1.47		12.9510	24.6535	759.70	391.60

Average Weekly Benefit: 252.29

After Second Amendment

(1) - State Average Weekly Wage	\$399.08
(2) - Rate of Compensation - % of Average Weekly Wage	66.67%
(3) - Minimum Weekly Benefit Specified by Act	89.32
(4) - Maximum Weekly Benefit Specified by Act	430.76

	Wage Intervals	Ratios to Average		Percent in Wage Bracket Workers	Wages	Average Wage in Interval	Average Benefit in Interval	
	0.00	133.98	0.00	0.34	3.4999	0.7603	86.70	89.32
	133.98	646.14	0.34	1.62	87.3836	80.4916	367.61	245.08
	646.14		1.62		9.1166	18.7481	820.71	430.76

Average Weekly Benefit: 256.56

	Individual	Cumulative
Effect of First Amendment:	0.0195	0.0195
Effect of Second Amendment:	0.0169	0.0367

- Rate of Compensation: Constant
- Minimum Weekly Benefit: Constant
- Maximum Weekly Benefit: Variable
- Rate of Inflation: 5%

Hypothetical Workmen's Compensation Law and Law Amendment:
Alternative Approach

Effect of First and Second Amendments Simultaneously

Before First Amendment

- (1) - State Average Weekly Wage \$380.08
- (2) - Rate of Compensation - % of Average Weekly Wage 66.67%
- (3) - Minimum Weekly Benefit Specified by Act \$89.32
- (4) - Maximum Weekly Benefit Specified by Act \$356.00

	Wage Intervals	Ratios to Average	Percent in Wage Bracket Workers	Wages	Average Wage in Interval	Average Benefit in Interval	
0.00	133.98	0.00	0.35	3.7873	0.8582	86.13	89.32
133.98	534.00	0.35	1.40	80.9369	71.1323	334.04	222.69
534.00		1.40		15.2758	28.0095	696.91	356.00

Average Weekly Benefit: 238.00

After Second Amendment

- (1) - State Average Weekly Wage \$380.08
- (2) - Rate of Compensation - % of Average Weekly Wage 66.67%
- (3) - Minimum Weekly Benefit Specified by Act \$89.32
- (4) - Maximum Weekly Benefit Specified by Act \$430.76

	Wage Intervals	Ratios to Average	Percent in Wage Bracket Workers	Wages	Average Wage in Interval	Average Benefit in Interval	
0.00	133.98	0.00	0.35	3.7873	0.8582	86.13	89.32
133.98	646.14	0.35	1.70	88.6626	82.9875	355.75	237.18
646.14		1.70		7.5501	16.1543	813.22	430.76

Average Weekly Benefit: 246.20

	Cumulative
Effect of First and Second Amendments:	0.0344

- Rate of Compensation: Constant
- Minimum Weekly Benefit: Variable
- Maximum Weekly Benefit: Variable
- Rate of Inflation: 10%

Hypothetical Workmen's Compensation Law and Law Amendment:

NCCI Approach

1. Effect of First Amendment

Before First Amendment

(1) - State Average Weekly Wage	\$380.08
(2) - Rate of Compensation - % of Average Weekly Wage	66.67%
(3) - Minimum Weekly Benefit Specified by Act	89.32
(4) - Maximum Weekly Benefit Specified by Act	356.00

Wage Intervals		Ratios to Average		Percent in Wage Bracket Workers		Average Wage in Interval	Average Benefit in Interval
0.00	133.98	0.00	0.35	3.7873	0.8582	86.13	89.32
133.98	534.00	0.35	1.40	80.9369	71.1323	334.04	222.69
534.00		1.40		15.2758	28.0095	696.91	356.00

Average Weekly Benefit: 238.00

After First Amendment

(1) - State Average Weekly Wage	\$380.08
(2) - Rate of Compensation - % of Average Weekly Wage	66.67%
(3) - Minimum Weekly Benefit Specified by Act	98.25
(4) - Maximum Weekly Benefit Specified by Act	391.60

Wage Intervals		Ratios to Average		Percent in Wage Bracket Workers		Average Wage in Interval	Average Benefit in Interval
0.00	147.38	0.00	0.39	4.4890	1.1247	95.23	98.25
147.38	587.40	0.39	1.55	84.5270	77.1776	347.03	231.37
587.40		1.55		10.9841	21.6977	750.80	391.60

Average Weekly Benefit: 242.99

- Rate of Compensation: Constant
- Minimum Weekly Benefit: Variable
- Maximum Weekly Benefit: Variable
- Rate of Inflation: 10%

Hypothetical Workmen's Compensation Law and Law Amendment:
NCCI Approach

2. Effect of Second Amendment

Before Second Amendment

(1) - State Average Weekly Wage	\$418.09
(2) - Rate of Compensation - % of Average Weekly Wage	66.67%
(3) - Minimum Weekly Benefit Specified by Act	98.25
(4) - Maximum Weekly Benefit Specified by Act	391.60

Wage Intervals		Ratios to Average		Percent in Wage Bracket Workers		Average Wage in Interval	Average Benefit in Interval
0.00	147.38	0.00	0.35	3.7873	0.8582	94.74	98.25
147.38	587.40	0.35	1.40	80.9369	71.1323	367.44	244.97
587.40		1.40		15.2758	28.0095	766.60	391.60

Average Weekly Benefit: 261.81

After Second Amendment

(1) - State Average Weekly Wage	\$418.09
(2) - Rate of Compensation - % of Average Weekly Wage	66.67%
(3) - Minimum Weekly Benefit Specified by Act	108.08
(4) - Maximum Weekly Benefit Specified by Act	430.76

Wage Intervals		Ratios to Average		Percent in Wage Bracket Workers		Average Wage in Interval	Average Benefit in Interval
0.00	162.11	0.00	0.39	4.4890	1.1247	104.75	108.08
162.11	646.14	0.39	1.55	84.5270	77.1776	381.74	254.50
646.14		1.55		10.9841	21.6977	825.88	430.76

Average Weekly Benefit: 267.29

	Individual	Cumulative
Effect of First Amendment:	0.0210	0.0210
Effect of Second Amendment:	0.0209	0.0423

- Rate of Compensation: Constant
- Minimum Weekly Benefit: Variable
- Maximum Weekly Benefit: Variable
- Rate of Inflation: 10%

Hypothetical Workmen's Compensation Law and Law Amendment:
Alternative Approach

Effect of First and Second Amendments Simultaneously

Before First Amendment

- (1) - State Average Weekly Wage \$380.08
- (2) - Rate of Compensation - % of Average Weekly Wage 66.67%
- (3) - Minimum Weekly Benefit Specified by Act \$89.32
- (4) - Maximum Weekly Benefit Specified by Act \$356.00

Wage Intervals		Ratios to Average		Percent in Wage Bracket Workers Wages		Average Wage in Interval	Average Benefit in Interval
0.00	133.98	0.00	0.35	3.7873	0.8582	86.13	89.32
133.98	534.00	0.35	1.40	80.9369	71.1323	334.04	222.69
534.00		1.40		15.2758	28.0095	696.91	356.00

Average Weekly Benefit: 238.00

After Second Amendment

- (1) - State Average Weekly Wage \$380.08
- (2) - Rate of Compensation - % of Average Weekly Wage 66.67%
- (3) - Minimum Weekly Benefit Specified by Act \$108.08
- (4) - Maximum Weekly Benefit Specified by Act \$430.76

Wage Intervals		Ratios to Average		Percent in Wage Bracket Workers Wages		Average Wage in Interval	Average Benefit in Interval
0.00	162.11	0.00	0.43	5.4620	1.5364	106.91	108.08
162.11	646.14	0.43	1.70	86.9879	82.3093	359.64	239.77
646.14		1.70		7.5501	16.1543	813.22	430.76

Average Weekly Benefit: 247.00

	Cumulative
Effect of First and Second Amendments:	0.0378

- Rate of Compensation: Constant
- Minimum Weekly Benefit: Variable
- Maximum Weekly Benefit: Constant
- Rate of Inflation: 10%

Hypothetical Workmen's Compensation Law and Law Amendment:

NCCI Approach

1. Effect of First Amendment

Before First Amendment

- (1) - State Average Weekly Wage \$380.08
- (2) - Rate of Compensation - % of Average Weekly Wage 66.67%
- (3) - Minimum Weekly Benefit Specified by Act 89.32
- (4) - Maximum Weekly Benefit Specified by Act 356.00

Wage Intervals		Ratios to Average		Percent in Wage Bracket Workers		Average Wage in Interval	Average Benefit in Interval
0.00	133.98	0.00	0.35	3.7873	0.8582	86.13	89.32
133.98	534.00	0.35	1.40	80.9369	71.1323	334.04	222.69
534.00		1.40		15.2758	28.0095	696.91	356.00

Average Weekly Benefit: 238.00

After First Amendment

- (1) - State Average Weekly Wage \$380.08
- (2) - Rate of Compensation - % of Average Weekly Wage 66.67%
- (3) - Minimum Weekly Benefit Specified by Act 98.25
- (4) - Maximum Weekly Benefit Specified by Act 356.00

Wage Intervals		Ratios to Average		Percent in Wage Bracket Workers		Average Wage in Interval	Average Benefit in Interval
0.00	147.38	0.00	0.39	4.4890	1.1247	95.23	98.25
147.38	534.00	0.39	1.40	80.2352	70.8658	335.70	223.81
534.00		1.40		15.2758	28.0095	696.91	356.00

Average Weekly Benefit: 238.37

- Rate of Compensation: Constant
- Minimum Weekly Benefit: Variable
- Maximum Weekly Benefit: Constant
- Rate of Inflation: 10%

Hypothetical Workmen's Compensation Law and Law Amendment:
NCCI Approach

2. Effect of Second Amendment

Before Second Amendment

(1) - State Average Weekly Wage	\$418.09
(2) - Rate of Compensation - % of Average Weekly Wage	66.67%
(3) - Minimum Weekly Benefit Specified by Act	98.25
(4) - Maximum Weekly Benefit Specified by Act	356.00

Wage Intervals		Ratios to Average		Percent in Wage Bracket Workers Wages		Average Wage in Interval	Average Benefit in Interval
0.00	147.38	0.00	0.35	3.7873	0.8582	94.74	98.25
147.38	534.00	0.35	1.28	74.8518	62.9496	351.61	234.42
534.00		1.28		21.3609	36.1922	708.37	356.00

Average Weekly Benefit: 255.23

After Second Amendment

(1) - State Average Weekly Wage	\$418.09
(2) - Rate of Compensation - % of Average Weekly Wage	66.67%
(3) - Minimum Weekly Benefit Specified by Act	108.08
(4) - Maximum Weekly Benefit Specified by Act	356.00

Wage Intervals		Ratios to Average		Percent in Wage Bracket Workers Wages		Average Wage in Interval	Average Benefit in Interval
0.00	162.11	0.00	0.39	4.4890	1.1247	104.75	108.08
162.11	534.00	0.39	1.28	74.1501	62.6831	353.43	235.63
534.00		1.28		21.3609	36.1922	708.37	356.00

Average Weekly Benefit: 255.62

	Individual	Cumulative
Effect of First Amendment:	0.0015	0.0015
Effect of Second Amendment:	0.0015	0.0030

- Rate of Compensation: Constant
- Minimum Weekly Benefit: Variable
- Maximum Weekly Benefit: Constant
- Rate of Inflation: 10%

Hypothetical Workmen's Compensation Law and Law Amendment:
Alternative Approach

Effect of First and Second Amendments Simultaneously

Before First Amendment

- (1) - State Average Weekly Wage \$380.08
- (2) - Rate of Compensation - % of Average Weekly Wage 66.67%
- (3) - Minimum Weekly Benefit Specified by Act \$89.32
- (4) - Maximum Weekly Benefit Specified by Act \$356.00

Wage Intervals		Ratios to Average		Percent in Wage Bracket Workers Wages		Average Wage in Interval	Average Benefit in Interval
0.00	133.98	0.00	0.35	3.7873	0.8582	86.13	89.32
133.98	534.00	0.35	1.40	80.9369	71.1323	334.04	222.69
534.00		1.40		15.2758	28.0095	696.91	356.00

Average Weekly Benefit: 238.00

After Second Amendment

- (1) - State Average Weekly Wage \$380.08
- (2) - Rate of Compensation - % of Average Weekly Wage 66.67%
- (3) - Minimum Weekly Benefit Specified by Act \$108.08
- (4) - Maximum Weekly Benefit Specified by Act \$356.00

Wage Intervals		Ratios to Average		Percent in Wage Bracket Workers Wages		Average Wage in Interval	Average Benefit in Interval
0.00	162.11	0.00	0.43	5.4620	1.5364	106.91	108.08
162.11	534.00	0.43	1.40	79.2622	70.4541	337.84	225.24
534.00		1.40		15.2758	28.0095	696.91	356.00

Average Weekly Benefit: 238.82

Cumulative
Effect of First and Second Amendments: 0.0034

- Rate of Compensation: Constant
- Minimum Weekly Benefit: Constant
- Maximum Weekly Benefit: Variable
- Rate of Inflation: 10%

Hypothetical Workmen's Compensation Law and Law Amendment:
NCCI Approach

1. Effect of First Amendment

Before First Amendment

(1) - State Average Weekly Wage	\$380.08
(2) - Rate of Compensation - % of Average Weekly Wage	66.67%
(3) - Minimum Weekly Benefit Specified by Act	89.32
(4) - Maximum Weekly Benefit Specified by Act	356.00

Wage Intervals		Ratios to Average		Percent in Wage Bracket Workers Wages		Average Wage in Interval	Average Benefit in Interval
0.00	133.98	0.00	0.35	3.7873	0.8582	86.13	89.32
133.98	534.00	0.35	1.40	80.9369	71.1323	334.04	222.69
534.00		1.40		15.2758	28.0095	696.91	356.00

Average Weekly Benefit: 238.00

After First Amendment

(1) - State Average Weekly Wage	\$380.08
(2) - Rate of Compensation - % of Average Weekly Wage	66.67%
(3) - Minimum Weekly Benefit Specified by Act	89.32
(4) - Maximum Weekly Benefit Specified by Act	391.60

Wage Intervals		Ratios to Average		Percent in Wage Bracket Workers Wages		Average Wage in Interval	Average Benefit in Interval
0.00	133.98	0.00	0.35	3.7873	0.8582	86.13	89.32
133.98	587.40	0.35	1.55	85.2287	77.4441	345.36	230.25
587.40		1.55		10.9841	21.6977	750.80	391.60

Average Weekly Benefit: 242.64

- Rate of Compensation: Constant
- Minimum Weekly Benefit: Constant
- Maximum Weekly Benefit: Variable
- Rate of Inflation: 10%

**Hypothetical Workmen's Compensation Law and Law Amendment:
NCCI Approach**

2. Effect of Second Amendment

Before Second Amendment

(1) - State Average Weekly Wage	\$418.09
(2) - Rate of Compensation - % of Average Weekly Wage	66.67%
(3) - Minimum Weekly Benefit Specified by Act	89.32
(4) - Maximum Weekly Benefit Specified by Act	391.60

Wage Intervals	Ratios to Average	Percent in Wage Bracket Workers	Average Wage in Interval	Average Benefit in Interval
0.00 - 133.98	0.00 - 0.32	3.2460	87.06	89.32
133.98 - 587.40	0.32 - 1.40	81.4781	365.94	243.97
587.40 -	1.40 -	15.2758	766.60	391.60

Average Weekly Benefit: 261.50

After Second Amendment

(1) - State Average Weekly Wage	\$418.09
(2) - Rate of Compensation - % of Average Weekly Wage	66.67%
(3) - Minimum Weekly Benefit Specified by Act	89.32
(4) - Maximum Weekly Benefit Specified by Act	430.76

Wage Intervals	Ratios to Average	Percent in Wage Bracket Workers	Average Wage in Interval	Average Benefit in Interval
0.00 - 133.98	0.00 - 0.32	3.2460	87.06	89.32
133.98 - 646.14	0.32 - 1.55	85.7699	378.39	252.27
646.14 -	1.55 -	10.9841	825.88	430.76

Average Weekly Benefit: 266.59

	Individual	Cumulative
Effect of First Amendment:	0.0195	0.0195
Effect of Second Amendment:	0.0195	0.0393

- Rate of Compensation: Constant
- Minimum Weekly Benefit: Constant
- Maximum Weekly Benefit: Variable
- Rate of Inflation: 10%

Hypothetical Workmen's Compensation Law and Law Amendment:
Alternative Approach

Effect of First and Second Amendments Simultaneously

Before First Amendment

(1) - State Average Weekly Wage	\$380.08
(2) - Rate of Compensation - % of Average Weekly Wage	66.67%
(3) - Minimum Weekly Benefit Specified by Act	\$89.32
(4) - Maximum Weekly Benefit Specified by Act	\$356.00

	Wage Intervals	Ratios to Average	Percent in Wage Bracket Workers	Wages	Average Wage in Interval	Average Benefit in Interval	
0.00	133.98	0.00	0.35	3.7873	0.8582	86.13	89.32
133.98	534.00	0.35	1.40	80.9369	71.1323	334.04	222.69
534.00		1.40		15.2758	28.0095	696.91	356.00

Average Weekly Benefit: 238.00

After Second Amendment

(1) - State Average Weekly Wage	\$380.08
(2) - Rate of Compensation - % of Average Weekly Wage	66.67%
(3) - Minimum Weekly Benefit Specified by Act	\$89.32
(4) - Maximum Weekly Benefit Specified by Act	\$430.76

	Wage Intervals	Ratios to Average	Percent in Wage Bracket Workers	Wages	Average Wage in Interval	Average Benefit in Interval	
0.00	133.98	0.00	0.35	3.7873	0.8582	86.13	89.32
133.98	646.14	0.35	1.70	88.6626	82.9875	355.75	237.18
646.14		1.70		7.5501	16.1543	813.22	430.76

Average Weekly Benefit: 246.20

Cumulative
Effect of First and Second Amendments: 0.0344

- Rate of Compensation: Variable
- Minimum Weekly Benefit: Variable
- Maximum Weekly Benefit: Variable
- Rate of Inflation: 5%

Hypothetical Workmen's Compensation Law and Law Amendment:
NCCI Approach

1. Effect of First Amendment

Before First Amendment

(1) - State Average Weekly Wage	\$380.08
(2) - Rate of Compensation - % of Average Weekly Wage	66.67%
(3) - Minimum Weekly Benefit Specified by Act	89.32
(4) - Maximum Weekly Benefit Specified by Act	356.00

Wage Intervals		Ratios to Average		Percent in Wage Bracket Workers		Average Wage in Interval	Average Benefit in Interval
0.00	133.98	0.00	0.35	3.7873	0.8582	86.13	89.32
133.98	534.00	0.35	1.40	80.9369	71.1323	334.04	222.69
534.00		1.40		15.2758	28.0095	696.91	356.00

Average Weekly Benefit: 238.00

After First Amendment

(1) - State Average Weekly Wage	\$380.08
(2) - Rate of Compensation - % of Average Weekly Wage	75.00%
(3) - Minimum Weekly Benefit Specified by Act	98.25
(4) - Maximum Weekly Benefit Specified by Act	391.60

Wage Intervals		Ratios to Average		Percent in Wage Bracket Workers		Average Wage in Interval	Average Benefit in Interval
0.00	127.73	0.00	0.34	3.5055	0.7622	82.64	98.25
127.73	509.08	0.34	1.34	78.2601	67.1618	326.18	244.63
509.08		1.34		18.2345	32.0760	668.59	391.60

Average Weekly Benefit: 266.30

- Rate of Compensation: Variable
- Minimum Weekly Benefit: Variable
- Maximum Weekly Benefit: Variable
- Rate of Inflation: 5%

**Hypothetical Workmen's Compensation Law and Law Amendment:
NCCI Approach**

2. Effect of Second Amendment

Before Second Amendment

(1) - State Average Weekly Wage	\$399.08
(2) - Rate of Compensation - % of Average Weekly Wage	75.00%
(3) - Minimum Weekly Benefit Specified by Act	98.25
(4) - Maximum Weekly Benefit Specified by Act	391.60

Wage Intervals		Ratios to Average	Percent in Wage Bracket		Average Wage in Interval	Average Benefit in Interval	
0.00	127.73	0.00	0.32	3.2393	0.6737	83.00	98.25
127.73	509.08	0.32	1.28	75.3063	63.0120	333.93	250.45
509.08		1.28		21.4545	36.3143	675.50	391.60

Average Weekly Benefit: 275.80

After Second Amendment

(1) - State Average Weekly Wage	\$399.08
(2) - Rate of Compensation - % of Average Weekly Wage	80.00%
(3) - Minimum Weekly Benefit Specified by Act	108.08
(4) - Maximum Weekly Benefit Specified by Act	430.76

Wage Intervals		Ratios to Average	Percent in Wage Bracket		Average Wage in Interval	Average Benefit in Interval	
0.00	140.50	0.00	0.35	3.7784	0.8548	90.29	108.08
140.50	559.99	0.35	1.40	80.8809	71.0430	350.54	280.43
559.99		1.40		15.3407	28.1022	731.07	430.76

Average Weekly Benefit: 296.98

	Individual	Cumulative
Effect of First Amendment:	0.1189	0.1189
Effect of Second Amendment:	0.0768	0.2048

- Rate of Compensation: Variable
- Minimum Weekly Benefit: Variable
- Maximum Weekly Benefit: Variable
- Rate of Inflation: 5%

Hypothetical Workmen's Compensation Law and Law Amendment:
Alternative Approach

Effect of First and Second Amendments Simultaneously

Before First Amendment

- (1) - State Average Weekly Wage \$380.08
- (2) - Rate of Compensation - % of Average Weekly Wage 66.67%
- (3) - Minimum Weekly Benefit Specified by Act \$89.32
- (4) - Maximum Weekly Benefit Specified by Act \$356.00

Wage Intervals		Ratios to Average		Percent in Wage Bracket Workers Wages		Average Wage in Interval	Average Benefit in Interval
0.00	133.98	0.00	0.35	3.7873	0.8582	86.13	89.32
133.98	534.00	0.35	1.40	80.9369	71.1323	334.04	222.69
534.00		1.40		15.2758	28.0095	696.91	356.00

Average Weekly Benefit: 238.00

After Second Amendment

- (1) - State Average Weekly Wage \$380.08
- (2) - Rate of Compensation - % of Average Weekly Wage 80.00%
- (3) - Minimum Weekly Benefit Specified by Act \$108.08
- (4) - Maximum Weekly Benefit Specified by Act \$430.76

Wage Intervals		Ratios to Average		Percent in Wage Bracket Workers Wages		Average Wage in Interval	Average Benefit in Interval
0.00	140.50	0.00	0.37	4.1288	0.9879	90.94	108.08
140.50	559.99	0.37	1.47	82.9665	74.4271	340.96	272.77
559.99		1.47		12.9048	24.5850	724.10	430.76

Average Weekly Benefit: 286.36

	Cumulative
Effect of First and Second Amendments:	0.2032

- Rate of Compensation: Variable
- Minimum Weekly Benefit: Variable
- Maximum Weekly Benefit: Constant
- Rate of Inflation: 5%

Hypothetical Workmen's Compensation Law and Law Amendment:

NCCI Approach

1. Effect of First Amendment

Before First Amendment

(1) - State Average Weekly Wage	\$380.08
(2) - Rate of Compensation - % of Average Weekly Wage	66.67%
(3) - Minimum Weekly Benefit Specified by Act	89.32
(4) - Maximum Weekly Benefit Specified by Act	356.00

Wage Intervals	Ratios to Average	Percent in Wage Bracket Workers	Average Wage in Interval	Average Benefit in Interval
0.00 133.98	0.00 0.35	3.7873	0.8582	86.13
133.98 534.00	0.35 1.40	80.9369	71.1323	334.04
534.00	1.40	15.2758	28.0095	696.91

Average Weekly Benefit: 238.00

After First Amendment

(1) - State Average Weekly Wage	\$380.08
(2) - Rate of Compensation - % of Average Weekly Wage	75.00%
(3) - Minimum Weekly Benefit Specified by Act	98.25
(4) - Maximum Weekly Benefit Specified by Act	356.00

Wage Intervals	Ratios to Average	Percent in Wage Bracket Workers	Average Wage in Interval	Average Benefit in Interval
0.00 127.73	0.00 0.34	3.5055	0.7622	82.64
127.73 462.80	0.34 1.22	71.6408	58.6533	311.18
462.80	1.22	24.8538	40.5845	620.64

Average Weekly Benefit: 259.12

- Rate of Compensation: Variable
- Minimum Weekly Benefit: Variable
- Maximum Weekly Benefit: Constant
- Rate of Inflation: 5%

Hypothetical Workmen's Compensation Law and Law Amendment:
NCCI Approach

2. Effect of Second Amendment

Before Second Amendment

(1) - State Average Weekly Wage	\$399.08
(2) - Rate of Compensation - % of Average Weekly Wage	75.00%
(3) - Minimum Weekly Benefit Specified by Act	98.25
(4) - Maximum Weekly Benefit Specified by Act	356.00

Wage Intervals		Ratios to Average		Percent in Wage Bracket Workers	Wages	Average Wage in Interval	Average Benefit in Interval
0.00	127.73	0.00	0.32	3.2393	0.6737	83.00	98.25
127.73	462.80	0.32	1.16	68.0983	54.2052	317.66	238.25
462.80		1.16		28.6624	45.1211	628.25	356.00

Average Weekly Benefit: 267.46

After Second Amendment

(1) - State Average Weekly Wage	\$399.08
(2) - Rate of Compensation - % of Average Weekly Wage	80.00%
(3) - Minimum Weekly Benefit Specified by Act	108.08
(4) - Maximum Weekly Benefit Specified by Act	356.00

Wage Intervals		Ratios to Average		Percent in Wage Bracket Workers	Wages	Average Wage in Interval	Average Benefit in Interval
0.00	140.50	0.00	0.35	3.7784	0.8548	90.29	108.08
140.50	462.80	0.35	1.16	67.5592	54.0241	319.13	255.30
462.80		1.16		28.6624	45.1211	628.25	356.00

Average Weekly Benefit: 278.60

	Individual	Cumulative
Effect of First Amendment:	0.0887	0.0887
Effect of Second Amendment:	0.0416	0.1341

- Rate of Compensation: Variable
- Minimum Weekly Benefit: Variable
- Maximum Weekly Benefit: Constant
- Rate of Inflation: 5%

Hypothetical Workmen's Compensation Law and Law Amendment:
Alternative Approach

Effect of First and Second Amendments Simultaneously

Before First Amendment

(1) - State Average Weekly Wage	\$380.08
(2) - Rate of Compensation - % of Average Weekly Wage	66.67%
(3) - Minimum Weekly Benefit Specified by Act	\$89.32
(4) - Maximum Weekly Benefit Specified by Act	\$356.00

Wage Intervals		Ratios to Average		Percent in Wage Bracket Workers Wages		Average Wage in Interval	Average Benefit in Interval
0.00	133.98	0.00	0.35	3.7873	0.8582	86.13	89.32
133.98	534.00	0.35	1.40	80.9369	71.1323	334.04	222.69
534.00		1.40		15.2758	28.0095	696.91	356.00

Average Weekly Benefit: 238.00

After Second Amendment

(1) - State Average Weekly Wage	\$380.08
(2) - Rate of Compensation - % of Average Weekly Wage	80.00%
(3) - Minimum Weekly Benefit Specified by Act	\$108.08
(4) - Maximum Weekly Benefit Specified by Act	\$356.00

Wage Intervals		Ratios to Average		Percent in Wage Bracket Workers Wages		Average Wage in Interval	Average Benefit in Interval
0.00	140.50	0.00	0.37	4.1288	0.9879	90.94	108.08
140.50	462.80	0.37	1.22	71.0175	58.4276	312.70	250.16
462.80		1.22		24.8538	40.5845	620.64	356.00

Average Weekly Benefit: 270.60

Cumulative
Effect of First and Second Amendments: 0.1369

- Rate of Compensation: Variable
- Minimum Weekly Benefit: Constant
- Maximum Weekly Benefit: Variable
- Rate of Inflation: 5%

Hypothetical Workmen's Compensation Law and Law Amendment:

NCCI Approach

1. Effect of First Amendment

Before First Amendment

(1) - State Average Weekly Wage	\$380.08
(2) - Rate of Compensation - % of Average Weekly Wage	66.67%
(3) - Minimum Weekly Benefit Specified by Act	89.32
(4) - Maximum Weekly Benefit Specified by Act	356.00

Wage Intervals	Ratios to Average	Percent in Wage Bracket Workers	Average Wage in Interval	Average Benefit in Interval
0.00 133.98	0.00 0.35	3.7873	86.13	89.32
133.98 534.00	0.35 1.40	80.9369	334.04	222.69
534.00	1.40	15.2758	696.91	356.00

Average Weekly Benefit: 238.00

After First Amendment

(1) - State Average Weekly Wage	\$380.08
(2) - Rate of Compensation - % of Average Weekly Wage	75.00%
(3) - Minimum Weekly Benefit Specified by Act	89.32
(4) - Maximum Weekly Benefit Specified by Act	391.60

Wage Intervals	Ratios to Average	Percent in Wage Bracket Workers	Average Wage in Interval	Average Benefit in Interval
0.00 116.11	0.00 0.31	2.9973	75.24	89.32
116.11 509.08	0.31 1.34	78.7682	324.89	243.67
509.08	1.34	18.2345	668.59	391.60

Average Weekly Benefit: 266.02

- Rate of Compensation: Variable
- Minimum Weekly Benefit: Constant
- Maximum Weekly Benefit: Variable
- Rate of Inflation: 5%

NCCI Approach

2. Effect of Second Amendment

Before Second Amendment

(1) - State Average Weekly Wage	\$399.08
(2) - Rate of Compensation - % of Average Weekly Wage	75.00%
(3) - Minimum Weekly Benefit Specified by Act	89.32
(4) - Maximum Weekly Benefit Specified by Act	391.60

Wage Intervals		Ratios to Average		Percent in Wage Bracket Workers		Average Wage in Interval	Average Benefit in Interval
0.00	116.11	0.00	0.29	2.7678	0.5241	75.56	89.32
116.11	509.08	0.29	1.28	75.7777	63.1616	332.64	249.48
509.08		1.28		21.4545	36.3143	675.50	391.60

Average Weekly Benefit: 275.54

After Second Amendment

(1) - State Average Weekly Wage	\$399.08
(2) - Rate of Compensation - % of Average Weekly Wage	80.00%
(3) - Minimum Weekly Benefit Specified by Act	89.32
(4) - Maximum Weekly Benefit Specified by Act	430.76

Wage Intervals		Ratios to Average		Percent in Wage Bracket Workers		Average Wage in Interval	Average Benefit in Interval
0.00	116.11	0.00	0.29	2.7678	0.5241	75.56	89.32
116.11	559.99	0.29	1.40	81.8915	71.3738	347.83	278.26
559.99		1.40		15.3407	28.1022	731.07	430.76

Average Weekly Benefit: 296.43

	Individual	Cumulative
Effect of First Amendment:	0.1177	0.1177
Effect of Second Amendment:	0.0758	0.2024

- Rate of Compensation: Variable
- Minimum Weekly Benefit: Constant
- Maximum Weekly Benefit: Variable
- Rate of Inflation: 5%

**Hypothetical Workmen's Compensation Law and Law Amendment:
Alternative Approach**

Effect of First and Second Amendments Simultaneously

Before First Amendment

- (1) - State Average Weekly Wage \$380.08
- (2) - Rate of Compensation - % of Average Weekly Wage 66.67%
- (3) - Minimum Weekly Benefit Specified by Act \$89.32
- (4) - Maximum Weekly Benefit Specified by Act \$356.00

	Wage Intervals	Ratios to Average	Percent in Wage Bracket Workers	Wages	Average Wage in Interval	Average Benefit in Interval		
	0.00	133.98	0.00	0.35	3.7873	0.8582	86.13	89.32
	133.98	534.00	0.35	1.40	80.9369	71.1323	334.04	222.69
	534.00		1.40		15.2758	28.0095	696.91	356.00

Average Weekly Benefit: 238.00

After Second Amendment

- (1) - State Average Weekly Wage \$380.08
- (2) - Rate of Compensation - % of Average Weekly Wage 80.00%
- (3) - Minimum Weekly Benefit Specified by Act \$89.32
- (4) - Maximum Weekly Benefit Specified by Act \$430.76

	Wage Intervals	Ratios to Average	Percent in Wage Bracket Workers	Wages	Average Wage in Interval	Average Benefit in Interval		
	0.00	116.11	0.00	0.31	2.9973	0.5933	75.24	89.32
	116.11	559.99	0.31	1.47	84.0979	74.8217	338.16	270.52
	559.99		1.47		12.9048	24.5850	724.10	430.76

Average Weekly Benefit: 285.77

	Cumulative
Effect of First and Second Amendments:	0.2007

- Rate of Compensation: Variable
- Minimum Weekly Benefit: Variable
- Maximum Weekly Benefit: Variable
- Rate of Inflation: 10%

Hypothetical Workmen's Compensation Law and Law Amendment:
NCCI Approach

1. Effect of First Amendment

Before First Amendment

(1) - State Average Weekly Wage	\$380.08
(2) - Rate of Compensation - % of Average Weekly Wage	66.67%
(3) - Minimum Weekly Benefit Specified by Act	89.32
(4) - Maximum Weekly Benefit Specified by Act	356.00

Wage Intervals		Ratios to Average		Percent in Wage Bracket Workers		Average Wage in Interval	Average Benefit in Interval
0.00	133.98	0.00	0.35	3.7873	0.8582	86.13	89.32
133.98	534.00	0.35	1.40	80.9369	71.1323	334.04	222.69
534.00		1.40		15.2758	28.0095	696.91	356.00

Average Weekly Benefit: 238.00

After First Amendment

(1) - State Average Weekly Wage	\$380.08
(2) - Rate of Compensation - % of Average Weekly Wage	75.00%
(3) - Minimum Weekly Benefit Specified by Act	98.25
(4) - Maximum Weekly Benefit Specified by Act	391.60

Wage Intervals		Ratios to Average		Percent in Wage Bracket Workers		Average Wage in Interval	Average Benefit in Interval
0.00	127.73	0.00	0.34	3.5055	0.7622	82.64	98.25
127.73	509.08	0.34	1.34	78.2601	67.1618	326.18	244.63
509.08		1.34		18.2345	32.0760	668.59	391.60

Average Weekly Benefit: 266.30

- Rate of Compensation: Variable
- Minimum Weekly Benefit: Variable
- Maximum Weekly Benefit: Variable
- Rate of Inflation: 10%

Hypothetical Workmen's Compensation Law and Law Amendment:
NCCI Approach

2. Effect of Second Amendment

Before Second Amendment

(1) - State Average Weekly Wage	\$418.09
(2) - Rate of Compensation - % of Average Weekly Wage	75.00%
(3) - Minimum Weekly Benefit Specified by Act	98.25
(4) - Maximum Weekly Benefit Specified by Act	391.60

Wage Intervals		Ratios to Average	Percent in Wage Bracket		Average Wage in Interval	Average Benefit in Interval
0.00	127.73	0.00	0.31	2.9973	82.76	98.25
127.73	509.08	0.31	1.22	72.1489	340.86	255.65
509.08		1.22		24.8538	682.71	391.60

Average Weekly Benefit: 284.72

After Second Amendment

(1) - State Average Weekly Wage	\$418.09
(2) - Rate of Compensation - % of Average Weekly Wage	80.00%
(3) - Minimum Weekly Benefit Specified by Act	108.08
(4) - Maximum Weekly Benefit Specified by Act	430.76

Wage Intervals		Ratios to Average	Percent in Wage Bracket		Average Wage in Interval	Average Benefit in Interval
0.00	140.50	0.00	0.34	3.5055	90.90	108.08
140.50	559.99	0.34	1.34	78.2601	358.80	287.04
559.99		1.34		18.2345	735.45	430.76

Average Weekly Benefit: 306.97

	Individual	Cumulative
Effect of First Amendment:	0.1189	0.1189
Effect of Second Amendment:	0.0782	0.2063

- Rate of Compensation: Variable
- Minimum Weekly Benefit: Variable
- Maximum Weekly Benefit: Variable
- Rate of Inflation: 10%

Hypothetical Workmen's Compensation Law and Law Amendment:
Alternative Approach

Effect of First and Second Amendments Simultaneously

Before First Amendment

- (1) - State Average Weekly Wage \$380.08
- (2) - Rate of Compensation - % of Average Weekly Wage 66.67%
- (3) - Minimum Weekly Benefit Specified by Act \$89.32
- (4) - Maximum Weekly Benefit Specified by Act \$356.00

Wage Intervals		Ratios to Average		Percent in Wage Bracket Workers Wages		Average Wage in Interval	Average Benefit in Interval
0.00	133.98	0.00	0.35	3.7873	0.8582	86.13	89.32
133.98	534.00	0.35	1.40	80.9369	71.1323	334.04	222.69
534.00		1.40		15.2758	28.0095	696.91	356.00

Average Weekly Benefit: 238.00

After Second Amendment

- (1) - State Average Weekly Wage \$380.08
- (2) - Rate of Compensation - % of Average Weekly Wage 80.00%
- (3) - Minimum Weekly Benefit Specified by Act \$108.08
- (4) - Maximum Weekly Benefit Specified by Act \$430.76

Wage Intervals		Ratios to Average		Percent in Wage Bracket Workers Wages		Average Wage in Interval	Average Benefit in Interval
0.00	140.50	0.00	0.37	4.1288	0.9879	90.94	108.08
140.50	559.99	0.37	1.47	82.9665	74.4271	340.96	272.77
559.99		1.47		12.9048	24.5850	724.10	430.76

Average Weekly Benefit: 286.36

	Cumulative
Effect of First and Second Amendments:	0.2032

- Rate of Compensation: Variable
- Minimum Weekly Benefit: Variable
- Maximum Weekly Benefit: Constant
- Rate of Inflation: 10%

Hypothetical Workmen's Compensation Law and Law Amendment:

NCCI Approach

1. Effect of First Amendment

Before First Amendment

- (1) - State Average Weekly Wage \$380.08
- (2) - Rate of Compensation - % of Average Weekly Wage 66.67%
- (3) - Minimum Weekly Benefit Specified by Act 89.32
- (4) - Maximum Weekly Benefit Specified by Act 356.00

Wage Intervals		Ratios to Average		Percent in Wage Bracket Workers		Average Wage in Interval	Average Benefit in Interval
0.00	133.98	0.00	0.35	3.7873	0.8582	86.13	89.32
133.98	534.00	0.35	1.40	80.9369	71.1323	334.04	222.69
534.00		1.40		15.2758	28.0095	696.91	356.00

Average Weekly Benefit: 238.00

After First Amendment

- (1) - State Average Weekly Wage \$380.08
- (2) - Rate of Compensation - % of Average Weekly Wage 75.00%
- (3) - Minimum Weekly Benefit Specified by Act 98.25
- (4) - Maximum Weekly Benefit Specified by Act 356.00

Wage Intervals		Ratios to Average		Percent in Wage Bracket Workers		Average Wage in Interval	Average Benefit in Interval
0.00	127.73	0.00	0.34	3.5055	0.7622	82.64	98.25
127.73	462.80	0.34	1.22	71.6408	58.6533	311.18	233.38
462.80		1.22		24.8538	40.5845	620.64	356.00

Average Weekly Benefit: 259.12

- Rate of Compensation: Variable
- Minimum Weekly Benefit: Variable
- Maximum Weekly Benefit: Constant
- Rate of Inflation: 10%

Hypothetical Workmen's Compensation Law and Law Amendment:
NCCI Approach

2. Effect of Second Amendment

Before Second Amendment

- (1) - State Average Weekly Wage \$418.09
- (2) - Rate of Compensation - % of Average Weekly Wage 75.00%
- (3) - Minimum Weekly Benefit Specified by Act 98.25
- (4) - Maximum Weekly Benefit Specified by Act 356.00

Wage Intervals		Ratios to Average		Percent in Wage Bracket Workers Wages		Average Wage in Interval	Average Benefit in Interval
0.00	127.73	0.00	0.31	2.9973	0.5933	82.76	98.25
127.73	462.80	0.31	1.11	64.6733	50.1352	324.10	243.08
462.80		1.11		32.3294	49.2715	637.19	356.00

Average Weekly Benefit: 275.24

After Second Amendment

- (1) - State Average Weekly Wage \$418.09
- (2) - Rate of Compensation - % of Average Weekly Wage 80.00%
- (3) - Minimum Weekly Benefit Specified by Act 108.08
- (4) - Maximum Weekly Benefit Specified by Act 356.00

Wage Intervals		Ratios to Average		Percent in Wage Bracket Workers Wages		Average Wage in Interval	Average Benefit in Interval
0.00	140.50	0.00	0.34	3.5055	0.7622	90.90	108.08
140.50	462.80	0.34	1.11	64.1652	49.9663	325.57	260.46
462.80		1.11		32.3294	49.2715	637.19	356.00

Average Weekly Benefit: 286.00

	Individual	Cumulative
Effect of First Amendment:	0.0887	0.0887
Effect of Second Amendment:	0.0391	0.1313

- Rate of Compensation: Variable
- Minimum Weekly Benefit: Variable
- Maximum Weekly Benefit: Constant
- Rate of Inflation: 10%

**Hypothetical Workmen's Compensation Law and Law Amendment:
Alternative Approach**

Effect of First and Second Amendments Simultaneously

Before First Amendment

- (1) - State Average Weekly Wage \$380.08
- (2) - Rate of Compensation - % of Average Weekly Wage 66.67%
- (3) - Minimum Weekly Benefit Specified by Act \$89.32
- (4) - Maximum Weekly Benefit Specified by Act \$356.00

Wage Intervals		Ratios to Average		Percent in Wage Bracket Workers Wages		Average Wage in Interval	Average Benefit in Interval
0.00	133.98	0.00	0.35	3.7873	0.8582	86.13	89.32
133.98	534.00	0.35	1.40	80.9369	71.1323	334.04	222.69
534.00		1.40		15.2758	28.0095	696.91	356.00

Average Weekly Benefit: 238.00

After Second Amendment

- (1) - State Average Weekly Wage \$380.08
- (2) - Rate of Compensation - % of Average Weekly Wage 80.00%
- (3) - Minimum Weekly Benefit Specified by Act \$108.08
- (4) - Maximum Weekly Benefit Specified by Act \$356.00

Wage Intervals		Ratios to Average		Percent in Wage Bracket Workers Wages		Average Wage in Interval	Average Benefit in Interval
0.00	140.50	0.00	0.37	4.1288	0.9879	90.94	108.08
140.50	462.80	0.37	1.22	71.0175	58.4276	312.70	250.16
462.80		1.22		24.8538	40.5845	620.64	356.00

Average Weekly Benefit: 270.60

Cumulative
Effect of First and Second Amendments: 0.1369

- Rate of Compensation: Variable
- Minimum Weekly Benefit: Constant
- Maximum Weekly Benefit: Variable
- Rate of Inflation: 10%

Hypothetical Workmen's Compensation Law and Law Amendment:
NCCI Approach

1. Effect of First Amendment

Before First Amendment

(1) - State Average Weekly Wage	\$380.08
(2) - Rate of Compensation - % of Average Weekly Wage	66.67%
(3) - Minimum Weekly Benefit Specified by Act	89.32
(4) - Maximum Weekly Benefit Specified by Act	356.00

Wage Intervals		Ratios to Average		Percent in Wage Bracket Workers		Average Wage in Interval	Average Benefit in Interval
0.00	133.98	0.00	0.35	3.7873	0.8582	86.13	89.32
133.98	534.00	0.35	1.40	80.9369	71.1323	334.04	222.69
534.00		1.40		15.2758	28.0095	696.91	356.00

Average Weekly Benefit: 238.00

After First Amendment

(1) - State Average Weekly Wage	\$380.08
(2) - Rate of Compensation - % of Average Weekly Wage	75.00%
(3) - Minimum Weekly Benefit Specified by Act	89.32
(4) - Maximum Weekly Benefit Specified by Act	391.60

Wage Intervals		Ratios to Average		Percent in Wage Bracket Workers		Average Wage in Interval	Average Benefit in Interval
0.00	116.11	0.00	0.31	2.9973	0.5933	75.24	89.32
116.11	509.08	0.31	1.34	78.7682	67.3307	324.89	243.67
509.08		1.34		18.2345	32.0760	668.59	391.60

Average Weekly Benefit: 266.02

- Rate of Compensation: Variable
- Minimum Weekly Benefit: Constant
- Maximum Weekly Benefit: Variable
- Rate of Inflation: 10%

NCCI Approach

2. Effect of Second Amendment

Before Second Amendment

- (1) - State Average Weekly Wage \$418.09
- (2) - Rate of Compensation - % of Average Weekly Wage 75.00%
- (3) - Minimum Weekly Benefit Specified by Act 89.32
- (4) - Maximum Weekly Benefit Specified by Act 391.60

Wage Intervals		Ratios to Average	Percent in Wage Bracket		Average Wage in Interval	Average Benefit in Interval	
0.00	116.11	0.00	0.28	2.5661	0.4673	76.14	89.32
116.11	509.08	0.28	1.22	72.5801	58.9482	339.56	254.67
509.08		1.22		24.8538	40.5845	682.71	391.60

Average Weekly Benefit: 284.46

After Second Amendment

- (1) - State Average Weekly Wage \$418.09
- (2) - Rate of Compensation - % of Average Weekly Wage 80.00%
- (3) - Minimum Weekly Benefit Specified by Act 89.32
- (4) - Maximum Weekly Benefit Specified by Act 430.76

Wage Intervals		Ratios to Average	Percent in Wage Bracket		Average Wage in Interval	Average Benefit in Interval	
0.00	116.11	0.00	0.28	2.5661	0.4673	76.14	89.32
116.11	559.99	0.28	1.34	79.1994	67.4567	356.10	284.88
559.99		1.34		18.2345	32.0760	735.45	430.76

Average Weekly Benefit: 306.46

	Individual	Cumulative
Effect of First Amendment:	0.1177	0.1177
Effect of Second Amendment:	0.0773	0.2041

- Rate of Compensation: Variable
- Minimum Weekly Benefit: Constant
- Maximum Weekly Benefit: Variable
- Rate of Inflation: 10%

Hypothetical Workmen's Compensation Law and Law Amendment:
Alternative Approach

Effect of First and Second Amendments Simultaneously

Before First Amendment

- (1) - State Average Weekly Wage \$380.08
- (2) - Rate of Compensation - % of Average Weekly Wage 66.67%
- (3) - Minimum Weekly Benefit Specified by Act \$89.32
- (4) - Maximum Weekly Benefit Specified by Act \$356.00

Wage Intervals		Ratios to Average		Percent in Wage Bracket Workers Wages		Average Wage in Interval	Average Benefit in Interval
0.00	133.98	0.00	0.35	3.7873	0.8582	86.13	89.32
133.98	534.00	0.35	1.40	80.9369	71.1323	334.04	222.69
534.00		1.40		15.2758	28.0095	696.91	356.00

Average Weekly Benefit: 238.00

After Second Amendment

- (1) - State Average Weekly Wage \$380.08
- (2) - Rate of Compensation - % of Average Weekly Wage 80.00%
- (3) - Minimum Weekly Benefit Specified by Act \$89.32
- (4) - Maximum Weekly Benefit Specified by Act \$430.76

Wage Intervals		Ratios to Average		Percent in Wage Bracket Workers Wages		Average Wage in Interval	Average Benefit in Interval
0.00	116.11	0.00	0.31	2.9973	0.5933	75.24	89.32
116.11	559.99	0.31	1.47	84.0979	74.8217	338.16	270.52
559.99		1.47		12.9048	24.5850	724.10	430.76

Average Weekly Benefit: 285.77

	Cumulative
Effect of First and Second Amendments:	0.2007

EXHIBIT IV
TABLE OF CONTENTS

IV. Summary of Financial Call Data

Sheet Number	Data	States
1	Premium	CT, FL, IL, LA
2	Premium	MI, NC, ORPC, ORSF, WI
3	Indemnity Losses	CT, FL, IL, LA
4	Indemnity Losses	MI, NC, ORPC, ORSF, WI
5	Medical Losses	CT, FL, IL, LA
6	Medical Losses	MI, NC, ORPC, ORSF, WI
7	Loss Ratios @1989	CT, FL, IL, LA
8	Loss Ratios @1989	MI, NC, ORPC, ORSF, WI
9	Loss Ratios @1990	CT, FL, IL, LA
10	Loss Ratios @1990	MI, NC, ORPC, ORSF, WI
11	Loss Ratios @1990	AL, AK, AZPC, AZSF, AR
12	Loss Ratios @1990	COPC, DC, HI, ID, IN
13	Loss Ratios @1990	IA, KS, KYVO, ME, MD
14	Loss Ratios @1990	MS, MO, MT, NE, NH
15	Loss Ratios @1990	NM, OKPC, RI, SC, SD
16	Loss Ratios @1990	TN, TX, UTPC, VT, VA

Summary of Premium from Financial Call Data

State Code	Policy Year	Standard Earned Premium	Premium Development Factors	Premium On-Level Factors	On-Level Premium (1)x(2)x(3)
CT	1974	\$96,068,511	1.000	2.778	\$266,878,324
	1975	111,410,761	1.000	2.513	279,975,242
	1976	126,033,529	1.000	2.303	290,255,217
	1977	164,765,035	1.000	2.050	337,768,322
	1978	215,273,672	1.000	1.757	378,235,842
	1979	302,268,654	1.000	1.363	411,992,175
	1980	340,560,637	1.000	1.224	416,846,220
	1981	363,380,462	1.000	1.165	423,338,238
	1982	422,455,623	1.000	1.102	465,546,097
	1983	455,286,549	1.000	1.118	509,010,362
	1984	505,237,570	1.000	1.097	554,245,614
	1985	541,838,670	1.003	1.112	604,150,117
	1986	603,896,762	1.002	1.040	629,260,426
	1987	733,722,444	1.015	0.941	700,704,934
1988	826,135,847	1.062	0.869	762,523,387	
FL	1981	543,414,887	1.000	2.922	1,587,858,300
	1982	525,075,064	1.000	3.007	1,578,900,717
	1983	622,309,897	1.000	2.667	1,659,700,495
	1984	775,064,335	1.000	2.447	1,896,582,428
	1985	969,202,566	1.001	2.049	1,987,834,463
	1986	1,110,478,924	1.002	1.843	2,051,054,573
	1987	1,192,253,605	1.006	1.789	2,146,056,489
	1988	1,312,121,416	1.063	1.582	2,206,988,222
IL	1981	891,486,582	1.000	1.381	1,231,142,970
	1982	785,689,039	1.000	1.405	1,103,893,100
	1983	791,797,753	1.000	1.450	1,148,106,742
	1984	904,885,903	1.000	1.381	1,249,647,432
	1985	1,004,501,969	0.999	1.383	1,388,221,721
	1986	1,332,526,005	1.000	1.178	1,569,715,634
	1987	1,529,409,256	0.998	1.149	1,754,232,417
	1988	1,732,388,628	1.032	1.007	1,799,951,784
	LA	1974	129,936,007	1.000	1.950	253,375,214
1975		158,103,744	1.000	1.847	292,017,615
1976		225,389,237	1.000	1.655	373,019,187
1977		272,349,929	1.000	1.406	382,924,000
1978		320,515,731	1.000	1.370	439,106,551
1979		353,707,102	1.000	1.418	501,556,671
1980		422,293,403	1.000	1.225	517,309,419
1981		423,014,467	1.000	1.217	514,808,606
1982		355,277,461	1.000	1.169	415,319,352
1983		316,313,392	1.000	1.221	386,218,652
1984		318,580,639	1.000	1.270	404,597,412
1985		356,485,445	1.000	1.240	442,041,952
1986		383,168,951	0.997	0.964	368,225,362
1987		440,535,090	1.005	0.878	388,551,949
1988		441,393,414	1.033	0.798	363,708,173

Summary of Premium from Financial Call Data

State Code	Policy Year	Standard Earned Premium	Premium Development Factors	Premium On-Level Factors	On-Level Premium (1)x(2)x(3)
MI	1981	852,902,762	1.000	0.780	665,264,154
	1982	629,538,879	1.000	0.918	577,916,691
	1983	554,148,632	1.000	1.174	650,570,494
	1984	568,406,977	1.000	1.283	729,266,151
	1985	639,418,702	1.001	1.281	819,734,776
	1986	783,355,209	1.003	1.108	870,307,637
	1987	871,153,528	1.003	1.006	878,993,910
	1988	901,326,527	1.017	1.094	1,003,176,425
NC	1981	\$253,553,642	1.000	1.170	\$296,657,761
	1982	270,280,934	1.000	1.095	295,957,623
	1983	266,212,698	1.000	1.191	317,059,323
	1984	265,348,138	1.000	1.403	372,283,438
	1985	290,817,775	1.000	1.384	402,491,801
	1986	366,781,949	0.999	1.235	452,608,925
	1987	421,479,207	1.002	1.168	493,130,672
	1988	482,156,808	1.054	1.009	512,532,687
ORPC	1981	191,795,441	1.000	0.915	175,492,829
	1982	139,588,489	1.000	1.200	167,506,187
	1983	124,024,013	1.000	1.779	220,638,719
	1984	150,562,556	1.000	1.645	247,675,405
	1985	211,732,696	1.000	1.385	293,249,784
	1986	290,796,466	1.001	1.135	330,344,785
	1987	320,302,674	1.012	0.997	323,185,398
	1988	343,969,830	1.029	0.992	351,193,196
ORSF	1981	215,645,913	1.000	0.924	199,256,824
	1982	155,809,082	1.000	1.284	200,058,861
	1983	118,578,693	1.000	1.778	210,832,916
	1984	127,509,668	1.000	1.638	208,860,836
	1985	151,403,816	0.999	1.355	205,000,767
	1986	210,766,664	0.997	1.116	234,583,297
	1987	264,377,957	0.998	0.986	260,147,910
	1988	287,576,967	1.003	0.982	283,263,312
WI	1974	103,923,570	1.000	2.508	260,640,314
	1975	116,967,703	1.000	2.488	291,015,645
	1976	135,646,451	1.000	2.338	317,141,402
	1977	174,176,980	1.000	2.179	379,531,639
	1978	209,954,170	1.000	2.112	443,423,207
	1979	248,657,616	1.000	1.904	473,444,101
	1980	284,743,135	1.000	1.794	510,829,184
	1981	301,547,191	1.000	1.711	515,947,244
	1982	301,983,702	1.000	1.620	489,213,597
	1983	331,384,537	1.000	1.555	515,302,955
	1984	382,458,521	1.000	1.500	573,687,782
	1985	411,151,744	1.002	1.466	603,981,912
	1986	493,293,701	1.003	1.317	651,640,979
	1987	626,251,332	1.004	1.130	710,795,262
1988	730,524,076	1.032	1.002	755,361,895	

Summary of Indemnity Losses from Financial Call Data

State Code	Policy Year	Incurred Indemnity Losses	Indemnity Development Factors	Indemnity On-Level Factors	On-Level Losses (1)x(2)x(3)
CT	1974	\$45,007,272	1.151	1.826	\$94,605,286
	1975	53,833,795	1.151	1.779	110,251,612
	1976	62,124,026	1.151	1.688	120,706,983
	1977	73,479,388	1.151	1.510	127,707,176
	1978	91,265,533	1.100	1.407	141,279,045
	1979	115,705,657	1.126	1.272	165,690,501
	1980	133,340,076	1.151	1.217	186,809,446
	1981	134,317,373	1.151	1.185	183,208,897
	1982	134,037,101	1.187	1.167	185,641,385
	1983	154,861,876	1.219	1.152	217,426,074
	1984	183,437,708	1.236	1.133	256,812,791
	1985	222,125,124	1.258	1.119	312,752,175
	1986	227,175,341	1.302	1.111	328,722,718
	1987	285,213,939	1.383	1.051	414,701,067
1988	276,676,831	1.548	1.014	434,382,625	
FL	1981	281,296,224	1.073	1.122	338,680,654
	1982	288,913,503	1.102	1.096	349,007,512
	1983	347,648,796	1.121	1.081	421,350,341
	1984	433,653,475	1.168	1.026	519,516,863
	1985	512,982,004	1.254	1.012	650,974,163
	1986	533,584,281	1.427	1.010	768,894,949
	1987	583,086,171	1.674	1.006	981,917,112
	1988	539,024,388	2.205	1.004	1,193,399,995
IL	1981	393,617,928	0.987	1.000	388,500,895
	1982	363,762,240	0.985	1.000	358,305,806
	1983	417,632,037	0.980	1.000	409,279,396
	1984	482,152,813	0.976	1.023	481,188,507
	1985	538,395,114	0.984	1.029	545,394,250
	1986	615,182,216	1.010	1.025	636,713,594
	1987	650,108,978	1.087	1.020	720,970,857
	1988	635,170,536	1.217	1.015	784,435,612
LA	1974	63,460,294	1.002	1.427	90,748,220
	1975	90,558,374	1.002	1.195	108,398,374
	1976	124,058,024	1.002	1.058	131,501,505
	1977	128,036,172	1.002	0.942	120,866,146
	1978	160,598,514	1.011	0.924	149,999,012
	1979	191,154,320	1.009	0.916	176,626,592
	1980	210,304,364	1.002	0.883	186,119,362
	1981	233,998,520	1.002	0.850	199,366,739
	1982	229,279,386	1.004	0.841	193,511,802
	1983	226,971,809	1.014	1.053	242,405,892
	1984	258,637,342	1.030	1.125	299,760,679
	1985	280,139,680	1.064	1.080	321,880,492
	1986	236,459,884	1.113	1.021	268,618,428
	1987	244,652,810	1.194	1.021	298,231,775
1988	202,586,966	1.459	1.017	300,639,058	

Summary of Indemnity Losses from Financial Call Data

State Code	Policy Year	Incurred Indemnity Losses	Indemnity Development Factors	Indemnity On-Level Factors	On-Level Losses (1)x(2)x(3)
MI	1981	291,246,412	1.053	1.018	312,216,154
	1982	271,441,454	1.069	1.085	314,872,087
	1983	302,365,525	1.084	1.080	354,070,030
	1984	363,290,723	1.112	1.077	435,222,286
	1985	387,721,381	1.159	1.074	482,713,119
	1986	400,575,536	1.219	1.067	521,148,772
	1987	390,124,693	1.317	1.060	544,614,071
	1988	357,514,128	1.605	1.057	606,343,961
NC	1981	\$73,499,104	1.029	1.189	\$89,889,404
	1982	75,319,147	1.035	1.167	90,985,530
	1983	89,288,510	1.045	1.097	102,324,632
	1984	110,295,540	1.054	1.070	124,413,369
	1985	124,978,815	1.059	1.058	139,976,273
	1986	134,469,759	1.072	1.047	150,875,070
	1987	166,055,728	1.131	1.027	192,956,756
	1988	166,488,532	1.243	1.012	209,442,573
ORPC	1981	65,137,741	1.063	1.296	89,759,807
	1982	61,481,921	1.064	1.273	83,246,521
	1983	82,607,166	1.063	1.273	111,767,496
	1984	103,823,148	1.096	1.272	144,729,468
	1985	115,085,758	1.123	1.132	146,273,998
	1986	119,732,859	1.187	0.985	139,967,712
	1987	120,647,693	1.249	0.991	149,361,844
	1988	118,351,558	1.393	1.000	164,863,720
ORSF	1981	71,352,842	1.092	1.294	100,821,566
	1982	70,185,931	1.164	1.273	104,015,550
	1983	82,965,101	1.251	1.273	132,163,406
	1984	91,506,796	1.331	1.273	155,012,512
	1985	104,338,037	1.390	1.120	162,454,324
	1986	127,597,873	1.423	0.985	178,892,218
	1987	142,727,294	1.434	0.991	202,815,485
	1988	151,209,521	1.486	1.000	224,697,348
WI	1974	38,240,374	1.032	1.938	76,480,748
	1975	41,858,824	1.032	1.811	78,234,142
	1976	58,036,312	1.032	1.686	100,983,183
	1977	67,380,744	1.032	1.630	113,334,411
	1978	88,912,819	1.016	1.576	142,349,423
	1979	97,009,347	1.029	1.543	154,050,843
	1980	96,560,641	1.032	1.500	149,475,872
	1981	110,130,712	1.032	1.415	160,790,840
	1982	117,158,974	1.031	1.302	157,227,343
	1983	127,255,711	1.025	1.263	164,796,146
	1984	151,203,456	1.029	1.197	186,282,658
	1985	176,464,847	1.036	1.155	211,228,422
	1986	193,065,097	1.046	1.126	227,430,684
	1987	200,822,772	1.070	1.104	237,171,694
	1988	210,961,922	1.141	1.080	259,905,088

Summary of Medical Losses from Financial Call Data

State Code	Policy Year	Incurred Medical Losses	Medical Development Factors	Medical On-Level Factors	On-Level Losses (1)x(2)x(3)
CT	1974	\$19,350,952	1.137	1.007	\$22,156,840
	1975	22,242,582	1.137	1.007	25,467,756
	1976	25,696,321	1.137	1.007	29,422,288
	1977	29,348,985	1.137	1.007	33,604,588
	1978	34,192,296	1.113	1.007	38,329,564
	1979	39,978,280	1.129	1.007	45,455,304
	1980	48,230,214	1.137	1.007	55,223,595
	1981	52,095,847	1.137	1.007	59,649,745
	1982	60,841,377	1.140	1.007	69,845,901
	1983	72,167,422	1.150	1.007	83,569,875
	1984	84,284,731	1.158	1.007	98,275,996
	1985	106,020,091	1.157	1.007	123,513,406
	1986	112,471,337	1.176	1.007	133,166,063
	1987	137,123,354	1.202	1.007	165,919,258
1988	149,054,703	1.285	1.007	192,876,786	
FL	1981	216,583,618	1.149	1.160	288,705,963
	1982	249,555,293	1.188	1.024	303,708,792
	1983	275,669,480	1.225	0.954	322,257,622
	1984	312,064,196	1.261	0.953	375,101,164
	1985	348,888,015	1.308	0.951	434,016,691
	1986	373,679,655	1.385	1.005	520,162,080
	1987	393,802,141	1.474	1.016	589,915,607
	1988	431,756,397	1.644	1.001	710,671,029
IL	1981	150,801,763	1.002	1.002	151,404,970
	1982	151,449,888	1.000	1.002	151,752,788
	1983	187,064,156	0.988	1.002	185,193,514
	1984	210,464,528	0.975	1.000	205,202,915
	1985	238,739,280	0.951	1.000	227,041,055
	1986	301,367,813	0.940	1.000	283,285,744
	1987	362,327,080	0.928	1.000	336,239,530
	1988	386,453,111	0.989	1.000	382,202,127
LA	1974	24,558,570	1.065	0.932	24,386,660
	1975	32,971,663	1.065	0.992	34,818,076
	1976	51,069,511	1.065	1.010	54,950,794
	1977	54,662,533	1.065	1.010	58,816,886
	1978	65,826,639	1.053	1.010	70,039,544
	1979	84,949,817	1.062	1.010	91,151,154
	1980	94,709,794	1.065	1.010	101,907,738
	1981	106,042,878	1.065	1.010	114,102,137
	1982	115,087,191	1.072	1.010	124,639,428
	1983	137,315,662	1.076	1.010	149,262,125
	1984	150,170,108	1.082	1.010	164,135,928
	1985	181,187,152	1.109	1.010	202,929,610
	1986	161,040,009	1.125	1.010	182,941,450
	1987	168,387,596	1.194	1.010	203,075,441
	1988	164,982,421	1.333	1.010	222,066,339

Summary of Medical Losses from Financial Call Data

State Code	Policy Year	Incurred Medical Losses	Medical Development Factors	Medical On-Level Factors	On-Level Losses (1)x(2)x(3)
MI	1981	120,199,603	1.075	0.889	114,910,820
	1982	118,667,186	1.083	0.902	115,937,841
	1983	139,048,740	1.075	0.902	134,877,278
	1984	171,264,221	1.076	0.902	166,297,559
	1985	192,684,506	1.075	0.902	186,903,971
	1986	217,047,894	1.079	0.902	211,187,601
	1987	238,908,368	1.097	0.902	236,280,376
	1988	259,740,953	1.161	0.910	274,546,187
NC	1981	\$52,603,696	1.035	1.455	\$79,221,166
	1982	57,684,315	1.037	1.326	79,315,933
	1983	69,068,304	1.032	1.262	89,926,932
	1984	86,422,983	1.033	1.182	105,522,462
	1985	95,766,383	1.033	1.151	113,866,229
	1986	114,315,839	1.032	1.088	128,376,687
	1987	146,397,358	1.064	1.067	166,161,001
	1988	155,161,814	1.127	1.013	177,194,792
ORPC	1981	41,480,507	1.167	0.985	47,661,103
	1982	43,025,285	1.197	0.985	50,726,811
	1983	54,301,243	1.223	0.985	65,432,998
	1984	75,471,528	1.263	0.985	93,886,581
	1985	82,517,503	1.303	0.985	105,869,956
	1986	88,026,670	1.366	0.985	118,483,898
	1987	94,388,381	1.391	0.991	130,067,189
	1988	106,027,963	1.430	1.000	151,619,987
ORSF	1981	52,215,621	1.419	0.985	72,997,438
	1982	54,194,051	1.476	0.985	78,798,150
	1983	66,326,638	1.542	0.985	100,750,163
	1984	76,993,895	1.636	0.985	124,037,165
	1985	90,725,543	1.742	0.985	155,685,032
	1986	104,211,112	1.826	0.985	187,475,790
	1987	121,929,669	1.872	0.991	226,179,536
	1988	138,771,646	1.853	1.000	257,143,860
WI	1974	25,858,249	1.053	1.005	27,358,027
	1975	27,465,179	1.053	1.005	29,058,159
	1976	34,800,919	1.053	1.005	36,819,372
	1977	40,033,794	1.053	1.005	42,355,754
	1978	52,751,226	1.058	1.005	56,074,553
	1979	59,943,598	1.060	1.005	63,839,932
	1980	65,849,754	1.053	1.005	69,669,040
	1981	74,363,039	1.053	1.003	78,527,369
	1982	77,643,735	1.060	1.000	82,302,359
	1983	89,613,937	1.057	1.000	94,721,931
	1984	105,338,661	1.060	1.000	111,658,981
	1985	127,370,412	1.060	1.000	135,012,637
	1986	142,370,623	1.059	1.000	150,770,490
	1987	168,418,890	1.042	1.000	175,492,483
	1988	193,209,717	1.072	1.000	207,120,817

Summary of Indemnity and Medical Loss Ratios
from 1989 Financial Call Data

State Code	Policy Year	Indemnity Loss Ratio	Medical Loss Ratio
CT	1974	35.4%	8.3%
	1975	39.4%	9.1%
	1976	41.6%	10.1%
	1977	37.8%	9.9%
	1978	37.4%	10.1%
	1979	40.2%	11.0%
	1980	44.8%	13.2%
	1981	43.3%	14.1%
	1982	39.9%	15.0%
	1983	42.7%	16.4%
	1984	46.3%	17.7%
	1985	51.8%	20.4%
	1986	52.2%	21.2%
	1987	59.2%	23.7%
1988	57.0%	25.3%	
FL	1981	21.3%	18.2%
	1982	22.1%	19.2%
	1983	25.4%	19.4%
	1984	27.4%	19.8%
	1985	32.7%	21.8%
	1986	37.5%	25.4%
	1987	45.8%	27.5%
	1988	54.1%	32.2%
IL	1981	31.6%	12.3%
	1982	32.5%	13.7%
	1983	35.6%	16.1%
	1984	38.5%	16.4%
	1985	39.3%	16.4%
	1986	40.6%	18.0%
	1987	41.1%	19.2%
	1988	43.6%	21.2%
LA	1974	35.8%	9.6%
	1975	37.1%	11.9%
	1976	35.3%	14.7%
	1977	31.6%	15.4%
	1978	34.2%	16.0%
	1979	35.2%	18.2%
	1980	36.0%	19.7%
	1981	38.7%	22.2%
	1982	46.6%	30.0%
	1983	62.8%	38.6%
	1984	74.1%	40.6%
	1985	72.8%	45.9%
	1986	72.9%	49.7%
	1987	76.8%	52.3%
1988	82.7%	61.1%	

Summary of Indemnity and Medical Loss Ratios
from 1989 Financial Call Data

State Code	Policy Year	Indemnity Loss Ratio	Medical Loss Ratio
MI	1981	46.9%	17.3%
	1982	54.5%	20.1%
	1983	54.4%	20.7%
	1984	59.7%	22.8%
	1985	58.9%	22.8%
	1986	59.9%	24.3%
	1987	62.0%	26.9%
	1988	60.4%	27.4%
NC	1981	30.3%	26.7%
	1982	30.7%	26.8%
	1983	32.3%	28.4%
	1984	33.4%	28.3%
	1985	34.8%	28.3%
	1986	33.3%	28.4%
	1987	39.1%	33.7%
	1988	40.9%	34.6%
ORPC	1981	51.1%	27.2%
	1982	49.7%	30.3%
	1983	50.7%	29.7%
	1984	58.4%	37.9%
	1985	49.9%	36.1%
	1986	42.4%	35.9%
	1987	46.2%	40.2%
	1988	46.9%	43.2%
ORSF	1981	50.6%	36.6%
	1982	52.0%	39.4%
	1983	62.7%	47.8%
	1984	74.2%	59.4%
	1985	79.2%	75.9%
	1986	76.3%	79.9%
	1987	78.0%	86.9%
	1988	79.3%	90.8%
WI	1974	29.3%	10.5%
	1975	26.9%	10.0%
	1976	31.8%	11.6%
	1977	29.9%	11.2%
	1978	32.1%	12.6%
	1979	32.5%	13.5%
	1980	29.3%	13.6%
	1981	31.2%	15.2%
	1982	32.1%	16.8%
	1983	32.0%	18.4%
	1984	32.5%	19.5%
	1985	35.0%	22.4%
	1986	34.9%	23.1%
	1987	33.4%	24.7%
1988	34.4%	27.4%	

Summary of Indemnity and Medical Loss Ratios
from 1990 Financial Call Data

State Code	Policy Year	Indemnity Loss Ratio	Medical Loss Ratio
CT	1981	34.0%	10.6%
	1982	31.3%	11.8%
	1983	33.0%	12.7%
	1984	49.0%	18.7%
	1985	55.0%	21.7%
	1986	54.3%	21.8%
	1987	64.6%	25.6%
	1988	64.7%	27.5%
FL	1981	21.4%	19.4%
	1982	21.0%	19.3%
	1983	24.1%	20.0%
	1984	26.4%	20.7%
	1985	31.2%	23.1%
	1986	35.6%	26.7%
	1987	43.1%	29.8%
	1988	49.4%	35.6%
IL	1981	31.7%	12.2%
	1982	32.7%	13.5%
	1983	35.8%	16.1%
	1984	39.0%	16.3%
	1985	39.7%	16.4%
	1986	41.9%	18.4%
	1987	42.5%	19.5%
	1988	45.8%	21.4%
LA	1981	39.8%	22.6%
	1982	47.6%	30.5%
	1983	63.5%	37.7%
	1984	75.1%	40.6%
	1985	72.0%	45.8%
	1986	71.8%	48.4%
	1987	75.1%	49.5%
	1988	74.7%	56.8%

Summary of Indemnity and Medical Loss Ratios
from 1990 Financial Call Data

State Code	Policy Year	Indemnity Loss Ratio	Medical Loss Ratio
MI	1981	48.3%	17.0%
	1982	54.8%	19.7%
	1983	55.5%	20.8%
	1984	45.7%	17.3%
	1985	46.1%	17.9%
	1986	45.9%	18.5%
	1987	47.4%	20.2%
	1988	49.1%	21.5%
NC	1981	30.0%	28.5%
	1982	31.1%	28.5%
	1983	31.8%	30.5%
	1984	32.9%	30.8%
	1985	35.3%	31.2%
	1986	34.0%	31.9%
	1987	40.9%	37.4%
	1988	44.7%	40.4%
ORPC	1981	54.5%	28.6%
	1982	53.2%	30.5%
	1983	54.1%	30.2%
	1984	60.3%	37.8%
	1985	51.9%	36.5%
	1986	43.4%	33.6%
	1987	49.5%	38.2%
	1988	48.8%	39.7%
ORSF	1981	52.9%	33.1%
	1982	51.2%	34.2%
	1983	62.7%	39.8%
	1984	73.2%	49.0%
	1985	74.6%	61.2%
	1986	72.0%	60.3%
	1987	68.2%	61.2%
	1988	63.2%	58.8%
WI	1981	31.0%	15.6%
	1982	32.6%	17.2%
	1983	32.7%	18.6%
	1984	33.1%	20.0%
	1985	35.6%	22.8%
	1986	34.9%	23.5%
	1987	32.9%	25.7%
	1988	33.0%	28.0%

Summary of Indemnity and Medical Loss Ratios
from 1990 Financial Call Data

State Code	Policy Year	Indemnity Loss Ratio	Medical Loss Ratio
AL	1981	21.7%	23.3%
	1982	21.5%	26.7%
	1983	24.3%	31.3%
	1984	27.9%	34.9%
	1985	31.9%	39.2%
	1986	33.0%	42.4%
	1987	35.6%	45.8%
	1988	40.6%	57.6%
	AK	1981	30.9%	14.1%
1982		44.0%	18.3%
1983		41.4%	19.3%
1984		34.6%	18.3%
1985		34.0%	21.2%
1986		31.8%	20.1%
1987		28.6%	21.2%
1988		25.8%	22.5%
AZPC		1981	21.9%	26.2%
	1982	20.6%	23.6%
	1983	22.8%	26.4%
	1984	24.0%	30.8%
	1985	23.6%	28.5%
	1986	23.0%	28.6%
	1987	25.0%	29.3%
	1988	26.1%	31.3%
	AZSF	1981	31.5%	35.6%
1982		35.2%	36.6%
1983		31.9%	39.2%
1984		34.3%	38.8%
1985		30.8%	32.3%
1986		32.3%	30.1%
1987		35.8%	35.5%
1988		38.9%	36.2%
AR		1981	28.6%	22.4%
	1982	30.1%	24.5%
	1983	34.7%	31.3%
	1984	30.6%	28.6%
	1985	32.1%	28.2%
	1986	31.0%	30.0%
	1987	35.4%	36.9%
	1988	37.5%	41.5%

Summary of Indemnity and Medical Loss Ratios
from 1990 Financial Call Data

State Code	Policy Year	Indemnity Loss Ratio	Medical Loss Ratio
COPC	1981	19.4%	12.9%
	1982	22.0%	12.9%
	1983	24.8%	15.8%
	1984	28.3%	18.6%
	1985	33.3%	20.2%
	1986	36.4%	21.5%
	1987	42.6%	23.2%
	1988	47.5%	25.7%
	DC	1981	46.2%
1982		60.5%	26.9%
1983		47.8%	25.2%
1984		47.3%	21.7%
1985		36.4%	22.5%
1986		37.6%	22.5%
1987		37.8%	23.7%
1988		32.9%	23.1%
HI		1981	43.7%	26.0%
	1982	47.2%	30.3%
	1983	45.3%	31.1%
	1984	42.3%	25.3%
	1985	41.8%	25.3%
	1986	40.1%	25.3%
	1987	43.1%	27.8%
	1988	46.2%	30.4%
	ID	1981	31.2%	14.0%
1982		34.4%	17.3%
1983		40.6%	21.7%
1984		39.3%	21.6%
1985		37.2%	21.0%
1986		37.2%	23.9%
1987		38.4%	25.0%
1988		38.9%	29.0%
IN		1981	21.3%
	1982	20.1%	18.7%
	1983	20.4%	21.1%
	1984	20.8%	21.9%
	1985	23.4%	24.1%
	1986	24.7%	25.4%
	1987	26.5%	28.6%
	1988	27.8%	34.0%

Summary of Indemnity and Medical Loss Ratios
from 1990 Financial Call Data

State Code	Policy Year	Indemnity Loss Ratio	Medical Loss Ratio
IA	1981	28.2%	13.8%
	1982	29.0%	14.7%
	1983	31.4%	17.4%
	1984	32.9%	20.6%
	1985	33.7%	18.6%
	1986	35.3%	20.7%
	1987	38.9%	23.8%
	1988	37.6%	26.7%
KS	1981	28.6%	18.8%
	1982	32.6%	21.3%
	1983	36.6%	25.4%
	1984	37.3%	24.1%
	1985	37.6%	24.1%
	1986	38.4%	26.7%
	1987	41.1%	32.1%
	1988	48.2%	36.7%
KYVO	1981	45.0%	31.2%
	1982	46.7%	30.9%
	1983	47.7%	36.0%
	1984	47.2%	37.8%
	1985	46.6%	41.3%
	1986	46.8%	43.0%
	1987	52.0%	49.6%
	1988	58.7%	60.4%
ME	1981	35.8%	15.0%
	1982	40.0%	16.8%
	1983	43.0%	18.7%
	1984	45.9%	20.8%
	1985	48.4%	22.3%
	1986	49.2%	21.1%
	1987	49.7%	23.2%
	1988	49.9%	28.8%
MD	1981	82.1%	40.9%
	1982	80.8%	39.9%
	1983	86.8%	42.7%
	1984	82.8%	44.3%
	1985	77.1%	38.7%
	1986	75.1%	41.0%
	1987	75.6%	40.7%
	1988	69.9%	41.0%

Summary of Indemnity and Medical Loss Ratios
from 1990 Financial Call Data

State Code	Policy Year	Indemnity Loss Ratio	Medical Loss Ratio
MS	1981	26.2%	23.5%
	1982	25.5%	24.3%
	1983	25.3%	27.4%
	1984	31.2%	36.7%
	1985	33.0%	32.1%
	1986	34.9%	40.8%
	1987	34.3%	42.4%
	1988	37.1%	45.1%
MO	1981	25.1%	16.2%
	1982	25.3%	15.8%
	1983	29.3%	19.2%
	1984	32.2%	20.1%
	1985	35.0%	22.7%
	1986	37.0%	24.6%
	1987	41.6%	30.2%
	1988	43.7%	31.8%
MT	1981	28.5%	12.0%
	1982	33.1%	14.7%
	1983	36.2%	18.2%
	1984	40.5%	21.0%
	1985	38.5%	18.7%
	1986	37.0%	21.1%
	1987	39.4%	19.6%
	1988	35.9%	21.9%
NE	1981	28.8%	21.7%
	1982	26.5%	20.0%
	1983	31.2%	23.5%
	1984	33.7%	26.4%
	1985	34.7%	26.4%
	1986	39.1%	30.1%
	1987	39.7%	31.4%
	1988	43.1%	36.8%
NH	1981	30.5%	13.1%
	1982	33.6%	15.3%
	1983	38.2%	19.5%
	1984	42.7%	23.8%
	1985	43.7%	19.7%
	1986	41.0%	18.8%
	1987	44.1%	22.1%
	1988	52.2%	26.3%

Summary of Indemnity and Medical Loss Ratios
from 1990 Financial Call Data

State Code	Policy Year	Indemnity Loss Ratio	Medical Loss Ratio
NM	1981	34.8%	21.0%
	1982	41.4%	26.7%
	1983	49.2%	33.1%
	1984	57.5%	36.9%
	1985	56.1%	38.1%
	1986	71.6%	50.4%
	1987	78.8%	55.6%
	1988	77.5%	59.6%
OKPC	1981	37.1%	16.3%
	1982	41.8%	20.5%
	1983	48.6%	26.5%
	1984	48.5%	24.0%
	1985	44.5%	23.9%
	1986	41.6%	22.4%
	1987	45.3%	25.3%
	1988	53.5%	31.1%
RI	1981	49.5%	12.9%
	1982	49.2%	12.6%
	1983	59.9%	15.9%
	1984	62.3%	15.4%
	1985	70.6%	17.4%
	1986	85.5%	21.1%
	1987	95.9%	23.3%
	1988	103.9%	25.2%
SC	1981	34.0%	19.9%
	1982	35.9%	20.9%
	1983	41.2%	24.9%
	1984	44.2%	27.2%
	1985	47.1%	26.0%
	1986	46.1%	26.9%
	1987	50.0%	33.0%
	1988	52.9%	32.0%
SD	1981	29.5%	16.2%
	1982	27.2%	16.6%
	1983	30.6%	21.0%
	1984	37.9%	25.8%
	1985	35.8%	23.7%
	1986	36.3%	28.4%
	1987	40.5%	30.4%
	1988	42.7%	31.4%

Summary of Indemnity and Medical Loss Ratios
from 1990 Financial Call Data

State Code	Policy Year	Indemnity Loss Ratio	Medical Loss Ratio
TN	1981	29.8%	18.3%
	1982	29.1%	19.8%
	1983	31.1%	23.4%
	1984	35.3%	26.6%
	1985	34.0%	25.5%
	1986	35.3%	26.9%
	1987	39.1%	32.1%
	1988	45.1%	36.9%
TX	1981	18.0%	11.2%
	1982	19.0%	13.3%
	1983	22.9%	15.9%
	1984	26.2%	18.3%
	1985	30.8%	21.8%
	1986	36.1%	26.9%
	1987	43.7%	34.5%
	1988	50.7%	42.5%
UTPC	1981	21.7%	30.2%
	1982	23.4%	36.6%
	1983	28.1%	33.3%
	1984	30.2%	33.7%
	1985	24.1%	29.8%
	1986	24.1%	34.5%
	1987	25.6%	36.8%
	1988	34.3%	50.4%
VT	1981	33.9%	15.5%
	1982	27.7%	24.1%
	1983	33.9%	17.1%
	1984	39.7%	19.7%
	1985	42.3%	22.0%
	1986	44.4%	27.2%
	1987	45.3%	27.4%
	1988	50.2%	31.0%
VA	1981	35.5%	26.7%
	1982	36.8%	28.1%
	1983	38.5%	31.1%
	1984	37.0%	31.1%
	1985	39.8%	32.9%
	1986	41.4%	35.5%
	1987	41.6%	36.6%
	1988	43.2%	40.2%

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V. Percentage Distribution of Ultimate
Frequency by Injury Type

Sheet Number	State
1	Florida
2	Illinois
3	Louisiana
4	Michigan

Percentage Distribution of Ultimate Frequency by Injury Type

FLORIDA

Policy Period	Fatal	Permanent Total	Major Permanent Partial	Minor Permanent Partial	Temporary Total	Medical Only
12/80 - 11/81	0.068%	0.059%	1.4%	0.9%	15.1%	82.5%
12/81 - 11/82	0.062%	0.064%	1.5%	0.9%	15.4%	82.0%
10/82 - 9/83	0.059%	0.074%	1.8%	1.1%	16.1%	80.9%
10/83 - 9/84	0.061%	0.083%	2.0%	1.3%	15.8%	80.7%
10/84 - 9/85	0.065%	0.111%	2.3%	1.2%	15.9%	80.4%
10/85 - 9/86	0.081%	0.097%	2.9%	1.0%	16.2%	79.7%
10/86 - 9/87	0.106%	0.079%	3.9%	1.3%	17.2%	77.4%

Percentage Distribution of Ultimate Frequency by Injury Type

ILLINOIS

Policy Period	Fatal	Permanent Total	Major		Minor		Temporary Total	Medical Only
			Permanent Partial	Permanent Partial	Permanent Partial	Permanent Partial		
3/73 - 2/74	0.077%	0.023%	1.0%	6.0%	6.0%	9.4%	83.5%	
3/74 - 2/75	0.085%	0.031%	1.3%	6.3%	6.3%	10.2%	82.1%	
3/75 - 2/76	0.085%	0.063%	1.8%	7.3%	7.3%	13.7%	77.0%	
3/76 - 2/77	0.092%	0.059%	1.6%	7.5%	7.5%	15.1%	75.6%	
3/77 - 2/78	0.080%	0.055%	1.6%	7.6%	7.6%	15.5%	75.2%	
3/78 - 5/79	0.090%	0.031%	1.9%	7.7%	7.7%	16.8%	73.5%	
6/79 - 5/80	0.084%	0.037%	2.0%	7.7%	7.7%	17.2%	73.0%	
6/80 - 5/81	0.064%	0.038%	2.0%	6.9%	6.9%	16.6%	74.4%	
6/81 - 3/82	0.059%	0.030%	2.0%	5.8%	5.8%	17.5%	74.7%	
4/82 - 3/83	0.064%	0.046%	2.3%	6.4%	6.4%	17.2%	74.0%	
4/83 - 3/84	0.058%	0.036%	2.3%	7.0%	7.0%	17.0%	73.6%	
4/84 - 3/85	0.060%	0.040%	2.4%	7.5%	7.5%	15.7%	74.3%	
4/85 - 3/86	0.054%	0.041%	2.5%	7.2%	7.2%	16.7%	73.5%	
4/86 - 3/87	0.056%	0.030%	2.4%	7.4%	7.4%	17.0%	73.0%	
4/87 - 3/88	0.059%	0.015%	2.3%	6.8%	6.8%	17.1%	73.7%	

Percentage Distribution of Ultimate Frequency by Injury Type

LOUISIANA

Policy Period	Fatal	Permanent Total	Major		Minor		Temporary Total	Medical Only
			Permanent Partial	Permanent Partial	Permanent Partial	Permanent Partial		
1/74 - 12/74	0.151%	0.177%	1.9%	2.8%	2.8%	13.3%	81.6%	
1/75 - 12/75	0.167%	0.157%	2.0%	2.2%	2.2%	13.7%	81.7%	
1/76 - 12/76	0.132%	0.138%	2.1%	2.3%	2.3%	13.3%	81.9%	
1/77 - 12/77	0.136%	0.125%	2.3%	2.5%	2.5%	14.0%	81.0%	
1/78 - 12/78	0.109%	0.104%	2.0%	2.2%	2.2%	12.8%	82.8%	
1/79 - 3/80	0.114%	0.130%	2.3%	2.1%	2.1%	13.8%	81.5%	
4/80 - 3/81	0.119%	0.123%	2.7%	2.0%	2.0%	13.0%	82.1%	
4/81 - 3/82	0.142%	0.156%	2.9%	2.0%	2.0%	12.9%	81.9%	
4/82 - 3/83	0.121%	0.184%	3.5%	2.4%	2.4%	14.0%	79.7%	
4/83 - 3/84	0.122%	0.172%	3.1%	1.9%	1.9%	14.7%	80.0%	
4/84 - 3/85	0.133%	0.166%	3.7%	1.8%	1.8%	15.0%	79.1%	
4/85 - 3/86	0.131%	0.124%	4.2%	1.5%	1.5%	15.9%	78.1%	
4/86 - 3/87	0.157%	0.083%	4.6%	1.4%	1.4%	18.1%	75.7%	

Percentage Distribution of Ultimate Frequency by Injury Type

MICHIGAN

Policy Period	Fatal	Permanent Total	Major Permanent Partial	Minor Permanent Partial	Temporary Total	Medical Only
4/82 - 3/83	0.065%	0.052%	1.8%	1.9%	14.8%	81.5%
4/83 - 3/84	0.056%	0.023%	2.0%	1.8%	14.8%	81.3%
4/84 - 3/85	0.050%	0.039%	1.9%	1.8%	14.8%	81.3%
4/85 - 3/86	0.062%	0.035%	1.9%	1.3%	15.6%	81.1%
4/86 - 3/87	0.062%	0.020%	2.0%	1.3%	16.9%	79.8%
4/87 - 3/88	0.061%	0.012%	2.0%	1.1%	17.7%	79.0%

EXHIBIT VI
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VI. Identification of Econometric Relationships

Sheet Number	State	Regression	Dependent Variable	Independent Variable(s)
1	Florida	Exponential	CPI-Indexed Medical Only Severity	Time
2	Florida	Exponential	Average Cost-Indexed Medical Only Severity	Time
3	Florida	Exponential	Medical Only-Indexed Fatal Medical Severity	Time
4	Florida	Exponential	Medical Only-Indexed Permanent Total Medical Severity	Time
5	Florida	Exponential	Medical Only-Indexed Major Permanent Partial Medical Severity	Time
6	Florida	Exponential	Medical Only-Indexed Minor Permanent Partial Medical Severity	Time
7	Florida	Exponential	Medical Only-Indexed Temporary Total Medical Severity	Time
8	Florida	Exponential	Medical Only-Indexed Serious Medical Severity	Time
9	Florida	Exponential	Medical Only-Indexed Non-Serious Medical Severity	Time
10	Florida	Exponential	Medical Only-Indexed Total Medical Severity	Time
11	Florida	Exponential	CPI-Indexed Total Medical Severity	Time
12	Florida	Exponential	Average Cost-Indexed Total Medical Severity	Time
13	Florida	Linear	Medical Only Frequency x 1000	Time
14	Florida	Linear	Fatal Frequency x 1000	Unemployment Rate
15	Florida	Linear	Permanent Total Frequency x 1000	Time, Unemployment Rate
16	Florida	Linear	Major Permanent Partial Frequency x 1000	Time, Unemployment Rate
17	Florida	Linear	Serious Frequency x 1000	Time, Unemployment Rate
18	Florida	Linear	Minor Permanent Partial Frequency x 1000	Time, Unemployment Rate
19	Florida	Linear	Temporary Total Frequency x 1000	Time, Unemployment Rate
20	Florida	Linear	Non-Serious Frequency x 1000	Time, Unemployment Rate
21	Florida	Exponential	SAWW-Indexed Fatal Indemnity Severity	Time
22	Florida	Exponential	SAWW-Indexed Permanent Total Indemnity Severity	Time
23	Florida	Exponential	SAWW-Indexed Major Permanent Partial Indemnity Severity	Time
24	Florida	Exponential	SAWW-Indexed Serious Indemnity Severity	Time
25	Florida	Exponential	SAWW-Indexed Minor Permanent Partial Indemnity Severity	Time
26	Florida	Exponential	SAWW-Indexed Temporary Total Indemnity Severity	Time
27	Florida	Exponential	SAWW-Indexed Non-Serious Indemnity Severity	Time
28	Florida	Linear	Total Indemnity Frequency x 1000	Unemployment Rate
29	Florida	Linear	Total Frequency x 1000	Unemployment Rate
30	Florida	Linear	Non-Serious Indemnity Severity	Unemployment Rate
31	Florida	Exponential	CPI-Indexed Total Medical Severity on Indemnity Claims	Time

Note: Payroll is used as the denominator in all frequency calculations.

EXHIBIT VI
TABLE OF CONTENTS (Continued)

Sheet Number	State	Regression	Dependent Variable	Independent Variable(s)
32	Illinois	Exponential	CPI-Indexed Medical Only Severity	Time
33	Illinois	Exponential	Average Cost-Indexed Medical Only Severity	Time
34	Illinois	Exponential	Medical Only-Indexed Fatal Medical Severity	Time
35	Illinois	Exponential	Medical Only-Indexed Permanent Total Medical Severity	Time
36	Illinois	Exponential	Medical Only-Indexed Major Permanent Partial Medical Severity	Time
37	Illinois	Exponential	Medical Only-Indexed Minor Permanent Partial Medical Severity	Time
38	Illinois	Exponential	Medical Only-Indexed Temporary Total Medical Severity	Time
39	Illinois	Exponential	Medical Only-Indexed Serious Medical Severity	Time
40	Illinois	Exponential	Medical Only-Indexed Non-Serious Medical Severity	Time
41	Illinois	Exponential	Medical Only-Indexed Total Medical Severity	Time
42	Illinois	Exponential	CPI-Indexed Total Medical Severity	Time
43	Illinois	Exponential	Average Cost-Indexed Total Medical Severity	Time
44	Illinois	Linear	Medical Only Frequency x 1000	Time, Unemployment Rate
45	Illinois	Linear	Fatal Frequency x 1000	Time, Unemployment Rate
46	Illinois	Linear	Permanent Total Frequency x 1000	Time, Unemployment Rate
47	Illinois	Linear	Major Permanent Partial Frequency x 1000	Time, Unemployment Rate
48	Illinois	Linear	Serious Frequency x 1000	Time, Unemployment Rate
49	Illinois	Linear	Minor Permanent Partial Frequency x 1000	Time, Unemployment Rate
50	Illinois	Linear	Temporary Total Frequency x 1000	Time, Unemployment Rate
51	Illinois	Linear	Non-Serious Frequency x 1000	Time, Unemployment Rate
52	Illinois	Exponential	SAWW-Indexed Fatal Indemnity Severity	Time
53	Illinois	Exponential	SAWW-Indexed Permanent Total Indemnity Severity	Time
54	Illinois	Exponential	SAWW-Indexed Major Permanent Partial Indemnity Severity	Time
55	Illinois	Exponential	SAWW-Indexed Serious Indemnity Severity	Time
56	Illinois	Exponential	SAWW-Indexed Minor Permanent Partial Indemnity Severity	Time
57	Illinois	Exponential	SAWW-Indexed Temporary Total Indemnity Severity	Time
58	Illinois	Exponential	SAWW-Indexed Non-Serious Indemnity Severity	Time
59	Illinois	Linear	Total Indemnity Frequency x 1000	Unemployment Rate
60	Illinois	Linear	Total Frequency x 1000	Unemployment Rate
61	Illinois	Linear	Non-Serious Indemnity Severity	Unemployment Rate
62	Illinois	Exponential	CPI-Indexed Total Medical Severity on Indemnity Claims	Time

EXHIBIT VI
TABLE OF CONTENTS (Continued)

Sheet Number	State	Regression	Dependent Variable	Independent Variable(s)
63	Louisiana	Exponential	CPI-Indexed Medical Only Severity	Time
64	Louisiana	Exponential	Average Cost-Indexed Medical Only Severity	Time
65	Louisiana	Exponential	Medical Only-Indexed Fatal Medical Severity	Time
66	Louisiana	Exponential	Medical Only-Indexed Permanent Total Medical Severity	Time
67	Louisiana	Exponential	Medical Only-Indexed Major Permanent Partial Medical Severity	Time
68	Louisiana	Exponential	Medical Only-Indexed Minor Permanent Partial Medical Severity	Time
69	Louisiana	Exponential	Medical Only-Indexed Temporary Total Medical Severity	Time
70	Louisiana	Exponential	Medical Only-Indexed Serious Medical Severity	Time
71	Louisiana	Exponential	Medical Only-Indexed Non-Serious Medical Severity	Time
72	Louisiana	Exponential	Medical Only-Indexed Total Medical Severity	Time
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Exponential Regression of CPI-Indexed
Medical Only Severity on Time

FLORIDA

Policy Period	Medical Only Severity	CPI Index	Indexed Medical Only Severity	Predicted Indexed Medical Only Severity	Predicted Medical Only Severity
12/80 - 11/81	\$201.64	0.658	\$306.44	\$272.50	\$179.30
12/81 - 11/82	209.01	0.726	287.89	281.68	204.50
10/82 - 9/83	212.05	0.773	274.32	289.56	223.83
10/83 - 9/84	221.06	0.820	269.59	299.32	245.44
10/84 - 9/85	236.58	0.874	270.69	309.40	270.42
10/85 - 9/86	302.17	0.938	322.14	319.83	300.00
10/86 - 9/87	382.55	1.000	382.55	330.60	330.60
				R ² =	0.809

Exponential Regression of Average Cost-Indexed
Medical Only Severity on Time

FLORIDA

Policy Period	Medical Only Severity	Average Cost Index	Indexed Medical Only Severity	Predicted Indexed Medical Only Severity	Predicted Medical Only Severity
12/80 - 11/81	\$201.64	0.550	\$366.62	\$323.96	\$178.18
12/81 - 11/82	209.01	0.630	331.76	324.95	204.72
10/82 - 9/83	212.05	0.689	307.76	325.77	224.46
10/83 - 9/84	221.06	0.756	292.41	326.77	247.03
10/84 - 9/85	236.58	0.827	286.07	327.76	271.06
10/85 - 9/86	302.17	0.909	332.42	328.76	298.84
10/86 - 9/87	382.55	1.000	382.55	329.76	329.76
				R ² =	0.799

Exponential Regression of Medical Only-Indexed
Fatal Medical Severity on Time

FLORIDA

Policy Period	Fatal Severity	Medical Only Index	Indexed Fatal Severity	Predicted Indexed Fatal Severity	Predicted Fatal Severity
12/80 - 11/81	\$8,053.71	0.527	\$15,282.18	\$26,264.51	\$13,841.40
12/81 - 11/82	22,074.65	0.546	40,429.76	25,453.23	13,897.47
10/82 - 9/83	15,648.23	0.554	28,245.90	24,796.35	13,737.18
10/83 - 9/84	12,131.10	0.578	20,988.06	24,030.42	13,889.58
10/84 - 9/85	18,255.32	0.618	29,539.35	23,288.15	14,392.08
10/85 - 9/86	24,848.99	0.790	31,454.42	22,568.81	17,829.36
10/86 - 9/87	13,455.21	1.000	13,455.21	21,871.69	21,871.69
				R ² =	-0.186

Exponential Regression of Medical Only-Indexed
Permanent Total Medical Severity on Time

FLORIDA

Policy Period	Permanent Total Severity	Medical Only Index	Indexed Permanent Total Severity	Predicted Indexed Permanent Total Severity	Predicted Permanent Total Severity
12/80 - 11/81	\$153,464.99	0.527	\$291,204.91	\$333,385.85	\$175,694.34
12/81 - 11/82	160,127.09	0.546	293,273.06	298,540.11	163,002.90
10/82 - 9/83	159,165.59	0.554	287,302.51	272,300.83	150,854.66
10/83 - 9/84	138,194.42	0.578	239,090.69	243,839.74	140,939.37
10/84 - 9/85	173,333.11	0.618	280,474.29	218,353.43	134,942.42
10/85 - 9/86	192,266.58	0.790	243,375.42	195,530.97	154,469.47
10/86 - 9/87	123,369.34	1.000	123,369.34	175,093.93	175,093.93
				R ² =	-1.037

Exponential Regression of Medical Only-Indexed
Major Permanent Partial Medical Severity on Time

FLORIDA

Policy Period	Major Permanent Partial Severity	Medical Only Index	Indexed Major Permanent Partial Severity	Predicted Indexed Major Permanent Partial Severity	Predicted Major Permanent Partial Severity
12/80 - 11/81	\$39,396.97	0.527	\$74,757.06	\$82,604.21	\$43,532.42
12/81 - 11/82	37,836.86	0.546	69,298.28	71,673.92	39,133.96
10/82 - 9/83	36,588.97	0.554	66,045.07	63,678.61	35,277.95
10/83 - 9/84	34,251.56	0.578	59,258.75	55,252.58	31,935.99
10/84 - 9/85	34,527.26	0.618	55,869.35	47,941.49	29,627.84
10/85 - 9/86	35,712.05	0.790	45,205.13	41,597.81	32,862.27
10/86 - 9/87	29,281.41	1.000	29,281.41	36,093.54	36,093.54
				R ² =	-0.659

Exponential Regression of Medical Only-Indexed
Minor Permanent Partial Medical Severity on Time

FLORIDA

Policy Period	Minor Permanent Partial Severity	Medical Only Index	Indexed Minor Permanent Partial Severity	Predicted Indexed Minor Permanent Partial Severity	Predicted Minor Permanent Partial Severity
12/80 - 11/81	\$6,735.30	0.527	\$12,780.46	\$11,513.93	\$6,067.84
12/81 - 11/82	6,772.29	0.546	12,403.46	11,101.73	6,061.54
10/82 - 9/83	5,731.46	0.554	10,345.60	10,769.53	5,966.32
10/83 - 9/84	4,800.86	0.578	8,305.99	10,383.98	6,001.94
10/84 - 9/85	5,202.83	0.618	8,418.82	10,012.23	6,187.56
10/85 - 9/86	7,878.54	0.790	9,972.84	9,653.79	7,626.50
10/86 - 9/87	11,245.07	1.000	11,245.07	9,308.19	9,308.19
				R ² =	0.746

Exponential Regression of Medical Only-Indexed
Temporary Total Medical Severity on Time

FLORIDA

Policy Period	Temporary Total Severity	Medical Only Index	Indexed Temporary Total Severity	Predicted Indexed Temporary Total Severity	Predicted Temporary Total Severity
12/80 - 11/81	\$1,858.26	0.527	\$3,526.11	\$3,434.58	\$1,810.02
12/81 - 11/82	1,930.60	0.546	3,535.90	3,422.19	1,868.52
10/82 - 9/83	1,889.30	0.554	3,410.29	3,411.90	1,890.19
10/83 - 9/84	1,877.01	0.578	3,247.42	3,399.59	1,964.96
10/84 - 9/85	1,952.36	0.618	3,159.16	3,387.32	2,093.37
10/85 - 9/86	2,580.63	0.790	3,266.62	3,375.10	2,666.33
10/86 - 9/87	3,678.46	1.000	3,678.46	3,362.93	3,362.93
				R ² =	0.949

Exponential Regression of Medical Only-Indexed
Serious Medical Severity on Time

FLORIDA

Policy Period	Serious Severity	Medical Only Index	Indexed Serious Severity	Predicted Indexed Serious Severity	Predicted Serious Severity
12/80 - 11/81	\$42,476.81	0.527	\$80,601.16	\$91,441.82	\$48,189.84
12/81 - 11/82	42,050.89	0.546	77,016.28	79,312.89	43,304.84
10/82 - 9/83	40,694.99	0.554	73,456.66	70,443.81	39,025.87
10/83 - 9/84	37,632.57	0.578	65,108.25	61,100.08	35,315.84
10/84 - 9/85	40,325.48	0.618	65,251.59	52,995.70	32,751.34
10/85 - 9/86	40,289.94	0.790	50,999.92	45,966.30	36,313.38
10/86 - 9/87	30,686.00	1.000	30,686.00	39,869.28	39,869.28
				R ² =	-1.029

Exponential Regression of Medical Only-Indexed
Non-Serious Medical Severity on Time

FLORIDA

Policy Period	Non-Serious Severity	Medical Only Index	Indexed Non-Serious Severity	Predicted Indexed Non-Serious Severity	Predicted Non-Serious Severity
12/80 - 11/81	\$2,137.23	0.527	\$4,055.46	\$3,916.73	\$2,064.11
12/81 - 11/82	2,211.88	0.546	4,051.06	3,892.79	2,125.46
10/82 - 9/83	2,129.07	0.554	3,843.09	3,872.95	2,145.62
10/83 - 9/84	2,101.19	0.578	3,635.28	3,849.28	2,224.89
10/84 - 9/85	2,187.51	0.618	3,539.66	3,825.76	2,364.32
10/85 - 9/86	2,892.86	0.790	3,661.85	3,802.38	3,003.88
10/86 - 9/87	4,200.31	1.000	4,200.31	3,779.14	3,779.14
				R ² =	0.931

Exponential Regression of Medical Only-Indexed
Total Medical Severity on Time

FLORIDA

Policy Period	Total Severity	Medical Only Index	Indexed Total Severity	Predicted Indexed Total Severity	Predicted Total Severity
12/80 - 11/81	\$1,136.27	0.527	\$2,156.11	\$2,220.92	\$1,170.42
12/81 - 11/82	1,221.95	0.546	2,238.00	2,265.61	1,237.02
10/82 - 9/83	1,310.01	0.554	2,364.64	2,303.54	1,276.16
10/83 - 9/84	1,354.11	0.578	2,342.75	2,349.89	1,358.24
10/84 - 9/85	1,562.05	0.618	2,527.59	2,397.18	1,481.45
10/85 - 9/86	1,991.67	0.790	2,521.10	2,445.41	1,931.88
10/86 - 9/87	2,338.29	1.000	2,338.29	2,494.62	2,494.62
				R ² =	0.969

Exponential Regression of CPI-Indexed
Total Medical Severity on Time

FLORIDA

Policy Period	Total Severity	CPI Index	Indexed Total Severity	Predicted Indexed Total Severity	Predicted Total Severity
12/80 - 11/81	\$1,136.27	0.658	\$1,726.85	\$1,581.28	\$1,040.48
12/81 - 11/82	1,221.95	0.726	1,683.13	1,667.57	1,210.66
10/82 - 9/83	1,310.01	0.773	1,694.71	1,743.06	1,347.39
10/83 - 9/84	1,354.11	0.820	1,651.35	1,838.18	1,507.31
10/84 - 9/85	1,562.05	0.874	1,787.24	1,938.48	1,694.23
10/85 - 9/86	1,991.67	0.938	2,123.32	2,044.26	1,917.52
10/86 - 9/87	2,338.29	1.000	2,338.29	2,155.81	2,155.81
				R ² =	0.924

Exponential Regression of Average Cost-Indexed
 Total Medical Severity on Time

FLORIDA

Policy Period	Total Severity	Average Cost Index	Indexed Total Severity	Predicted Indexed Total Severity	Predicted Total Severity
12/80 - 11/81	\$1,136.27	0.550	\$2,065.95	\$1,879.94	\$1,033.97
12/81 - 11/82	1,221.95	0.630	1,939.60	1,923.75	1,211.96
10/82 - 9/83	1,310.01	0.689	1,901.32	1,961.03	1,351.15
10/83 - 9/84	1,354.11	0.756	1,791.15	2,006.73	1,517.09
10/84 - 9/85	1,562.05	0.827	1,888.81	2,053.49	1,698.24
10/85 - 9/86	1,991.67	0.909	2,191.06	2,101.35	1,910.12
10/86 - 9/87	2,338.29	1.000	2,338.29	2,150.31	2,150.31
				R ² =	0.917

Regression of Medical Only Frequency x 1000
on Time and Unemployment Rate

FLORIDA

Policy Period	Time	Unemployment Rate	Medical Only Frequency	Predicted Medical Only Frequency
12/80 - 11/81	0.167	7.40%	2.0969	2.1886
12/81 - 11/82	1.167	8.40%	1.9447	1.9330
10/82 - 9/83	2.000	7.90%	1.8408	1.8464
10/83 - 9/84	3.000	6.30%	1.9535	1.8373
10/84 - 9/85	4.000	5.90%	1.8077	1.7144
10/85 - 9/86	5.000	5.60%	1.5468	1.5820
10/86 - 9/87	6.000	5.20%	1.3703	1.4592
			R ² =	0.896

Regression of Fatal Frequency x 1000
on Time and Unemployment Rate

FLORIDA

Policy Period	Time	Unemployment Rate	Fatal Frequency	Predicted Fatal Frequency
12/80 - 11/81	0.167	7.40%	0.001732	0.001586
12/81 - 11/82	1.167	8.40%	0.001462	0.001399
10/82 - 9/83	2.000	7.90%	0.001349	0.001433
10/83 - 9/84	3.000	6.30%	0.001467	0.001616
10/84 - 9/85	4.000	5.90%	0.001465	0.001628
10/85 - 9/86	5.000	5.60%	0.001580	0.001626
10/86 - 9/87	6.000	5.20%	0.001873	0.001638
			R ² =	0.307

Regression of Permanent Total Frequency x 1000
on Time and Unemployment Rate

FLORIDA

Policy Period	Time	Unemployment Rate	Permanent Total Frequency	Predicted Permanent Total Frequency
12/80 - 11/81	0.167	7.40%	0.001490	0.001804
12/81 - 11/82	1.167	8.40%	0.001528	0.001559
10/82 - 9/83	2.000	7.90%	0.001677	0.001608
10/83 - 9/84	3.000	6.30%	0.002020	0.001857
10/84 - 9/85	4.000	5.90%	0.002494	0.001878
10/85 - 9/86	5.000	5.60%	0.001875	0.001880
10/86 - 9/87	6.000	5.20%	0.001406	0.001901
			R ² =	0.137

Regression of Major Permanent Partial Frequency x 1000
 on Time and Unemployment Rate

FLORIDA

Policy Period	Time	Unemployment Rate	Major Permanent Partial Frequency	Predicted Major Permanent Partial Frequency
12/80 - 11/81	0.167	7.40%	0.0343	0.0329
12/81 - 11/82	1.167	8.40%	0.0359	0.0355
10/82 - 9/83	2.000	7.90%	0.0402	0.0406
10/83 - 9/84	3.000	6.30%	0.0490	0.0488
10/84 - 9/85	4.000	5.90%	0.0516	0.0545
10/85 - 9/86	5.000	5.60%	0.0569	0.0599
10/86 - 9/87	6.000	5.20%	0.0698	0.0655
			R ² =	0.961

Regression of Serious Frequency x 1000
on Time and Unemployment Rate

FLORIDA

Policy Period	Time	Unemployment Rate	Serious Frequency	Predicted Serious Frequency
12/80 - 11/81	0.167	7.40%	0.0375	0.0363
12/81 - 11/82	1.167	8.40%	0.0389	0.0385
10/82 - 9/83	2.000	7.90%	0.0432	0.0436
10/83 - 9/84	3.000	6.30%	0.0525	0.0523
10/84 - 9/85	4.000	5.90%	0.0556	0.0580
10/85 - 9/86	5.000	5.60%	0.0604	0.0634
10/86 - 9/87	6.000	5.20%	0.0731	0.0691
			R ² =	0.967

Regression of Minor Permanent Partial Frequency x 1000
on Time and Unemployment Rate

FLORIDA

Policy Period	Time	Unemployment Rate	Minor Permanent Partial Frequency	Predicted Minor Permanent Partial Frequency
12/80 - 11/81	0.167	7.40%	0.0233	0.0269
12/81 - 11/82	1.167	8.40%	0.0225	0.0232
10/82 - 9/83	2.000	7.90%	0.0244	0.0232
10/83 - 9/84	3.000	6.30%	0.0317	0.0255
10/84 - 9/85	4.000	5.90%	0.0279	0.0250
10/85 - 9/86	5.000	5.60%	0.0197	0.0243
10/86 - 9/87	6.000	5.20%	0.0225	0.0238
			R ² =	0.114

Regression of Temporary Total Frequency x 1000
 on Time and Unemployment Rate

FLORIDA

Policy Period	Time	Unemployment Rate	Temporary Total Frequency	Predicted Temporary Total Frequency
12/80 - 11/81	0.167	7.40%	0.3839	0.3992
12/81 - 11/82	1.167	8.40%	0.3646	0.3695
10/82 - 9/83	2.000	7.90%	0.3666	0.3594
10/83 - 9/84	3.000	6.30%	0.3816	0.3582
10/84 - 9/85	4.000	5.90%	0.3581	0.3439
10/85 - 9/86	5.000	5.60%	0.3142	0.3284
10/86 - 9/87	6.000	5.20%	0.3038	0.3141
			R ² =	0.773

Regression of Non-Serious Frequency x 1000
on Time and Unemployment Rate

FLORIDA

Policy Period	Time	Unemployment Rate	Non-Serious Frequency	Predicted Non-Serious Frequency
12/80 - 11/81	0.167	7.40%	0.4071	0.4261
12/81 - 11/82	1.167	8.40%	0.3871	0.3927
10/82 - 9/83	2.000	7.90%	0.3910	0.3826
10/83 - 9/84	3.000	6.30%	0.4133	0.3837
10/84 - 9/85	4.000	5.90%	0.3860	0.3689
10/85 - 9/86	5.000	5.60%	0.3339	0.3528
10/86 - 9/87	6.000	5.20%	0.3263	0.3380
			R ² =	0.698

Exponential Regression of SAWW-Indexed
Fatal Indemnity Severity on Time

FLORIDA

Policy Period	Fatal Severity	SAWW Index	Indexed Fatal Severity	Predicted Indexed Fatal Severity	Predicted Fatal Severity
12/80 - 11/81	\$91,913.48	0.756	\$121,578.68	\$105,440.91	\$79,713.33
12/81 - 11/82	85,673.78	0.805	106,427.06	107,644.84	86,654.10
10/82 - 9/83	87,592.91	0.835	104,901.69	109,516.60	91,446.36
10/83 - 9/84	85,405.59	0.870	98,167.35	111,805.72	97,270.98
10/84 - 9/85	94,254.12	0.912	103,348.82	114,142.69	104,098.13
10/85 - 9/86	109,329.16	0.952	114,841.55	116,528.50	110,935.13
10/86 - 9/87	139,052.66	1.000	139,052.66	118,964.19	118,964.19
				R ² =	0.645

Exponential Regression of SAWW-Indexed
 Permanent Total Indemnity Severity on Time

FLORIDA

Policy Period	Permanent Total Severity	SAWW Index	Indexed Permanent Total Severity	Predicted Indexed Permanent Total Severity	Predicted Permanent Total Severity
12/80 - 11/81	\$268,716.92	0.756	\$355,445.66	\$348,567.85	\$263,517.30
12/81 - 11/82	267,676.15	0.805	332,516.96	324,183.37	260,967.61
10/82 - 9/83	284,432.74	0.835	340,638.01	305,171.21	254,817.96
10/83 - 9/84	218,734.53	0.870	251,419.00	283,822.60	246,925.66
10/84 - 9/85	206,731.87	0.912	226,679.68	263,967.45	240,738.31
10/85 - 9/86	231,811.84	0.952	243,499.83	245,501.29	233,717.23
10/86 - 9/87	259,203.25	1.000	259,203.25	228,326.95	228,326.95
				R ² =	0.242

Exponential Regression of SAWW-Indexed
Major Permanent Partial Indemnity Severity on Time

FLORIDA

Policy Period	Major Permanent Partial Severity	SAWW Index	Indexed Major Permanent Partial Severity	Predicted Indexed Major Permanent Partial Severity	Predicted Major Permanent Partial Severity
12/80 - 11/81	\$58,060.96	0.756	\$76,800.21	\$73,509.25	\$55,572.99
12/81 - 11/82	60,167.09	0.805	74,741.72	74,657.38	60,099.19
10/82 - 9/83	61,286.99	0.835	73,397.59	75,627.84	63,149.24
10/83 - 9/84	64,770.89	0.870	74,449.30	76,809.06	66,823.88
10/84 - 9/85	68,876.68	0.912	75,522.68	78,008.72	71,143.96
10/85 - 9/86	76,731.67	0.952	80,600.50	79,227.13	75,424.23
10/86 - 9/87	83,032.39	1.000	83,032.39	80,464.57	80,464.57
				R ² =	0.947

Exponential Regression of SAWW-Indexed
Serious Indemnity Severity on Time

FLORIDA

Policy Period	Serious Severity	SAWW Index	Indexed Serious Severity	Predicted Indexed Serious Severity	Predicted Serious Severity
12/80 - 11/81	\$67,980.28	0.756	\$89,921.00	\$86,352.20	\$65,282.26
12/81 - 11/82	69,284.07	0.805	86,067.16	86,122.82	69,328.87
10/82 - 9/83	70,773.95	0.835	84,759.22	85,932.14	71,753.34
10/83 - 9/84	71,270.89	0.870	81,920.56	85,703.88	74,562.37
10/84 - 9/85	75,729.99	0.912	83,037.27	85,476.22	77,954.31
10/85 - 9/86	82,400.69	0.952	86,555.35	85,249.17	81,157.21
10/86 - 9/87	87,856.26	1.000	87,856.26	85,022.72	85,022.72
				R ² =	0.899

Exponential Regression of SAWW-Indexed
Minor Permanent Partial Indemnity Severity on Time

FLORIDA

Policy Period	Minor Permanent Partial Severity	SAWW Index	Indexed Minor Permanent Partial Severity	Predicted Indexed Minor Permanent Partial Severity	Predicted Minor Permanent Partial Severity
12/80 - 11/81	\$4,707.82	0.756	\$6,227.27	\$5,278.02	\$3,990.18
12/81 - 11/82	4,712.76	0.805	5,854.36	5,327.82	4,288.90
10/82 - 9/83	4,126.51	0.835	4,941.93	5,369.69	4,483.69
10/83 - 9/84	3,575.44	0.870	4,109.70	5,420.36	4,715.71
10/84 - 9/85	4,087.58	0.912	4,482.00	5,471.51	4,990.02
10/85 - 9/86	6,055.38	0.952	6,360.70	5,523.14	5,258.03
10/86 - 9/87	6,532.75	1.000	6,532.75	5,575.26	5,575.26
				R ² =	0.363

Exponential Regression of SAWW-Indexed
Temporary Total Indemnity Severity on Time

FLORIDA

Policy Period	Temporary Total Severity	SAWW Index	Indexed Temporary Total Severity	Predicted Indexed Temporary Total Severity	Predicted Temporary Total Severity
12/80 - 11/81	\$1,079.48	0.756	\$1,427.88	\$1,367.34	\$1,033.71
12/81 - 11/82	1,153.87	0.805	1,433.38	1,404.28	1,130.44
10/82 - 9/83	1,170.96	0.835	1,402.34	1,435.81	1,198.90
10/83 - 9/84	1,200.05	0.870	1,379.37	1,474.60	1,282.90
10/84 - 9/85	1,318.02	0.912	1,445.20	1,514.43	1,381.16
10/85 - 9/86	1,535.46	0.952	1,612.88	1,555.33	1,480.68
10/86 - 9/87	1,657.49	1.000	1,657.49	1,597.34	1,597.34
				R ² =	0.925

Exponential Regression of SAWW-Indexed
Non-Serious Indemnity Severity on Time

FLORIDA

Policy Period	Non-Serious Severity	SAWW Index	Indexed Non-Serious Severity	Predicted Indexed Non-Serious Severity	Predicted Non-Serious Severity
12/80 - 11/81	\$1,287.02	0.756	\$1,702.41	\$1,600.55	\$1,210.02
12/81 - 11/82	1,360.63	0.805	1,690.22	1,644.77	1,324.04
10/82 - 9/83	1,355.40	0.835	1,623.23	1,682.55	1,404.93
10/83 - 9/84	1,382.18	0.870	1,588.71	1,729.03	1,504.26
10/84 - 9/85	1,518.38	0.912	1,664.90	1,776.80	1,620.44
10/85 - 9/86	1,801.84	0.952	1,892.69	1,825.88	1,738.24
10/86 - 9/87	1,993.72	1.000	1,993.72	1,876.33	1,876.33
				R ² =	0.877

Regression of Total Indemnity Frequency x 1000
on Unemployment Rate

FLORIDA

Policy Period	Unemployment Rate	Total Indemnity Frequency	Predicted Total Indemnity Frequency
12/80 - 11/81	7.40%	0.4447	0.4350
12/81 - 11/82	8.40%	0.4259	0.4427
10/82 - 9/83	7.90%	0.4342	0.4389
10/83 - 9/84	6.30%	0.4658	0.4265
10/84 - 9/85	5.90%	0.4416	0.4235
10/85 - 9/86	5.60%	0.3943	0.4212
10/86 - 9/87	5.20%	0.3994	0.4181
		R ² =	0.139

Regression of Total Frequency x 1000
on Unemployment Rate

FLORIDA

Policy Period	Unemployment Rate	Total Frequency	Predicted Total Frequency
12/80 - 11/81	7.40%	2.5416	2.3384
12/81 - 11/82	8.40%	2.3706	2.4956
10/82 - 9/83	7.90%	2.2750	2.4170
10/83 - 9/84	6.30%	2.4193	2.1654
10/84 - 9/85	5.90%	2.2494	2.1025
10/85 - 9/86	5.60%	1.9411	2.0553
10/86 - 9/87	5.20%	1.7697	1.9924
		R ² =	0.498

Regression of Non-Serious Indemnity Severity
on Unemployment Rate

FLORIDA

Policy Period	Unemployment Rate	Non-Serious Indemnity Severity	Predicted Non-Serious Indemnity Severity
12/80 - 11/81	7.40%	\$1,287.02	\$1,400.47
12/81 - 11/82	8.40%	1,360.63	1,224.80
10/82 - 9/83	7.90%	1,355.40	1,312.64
10/83 - 9/84	6.30%	1,382.18	1,593.70
10/84 - 9/85	5.90%	1,518.38	1,663.97
10/85 - 9/86	5.60%	1,801.84	1,716.67
10/86 - 9/87	5.20%	1,993.72	1,786.93
		R ² =	0.653

Exponential Regression of CPI-Indexed Total
Medical Severity on Indemnity Claims on Time

FLORIDA

Policy Period	Total Medical Severity	CPI Index	Indexed Total Medical Severity	Predicted Indexed Total Medical Severity	Predicted Total Medical Severity
12/80 - 11/81	\$5,543.43	0.658	\$8,424.67	\$7,796.14	\$5,129.86
12/81 - 11/82	5,846.91	0.726	8,053.60	7,949.38	5,771.25
10/82 - 9/83	5,964.94	0.773	7,716.61	8,079.38	6,245.36
10/83 - 9/84	6,106.40	0.820	7,446.83	8,238.18	6,755.31
10/84 - 9/85	6,987.57	0.874	7,994.93	8,400.11	7,341.70
10/85 - 9/86	8,619.91	0.938	9,189.67	8,565.22	8,034.18
10/86 - 9/87	9,048.63	1.000	9,048.63	8,733.57	8,733.57
				R ² =	0.897

Exponential Regression of CPI-Indexed
Medical Only Severity on Time

ILLINOIS

Policy Period	Medical Only Severity	CPI Index	Indexed Medical Only Severity	Predicted Indexed Medical Only Severity	Predicted Medical Only Severity
3/73 - 2/74	\$52.57	0.295	\$178.20	\$178.23	\$52.58
3/74 - 2/75	60.28	0.329	183.22	181.02	59.56
3/75 - 2/76	64.81	0.365	177.56	183.85	67.11
3/76 - 2/77	73.71	0.402	183.36	186.73	75.07
3/77 - 2/78	83.44	0.438	190.50	189.65	83.07
3/78 - 5/79	93.55	0.485	192.89	192.99	93.60
6/79 - 5/80	108.00	0.545	198.17	196.40	107.04
6/80 - 5/81	123.13	0.604	203.86	199.47	120.48
6/81 - 3/82	138.45	0.664	208.51	202.33	134.35
4/82 - 3/83	152.71	0.723	211.22	205.23	148.38
4/83 - 3/84	160.90	0.772	208.42	208.44	160.92
4/84 - 3/85	170.85	0.819	208.61	211.70	173.38
4/85 - 3/86	183.79	0.878	209.33	215.01	188.78
4/86 - 3/87	201.75	0.939	214.86	218.38	205.06
4/87 - 3/88	223.00	1.000	223.00	221.80	221.80
				R ² =	0.998

Exponential Regression of Average Cost-Indexed
Medical Only Severity on Time

ILLINOIS

Policy Period	Medical Only Severity	Average Cost Index	Indexed Medical Only Severity	Predicted Indexed Medical Only Severity	Predicted Medical Only Severity
3/73 - 2/74	\$52.57	0.227	\$231.59	\$218.98	\$49.71
3/74 - 2/75	60.28	0.269	224.09	218.85	58.87
3/75 - 2/76	64.81	0.290	223.48	218.73	63.43
3/76 - 2/77	73.71	0.346	213.03	218.61	75.64
3/77 - 2/78	83.44	0.403	207.05	218.49	88.05
3/78 - 5/79	93.55	0.462	202.49	218.36	100.88
6/79 - 5/80	108.00	0.490	220.41	218.22	106.93
6/80 - 5/81	123.13	0.558	220.66	218.10	121.70
6/81 - 3/82	138.45	0.633	218.72	217.99	137.99
4/82 - 3/83	152.71	0.698	218.78	217.88	152.08
4/83 - 3/84	160.90	0.750	214.53	217.76	163.32
4/84 - 3/85	170.85	0.788	216.81	217.64	171.50
4/85 - 3/86	183.79	0.843	218.02	217.52	183.37
4/86 - 3/87	201.75	0.914	220.73	217.40	198.70
4/87 - 3/88	223.00	1.000	223.00	217.28	217.28
				R ² =	0.997

Exponential Regression of Medical Only-Indexed
Fatal Medical Severity on Time

ILLINOIS

Policy Period	Fatal Severity	Medical Only Index	Indexed Fatal Severity	Predicted Indexed Fatal Severity	Predicted Fatal Severity
3/73 - 2/74	\$1,710.00	0.236	\$7,245.76	\$7,437.18	\$1,755.18
3/74 - 2/75	1,566.36	0.270	5,801.33	7,276.22	1,964.58
3/75 - 2/76	3,645.63	0.291	12,527.94	7,118.74	2,071.55
3/76 - 2/77	3,348.13	0.331	10,115.20	6,964.67	2,305.30
3/77 - 2/78	2,378.78	0.374	6,360.37	6,813.93	2,548.41
3/78 - 5/79	1,679.77	0.420	3,999.45	6,648.24	2,792.26
6/79 - 5/80	3,645.44	0.484	7,531.90	6,486.59	3,139.51
6/80 - 5/81	2,334.13	0.552	4,228.50	6,346.20	3,503.10
6/81 - 3/82	3,776.54	0.621	6,081.38	6,220.18	3,862.73
4/82 - 3/83	3,794.63	0.685	5,539.61	6,096.66	4,176.21
4/83 - 3/84	2,588.94	0.722	3,585.79	5,964.71	4,306.52
4/84 - 3/85	6,124.22	0.766	7,995.07	5,835.61	4,470.08
4/85 - 3/86	8,830.65	0.824	10,716.81	5,709.31	4,704.47
4/86 - 3/87	3,598.72	0.905	3,976.49	5,585.74	5,055.10
4/87 - 3/88	6,479.95	1.000	6,479.95	5,464.85	5,464.85

R² = 0.433

Exponential Regression of Medical Only-Indexed
Permanent Total Medical Severity on Time

ILLINOIS

Policy Period	Permanent Total Severity	Medical Only Index	Indexed Permanent Total Severity	Predicted Indexed Permanent Total Severity	Predicted Permanent Total Severity
3/73 - 2/74	\$22,011.63	0.236	\$93,269.62	\$87,332.58	\$20,610.49
3/74 - 2/75	24,302.45	0.270	90,009.07	87,425.07	23,604.77
3/75 - 2/76	18,569.50	0.291	63,812.71	87,517.66	25,467.64
3/76 - 2/77	31,279.45	0.331	94,499.85	87,610.35	28,999.03
3/77 - 2/78	23,420.43	0.374	62,621.47	87,703.13	32,800.97
3/78 - 5/79	41,480.57	0.420	98,763.26	87,807.64	36,879.21
6/79 - 5/80	61,211.03	0.484	126,469.07	87,912.26	42,549.54
6/80 - 5/81	53,475.97	0.552	96,876.76	88,005.37	48,578.96
6/81 - 3/82	66,011.42	0.621	106,298.58	88,090.80	54,704.39
4/82 - 3/83	70,405.43	0.685	102,781.65	88,176.32	60,400.78
4/83 - 3/84	47,153.17	0.722	65,309.10	88,269.70	63,730.73
4/84 - 3/85	73,948.84	0.766	96,538.96	88,363.19	67,686.20
4/85 - 3/86	57,703.58	0.824	70,028.62	88,456.77	72,888.38
4/86 - 3/87	83,222.17	0.905	91,958.20	88,550.45	80,138.16
4/87 - 3/88	86,225.27	1.000	86,225.27	88,644.23	88,644.23
				R ² =	0.822

Exponential Regression of Medical Only-Indexed
Major Permanent Partial Medical Severity on Time

ILLINOIS

Policy Period	Major Permanent Partial Severity	Medical Only Index	Indexed Major Permanent Partial Severity	Predicted Indexed Major Permanent Partial Severity	Predicted Major Permanent Partial Severity
3/73 - 2/74	\$4,400.89	0.236	\$18,647.84	\$18,694.72	\$4,411.95
3/74 - 2/75	4,949.04	0.270	18,329.78	18,802.60	5,076.70
3/75 - 2/76	5,138.36	0.291	17,657.59	18,911.11	5,503.13
3/76 - 2/77	6,411.80	0.331	19,371.00	19,020.24	6,295.70
3/77 - 2/78	7,386.76	0.374	19,750.70	19,130.00	7,154.62
3/78 - 5/79	8,394.87	0.420	19,987.79	19,254.24	8,086.78
6/79 - 5/80	9,526.62	0.484	19,683.10	19,379.29	9,379.58
6/80 - 5/81	11,245.57	0.552	20,372.41	19,491.12	10,759.10
6/81 - 3/82	12,113.73	0.621	19,506.81	19,594.21	12,168.00
4/82 - 3/83	13,571.67	0.685	19,812.66	19,697.83	13,493.02
4/83 - 3/84	14,365.54	0.722	19,896.87	19,811.51	14,303.91
4/84 - 3/85	14,391.03	0.766	18,787.25	19,925.83	15,263.19
4/85 - 3/86	16,408.55	0.824	19,913.29	20,040.82	16,513.64
4/86 - 3/87	19,825.62	0.905	21,906.76	20,156.48	18,241.61
4/87 - 3/88	18,817.39	1.000	18,817.39	20,272.79	20,272.79
				R ² =	0.983

Exponential Regression of Medical Only-Indexed
Minor Permanent Partial Medical Severity on Time

ILLINOIS

Policy Period	Minor Permanent Partial Severity	Medical Only Index	Indexed Minor Permanent Partial Severity	Predicted Indexed Minor Permanent Partial Severity	Predicted Minor Permanent Partial Severity
3/73 - 2/74	\$638.04	0.236	\$2,703.56	\$2,506.20	\$591.46
3/74 - 2/75	628.53	0.270	2,327.89	2,547.10	687.72
3/75 - 2/76	681.15	0.291	2,340.72	2,588.66	753.30
3/76 - 2/77	911.95	0.331	2,755.14	2,630.90	870.83
3/77 - 2/78	1,039.53	0.374	2,779.49	2,673.83	1,000.01
3/78 - 5/79	1,214.21	0.420	2,890.98	2,722.96	1,143.64
6/79 - 5/80	1,352.04	0.484	2,793.47	2,772.99	1,342.13
6/80 - 5/81	1,623.95	0.552	2,941.94	2,818.24	1,555.67
6/81 - 3/82	1,885.64	0.621	3,036.46	2,860.37	1,776.29
4/82 - 3/83	1,967.54	0.685	2,872.32	2,903.12	1,988.64
4/83 - 3/84	2,049.82	0.722	2,839.09	2,950.49	2,130.25
4/84 - 3/85	2,015.31	0.766	2,630.95	2,998.63	2,296.95
4/85 - 3/86	2,265.19	0.824	2,749.02	3,047.56	2,511.19
4/86 - 3/87	2,772.68	0.905	3,063.73	3,097.29	2,803.05
4/87 - 3/88	3,671.90	1.000	3,671.90	3,147.83	3,147.83

R² = 0.956

Exponential Regression of Medical Only-Indexed
Temporary Total Medical Severity on Time

ILLINOIS

Policy Period	Temporary Total Severity	Medical Only Index	Indexed Temporary Total Severity	Predicted Indexed Temporary Total Severity	Predicted Temporary Total Severity
3/73 - 2/74	\$342.15	0.236	\$1,449.79	\$1,206.52	\$284.74
3/74 - 2/75	347.24	0.270	1,286.07	1,231.70	332.56
3/75 - 2/76	358.40	0.291	1,231.62	1,257.40	365.90
3/76 - 2/77	417.97	0.331	1,262.75	1,283.65	424.89
3/77 - 2/78	465.66	0.374	1,245.08	1,310.44	490.10
3/78 - 5/79	519.70	0.420	1,237.38	1,341.24	563.32
6/79 - 5/80	595.85	0.484	1,231.10	1,372.78	664.42
6/80 - 5/81	738.73	0.552	1,338.28	1,401.43	773.59
6/81 - 3/82	854.89	0.621	1,376.63	1,428.21	886.92
4/82 - 3/83	1,012.68	0.685	1,478.36	1,455.51	997.03
4/83 - 3/84	1,040.16	0.722	1,440.66	1,485.89	1,072.81
4/84 - 3/85	1,121.39	0.766	1,463.96	1,516.90	1,161.95
4/85 - 3/86	1,282.28	0.824	1,556.17	1,548.56	1,276.01
4/86 - 3/87	1,499.04	0.905	1,656.40	1,580.88	1,430.70
4/87 - 3/88	1,843.69	1.000	1,843.69	1,613.87	1,613.87

R² = 0.975

Exponential Regression of Medical Only-Indexed
Serious Medical Severity on Time

ILLINOIS

Policy Period	Serious Severity	Medical Only Index	Indexed Serious Severity	Predicted Indexed Serious Severity	Predicted Serious Severity
3/73 - 2/74	\$4,590.44	0.236	\$19,451.02	\$19,910.56	\$4,698.89
3/74 - 2/75	5,157.29	0.270	19,101.07	19,969.58	5,391.79
3/75 - 2/76	5,500.86	0.291	18,903.30	20,028.78	5,828.38
3/76 - 2/77	7,095.28	0.331	21,435.89	20,088.16	6,649.18
3/77 - 2/78	7,666.38	0.374	20,498.34	20,147.71	7,535.24
3/78 - 5/79	8,596.77	0.420	20,468.50	20,214.91	8,490.26
6/79 - 5/80	10,186.99	0.484	21,047.50	20,282.34	9,816.65
6/80 - 5/81	11,726.05	0.552	21,242.84	20,342.47	11,229.04
6/81 - 3/82	12,656.93	0.621	20,381.53	20,397.74	12,667.00
4/82 - 3/83	14,405.97	0.685	21,030.61	20,453.17	14,010.42
4/83 - 3/84	14,575.96	0.722	20,188.31	20,513.80	14,810.96
4/84 - 3/85	15,150.84	0.766	19,779.16	20,574.61	15,760.15
4/85 - 3/86	16,913.38	0.824	20,525.95	20,635.60	17,003.74
4/86 - 3/87	20,219.35	0.905	22,341.82	20,696.78	18,730.58
4/87 - 3/88	18,931.27	1.000	18,931.27	20,758.13	20,758.13

R² = 0.981

Exponential Regression of Medical Only-Indexed
Non-Serious Medical Severity on Time

ILLINOIS

Policy Period	Non-Serious Severity	Medical Only Index	Indexed Non-Serious Severity	Predicted Indexed Non-Serious Severity	Predicted Non-Serious Severity
3/73 - 2/74	\$456.56	0.236	\$1,934.58	\$1,664.41	\$392.80
3/74 - 2/75	454.52	0.270	1,683.41	1,688.22	455.82
3/75 - 2/76	471.07	0.291	1,618.80	1,712.36	498.30
3/76 - 2/77	582.43	0.331	1,759.61	1,736.85	574.90
3/77 - 2/78	654.66	0.374	1,750.43	1,761.69	658.87
3/78 - 5/79	738.23	0.420	1,757.69	1,790.06	751.82
6/79 - 5/80	829.26	0.484	1,713.35	1,818.88	880.34
6/80 - 5/81	997.83	0.552	1,807.66	1,844.90	1,018.38
6/81 - 3/82	1,110.55	0.621	1,788.33	1,869.07	1,160.69
4/82 - 3/83	1,270.92	0.685	1,855.36	1,893.55	1,297.08
4/83 - 3/84	1,333.13	0.722	1,846.44	1,920.63	1,386.70
4/84 - 3/85	1,411.00	0.766	1,842.04	1,948.10	1,492.25
4/85 - 3/86	1,578.74	0.824	1,915.95	1,975.96	1,628.19
4/86 - 3/87	1,886.99	0.905	2,085.07	2,004.22	1,813.82
4/87 - 3/88	2,365.72	1.000	2,365.72	2,032.88	2,032.88

R² = 0.969

Exponential Regression of Medical Only-Indexed
Total Medical Severity on Time

ILLINOIS

Policy Period	Total Severity	Medical Only Index	Indexed Total Severity	Predicted Indexed Total Severity	Predicted Total Severity
3/73 - 2/74	\$162.83	0.236	\$689.97	\$788.20	\$186.01
3/74 - 2/75	199.58	0.270	739.19	814.71	219.97
3/75 - 2/76	257.64	0.291	885.36	842.11	245.06
3/76 - 2/77	311.75	0.331	941.84	870.44	288.12
3/77 - 2/78	346.99	0.374	927.79	899.72	336.50
3/78 - 5/79	424.77	0.420	1,011.35	933.84	392.21
6/79 - 5/80	505.49	0.484	1,044.41	969.25	469.12
6/80 - 5/81	572.71	0.552	1,037.51	1,001.86	553.03
6/81 - 3/82	621.33	0.621	1,000.53	1,032.71	641.31
4/82 - 3/83	757.83	0.685	1,106.33	1,064.51	729.19
4/83 - 3/84	790.63	0.722	1,095.06	1,100.32	794.43
4/84 - 3/85	830.27	0.766	1,083.90	1,137.33	871.19
4/85 - 3/86	950.21	0.824	1,153.16	1,175.59	968.68
4/86 - 3/87	1,118.53	0.905	1,235.94	1,215.13	1,099.70
4/87 - 3/88	1,170.71	1.000	1,170.71	1,256.01	1,256.01
				R ² =	0.990

Exponential Regression of CPI-Indexed
Total Medical Severity on Time

ILLINOIS

Policy Period	Total Severity	CPI Index	Indexed Total Severity	Predicted Indexed Total Severity	Predicted Total Severity
3/73 - 2/74	\$162.83	0.295	\$551.98	\$630.28	\$185.93
3/74 - 2/75	199.58	0.329	606.63	661.65	217.68
3/75 - 2/76	257.64	0.365	705.87	694.58	253.52
3/76 - 2/77	311.75	0.402	775.49	729.15	293.12
3/77 - 2/78	346.99	0.438	792.22	765.44	335.26
3/78 - 5/79	424.77	0.485	875.81	808.44	392.09
6/79 - 5/80	505.49	0.545	927.51	853.84	465.34
6/80 - 5/81	572.71	0.604	948.19	896.34	541.39
6/81 - 3/82	621.33	0.664	935.73	937.16	622.27
4/82 - 3/83	757.83	0.723	1,048.18	979.83	708.42
4/83 - 3/84	790.63	0.772	1,024.14	1,028.60	794.08
4/84 - 3/85	830.27	0.819	1,013.76	1,079.79	884.35
4/85 - 3/86	950.21	0.878	1,082.24	1,133.54	995.25
4/86 - 3/87	1,118.53	0.939	1,191.19	1,189.96	1,117.37
4/87 - 3/88	1,170.71	1.000	1,170.71	1,249.19	1,249.19
				R ² =	0.988

Exponential Regression of Average Cost-Indexed
Total Medical Severity on Time

ILLINOIS

Policy Period	Total Severity	Average Cost Index	Indexed Total Severity	Predicted Indexed Total Severity	Predicted Total Severity
3/73 - 2/74	\$162.83	0.227	\$717.33	\$774.36	\$175.78
3/74 - 2/75	199.58	0.269	741.94	799.93	215.18
3/75 - 2/76	257.64	0.290	888.42	826.35	239.64
3/76 - 2/77	311.75	0.346	901.01	853.65	295.36
3/77 - 2/78	346.99	0.403	861.02	881.84	355.38
3/78 - 5/79	424.77	0.462	919.41	914.68	422.58
6/79 - 5/80	505.49	0.490	1,031.62	948.73	464.88
6/80 - 5/81	572.71	0.558	1,026.35	980.07	546.88
6/81 - 3/82	621.33	0.633	981.56	1,009.70	639.14
4/82 - 3/83	757.83	0.698	1,085.72	1,040.23	726.08
4/83 - 3/84	790.63	0.750	1,054.18	1,074.59	805.94
4/84 - 3/85	830.27	0.788	1,053.64	1,110.08	874.74
4/85 - 3/86	950.21	0.843	1,127.17	1,146.75	966.71
4/86 - 3/87	1,118.53	0.914	1,223.77	1,184.62	1,082.74
4/87 - 3/88	1,170.71	1.000	1,170.71	1,223.75	1,223.75
				R ² =	0.992

Regression of Medical Only Frequency x 1000
on Time and Unemployment Rate

ILLINOIS

Policy Period	Time	Unemployment Rate	Medical Only Frequency	Predicted Medical Only Frequency
3/73 - 2/74	0.000	4.40%	2.0233	2.0588
3/74 - 2/75	1.000	6.20%	2.2851	1.9438
3/75 - 2/76	2.000	6.70%	1.7527	1.8718
3/76 - 2/77	3.000	6.30%	1.7247	1.8297
3/77 - 2/78	4.000	6.10%	1.7181	1.7809
3/78 - 5/79	5.125	5.90%	1.7101	1.7253
6/79 - 5/80	6.250	7.80%	1.5309	1.6000
6/80 - 5/81	7.250	8.70%	1.4735	1.5147
6/81 - 3/82	8.167	10.70%	1.4244	1.3977
4/82 - 3/83	9.083	11.30%	1.3071	1.3270
4/83 - 3/84	10.083	9.70%	1.3732	1.3247
4/84 - 3/85	11.083	9.00%	1.3158	1.2925
4/85 - 3/86	12.083	8.30%	1.2211	1.2603
4/86 - 3/87	13.083	7.60%	1.2150	1.2281
4/87 - 3/88	14.083	6.90%	1.2764	1.1959

R² = 0.877

Regression of Fatal Frequency x 1000
on Time and Unemployment Rate

ILLINOIS

Policy Period	Time	Unemployment Rate	Fatal Frequency	Predicted Fatal Frequency
3/73 - 2/74	0.000	4.40%	0.001870	0.002319
3/74 - 2/75	1.000	6.20%	0.002369	0.002118
3/75 - 2/76	2.000	6.70%	0.001945	0.002000
3/76 - 2/77	3.000	6.30%	0.002094	0.001939
3/77 - 2/78	4.000	6.10%	0.001825	0.001866
3/78 - 5/79	5.125	5.90%	0.002084	0.001782
6/79 - 5/80	6.250	7.80%	0.001756	0.001563
6/80 - 5/81	7.250	8.70%	0.001276	0.001420
6/81 - 3/82	8.167	10.70%	0.001119	0.001213
4/82 - 3/83	9.083	11.30%	0.001138	0.001095
4/83 - 3/84	10.083	9.70%	0.001078	0.001111
4/84 - 3/85	11.083	9.00%	0.001057	0.001070
4/85 - 3/86	12.083	8.30%	0.000896	0.001028
4/86 - 3/87	13.083	7.60%	0.000936	0.000987
4/87 - 3/88	14.083	6.90%	0.001015	0.000946
			R ² =	0.866

Regression of Permanent Total Frequency x 1000
on Time and Unemployment Rate

ILLINOIS

Policy Period	Time	Unemployment Rate	Permanent Total Frequency	Predicted Permanent Total Frequency
3/73 - 2/74	0.000	4.40%	0.000562	0.001053
3/74 - 2/75	1.000	6.20%	0.000851	0.001061
3/75 - 2/76	2.000	6.70%	0.001430	0.001026
3/76 - 2/77	3.000	6.30%	0.001356	0.000960
3/77 - 2/78	4.000	6.10%	0.001262	0.000901
3/78 - 5/79	5.125	5.90%	0.000713	0.000836
6/79 - 5/80	6.250	7.80%	0.000780	0.000841
6/80 - 5/81	7.250	8.70%	0.000744	0.000819
6/81 - 3/82	8.167	10.70%	0.000568	0.000838
4/82 - 3/83	9.083	11.30%	0.000817	0.000810
4/83 - 3/84	10.083	9.70%	0.000677	0.000704
4/84 - 3/85	11.083	9.00%	0.000706	0.000628
4/85 - 3/86	12.083	8.30%	0.000690	0.000553
4/86 - 3/87	13.083	7.60%	0.000500	0.000477
4/87 - 3/88	14.083	6.90%	0.000254	0.000401
			R ² =	0.400

Regression of Major Permanent Partial Frequency x 1000
on Time and Unemployment Rate

ILLINOIS

Policy Period	Time	Unemployment Rate	Major Permanent Partial Frequency	Predicted Major Permanent Partial Frequency
3/73 - 2/74	0.000	4.40%	0.0232	0.0340
3/74 - 2/75	1.000	6.20%	0.0374	0.0357
3/75 - 2/76	2.000	6.70%	0.0416	0.0364
3/76 - 2/77	3.000	6.30%	0.0365	0.0365
3/77 - 2/78	4.000	6.10%	0.0366	0.0368
3/78 - 5/79	5.125	5.90%	0.0447	0.0370
6/79 - 5/80	6.250	7.80%	0.0429	0.0389
6/80 - 5/81	7.250	8.70%	0.0397	0.0399
6/81 - 3/82	8.167	10.70%	0.0375	0.0417
4/82 - 3/83	9.083	11.30%	0.0403	0.0425
4/83 - 3/84	10.083	9.70%	0.0434	0.0417
4/84 - 3/85	11.083	9.00%	0.0421	0.0416
4/85 - 3/86	12.083	8.30%	0.0414	0.0414
4/86 - 3/87	13.083	7.60%	0.0405	0.0413
4/87 - 3/88	14.083	6.90%	0.0390	0.0412
			R ² =	0.299

Regression of Serious Frequency x 1000
on Time and Unemployment Rate

ILLINOIS

Policy Period	Time	Unemployment Rate	Serious Frequency	Predicted Serious Frequency
3/73 - 2/74	0.000	4.40%	0.0256	0.0374
3/74 - 2/75	1.000	6.20%	0.0406	0.0389
3/75 - 2/76	2.000	6.70%	0.0450	0.0395
3/76 - 2/77	3.000	6.30%	0.0399	0.0394
3/77 - 2/78	4.000	6.10%	0.0397	0.0395
3/78 - 5/79	5.125	5.90%	0.0475	0.0397
6/79 - 5/80	6.250	7.80%	0.0454	0.0413
6/80 - 5/81	7.250	8.70%	0.0417	0.0421
6/81 - 3/82	8.167	10.70%	0.0392	0.0438
4/82 - 3/83	9.083	11.30%	0.0423	0.0444
4/83 - 3/84	10.083	9.70%	0.0451	0.0435
4/84 - 3/85	11.083	9.00%	0.0439	0.0433
4/85 - 3/86	12.083	8.30%	0.0430	0.0430
4/86 - 3/87	13.083	7.60%	0.0419	0.0428
4/87 - 3/88	14.083	6.90%	0.0402	0.0425
			R ² =	0.188

Regression of Minor Permanent Partial Frequency x 1000
on Time and Unemployment Rate

ILLINOIS

Policy Period	Time	Unemployment Rate	Minor Permanent Partial Frequency	Predicted Minor Permanent Partial Frequency
3/73 - 2/74	0.000	4.40%	0.1442	0.1818
3/74 - 2/75	1.000	6.20%	0.1749	0.1695
3/75 - 2/76	2.000	6.70%	0.1670	0.1639
3/76 - 2/77	3.000	6.30%	0.1717	0.1631
3/77 - 2/78	4.000	6.10%	0.1739	0.1612
3/78 - 5/79	5.125	5.90%	0.1792	0.1589
6/79 - 5/80	6.250	7.80%	0.1612	0.1457
6/80 - 5/81	7.250	8.70%	0.1360	0.1380
6/81 - 3/82	8.167	10.70%	0.1098	0.1249
4/82 - 3/83	9.083	11.30%	0.1126	0.1191
4/83 - 3/84	10.083	9.70%	0.1297	0.1245
4/84 - 3/85	11.083	9.00%	0.1335	0.1252
4/85 - 3/86	12.083	8.30%	0.1200	0.1259
4/86 - 3/87	13.083	7.60%	0.1240	0.1267
4/87 - 3/88	14.083	6.90%	0.1183	0.1274
			R ² =	0.680

Regression of Temporary Total Frequency x 1000
on Time and Unemployment Rate

ILLINOIS

Policy Period	Time	Unemployment Rate	Temporary Total Frequency	Predicted Temporary Total Frequency
3/73 - 2/74	0.000	4.40%	0.2288	0.3125
3/74 - 2/75	1.000	6.20%	0.2837	0.3182
3/75 - 2/76	2.000	6.70%	0.3113	0.3184
3/76 - 2/77	3.000	6.30%	0.3439	0.3147
3/77 - 2/78	4.000	6.10%	0.3541	0.3119
3/78 - 5/79	5.125	5.90%	0.3903	0.3089
6/79 - 5/80	6.250	7.80%	0.3610	0.3148
6/80 - 5/81	7.250	8.70%	0.3286	0.3166
6/81 - 3/82	8.167	10.70%	0.3329	0.3233
4/82 - 3/83	9.083	11.30%	0.3038	0.3241
4/83 - 3/84	10.083	9.70%	0.3172	0.3153
4/84 - 3/85	11.083	9.00%	0.2786	0.3104
4/85 - 3/86	12.083	8.30%	0.2778	0.3055
4/86 - 3/87	13.083	7.60%	0.2830	0.3006
4/87 - 3/88	14.083	6.90%	0.2960	0.2957
			R ² =	0.036

Regression of Non-Serious Frequency x 1000
on Time and Unemployment Rate

ILLINOIS

Policy Period	Time	Unemployment Rate	Non-Serious Frequency	Predicted Non-Serious Frequency
3/73 - 2/74	0.000	4.40%	0.3730	0.4944
3/74 - 2/75	1.000	6.20%	0.4587	0.4877
3/75 - 2/76	2.000	6.70%	0.4782	0.4823
3/76 - 2/77	3.000	6.30%	0.5156	0.4778
3/77 - 2/78	4.000	6.10%	0.5280	0.4731
3/78 - 5/79	5.125	5.90%	0.5695	0.4678
6/79 - 5/80	6.250	7.80%	0.5222	0.4605
6/80 - 5/81	7.250	8.70%	0.4645	0.4547
6/81 - 3/82	8.167	10.70%	0.4428	0.4482
4/82 - 3/83	9.083	11.30%	0.4164	0.4431
4/83 - 3/84	10.083	9.70%	0.4468	0.4398
4/84 - 3/85	11.083	9.00%	0.4121	0.4357
4/85 - 3/86	12.083	8.30%	0.3978	0.4315
4/86 - 3/87	13.083	7.60%	0.4070	0.4273
4/87 - 3/88	14.083	6.90%	0.4143	0.4231
			R ² =	0.168

Exponential Regression of SAWW-Indexed
Fatal Indemnity Severity on Time

ILLINOIS

Policy Period	Fatal Severity	SAWW Index	Indexed Fatal Severity	Predicted Indexed Fatal Severity	Predicted Fatal Severity
3/73 - 2/74	\$113,957.48	0.450	\$253,238.84	\$224,017.06	\$100,807.68
3/74 - 2/75	147,332.03	0.493	298,847.93	218,103.54	107,525.05
3/75 - 2/76	113,932.75	0.526	216,602.19	212,346.13	111,694.07
3/76 - 2/77	96,849.61	0.559	173,255.12	206,740.71	115,568.05
3/77 - 2/78	120,752.50	0.607	198,933.28	201,283.25	122,178.93
3/78 - 5/79	137,343.16	0.666	206,220.96	195,315.62	130,080.20
6/79 - 5/80	118,840.37	0.725	163,917.75	189,524.92	137,405.56
6/80 - 5/81	115,139.90	0.776	148,376.16	184,521.91	143,189.01
6/81 - 3/82	121,301.31	0.816	148,653.57	180,051.93	146,922.38
4/82 - 3/83	121,304.09	0.861	140,887.44	175,690.23	151,269.29
4/83 - 3/84	147,680.97	0.883	167,249.12	171,052.43	151,039.30
4/84 - 3/85	153,070.21	0.889	172,182.46	166,537.06	148,051.45
4/85 - 3/86	162,818.33	0.925	176,019.82	162,140.88	149,980.32
4/86 - 3/87	184,359.86	0.963	191,443.26	157,860.75	152,019.90
4/87 - 3/88	181,517.80	1.000	181,517.80	153,693.61	153,693.61

R² = 0.283

Exponential Regression of SAWW-Indexed
Permanent Total Indemnity Severity on Time

ILLINOIS

Policy Period	Permanent Total Severity	SAWW Index	Indexed Permanent Total Severity	Predicted Indexed Permanent Total Severity	Predicted Permanent Total Severity
3/73 - 2/74	\$167,484.83	0.450	\$372,188.51	\$280,619.21	\$126,278.65
3/74 - 2/75	152,500.39	0.493	309,331.42	275,526.71	135,834.67
3/75 - 2/76	108,266.42	0.526	205,829.70	270,526.63	142,297.01
3/76 - 2/77	111,975.08	0.559	200,313.20	265,617.29	148,480.06
3/77 - 2/78	136,080.73	0.607	224,185.72	260,797.03	158,303.80
3/78 - 5/79	172,043.58	0.666	258,323.69	255,478.73	170,148.83
6/79 - 5/80	228,057.00	0.725	314,561.38	250,268.88	181,444.94
6/80 - 5/81	216,591.46	0.776	279,112.71	245,727.16	190,684.28
6/81 - 3/82	213,543.66	0.816	261,695.66	241,636.36	197,175.27
4/82 - 3/83	188,152.86	0.861	218,528.29	237,613.66	204,585.36
4/83 - 3/84	186,801.84	0.883	211,553.61	233,301.59	206,005.31
4/84 - 3/85	212,849.14	0.889	239,425.35	229,067.79	203,641.26
4/85 - 3/86	204,666.48	0.925	221,261.06	224,910.81	208,042.50
4/86 - 3/87	200,589.85	0.963	208,296.83	220,829.27	212,658.59
4/87 - 3/88	233,456.50	1.000	233,456.50	216,821.80	216,821.80

R² = 0.589

Exponential Regression of SAWW-Indexed
Major Permanent Partial Indemnity Severity on Time

ILLINOIS

Policy Period	Major Permanent Partial Severity	SAWW Index	Indexed Major Permanent Partial Severity	Predicted Indexed Major Permanent Partial Severity	Predicted Major Permanent Partial Severity
3/73 - 2/74	\$31,058.82	0.450	\$69,019.60	\$61,480.30	\$27,666.13
3/74 - 2/75	31,968.87	0.493	64,845.58	61,006.55	30,076.23
3/75 - 2/76	27,992.68	0.526	53,218.02	60,536.46	31,842.18
3/76 - 2/77	35,701.65	0.559	63,866.99	60,069.98	33,579.12
3/77 - 2/78	38,455.86	0.607	63,353.97	59,607.10	36,181.51
3/78 - 5/79	40,126.88	0.666	60,250.57	59,090.62	39,354.36
6/79 - 5/80	40,533.30	0.725	55,908.00	58,578.62	42,469.50
6/80 - 5/81	42,023.64	0.776	54,154.18	58,127.23	45,106.73
6/81 - 3/82	43,419.48	0.816	53,210.15	57,716.52	47,096.68
4/82 - 3/83	43,957.17	0.861	51,053.62	57,308.71	49,342.80
4/83 - 3/84	44,736.42	0.883	50,664.12	56,867.10	50,213.65
4/84 - 3/85	47,495.64	0.889	53,425.92	56,428.90	50,165.30
4/85 - 3/86	53,751.00	0.925	58,109.19	55,994.08	51,794.53
4/86 - 3/87	60,407.86	0.963	62,728.83	55,562.61	53,506.79
4/87 - 3/88	63,203.23	1.000	63,203.23	55,134.46	55,134.46
				R ² =	0.825

Exponential Regression of SAWW-Indexed
Serious Indemnity Severity on Time

ILLINOIS

Policy Period	Serious Severity	SAWW Index	Indexed Serious Severity	Predicted Indexed Serious Severity	Predicted Serious Severity
3/73 - 2/74	\$40,093.89	0.450	\$89,097.53	\$77,134.17	\$34,710.38
3/74 - 2/75	41,223.48	0.493	83,617.61	75,579.86	37,260.87
3/75 - 2/76	34,259.72	0.526	65,132.55	74,056.87	38,953.91
3/76 - 2/77	41,496.37	0.559	74,233.22	72,564.56	40,563.59
3/77 - 2/78	45,346.17	0.607	74,705.39	71,102.33	43,159.11
3/78 - 5/79	46,374.86	0.666	69,631.92	69,492.51	46,282.01
6/79 - 5/80	46,784.68	0.725	64,530.59	67,919.13	49,241.37
6/80 - 5/81	47,373.87	0.776	61,048.80	66,550.51	51,643.20
6/81 - 3/82	48,113.57	0.816	58,962.71	65,320.18	53,301.27
4/82 - 3/83	48,821.60	0.861	56,703.37	64,112.60	55,200.94
4/83 - 3/84	49,323.18	0.883	55,858.64	62,820.68	55,470.66
4/84 - 3/85	52,700.25	0.889	59,280.37	61,554.79	54,722.21
4/85 - 3/86	58,447.85	0.925	63,186.86	60,314.41	55,790.83
4/86 - 3/87	64,846.56	0.963	67,338.07	59,099.03	56,912.37
4/87 - 3/88	67,261.50	1.000	67,261.50	57,908.14	57,908.14

R² = 0.678

Exponential Regression of SAWW-Indexed
Minor Permanent Partial Indemnity Severity on Time

ILLINOIS

Policy Period	Minor Permanent Partial Severity	SAWW Index	Indexed Minor Permanent Partial Severity	Predicted Indexed Minor Permanent Partial Severity	Predicted Minor Permanent Partial Severity
3/73 - 2/74	\$3,491.24	0.450	\$7,758.31	\$7,094.29	\$3,192.43
3/74 - 2/75	3,323.91	0.493	6,742.21	6,891.91	3,397.71
3/75 - 2/76	3,063.34	0.526	5,823.84	6,695.32	3,521.74
3/76 - 2/77	3,923.21	0.559	7,018.26	6,504.32	3,635.92
3/77 - 2/78	4,196.47	0.607	6,913.46	6,318.78	3,835.50
3/78 - 5/79	4,333.83	0.666	6,507.25	6,116.36	4,073.50
6/79 - 5/80	4,167.47	0.725	5,748.23	5,920.43	4,292.31
6/80 - 5/81	4,389.05	0.776	5,655.99	5,751.54	4,463.20
6/81 - 3/82	4,511.49	0.816	5,528.79	5,600.97	4,570.39
4/82 - 3/83	4,384.96	0.861	5,092.87	5,454.33	4,696.18
4/83 - 3/84	4,142.65	0.883	4,691.56	5,298.74	4,678.79
4/84 - 3/85	4,041.42	0.889	4,546.03	5,147.59	4,576.21
4/85 - 3/86	4,541.75	0.925	4,910.00	5,000.75	4,625.69
4/86 - 3/87	5,012.45	0.963	5,205.04	4,858.09	4,678.35
4/87 - 3/88	5,577.92	1.000	5,577.92	4,719.51	4,719.51
				R ² =	0.614

Exponential Regression of SAWW-Indexed
Temporary Total Indemnity Severity on Time

ILLINOIS

Policy Period	Temporary Total Severity	SAWW Index	Indexed Temporary Total Severity	Predicted Indexed Temporary Total Severity	Predicted Temporary Total Severity
3/73 - 2/74	\$1,147.09	0.450	\$2,549.09	\$1,977.69	\$889.96
3/74 - 2/75	1,096.71	0.493	2,224.56	1,968.59	970.52
3/75 - 2/76	905.92	0.526	1,722.28	1,959.54	1,030.72
3/76 - 2/77	1,078.37	0.559	1,929.11	1,950.53	1,090.35
3/77 - 2/78	1,128.00	0.607	1,858.32	1,941.56	1,178.53
3/78 - 5/79	1,228.01	0.666	1,843.86	1,931.52	1,286.39
6/79 - 5/80	1,240.79	0.725	1,711.43	1,921.53	1,393.11
6/80 - 5/81	1,369.06	0.776	1,764.25	1,912.70	1,484.25
6/81 - 3/82	1,407.51	0.816	1,724.89	1,904.64	1,554.18
4/82 - 3/83	1,516.42	0.861	1,761.23	1,896.61	1,632.98
4/83 - 3/84	1,502.42	0.883	1,701.49	1,887.89	1,667.00
4/84 - 3/85	1,626.30	0.889	1,829.36	1,879.21	1,670.61
4/85 - 3/86	1,886.20	0.925	2,039.14	1,870.57	1,730.27
4/86 - 3/87	1,993.26	0.963	2,069.84	1,861.96	1,793.07
4/87 - 3/88	2,181.08	1.000	2,181.08	1,853.40	1,853.40
				R ² =	0.802

Exponential Regression of SAWW-Indexed
Non-Serious Indemnity Severity on Time

ILLINOIS

Policy Period	Non-Serious Severity	SAWW Index	Indexed Non-Serious Severity	Predicted Indexed Non-Serious Severity	Predicted Non-Serious Severity
3/73 - 2/74	\$2,053.47	0.450	\$4,563.27	\$3,771.01	\$1,696.96
3/74 - 2/75	1,946.09	0.493	3,947.44	3,674.56	1,811.56
3/75 - 2/76	1,659.10	0.526	3,154.18	3,580.58	1,883.38
3/76 - 2/77	2,025.53	0.559	3,623.49	3,488.99	1,950.35
3/77 - 2/78	2,138.57	0.607	3,523.18	3,399.76	2,063.65
3/78 - 5/79	2,205.26	0.666	3,311.20	3,302.09	2,199.19
6/79 - 5/80	2,144.17	0.725	2,957.48	3,207.22	2,325.24
6/80 - 5/81	2,253.00	0.776	2,903.35	3,125.19	2,425.15
6/81 - 3/82	2,177.38	0.816	2,668.36	3,051.84	2,490.30
4/82 - 3/83	2,292.21	0.861	2,662.26	2,980.21	2,565.96
4/83 - 3/84	2,268.54	0.883	2,569.13	2,903.98	2,564.22
4/84 - 3/85	2,408.76	0.889	2,709.52	2,829.71	2,515.61
4/85 - 3/86	2,687.13	0.925	2,905.01	2,757.33	2,550.53
4/86 - 3/87	2,912.88	0.963	3,024.80	2,686.81	2,587.39
4/87 - 3/88	3,151.01	1.000	3,151.01	2,618.08	2,618.08

R² = 0.527

Regression of Total Indemnity Frequency x 1000
on Unemployment Rate

ILLINOIS

Policy Period	Unemployment Rate	Total Indemnity Frequency	Predicted Total Indemnity Frequency
3/73 - 2/74	4.40%	0.3987	0.5197
3/74 - 2/75	6.20%	0.4993	0.5078
3/75 - 2/76	6.70%	0.5232	0.5045
3/76 - 2/77	6.30%	0.5555	0.5072
3/77 - 2/78	6.10%	0.5677	0.5085
3/78 - 5/79	5.90%	0.6170	0.5098
6/79 - 5/80	7.80%	0.5676	0.4972
6/80 - 5/81	8.70%	0.5062	0.4913
6/81 - 3/82	10.70%	0.4819	0.4780
4/82 - 3/83	11.30%	0.4587	0.4741
4/83 - 3/84	9.70%	0.4920	0.4847
4/84 - 3/85	9.00%	0.4560	0.4893
4/85 - 3/86	8.30%	0.4408	0.4939
4/86 - 3/87	7.60%	0.4489	0.4986
4/87 - 3/88	6.90%	0.4545	0.5032
		R ² =	0.046

Regression of Total Frequency x 1000
on Unemployment Rate

ILLINOIS

Policy Period	Unemployment Rate	Total Frequency	Predicted Total Frequency
3/73 - 2/74	4.40%	2.4220	2.4357
3/74 - 2/75	6.20%	2.7844	2.2283
3/75 - 2/76	6.70%	2.2759	2.1706
3/76 - 2/77	6.30%	2.2802	2.2167
3/77 - 2/78	6.10%	2.2858	2.2398
3/78 - 5/79	5.90%	2.3271	2.2629
6/79 - 5/80	7.80%	2.0985	2.0439
6/80 - 5/81	8.70%	1.9798	1.9401
6/81 - 3/82	10.70%	1.9063	1.7096
4/82 - 3/83	11.30%	1.7658	1.6404
4/83 - 3/84	9.70%	1.8652	1.8249
4/84 - 3/85	9.00%	1.7718	1.9055
4/85 - 3/86	8.30%	1.6618	1.9862
4/86 - 3/87	7.60%	1.6639	2.0669
4/87 - 3/88	6.90%	1.7309	2.1476
		R ² =	0.446

Regression of Non-Serious Indemnity Severity
on Unemployment Rate

ILLINOIS

Policy Period	Unemployment Rate	Non-Serious Indemnity Severity	Predicted Non-Serious Indemnity Severity
3/73 - 2/74	4.40%	\$2,053.47	\$2,165.75
3/74 - 2/75	6.20%	1,946.09	2,232.41
3/75 - 2/76	6.70%	1,659.10	2,250.93
3/76 - 2/77	6.30%	2,025.53	2,236.11
3/77 - 2/78	6.10%	2,138.57	2,228.71
3/78 - 5/79	5.90%	2,205.26	2,221.30
6/79 - 5/80	7.80%	2,144.17	2,291.66
6/80 - 5/81	8.70%	2,253.00	2,324.99
6/81 - 3/82	10.70%	2,177.38	2,399.06
4/82 - 3/83	11.30%	2,292.21	2,421.28
4/83 - 3/84	9.70%	2,268.54	2,362.02
4/84 - 3/85	9.00%	2,408.76	2,336.10
4/85 - 3/86	8.30%	2,687.13	2,310.18
4/86 - 3/87	7.60%	2,912.88	2,284.26
4/87 - 3/88	6.90%	3,151.01	2,258.33
		R ² =	0.035

Exponential Regression of CPI-Indexed Total
Medical Severity on Indemnity Claims on Time

ILLINOIS

Policy Period	Total Medical Severity	CPI Index	Indexed Total Medical Severity	Predicted Indexed Total Medical Severity	Predicted Total Medical Severity
3/73 - 2/74	\$722.46	0.295	\$2,449.02	\$2,377.91	\$701.48
3/74 - 2/75	837.11	0.329	2,544.41	2,459.39	809.14
3/75 - 2/76	903.59	0.365	2,475.59	2,543.66	928.44
3/76 - 2/77	1,050.76	0.402	2,613.83	2,630.82	1,057.59
3/77 - 2/78	1,144.65	0.438	2,613.36	2,720.97	1,191.78
3/78 - 5/79	1,342.83	0.485	2,768.72	2,826.08	1,370.65
6/79 - 5/80	1,577.61	0.545	2,894.70	2,935.26	1,599.72
6/80 - 5/81	1,881.38	0.604	3,114.87	3,035.84	1,833.65
6/81 - 3/82	2,048.59	0.664	3,085.23	3,131.06	2,079.02
4/82 - 3/83	2,482.02	0.723	3,432.95	3,229.27	2,334.76
4/83 - 3/84	2,548.36	0.772	3,300.98	3,339.92	2,578.42
4/84 - 3/85	2,732.98	0.819	3,336.97	3,454.37	2,829.13
4/85 - 3/86	3,073.50	0.878	3,500.57	3,572.74	3,136.86
4/86 - 3/87	3,599.94	0.939	3,833.80	3,695.16	3,469.76
4/87 - 3/88	3,832.07	1.000	3,832.07	3,821.78	3,821.78
				R ² =	0.996

Exponential Regression of CPI-Indexed
Medical Only Severity on Time

LOUISIANA

Policy Period	Medical Only Severity	CPI Index	Indexed Medical Only Severity	Predicted Indexed Medical Only Severity	Predicted Medical Only Severity
1/74 - 12/74	\$59.41	0.344	\$172.70	\$173.54	\$59.70
1/75 - 12/75	71.42	0.383	186.48	182.29	69.82
1/76 - 12/76	84.68	0.421	201.14	191.47	80.61
1/77 - 12/77	91.92	0.460	199.83	201.12	92.52
1/78 - 12/78	101.60	0.502	202.39	211.26	106.05
1/79 - 3/80	129.16	0.562	229.82	223.27	125.48
4/80 - 3/81	145.41	0.632	230.08	235.97	149.13
4/81 - 3/82	170.45	0.704	242.12	247.86	174.49
4/82 - 3/83	198.54	0.770	257.84	260.35	200.47
4/83 - 3/84	219.44	0.822	266.96	273.47	224.79
4/84 - 3/85	238.17	0.872	273.13	287.25	250.48
4/85 - 3/86	278.59	0.935	297.96	301.73	282.11
4/86 - 3/87	349.84	1.000	349.84	316.93	316.93
				R ² =	0.985

Exponential Regression of Average Cost-Indexed
Medical Only Severity on Time

LOUISIANA

Policy Period	Medical Only Severity	Average Cost Index	Indexed Medical Only Severity	Predicted Indexed Medical Only Severity	Predicted Medical Only Severity
1/74 - 12/74	\$59.41	0.234	\$253.89	\$258.01	\$60.37
1/75 - 12/75	71.42	0.259	275.75	262.56	68.00
1/76 - 12/76	84.68	0.294	288.03	267.20	78.56
1/77 - 12/77	91.92	0.351	261.88	271.92	95.44
1/78 - 12/78	101.60	0.403	252.11	276.72	111.52
1/79 - 3/80	129.16	0.435	296.92	282.22	122.77
4/80 - 3/81	145.41	0.511	284.56	287.83	147.08
4/81 - 3/82	170.45	0.597	285.51	292.91	174.87
4/82 - 3/83	198.54	0.675	294.13	298.09	201.21
4/83 - 3/84	219.44	0.727	301.84	303.35	220.53
4/84 - 3/85	238.17	0.804	296.23	308.70	248.20
4/85 - 3/86	278.59	0.906	307.49	314.16	284.62
4/86 - 3/87	349.84	1.000	349.84	319.70	319.70
				R ² =	0.986

Exponential Regression of Medical Only-Indexed
Fatal Medical Severity on Time

LOUISIANA

Policy Period	Fatal Severity	Medical Only Index	Indexed Fatal Severity	Predicted Indexed Fatal Severity	Predicted Fatal Severity
1/74 - 12/74	\$1,685.66	0.170	\$9,915.65	\$11,957.78	\$2,032.82
1/75 - 12/75	1,876.46	0.204	9,198.33	11,730.18	2,392.96
1/76 - 12/76	4,122.90	0.242	17,036.78	11,506.90	2,784.67
1/77 - 12/77	3,646.68	0.263	13,865.70	11,287.88	2,968.71
1/78 - 12/78	3,285.15	0.290	11,328.10	11,073.03	3,211.18
1/79 - 3/80	3,243.21	0.369	8,789.19	10,836.20	3,998.56
4/80 - 3/81	4,320.25	0.416	10,385.22	10,604.44	4,411.45
4/81 - 3/82	6,092.08	0.487	12,509.40	10,402.59	5,066.06
4/82 - 3/83	3,379.07	0.568	5,949.07	10,204.59	5,796.21
4/83 - 3/84	12,327.54	0.627	19,661.15	10,010.36	6,276.49
4/84 - 3/85	7,268.60	0.681	10,673.42	9,819.82	6,687.30
4/85 - 3/86	5,028.51	0.796	6,317.22	9,632.91	7,667.79
4/86 - 3/87	10,018.68	1.000	10,018.68	9,449.55	9,449.55

R² = 0.538

Exponential Regression of Medical Only-Indexed
Permanent Total Medical Severity on Time

LOUISIANA

Policy Period	Permanent Total Severity	Medical Only Index	Indexed Permanent Total Severity	Predicted Indexed Permanent Total Severity	Predicted Permanent Total Severity
1/74 - 12/74	\$10,553.48	0.170	\$62,079.29	\$129,739.11	\$22,055.65
1/75 - 12/75	24,047.74	0.204	117,881.08	132,006.19	26,929.26
1/76 - 12/76	64,210.42	0.242	265,332.31	134,312.90	32,503.72
1/77 - 12/77	67,622.62	0.263	257,120.23	136,659.91	35,941.56
1/78 - 12/78	39,138.72	0.290	134,961.10	139,047.93	40,323.90
1/79 - 3/80	42,775.69	0.369	115,923.28	141,784.38	52,318.44
4/80 - 3/81	84,100.16	0.416	202,163.85	144,574.67	60,143.06
4/81 - 3/82	41,187.94	0.487	84,574.83	147,101.00	71,638.19
4/82 - 3/83	86,593.06	0.568	152,452.57	149,671.47	85,013.40
4/83 - 3/84	82,022.63	0.627	130,817.59	152,286.87	95,483.86
4/84 - 3/85	99,950.05	0.681	146,769.53	154,947.96	105,519.56
4/85 - 3/86	188,232.39	0.796	236,472.85	157,655.55	125,493.82
4/86 - 3/87	127,348.81	1.000	127,348.81	160,410.46	160,410.46

R² = 0.665

Exponential Regression of Medical Only-Indexed
Major Permanent Partial Medical Severity on Time

LOUISIANA

Policy Period	Major Permanent Partial Severity	Medical Only Index	Indexed Major Permanent Partial Severity	Predicted Indexed Major Permanent Partial Severity	Predicted Major Permanent Partial Severity
1/74 - 12/74	\$5,731.08	0.170	\$33,712.24	\$38,712.73	\$6,581.16
1/75 - 12/75	7,652.31	0.204	37,511.32	38,729.06	7,900.73
1/76 - 12/76	9,500.31	0.242	39,257.48	38,745.40	9,376.39
1/77 - 12/77	10,866.90	0.263	41,319.01	38,761.74	10,194.34
1/78 - 12/78	12,371.74	0.290	42,661.17	38,778.10	11,245.65
1/79 - 3/80	13,808.38	0.369	37,421.08	38,796.50	14,315.91
4/80 - 3/81	16,504.70	0.416	39,674.76	38,814.92	16,147.01
4/81 - 3/82	18,076.29	0.487	37,117.64	38,831.29	18,910.84
4/82 - 3/83	24,133.85	0.568	42,489.17	38,847.67	22,065.48
4/83 - 3/84	27,562.37	0.627	43,959.12	38,864.06	24,367.77
4/84 - 3/85	29,292.75	0.681	43,014.32	38,880.46	26,477.59
4/85 - 3/86	29,811.22	0.796	37,451.28	38,896.86	30,961.90
4/86 - 3/87	31,264.94	1.000	31,264.94	38,913.27	38,913.27

R² = 0.914

Exponential Regression of Medical Only-Indexed
Minor Permanent Partial Medical Severity on Time

LOUISIANA

Policy Period	Minor Permanent Partial Severity	Medical Only Index	Indexed Minor Permanent Partial Severity	Predicted Indexed Minor Permanent Partial Severity	Predicted Minor Permanent Partial Severity
1/74 - 12/74	\$1,143.11	0.170	\$6,724.18	\$7,077.06	\$1,203.10
1/75 - 12/75	1,424.28	0.204	6,981.76	7,147.42	1,458.07
1/76 - 12/76	1,876.57	0.242	7,754.42	7,218.48	1,746.87
1/77 - 12/77	1,921.68	0.263	7,306.77	7,290.25	1,917.34
1/78 - 12/78	2,289.66	0.290	7,895.38	7,362.73	2,135.19
1/79 - 3/80	2,740.77	0.369	7,427.56	7,445.14	2,747.26
4/80 - 3/81	3,249.36	0.416	7,810.96	7,528.46	3,131.84
4/81 - 3/82	3,641.74	0.487	7,477.91	7,603.31	3,702.81
4/82 - 3/83	4,231.51	0.568	7,449.84	7,678.90	4,361.62
4/83 - 3/84	5,220.57	0.627	8,326.27	7,755.25	4,862.54
4/84 - 3/85	3,917.28	0.681	5,752.25	7,832.35	5,333.83
4/85 - 3/86	6,070.57	0.796	7,626.34	7,910.22	6,296.54
4/86 - 3/87	9,929.76	1.000	9,929.76	7,988.87	7,988.87

R² = 0.912

Exponential Regression of Medical Only-Indexed
Temporary Total Medical Severity on Time

LOUISIANA

Policy Period	Temporary Total Severity	Medical Only Index	Indexed Temporary Total Severity	Predicted Indexed Temporary Total Severity	Predicted Temporary Total Severity
1/74 - 12/74	\$491.23	0.170	\$2,889.59	\$2,688.68	\$457.07
1/75 - 12/75	565.43	0.204	2,771.72	2,735.34	558.01
1/76 - 12/76	700.24	0.242	2,893.55	2,782.81	673.44
1/77 - 12/77	750.14	0.263	2,852.24	2,831.11	744.58
1/78 - 12/78	886.02	0.290	3,055.24	2,880.24	835.27
1/79 - 3/80	910.84	0.369	2,468.40	2,936.54	1,083.58
4/80 - 3/81	1,179.44	0.416	2,835.19	2,993.93	1,245.48
4/81 - 3/82	1,345.69	0.487	2,763.22	3,045.89	1,483.35
4/82 - 3/83	1,711.23	0.568	3,012.73	3,098.76	1,760.09
4/83 - 3/84	2,105.87	0.627	3,358.64	3,152.53	1,976.64
4/84 - 3/85	2,183.47	0.681	3,206.27	3,207.25	2,184.14
4/85 - 3/86	2,565.21	0.796	3,222.63	3,262.91	2,597.28
4/86 - 3/87	3,714.30	1.000	3,714.30	3,319.54	3,319.54

R² = 0.978

Exponential Regression of Medical Only-Indexed
Serious Medical Severity on Time

LOUISIANA

Policy Period	Serious Severity	Medical Only Index	Indexed Serious Severity	Predicted Indexed Serious Severity	Predicted Serious Severity
1/74 - 12/74	\$5,840.46	0.170	\$34,355.65	\$43,880.12	\$7,459.62
1/75 - 12/75	8,329.16	0.204	40,829.22	43,691.07	8,912.98
1/76 - 12/76	12,345.60	0.242	51,014.88	43,502.84	10,527.69
1/77 - 12/77	13,262.22	0.263	50,426.69	43,315.41	11,391.95
1/78 - 12/78	13,171.60	0.290	45,419.31	43,128.80	12,507.35
1/79 - 3/80	14,798.48	0.369	40,104.28	42,919.82	15,837.41
4/80 - 3/81	18,854.29	0.416	45,322.81	42,711.85	17,768.13
4/81 - 3/82	18,666.70	0.487	38,329.98	42,527.84	20,711.06
4/82 - 3/83	26,486.81	0.568	46,631.71	42,344.62	24,051.74
4/83 - 3/84	29,770.70	0.627	47,481.18	42,162.18	26,435.69
4/84 - 3/85	31,474.68	0.681	46,218.33	41,980.54	28,588.75
4/85 - 3/86	33,487.26	0.796	42,069.42	41,799.68	33,272.54
4/86 - 3/87	32,218.89	1.000	32,218.89	41,619.59	41,619.59

R² = 0.883

Exponential Regression of Medical Only-Indexed
Non-Serious Medical Severity on Time

LOUISIANA

Policy Period	Non-Serious Severity	Medical Only Index	Indexed Non-Serious Severity	Predicted Indexed Non-Serious Severity	Predicted Non-Serious Severity
1/74 - 12/74	\$605.07	0.170	\$3,559.24	\$3,413.26	\$580.25
1/75 - 12/75	686.29	0.204	3,364.17	3,440.27	701.81
1/76 - 12/76	875.52	0.242	3,617.85	3,467.50	839.13
1/77 - 12/77	925.07	0.263	3,517.38	3,494.94	919.17
1/78 - 12/78	1,091.97	0.290	3,765.41	3,522.60	1,021.55
1/79 - 3/80	1,152.88	0.369	3,124.34	3,553.98	1,311.42
4/80 - 3/81	1,452.71	0.416	3,492.09	3,585.63	1,491.62
4/81 - 3/82	1,653.76	0.487	3,395.81	3,614.01	1,760.02
4/82 - 3/83	2,083.84	0.568	3,668.73	3,642.61	2,069.00
4/83 - 3/84	2,467.73	0.627	3,935.77	3,671.44	2,301.99
4/84 - 3/85	2,371.46	0.681	3,482.32	3,700.50	2,520.04
4/85 - 3/86	2,871.89	0.796	3,607.90	3,729.78	2,968.91
4/86 - 3/87	4,154.09	1.000	4,154.09	3,759.30	3,759.30
				R ² =	0.980

Exponential Regression of Medical Only-Indexed
Total Medical Severity on Time

LOUISIANA

Policy Period	Total Severity	Medical Only Index	Indexed Total Severity	Predicted Indexed Total Severity	Predicted Total Severity
1/74 - 12/74	\$276.57	0.170	\$1,626.90	\$1,708.47	\$290.44
1/75 - 12/75	365.35	0.204	1,790.91	1,778.26	362.76
1/76 - 12/76	503.18	0.242	2,079.27	1,850.90	447.92
1/77 - 12/77	564.56	0.263	2,146.63	1,926.51	506.67
1/78 - 12/78	543.07	0.290	1,872.64	2,005.22	581.51
1/79 - 3/80	670.57	0.369	1,817.27	2,097.60	774.02
4/80 - 3/81	888.97	0.416	2,136.94	2,194.25	912.81
4/81 - 3/82	983.04	0.487	2,018.56	2,283.89	1,112.25
4/82 - 3/83	1,512.01	0.568	2,661.99	2,377.19	1,350.24
4/83 - 3/84	1,596.12	0.627	2,545.65	2,474.30	1,551.38
4/84 - 3/85	1,858.12	0.681	2,728.52	2,575.37	1,753.83
4/85 - 3/86	2,210.96	0.796	2,777.59	2,680.58	2,133.74
4/86 - 3/87	2,638.72	1.000	2,638.72	2,790.09	2,790.09

R² = 0.985

Exponential Regression of CPI-Indexed
Total Medical Severity on Time

LOUISIANA

Policy Period	Total Severity	CPI Index	Indexed Total Severity	Predicted Indexed Total Severity	Predicted Total Severity
1/74 - 12/74	\$276.57	0.344	\$803.99	\$847.55	\$291.56
1/75 - 12/75	365.35	0.383	953.90	926.62	354.89
1/76 - 12/76	503.18	0.421	1,195.21	1,013.06	426.50
1/77 - 12/77	564.56	0.460	1,227.31	1,107.57	509.48
1/78 - 12/78	543.07	0.502	1,081.81	1,210.90	607.87
1/79 - 3/80	670.57	0.562	1,193.19	1,338.71	752.35
4/80 - 3/81	888.97	0.632	1,406.59	1,480.01	935.36
4/81 - 3/82	983.04	0.704	1,396.37	1,618.08	1,139.13
4/82 - 3/83	1,512.01	0.770	1,963.65	1,769.03	1,362.15
4/83 - 3/84	1,596.12	0.822	1,941.75	1,934.06	1,589.80
4/84 - 3/85	1,858.12	0.872	2,130.88	2,114.50	1,843.84
4/85 - 3/86	2,210.96	0.935	2,364.67	2,311.76	2,161.50
4/86 - 3/87	2,638.72	1.000	2,638.72	2,527.43	2,527.43

R² = 0.988

Exponential Regression of Average Cost-Indexed
Total Medical Severity on Time

LOUISIANA

Policy Period	Total Severity	Average Cost Index	Indexed Total Severity	Predicted Indexed Total Severity	Predicted Total Severity
1/74 - 12/74	\$276.57	0.234	\$1,181.94	\$1,260.06	\$294.85
1/75 - 12/75	365.35	0.259	1,410.60	1,334.68	345.68
1/76 - 12/76	503.18	0.294	1,711.51	1,413.72	415.63
1/77 - 12/77	564.56	0.351	1,608.44	1,497.43	525.60
1/78 - 12/78	543.07	0.403	1,347.56	1,586.11	639.20
1/79 - 3/80	670.57	0.435	1,541.54	1,692.16	736.09
4/80 - 3/81	888.97	0.511	1,739.66	1,805.30	922.51
4/81 - 3/82	983.04	0.597	1,646.63	1,912.21	1,141.59
4/82 - 3/83	1,512.01	0.675	2,240.02	2,025.45	1,367.18
4/83 - 3/84	1,596.12	0.727	2,195.49	2,145.39	1,559.70
4/84 - 3/85	1,858.12	0.804	2,311.10	2,272.44	1,827.04
4/85 - 3/86	2,210.96	0.906	2,440.36	2,407.01	2,180.75
4/86 - 3/87	2,638.72	1.000	2,638.72	2,549.55	2,549.55

R² = 0.988

Regression of Medical Only Frequency x 1000
on Time and Unemployment Rate

LOUISIANA

Policy Period	Time	Unemployment Rate	Medical Only Frequency	Predicted Medical Only Frequency
1/74 - 12/74	0	7.10%	3.6460	3.4398
1/75 - 12/75	1	7.10%	3.8321	3.2543
1/76 - 12/76	2	6.90%	2.4058	3.0667
1/77 - 12/77	3	7.00%	2.3747	2.8824
1/78 - 12/78	4	6.90%	2.6024	2.6959
1/79 - 3/80	5.125	6.70%	2.6578	2.4852
4/80 - 3/81	6.25	8.00%	2.7743	2.2909
4/81 - 3/82	7.25	9.80%	2.1167	2.1253
4/82 - 3/83	8.25	11.30%	1.7989	1.9564
4/83 - 3/84	9.25	10.60%	1.6783	1.7633
4/84 - 3/85	10.25	11.10%	1.5673	1.5834
4/85 - 3/86	11.25	12.60%	1.4614	1.4145
4/86 - 3/87	12.25	12.30%	1.2685	1.2258
			R ² =	0.818

Regression of Fatal Frequency x 1000
on Time and Unemployment Rate

LOUISIANA

Policy Period	Time	Unemployment Rate	Fatal Frequency	Predicted Fatal Frequency
1/74 - 12/74	0	7.10%	0.006724	0.006509
1/75 - 12/75	1	7.10%	0.007833	0.005932
1/76 - 12/76	2	6.90%	0.003863	0.005260
1/77 - 12/77	3	7.00%	0.003980	0.004730
1/78 - 12/78	4	6.90%	0.003437	0.004106
1/79 - 3/80	5.125	6.70%	0.003724	0.003363
4/80 - 3/81	6.25	8.00%	0.004038	0.003323
4/81 - 3/82	7.25	9.80%	0.003677	0.003591
4/82 - 3/83	8.25	11.30%	0.002726	0.003717
4/83 - 3/84	9.25	10.60%	0.002550	0.002812
4/84 - 3/85	10.25	11.10%	0.002636	0.002469
4/85 - 3/86	11.25	12.60%	0.002455	0.002596
4/86 - 3/87	12.25	12.30%	0.002640	0.001878
			R ² =	0.722

Regression of Permanent Total Frequency x 1000
on Time and Unemployment Rate

LOUISIANA

Policy Period	Time	Unemployment Rate	Permanent Total Frequency	Predicted Permanent Total Frequency
1/74 - 12/74	0	7.10%	0.007901	0.007098
1/75 - 12/75	1	7.10%	0.007352	0.006407
1/76 - 12/76	2	6.90%	0.004049	0.005587
1/77 - 12/77	3	7.00%	0.003660	0.004962
1/78 - 12/78	4	6.90%	0.003272	0.004206
1/79 - 3/80	5.125	6.70%	0.004232	0.003300
4/80 - 3/81	6.25	8.00%	0.004166	0.003366
4/81 - 3/82	7.25	9.80%	0.004019	0.003844
4/82 - 3/83	8.25	11.30%	0.004149	0.004126
4/83 - 3/84	9.25	10.60%	0.003602	0.002982
4/84 - 3/85	10.25	11.10%	0.003290	0.002616
4/85 - 3/86	11.25	12.60%	0.002319	0.002898
4/86 - 3/87	12.25	12.30%	0.001392	0.002013

R² = 0.744

Regression of Major Permanent Partial Frequency x 1000
on Time and Unemployment Rate

LOUISIANA

Policy Period	Time	Unemployment Rate	Major Permanent Partial Frequency	Predicted Major Permanent Partial Frequency
1/74 - 12/74	0	7.10%	0.0850	0.0824
1/75 - 12/75	1	7.10%	0.0961	0.0804
1/76 - 12/76	2	6.90%	0.0626	0.0777
1/77 - 12/77	3	7.00%	0.0671	0.0760
1/78 - 12/78	4	6.90%	0.0637	0.0736
1/79 - 3/80	5.125	6.70%	0.0761	0.0706
4/80 - 3/81	6.25	8.00%	0.0907	0.0726
4/81 - 3/82	7.25	9.80%	0.0750	0.0765
4/82 - 3/83	8.25	11.30%	0.0792	0.0793
4/83 - 3/84	9.25	10.60%	0.0651	0.0750
4/84 - 3/85	10.25	11.10%	0.0740	0.0746
4/85 - 3/86	11.25	12.60%	0.0786	0.0775
4/86 - 3/87	12.25	12.30%	0.0774	0.0744
			R ² =	0.102

Regression of Serious Frequency x 1000
on Time and Unemployment Rate

LOUISIANA

Policy Period	Time	Unemployment Rate	Serious Frequency	Predicted Serious Frequency
1/74 - 12/74	0	7.10%	0.0996	0.0960
1/75 - 12/75	1	7.10%	0.1112	0.0927
1/76 - 12/76	2	6.90%	0.0705	0.0885
1/77 - 12/77	3	7.00%	0.0747	0.0857
1/78 - 12/78	4	6.90%	0.0705	0.0819
1/79 - 3/80	5.125	6.70%	0.0841	0.0773
4/80 - 3/81	6.25	8.00%	0.0989	0.0793
4/81 - 3/82	7.25	9.80%	0.0827	0.0839
4/82 - 3/83	8.25	11.30%	0.0861	0.0872
4/83 - 3/84	9.25	10.60%	0.0712	0.0808
4/84 - 3/85	10.25	11.10%	0.0799	0.0797
4/85 - 3/86	11.25	12.60%	0.0834	0.0830
4/86 - 3/87	12.25	12.30%	0.0814	0.0783
			R ² =	0.209

Regression of Minor Permanent Partial Frequency x 1000
 on Time and Unemployment Rate

LOUISIANA

Policy Period	Time	Unemployment Rate	Minor Permanent Partial Frequency	Predicted Minor Permanent Partial Frequency
1/74 - 12/74	0	7.10%	0.1262	0.1105
1/75 - 12/75	1	7.10%	0.1054	0.1011
1/76 - 12/76	2	6.90%	0.0686	0.0908
1/77 - 12/77	3	7.00%	0.0719	0.0819
1/78 - 12/78	4	6.90%	0.0693	0.0721
1/79 - 3/80	5.125	6.70%	0.0689	0.0606
4/80 - 3/81	6.25	8.00%	0.0670	0.0564
4/81 - 3/82	7.25	9.80%	0.0515	0.0559
4/82 - 3/83	8.25	11.30%	0.0550	0.0539
4/83 - 3/84	9.25	10.60%	0.0405	0.0411
4/84 - 3/85	10.25	11.10%	0.0362	0.0342
4/85 - 3/86	11.25	12.60%	0.0285	0.0322
4/86 - 3/87	12.25	12.30%	0.0231	0.0213
			R ² =	0.893

Regression of Temporary Total Frequency x 1000
on Time and Unemployment Rate

LOUISIANA

Policy Period	Time	Unemployment Rate	Temporary Total Frequency	Predicted Temporary Total Frequency
1/74 - 12/74	0	7.10%	0.5963	0.5592
1/75 - 12/75	1	7.10%	0.6437	0.5299
1/76 - 12/76	2	6.90%	0.3917	0.4985
1/77 - 12/77	3	7.00%	0.4097	0.4702
1/78 - 12/78	4	6.90%	0.4028	0.4399
1/79 - 3/80	5.125	6.70%	0.4519	0.4048
4/80 - 3/81	6.25	8.00%	0.4403	0.3855
4/81 - 3/82	7.25	9.80%	0.3326	0.3751
4/82 - 3/83	8.25	11.30%	0.3167	0.3615
4/83 - 3/84	9.25	10.60%	0.3079	0.3248
4/84 - 3/85	10.25	11.10%	0.2980	0.3008
4/85 - 3/86	11.25	12.60%	0.2971	0.2872
4/86 - 3/87	12.25	12.30%	0.3036	0.2548
			R ² =	0.721

Regression of Non-Serious Frequency x 1000
on Time and Unemployment Rate

LOUISIANA

Policy Period	Time	Unemployment Rate	Non-Serious Frequency	Predicted Non-Serious Frequency
1/74 - 12/74	0	7.10%	0.7225	0.6697
1/75 - 12/75	1	7.10%	0.7491	0.6311
1/76 - 12/76	2	6.90%	0.4603	0.5893
1/77 - 12/77	3	7.00%	0.4816	0.5522
1/78 - 12/78	4	6.90%	0.4720	0.5119
1/79 - 3/80	5.125	6.70%	0.5207	0.4653
4/80 - 3/81	6.25	8.00%	0.5072	0.4419
4/81 - 3/82	7.25	9.80%	0.3842	0.4310
4/82 - 3/83	8.25	11.30%	0.3717	0.4154
4/83 - 3/84	9.25	10.60%	0.3483	0.3659
4/84 - 3/85	10.25	11.10%	0.3342	0.3350
4/85 - 3/86	11.25	12.60%	0.3256	0.3194
4/86 - 3/87	12.25	12.30%	0.3267	0.2761
			R ² =	0.771

Exponential Regression of SAWW-Indexed
Fatal Indemnity Severity on Time

LOUISIANA

Policy Period	Fatal Severity	SAWW Index	Indexed Fatal Severity	Predicted Indexed Fatal Severity	Predicted Fatal Severity
1/74 - 12/74	\$88,646.60	0.512	\$173,137.89	\$126,041.80	\$64,533.40
1/75 - 12/75	69,001.54	0.568	121,481.58	126,538.71	71,873.99
1/76 - 12/76	64,705.44	0.585	110,607.59	127,037.57	74,316.98
1/77 - 12/77	81,005.23	0.619	130,864.67	127,538.41	78,946.27
1/78 - 12/78	91,051.45	0.683	133,311.05	128,041.21	87,452.15
1/79 - 3/80	81,924.97	0.762	107,513.08	128,609.24	98,000.24
4/80 - 3/81	119,123.17	0.848	140,475.44	129,179.79	109,544.46
4/81 - 3/82	105,743.35	0.914	115,692.94	129,689.06	118,535.80
4/82 - 3/83	111,633.49	0.946	118,005.80	130,200.35	123,169.53
4/83 - 3/84	103,826.05	0.936	110,925.27	130,713.65	122,347.97
4/84 - 3/85	104,373.00	0.961	108,608.74	131,228.97	126,111.04
4/85 - 3/86	133,759.26	0.988	135,383.87	131,746.33	130,165.37
4/86 - 3/87	203,268.22	1.000	203,268.22	132,265.72	132,265.72

R² = 0.526

Exponential Regression of SAWW-Indexed
Permanent Total Indemnity Severity on Time

LOUISIANA

Policy Period	Permanent Total Severity	SAWW Index	Indexed Permanent Total Severity	Predicted Indexed Permanent Total Severity	Predicted Permanent Total Severity
1/74 - 12/74	\$18,651.18	0.512	\$36,428.09	\$20,374.98	\$10,431.99
1/75 - 12/75	15,231.84	0.568	26,816.62	24,022.84	13,644.97
1/76 - 12/76	17,401.42	0.585	29,746.02	28,323.81	16,569.43
1/77 - 12/77	15,293.11	0.619	24,706.16	33,394.81	20,671.39
1/78 - 12/78	26,012.19	0.683	38,085.20	39,373.70	26,892.24
1/79 - 3/80	34,917.69	0.762	45,823.74	47,388.66	36,110.16
4/80 - 3/81	36,420.09	0.848	42,948.22	57,035.15	48,365.81
4/81 - 3/82	32,013.45	0.914	35,025.66	67,246.53	61,463.33
4/82 - 3/83	48,262.31	0.946	51,017.24	79,286.12	75,004.67
4/83 - 3/84	102,050.70	0.936	109,028.53	93,481.24	87,498.44
4/84 - 3/85	128,604.03	0.961	133,823.13	110,217.80	105,919.31
4/85 - 3/86	177,007.02	0.988	179,156.90	129,950.82	128,391.41
4/86 - 3/87	214,402.31	1.000	214,402.31	153,216.77	153,216.77

R² = 0.840

Exponential Regression of SAWW-Indexed
Major Permanent Partial Indemnity Severity on Time

LOUISIANA

Policy Period	Major Permanent Partial Severity	SAWW Index	Indexed Major Permanent Partial Severity	Predicted Indexed Major Permanent Partial Severity	Predicted Major Permanent Partial Severity
1/74 - 12/74	\$26,385.82	0.512	\$51,534.80	\$47,484.04	\$24,311.83
1/75 - 12/75	28,030.65	0.568	49,349.74	48,175.62	27,363.75
1/76 - 12/76	30,923.44	0.585	52,860.58	48,877.27	28,593.20
1/77 - 12/77	31,642.62	0.619	51,118.93	49,589.13	30,695.67
1/78 - 12/78	33,887.77	0.683	49,616.06	50,311.37	34,362.66
1/79 - 3/80	35,030.55	0.762	45,971.85	51,136.46	38,965.99
4/80 - 3/81	37,521.68	0.848	44,247.26	51,975.09	44,074.88
4/81 - 3/82	39,017.86	0.914	42,689.12	52,732.08	48,197.12
4/82 - 3/83	47,933.85	0.946	50,670.03	53,500.09	50,611.08
4/83 - 3/84	59,900.92	0.936	63,996.71	54,279.28	50,805.41
4/84 - 3/85	58,852.92	0.961	61,241.33	55,069.83	52,922.10
4/85 - 3/86	57,956.31	0.988	58,660.23	55,871.88	55,201.42
4/86 - 3/87	57,410.26	1.000	57,410.26	56,685.62	56,685.62

R² = 0.852

Exponential Regression of SAWW-Indexed
 Serious Indemnity Severity on Time

LOUISIANA

Policy Period	Serious Severity	SAWW Index	Indexed Serious Severity	Predicted Indexed Serious Severity	Predicted Serious Severity
1/74 - 12/74	\$29,974.02	0.512	\$58,543.01	\$50,777.76	\$25,998.21
1/75 - 12/75	30,069.82	0.568	52,939.82	51,567.49	29,290.34
1/76 - 12/76	31,997.45	0.585	54,696.50	52,369.50	30,636.16
1/77 - 12/77	33,471.42	0.619	54,073.38	53,183.99	32,920.89
1/78 - 12/78	36,310.49	0.683	53,163.24	54,011.14	36,889.61
1/79 - 3/80	37,102.08	0.762	48,690.39	54,957.08	41,877.29
4/80 - 3/81	40,806.81	0.848	48,121.24	55,919.58	47,419.80
4/81 - 3/82	41,644.53	0.914	45,562.94	56,789.28	51,905.40
4/82 - 3/83	49,966.51	0.946	52,818.72	57,672.50	54,558.19
4/83 - 3/84	63,604.93	0.936	67,953.99	58,569.46	54,821.02
4/84 - 3/85	63,225.26	0.961	65,791.11	59,480.37	57,160.64
4/85 - 3/86	63,497.55	0.988	64,268.78	60,405.45	59,680.59
4/86 - 3/87	64,824.74	1.000	64,824.74	61,344.92	61,344.92

R² = 0.850

Exponential Regression of SAWW-Indexed
Minor Permanent Partial Indemnity Severity on Time

LOUISIANA

Policy Period	Minor Permanent Partial Severity	SAWW Index	Indexed Minor Permanent Partial Severity	Predicted Indexed Minor Permanent Partial Severity	Predicted Minor Permanent Partial Severity
1/74 - 12/74	\$3,283.52	0.512	\$6,413.13	\$6,834.68	\$3,499.36
1/75 - 12/75	3,551.93	0.568	6,253.40	6,554.17	3,722.77
1/76 - 12/76	3,756.29	0.585	6,421.01	6,285.17	3,676.82
1/77 - 12/77	3,803.42	0.619	6,144.46	6,027.21	3,730.84
1/78 - 12/78	3,921.60	0.683	5,741.73	5,779.83	3,947.63
1/79 - 3/80	4,619.52	0.762	6,062.36	5,513.65	4,201.40
4/80 - 3/81	4,750.90	0.848	5,602.48	5,259.73	4,460.25
4/81 - 3/82	4,799.52	0.914	5,251.12	5,043.86	4,610.09
4/82 - 3/83	4,536.87	0.946	4,795.85	4,836.85	4,575.66
4/83 - 3/84	4,674.25	0.936	4,993.86	4,638.33	4,341.47
4/84 - 3/85	3,420.74	0.961	3,559.56	4,447.96	4,274.49
4/85 - 3/86	4,079.72	0.988	4,129.27	4,265.40	4,214.22
4/86 - 3/87	4,379.19	1.000	4,379.19	4,090.34	4,090.34

R² = 0.615

Exponential Regression of SAWW-Indexed
Temporary Total Indemnity Severity on Time

LOUISIANA

Policy Period	Temporary Total Severity	SAWW Index	Indexed Temporary Total Severity	Predicted Indexed Temporary Total Severity	Predicted Temporary Total Severity
1/74 - 12/74	\$1,381.94	0.512	\$2,699.10	\$2,480.43	\$1,269.98
1/75 - 12/75	1,249.07	0.568	2,199.07	2,363.54	1,342.49
1/76 - 12/76	1,344.13	0.585	2,297.66	2,252.16	1,317.51
1/77 - 12/77	1,323.25	0.619	2,137.72	2,146.03	1,328.39
1/78 - 12/78	1,397.71	0.683	2,046.43	2,044.90	1,396.66
1/79 - 3/80	1,460.82	0.762	1,917.09	1,936.81	1,475.85
4/80 - 3/81	1,570.97	0.848	1,852.56	1,834.44	1,555.60
4/81 - 3/82	1,562.35	0.914	1,709.35	1,747.99	1,597.66
4/82 - 3/83	1,571.43	0.946	1,661.13	1,665.62	1,575.67
4/83 - 3/84	1,444.86	0.936	1,543.65	1,587.12	1,485.55
4/84 - 3/85	1,327.66	0.961	1,381.54	1,512.33	1,453.35
4/85 - 3/86	1,426.43	0.988	1,443.76	1,441.06	1,423.77
4/86 - 3/87	1,536.78	1.000	1,536.78	1,373.15	1,373.15
				R ² =	0.498

Exponential Regression of SAWW-Indexed
Non-Serious Indemnity Severity on Time

LOUISIANA

Policy Period	Non-Serious Severity	SAWW Index	Indexed Non-Serious Severity	Predicted Indexed Non-Serious Severity	Predicted Non-Serious Severity
1/74 - 12/74	\$1,714.03	0.512	\$3,347.71	\$3,211.55	\$1,644.31
1/75 - 12/75	1,573.15	0.568	2,769.63	3,039.16	1,726.24
1/76 - 12/76	1,703.54	0.585	2,912.03	2,876.02	1,682.47
1/77 - 12/77	1,693.58	0.619	2,735.99	2,721.64	1,684.70
1/78 - 12/78	1,768.03	0.683	2,588.62	2,575.55	1,759.10
1/79 - 3/80	1,878.62	0.762	2,465.38	2,420.55	1,844.46
4/80 - 3/81	1,990.77	0.848	2,347.61	2,274.88	1,929.10
4/81 - 3/82	1,996.70	0.914	2,184.57	2,152.77	1,967.63
4/82 - 3/83	2,009.85	0.946	2,124.58	2,037.21	1,927.20
4/83 - 3/84	1,820.04	0.936	1,944.49	1,927.86	1,804.48
4/84 - 3/85	1,554.61	0.961	1,617.70	1,824.38	1,753.23
4/85 - 3/86	1,658.57	0.988	1,678.71	1,726.45	1,705.73
4/86 - 3/87	1,737.90	1.000	1,737.90	1,633.78	1,633.78
				R ² =	0.667

Regression of Total Indemnity Frequency x 1000
on Unemployment Rate

LOUISIANA

Policy Period	Unemployment Rate	Total Indemnity Frequency	Predicted Total Indemnity Frequency
1/74 - 12/74	7.10%	0.8221	0.6377
1/75 - 12/75	7.10%	0.8603	0.6377
1/76 - 12/76	6.90%	0.5309	0.6471
1/77 - 12/77	7.00%	0.5564	0.6424
1/78 - 12/78	6.90%	0.5425	0.6471
1/79 - 3/80	6.70%	0.6048	0.6566
4/80 - 3/81	8.00%	0.6061	0.5950
4/81 - 3/82	9.80%	0.4669	0.5095
4/82 - 3/83	11.30%	0.4578	0.4384
4/83 - 3/84	10.60%	0.4196	0.4716
4/84 - 3/85	11.10%	0.4141	0.4479
4/85 - 3/86	12.60%	0.4090	0.3767
4/86 - 3/87	12.30%	0.4081	0.3909
		R ² =	0.530

Regression of Total Frequency x 1000
 on Unemployment Rate

LOUISIANA

Policy Period	Unemployment Rate	Total Frequency	Predicted Total Frequency
1/74 - 12/74	7.10%	4.4681	3.5117
1/75 - 12/75	7.10%	4.6924	3.5117
1/76 - 12/76	6.90%	2.9367	3.5784
1/77 - 12/77	7.00%	2.9311	3.5450
1/78 - 12/78	6.90%	3.1449	3.5784
1/79 - 3/80	6.70%	3.2626	3.6451
4/80 - 3/81	8.00%	3.3804	3.2116
4/81 - 3/82	9.80%	2.5836	2.6114
4/82 - 3/83	11.30%	2.2567	2.1113
4/83 - 3/84	10.60%	2.0978	2.3447
4/84 - 3/85	11.10%	1.9814	2.1779
4/85 - 3/86	12.60%	1.8704	1.6778
4/86 - 3/87	12.30%	1.6766	1.7778
		R ² =	0.659

Regression of Non-Serious Indemnity Severity
on Unemployment Rate

LOUISIANA

Policy Period	Unemployment Rate	Non-Serious Indemnity Severity	Predicted Non-Serious Indemnity Severity
1/74 - 12/74	7.10%	\$1,714.03	\$1,772.06
1/75 - 12/75	7.10%	1,573.15	1,772.06
1/76 - 12/76	6.90%	1,703.54	1,771.56
1/77 - 12/77	7.00%	1,693.58	1,771.81
1/78 - 12/78	6.90%	1,768.03	1,771.56
1/79 - 3/80	6.70%	1,878.62	1,771.07
4/80 - 3/81	8.00%	1,990.77	1,774.31
4/81 - 3/82	9.80%	1,996.70	1,778.79
4/82 - 3/83	11.30%	2,009.85	1,782.53
4/83 - 3/84	10.60%	1,820.04	1,780.79
4/84 - 3/85	11.10%	1,554.61	1,782.04
4/85 - 3/86	12.60%	1,658.57	1,785.77
4/86 - 3/87	12.30%	1,737.90	1,785.03
		R ² =	0.001

Exponential Regression of CPI-Indexed Total
Medical Severity on Indemnity Claims on Time

LOUISIANA

Policy Period	Total Medical Severity	CPI Index	Indexed Total Medical Severity	Predicted Indexed Total Medical Severity	Predicted Total Medical Severity
1/74 - 12/74	\$1,239.66	0.344	\$3,603.66	\$4,101.19	\$1,410.81
1/75 - 12/75	1,674.50	0.383	4,372.06	4,428.23	1,696.01
1/76 - 12/76	2,399.75	0.421	5,700.12	4,781.36	2,012.95
1/77 - 12/77	2,581.99	0.460	5,613.02	5,162.64	2,374.82
1/78 - 12/78	2,660.89	0.502	5,300.58	5,574.33	2,798.32
1/79 - 3/80	3,049.75	0.562	5,426.60	6,076.85	3,415.19
4/80 - 3/81	4,292.31	0.632	6,791.63	6,624.68	4,186.80
4/81 - 3/82	4,667.27	0.704	6,629.64	7,152.95	5,035.68
4/82 - 3/83	6,673.30	0.770	8,666.62	7,723.36	5,946.99
4/83 - 3/84	7,102.90	0.822	8,641.00	8,339.25	6,854.86
4/84 - 3/85	7,989.04	0.872	9,161.74	9,004.25	7,851.71
4/85 - 3/86	9,115.31	0.935	9,748.99	9,722.29	9,090.34
4/86 - 3/87	9,753.18	1.000	9,753.18	10,497.58	10,497.58

R² = 0.984

Exponential Regression of CPI-Indexed
Medical Only Severity on Time

MICHIGAN

Policy Period	Medical Only Severity	CPI Index	Indexed Medical Only Severity	Predicted Indexed Medical Only Severity	Predicted Medical Only Severity
4/82 - 3/83	\$142.45	0.723	\$197.03	\$185.58	\$134.18
4/83 - 3/84	149.56	0.772	193.73	191.59	147.90
4/84 - 3/85	154.28	0.819	188.38	197.78	161.98
4/85 - 3/86	162.89	0.878	185.52	204.18	179.27
4/86 - 3/87	196.78	0.939	209.56	210.79	197.93
4/87 - 3/88	235.59	1.000	235.59	217.60	217.60
				R ² =	0.887

Exponential Regression of Average Cost-Indexed
Medical Only Severity on Time

MICHIGAN

Policy Period	Medical Only Severity	Average Cost Index	Indexed Medical Only Severity	Predicted Indexed Medical Only Severity	Predicted Medical Only Severity
4/82 - 3/83	\$142.45	0.667	\$213.57	\$200.49	\$133.73
4/83 - 3/84	149.56	0.730	204.88	203.83	148.79
4/84 - 3/85	154.28	0.782	197.29	207.22	162.05
4/85 - 3/86	162.89	0.847	192.31	210.67	178.44
4/86 - 3/87	196.78	0.925	212.74	214.18	198.12
4/87 - 3/88	235.59	1.000	235.59	217.75	217.75
				R ² =	0.891

Exponential Regression of Medical Only-Indexed
Fatal Medical Severity on Time

MICHIGAN

Policy Period	Fatal Severity	Medical Only Index	Indexed Fatal Severity	Predicted Indexed Fatal Severity	Predicted Fatal Severity
4/82 - 3/83	\$6,433.60	0.605	\$10,634.05	\$15,246.81	\$9,224.32
4/83 - 3/84	6,304.26	0.635	9,927.97	12,700.84	8,065.03
4/84 - 3/85	19,692.66	0.655	30,065.13	10,580.00	6,929.90
4/85 - 3/86	5,341.38	0.691	7,729.93	8,813.31	6,090.00
4/86 - 3/87	5,635.89	0.835	6,749.57	7,341.63	6,130.26
4/87 - 3/88	4,895.54	1.000	4,895.54	6,115.70	6,115.70
				R ² =	-0.071

Exponential Regression of Medical Only-Indexed
Permanent Total Medical Severity on Time

MICHIGAN

Policy Period	Permanent Total Severity	Medical Only Index	Indexed Permanent Total Severity	Predicted Indexed Permanent Total Severity	Predicted Permanent Total Severity
4/82 - 3/83	\$33,115.37	0.605	\$54,736.15	\$84,958.93	\$51,400.15
4/83 - 3/84	68,664.22	0.635	108,132.63	105,705.39	67,122.92
4/84 - 3/85	135,760.06	0.655	207,267.27	131,518.02	86,144.30
4/85 - 3/86	118,632.50	0.691	171,682.34	163,633.93	113,071.05
4/86 - 3/87	324,595.41	0.835	388,737.02	203,592.36	169,999.62
4/87 - 3/88	121,739.80	1.000	121,739.80	253,308.40	253,308.40
				R ² =	0.139

Exponential Regression of Medical Only-Indexed
Major Permanent Partial Medical Severity on Time

MICHIGAN

Policy Period	Major Permanent Partial Severity	Medical Only Index	Indexed Major Permanent Partial Severity	Predicted Indexed Major Permanent Partial Severity	Predicted Major Permanent Partial Severity
4/82 - 3/83	\$16,640.71	0.605	\$27,505.31	\$28,719.45	\$17,375.27
4/83 - 3/84	16,200.71	0.635	25,512.93	27,607.89	17,531.01
4/84 - 3/85	18,880.35	0.655	28,824.96	26,539.35	17,383.27
4/85 - 3/86	19,556.66	0.691	28,301.97	25,512.16	17,628.91
4/86 - 3/87	22,100.67	0.835	26,467.87	24,524.74	20,478.16
4/87 - 3/88	20,484.78	1.000	20,484.78	23,575.53	23,575.53
				R ² =	0.199

Exponential Regression of Medical Only-Indexed
Minor Permanent Partial Medical Severity on Time

MICHIGAN

Policy Period	Minor Permanent Partial Severity	Medical Only Index	Indexed Minor Permanent Partial Severity	Predicted Indexed Minor Permanent Partial Severity	Predicted Minor Permanent Partial Severity
4/82 - 3/83	\$2,477.15	0.605	\$4,094.46	\$3,885.71	\$2,350.86
4/83 - 3/84	2,548.28	0.635	4,013.04	4,007.87	2,545.00
4/84 - 3/85	2,519.71	0.655	3,846.89	4,133.87	2,707.68
4/85 - 3/86	2,925.25	0.691	4,233.36	4,263.82	2,946.30
4/86 - 3/87	3,540.19	0.835	4,239.75	4,397.87	3,672.22
4/87 - 3/88	4,826.83	1.000	4,826.83	4,536.13	4,536.13
				R ² =	0.964

Exponential Regression of Medical Only-Indexed
Temporary Total Medical Severity on Time

MICHIGAN

Policy Period	Temporary Total Severity	Medical Only Index	Indexed Temporary Total Severity	Predicted Indexed Temporary Total Severity	Predicted Temporary Total Severity
4/82 - 3/83	\$1,226.07	0.605	\$2,026.56	\$1,997.69	\$1,208.60
4/83 - 3/84	1,339.49	0.635	2,109.43	2,074.42	1,317.26
4/84 - 3/85	1,387.12	0.655	2,117.74	2,154.11	1,410.94
4/85 - 3/86	1,508.42	0.691	2,182.95	2,236.85	1,545.67
4/86 - 3/87	1,865.67	0.835	2,234.34	2,322.78	1,939.52
4/87 - 3/88	2,533.53	1.000	2,533.53	2,412.00	2,412.00
				R ² =	0.981

Exponential Regression of Medical Only-Indexed
Serious Medical Severity on Time

MICHIGAN

Policy Period	Serious Severity	Medical Only Index	Indexed Serious Severity	Predicted Indexed Serious Severity	Predicted Serious Severity
4/82 - 3/83	\$16,745.45	0.605	\$27,678.43	\$29,831.05	\$18,047.79
4/83 - 3/84	16,519.92	0.635	26,015.62	28,843.99	18,315.93
4/84 - 3/85	21,176.45	0.655	32,330.46	27,889.59	18,267.68
4/85 - 3/86	20,856.01	0.691	30,182.36	26,966.77	18,634.03
4/86 - 3/87	24,516.83	0.835	29,361.47	26,074.48	21,772.19
4/87 - 3/88	20,620.27	1.000	20,620.27	25,211.71	25,211.71
				R ² =	-0.030

Exponential Regression of Medical Only-Indexed
Non-Serious Medical Severity on Time

MICHIGAN

Policy Period	Non-Serious Severity	Medical Only Index	Indexed Non-Serious Severity	Predicted Indexed Non-Serious Severity	Predicted Non-Serious Severity
4/82 - 3/83	\$1,365.40	0.605	\$2,256.86	\$2,223.13	\$1,344.99
4/83 - 3/84	1,473.75	0.635	2,320.87	2,282.85	1,449.61
4/84 - 3/85	1,511.47	0.655	2,307.59	2,344.16	1,535.43
4/85 - 3/86	1,618.98	0.691	2,342.95	2,407.13	1,663.33
4/86 - 3/87	1,982.73	0.835	2,374.53	2,471.79	2,063.94
4/87 - 3/88	2,671.83	1.000	2,671.83	2,538.18	2,538.18
				R ² =	0.977

Exponential Regression of Medical Only-Indexed
Total Medical Severity on Time

MICHIGAN

Policy Period	Total Severity	Medical Only Index	Indexed Total Severity	Predicted Indexed Total Severity	Predicted Total Severity
4/82 - 3/83	\$664.97	0.605	\$1,099.12	\$1,132.74	\$685.31
4/83 - 3/84	707.95	0.635	1,114.88	1,144.67	726.87
4/84 - 3/85	804.80	0.655	1,228.70	1,156.73	757.66
4/85 - 3/86	824.10	0.691	1,192.62	1,168.92	807.72
4/86 - 3/87	1,021.36	0.835	1,223.19	1,181.23	986.33
4/87 - 3/88	1,125.46	1.000	1,125.46	1,193.67	1,193.67
				R ² =	0.944

Exponential Regression of CPI-Indexed
 Total Medical Severity on Time

MICHIGAN

Policy Period	Total Severity	CPI Index	Indexed Total Severity	Predicted Indexed Total Severity	Predicted Total Severity
4/82 - 3/83	\$664.97	0.723	\$919.74	\$892.67	\$645.40
4/83 - 3/84	707.95	0.772	917.03	931.11	718.82
4/84 - 3/85	804.80	0.819	982.66	971.20	795.41
4/85 - 3/86	824.10	0.878	938.61	1,013.02	889.43
4/86 - 3/87	1,021.36	0.939	1,087.71	1,056.64	992.18
4/87 - 3/88	1,125.46	1.000	1,125.46	1,102.14	1,102.14
				R ² =	0.961

Exponential Regression of Average Cost-Indexed
 Total Medical Severity on Time

MICHIGAN

Policy Period	Total Severity	Average Cost Index	Indexed Total Severity	Predicted Indexed Total Severity	Predicted Total Severity
4/82 - 3/83	\$664.97	0.667	\$996.96	\$964.37	\$643.23
4/83 - 3/84	707.95	0.730	969.79	990.60	723.14
4/84 - 3/85	804.80	0.782	1,029.16	1,017.55	795.72
4/85 - 3/86	824.10	0.847	972.96	1,045.23	885.31
4/86 - 3/87	1,021.36	0.925	1,104.17	1,073.66	993.14
4/87 - 3/88	1,125.46	1.000	1,125.46	1,102.87	1,102.87
				R ² =	0.964

Regression of Medical Only Frequency x 1000
on Time and Unemployment Rate

MICHIGAN

Policy Period	Time	Unemployment Rate	Medical Only Frequency	Predicted Medical Only Frequency
4/82 - 3/83	0	14.5%	1.8921	1.8855
4/83 - 3/84	1	12.0%	1.9934	2.0243
4/84 - 3/85	2	10.2%	2.1047	2.0552
4/85 - 3/86	3	9.1%	1.9947	1.9783
4/86 - 3/87	4	8.4%	1.7494	1.8398
4/87 - 3/88	5	7.8%	1.7347	1.6858
			R ² =	0.869

Regression of Fatal Frequency x 1000
on Time and Unemployment Rate

MICHIGAN

Policy Period	Time	Unemployment Rate	Fatal Frequency	Predicted Fatal Frequency
4/82 - 3/83	0	14.5%	0.00150	0.00147
4/83 - 3/84	1	12.0%	0.00136	0.00141
4/84 - 3/85	2	10.2%	0.00129	0.00138
4/85 - 3/86	3	9.1%	0.00153	0.00137
4/86 - 3/87	4	8.4%	0.00137	0.00138
4/87 - 3/88	5	7.8%	0.00135	0.00138
			R ² =	0.148

Regression of Permanent Total Frequency x 1000
on Time and Unemployment Rate

MICHIGAN

Policy Period	Time	Unemployment Rate	Permanent Total Frequency	Predicted Permanent Total Frequency
4/82 - 3/83	0	14.5%	0.001214	0.001049
4/83 - 3/84	1	12.0%	0.000566	0.000970
4/84 - 3/85	2	10.2%	0.001018	0.000850
4/85 - 3/86	3	9.1%	0.000867	0.000687
4/86 - 3/87	4	8.4%	0.000434	0.000501
4/87 - 3/88	5	7.8%	0.000269	0.000309
			R ² =	0.612

Regression of Major Permanent Partial Frequency x 1000
 on Time and Unemployment Rate

MICHIGAN

Policy Period	Time	Unemployment Rate	Major Permanent Partial Frequency	Predicted Major Permanent Partial Frequency
4/82 - 3/83	0	14.5%	0.0420	0.0428
4/83 - 3/84	1	12.0%	0.0487	0.0472
4/84 - 3/85	2	10.2%	0.0499	0.0490
4/85 - 3/86	3	9.1%	0.0470	0.0481
4/86 - 3/87	4	8.4%	0.0433	0.0456
4/87 - 3/88	5	7.8%	0.0447	0.0428
			R ² =	0.713

Regression of Serious Frequency x 1000
on Time and Unemployment Rate

MICHIGAN

Policy Period	Time	Unemployment Rate	Serious Frequency	Predicted Serious Frequency
4/82 - 3/83	0	14.5%	0.0447	0.0453
4/83 - 3/84	1	12.0%	0.0506	0.0496
4/84 - 3/85	2	10.2%	0.0523	0.0512
4/85 - 3/86	3	9.1%	0.0494	0.0501
4/86 - 3/87	4	8.4%	0.0451	0.0475
4/87 - 3/88	5	7.8%	0.0463	0.0445
			R ² =	0.751

Regression of Minor Permanent Partial Frequency x 1000
on Time and Unemployment Rate

MICHIGAN

Policy Period	Time	Unemployment Rate	Minor Permanent Partial Frequency	Predicted Minor Permanent Partial Frequency
4/82 - 3/83	0	14.5%	0.0430	0.0439
4/83 - 3/84	1	12.0%	0.0453	0.0448
4/84 - 3/85	2	10.2%	0.0473	0.0426
4/85 - 3/86	3	9.1%	0.0324	0.0372
4/86 - 3/87	4	8.4%	0.0279	0.0300
4/87 - 3/88	5	7.8%	0.0250	0.0224
			R ² =	0.874

Regression of Temporary Total Frequency x 1000
on Time and Unemployment Rate

MICHIGAN

Policy Period	Time	Unemployment Rate	Temporary Total Frequency	Predicted Temporary Total Frequency
4/82 - 3/83	0	14.5%	0.3431	0.3432
4/83 - 3/84	1	12.0%	0.3624	0.3643
4/84 - 3/85	2	10.2%	0.3837	0.3774
4/85 - 3/86	3	9.1%	0.3830	0.3825
4/86 - 3/87	4	8.4%	0.3710	0.3830
4/87 - 3/88	5	7.8%	0.3895	0.3824
			R ² =	0.841

Regression of Non-Serious Frequency x 1000
on Time and Unemployment Rate

MICHIGAN

Policy Period	Time	Unemployment Rate	Non-Serious Frequency	Predicted Non-Serious Frequency
4/82 - 3/83	0	14.5%	0.3861	0.3871
4/83 - 3/84	1	12.0%	0.4077	0.4091
4/84 - 3/85	2	10.2%	0.4310	0.4200
4/85 - 3/86	3	9.1%	0.4154	0.4197
4/86 - 3/87	4	8.4%	0.3989	0.4130
4/87 - 3/88	5	7.8%	0.4145	0.4048
			R ² =	0.631

Exponential Regression of SAWW-Indexed
Fatal Indemnity Severity on Time

MICHIGAN

Policy Period	Fatal Severity	SAWW Index	Indexed Fatal Severity	Predicted Indexed Fatal Severity	Predicted Fatal Severity
4/82 - 3/83	\$83,468.02	0.831	\$100,442.86	\$91,236.27	\$75,817.34
4/83 - 3/84	87,857.23	0.861	102,040.92	99,634.44	85,785.25
4/84 - 3/85	93,570.81	0.910	102,825.06	108,805.65	99,013.14
4/85 - 3/86	96,572.70	0.954	101,229.25	118,821.05	113,355.28
4/86 - 3/87	115,484.02	0.970	119,055.69	129,758.36	125,865.61
4/87 - 3/88	170,131.96	1.000	170,131.96	141,702.43	141,702.43
				R ² =	0.755

Exponential Regression of SAWW-Indexed
Permanent Total Indemnity Severity on Time

MICHIGAN

Policy Period	Permanent Total Severity	SAWW Index	Indexed Permanent Total Severity	Predicted Indexed Permanent Total Severity	Predicted Permanent Total Severity
4/82 - 3/83	\$208,444.17	0.831	\$250,835.35	\$246,333.98	\$204,703.54
4/83 - 3/84	183,232.35	0.861	212,813.41	229,375.79	197,492.56
4/84 - 3/85	182,177.87	0.910	200,195.46	213,585.04	194,362.39
4/85 - 3/86	212,920.29	0.954	223,186.89	198,881.36	189,732.82
4/86 - 3/87	213,531.54	0.970	220,135.60	185,189.92	179,634.22
4/87 - 3/88	145,980.16	1.000	145,980.16	172,441.02	172,441.02
				R ² =	0.204

Exponential Regression of SAWW-Indexed
 Major Permanent Partial Indemnity Severity on Time

MICHIGAN

Policy Period	Major Permanent Partial Severity	SAWW Index	Indexed Major Permanent Partial Severity	Predicted Indexed Major Permanent Partial Severity	Predicted Major Permanent Partial Severity
4/82 - 3/83	\$68,231.07	0.831	\$82,107.18	\$77,316.60	\$64,250.10
4/83 - 3/84	65,600.96	0.861	76,191.59	79,110.72	68,114.33
4/84 - 3/85	72,258.33	0.910	79,404.76	80,946.47	73,661.29
4/85 - 3/86	74,784.25	0.954	78,390.20	82,824.81	79,014.87
4/86 - 3/87	83,659.91	0.970	86,247.33	84,746.75	82,204.35
4/87 - 3/88	89,729.02	1.000	89,729.02	86,713.28	86,713.28
				R ² =	0.876

Exponential Regression of SAWW-Indexed
 Serious Indemnity Severity on Time

MICHIGAN

Policy Period	Serious Severity	SAWW Index	Indexed Serious Severity	Predicted Indexed Serious Severity	Predicted Serious Severity
4/82 - 3/83	\$72,554.97	0.831	\$87,310.43	\$81,184.86	\$67,464.62
4/83 - 3/84	67,514.41	0.861	78,413.95	82,679.49	71,187.04
4/84 - 3/85	74,926.12	0.910	82,336.40	84,201.64	76,623.49
4/85 - 3/86	77,883.81	0.954	81,639.22	85,751.80	81,807.22
4/86 - 3/87	85,876.66	0.970	88,532.64	87,330.51	84,710.60
4/87 - 3/88	92,392.74	1.000	92,392.74	88,938.28	88,938.28
				R ² =	0.830

Exponential Regression of SAWW-Indexed
Minor Permanent Partial Indemnity Severity on Time

MICHIGAN

Policy Period	Minor Permanent Partial Severity	SAWW Index	Indexed Minor Permanent Partial Severity	Predicted Indexed Minor Permanent Partial Severity	Predicted Minor Permanent Partial Severity
4/82 - 3/83	\$5,312.43	0.831	\$6,392.81	\$5,733.27	\$4,764.35
4/83 - 3/84	4,800.20	0.861	5,575.15	5,668.03	4,880.17
4/84 - 3/85	4,365.42	0.910	4,797.17	5,603.53	5,099.21
4/85 - 3/86	5,210.69	0.954	5,461.94	5,539.76	5,284.94
4/86 - 3/87	5,398.43	0.970	5,565.39	5,476.72	5,312.42
4/87 - 3/88	5,755.50	1.000	5,755.50	5,414.40	5,414.40
				R ² =	0.185

Exponential Regression of SAWW-Indexed
Temporary Total Indemnity Severity on Time

MICHIGAN

Policy Period	Temporary Total Severity	SAWW Index	Indexed Temporary Total Severity	Predicted Indexed Temporary Total Severity	Predicted Temporary Total Severity
4/82 - 3/83	\$1,739.15	0.831	\$2,092.84	\$1,983.24	\$1,648.07
4/83 - 3/84	1,728.42	0.861	2,007.46	2,019.60	1,738.87
4/84 - 3/85	1,776.60	0.910	1,952.31	2,056.62	1,871.52
4/85 - 3/86	1,906.53	0.954	1,998.46	2,094.31	1,997.98
4/86 - 3/87	2,079.13	0.970	2,143.43	2,132.70	2,068.72
4/87 - 3/88	2,274.31	1.000	2,274.31	2,171.80	2,171.80
				R ² =	0.849

Exponential Regression of SAWW-Indexed
 Non-Serious Indemnity Severity on Time

MICHIGAN

Policy Period	Non-Serious Severity	SAWW Index	Indexed Non-Serious Severity	Predicted Indexed Non-Serious Severity	Predicted Non-Serious Severity
4/82 - 3/83	\$2,137.08	0.831	\$2,571.70	\$2,427.47	\$2,017.23
4/83 - 3/84	2,069.61	0.861	2,403.72	2,413.81	2,078.29
4/84 - 3/85	2,060.86	0.910	2,264.68	2,400.21	2,184.20
4/85 - 3/86	2,164.35	0.954	2,268.71	2,386.70	2,276.91
4/86 - 3/87	2,311.17	0.970	2,382.65	2,373.26	2,302.06
4/87 - 3/88	2,484.24	1.000	2,484.24	2,359.90	2,359.90
				R ² =	0.570

Regression of Total Indemnity Frequency x 1000
on Unemployment Rate

MICHIGAN

Policy Period	Unemployment Rate	Total Indemnity Frequency	Predicted Total Indemnity Frequency
4/82 - 3/83	14.5%	0.4307	0.4433
4/83 - 3/84	12.0%	0.4584	0.4515
4/84 - 3/85	10.2%	0.4833	0.4574
4/85 - 3/86	9.1%	0.4648	0.4611
4/86 - 3/87	8.4%	0.4440	0.4634
4/87 - 3/88	7.8%	0.4608	0.4653
		R ² =	0.212

Regression of Total Frequency x 1000
on Unemployment Rate

MICHIGAN

Policy Period	Unemployment Rate	Total Frequency	Predicted Total Frequency
4/82 - 3/83	14.5%	2.3229	2.4449
4/83 - 3/84	12.0%	2.4518	2.3991
4/84 - 3/85	10.2%	2.5880	2.3661
4/85 - 3/86	9.1%	2.4595	2.3459
4/86 - 3/87	8.4%	2.1934	2.3330
4/87 - 3/88	7.8%	2.1955	2.3220
		R ² =	0.085

Regression of Non-Serious Indemnity Severity
on Unemployment Rate

MICHIGAN

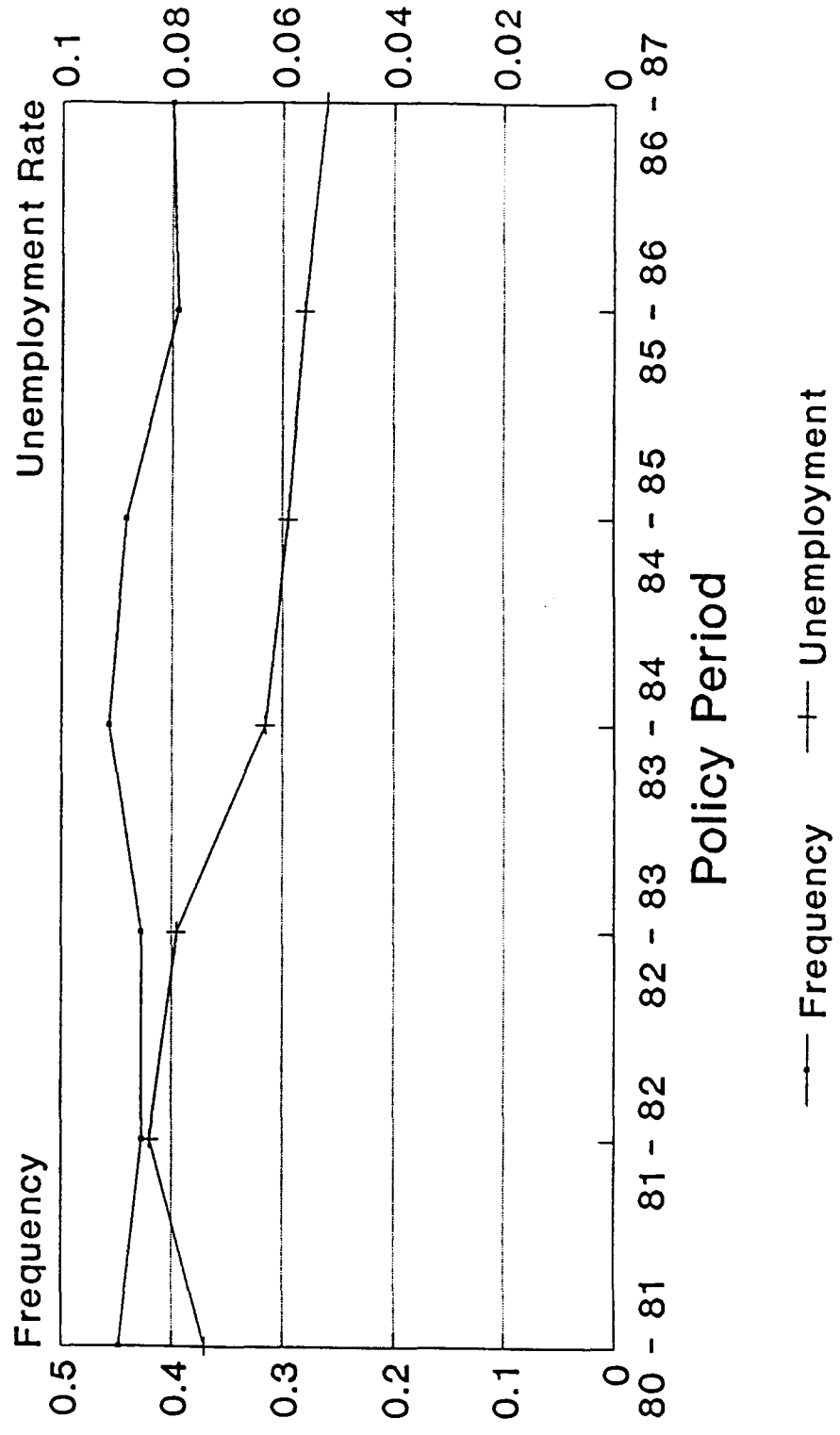
Policy Period	Unemployment Rate	Non-Serious Indemnity Severity	Predicted Non-Serious Indemnity Severity
4/82 - 3/83	14.5%	\$2,137.08	\$2,027.59
4/83 - 3/84	12.0%	2,069.61	2,133.77
4/84 - 3/85	10.2%	2,060.86	2,210.21
4/85 - 3/86	9.1%	2,164.35	2,256.93
4/86 - 3/87	8.4%	2,311.17	2,286.66
4/87 - 3/88	7.8%	2,484.24	2,312.14
		R ² =	0.427

Exponential Regression of CPI-Indexed Total
 Medical Severity on Indemnity Claims on Time

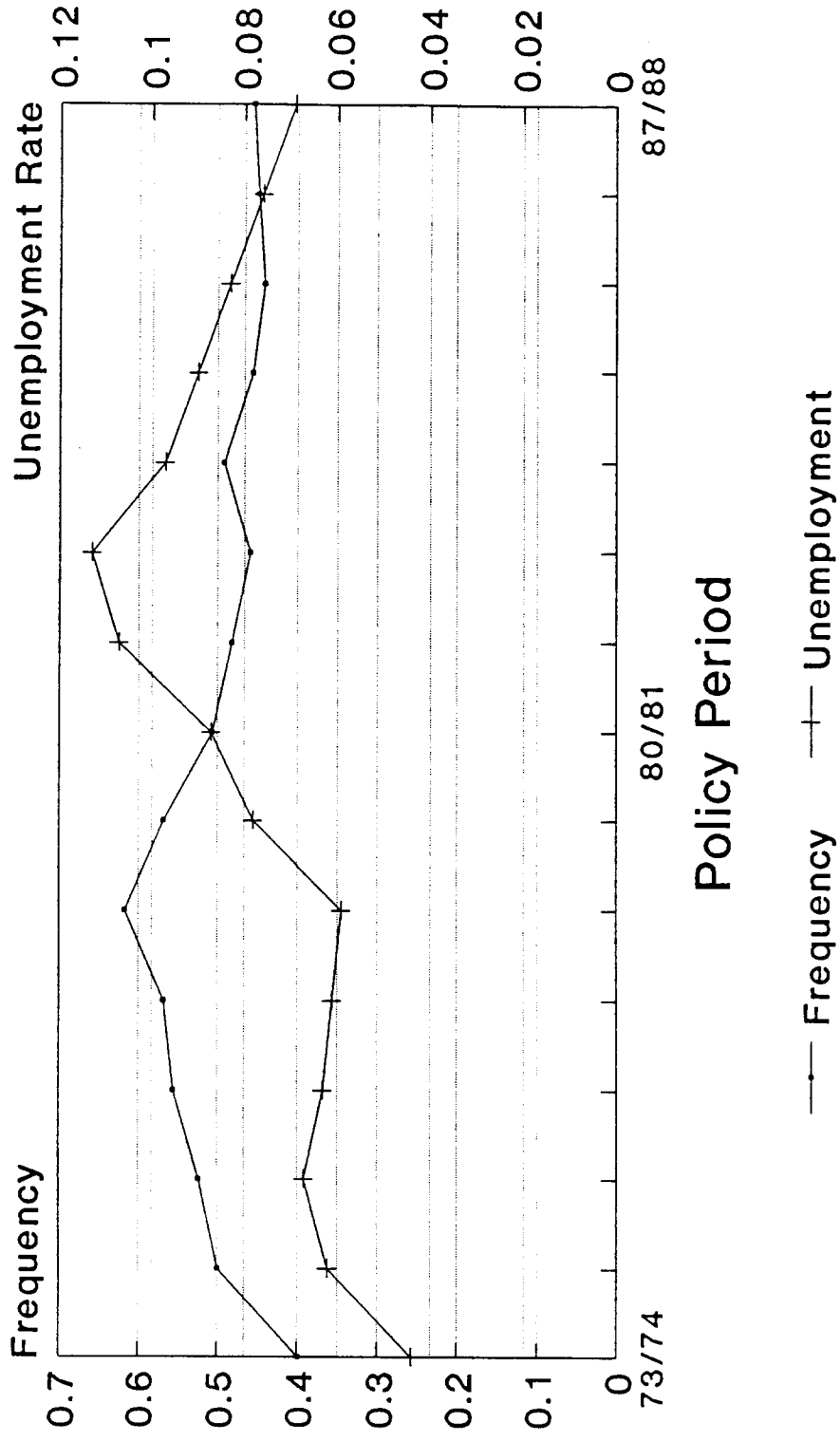
MICHIGAN

Policy Period	Total Medical Severity	CPI Index	Indexed Total Medical Severity	Predicted Indexed Total Medical Severity	Predicted Total Medical Severity
4/82 - 3/83	\$2,960.23	0.723	\$4,094.37	\$4,078.99	\$2,949.11
4/83 - 3/84	3,136.26	0.772	4,062.51	4,163.80	3,214.45
4/84 - 3/85	3,637.90	0.819	4,441.88	4,250.37	3,481.06
4/85 - 3/86	3,661.88	0.878	4,170.71	4,338.75	3,809.42
4/86 - 3/87	4,270.34	0.939	4,547.75	4,428.96	4,158.79
4/87 - 3/88	4,475.27	1.000	4,475.27	4,521.05	4,521.05
				R ² =	0.963

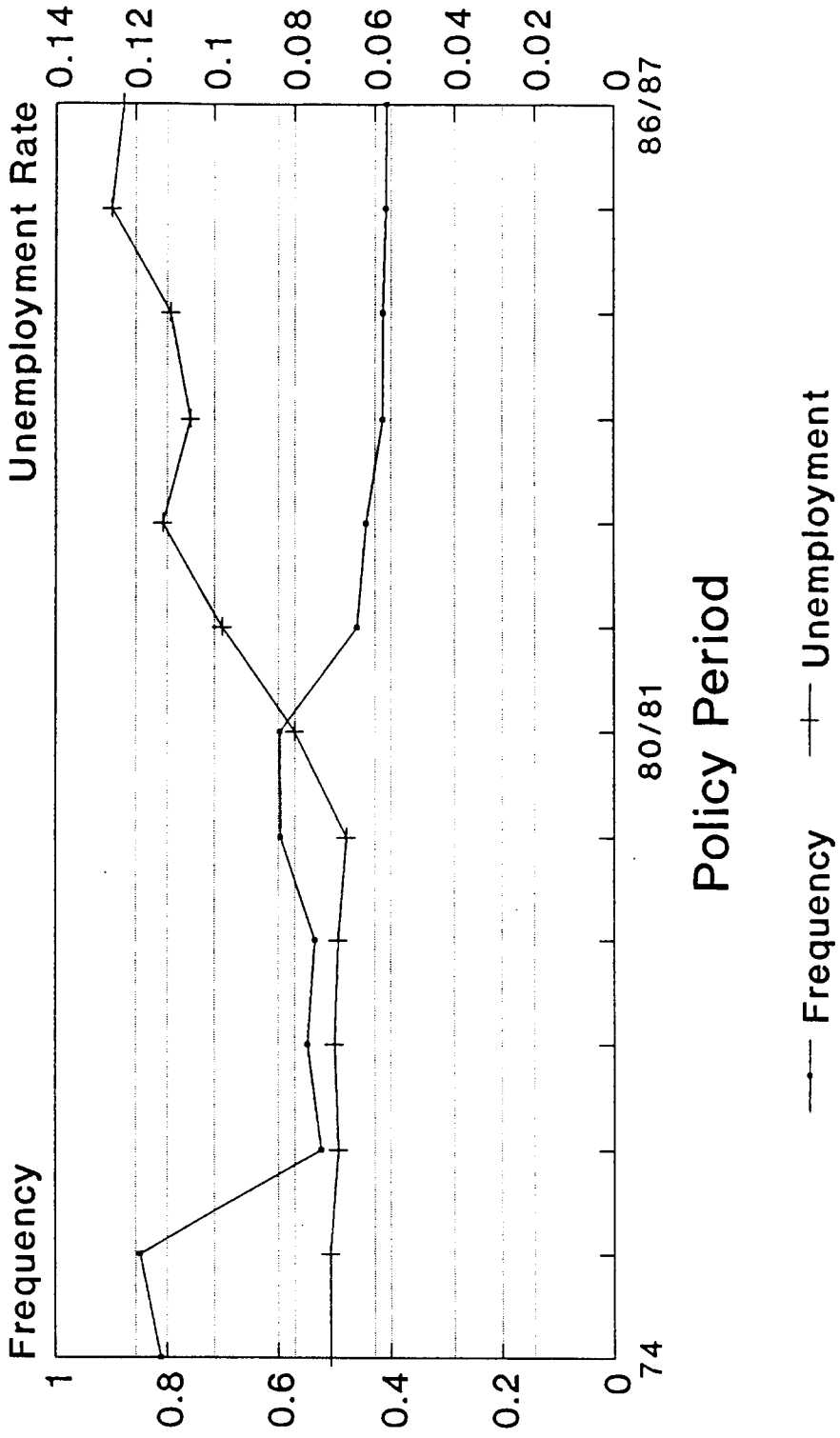
Florida Total Indemnity Frequency



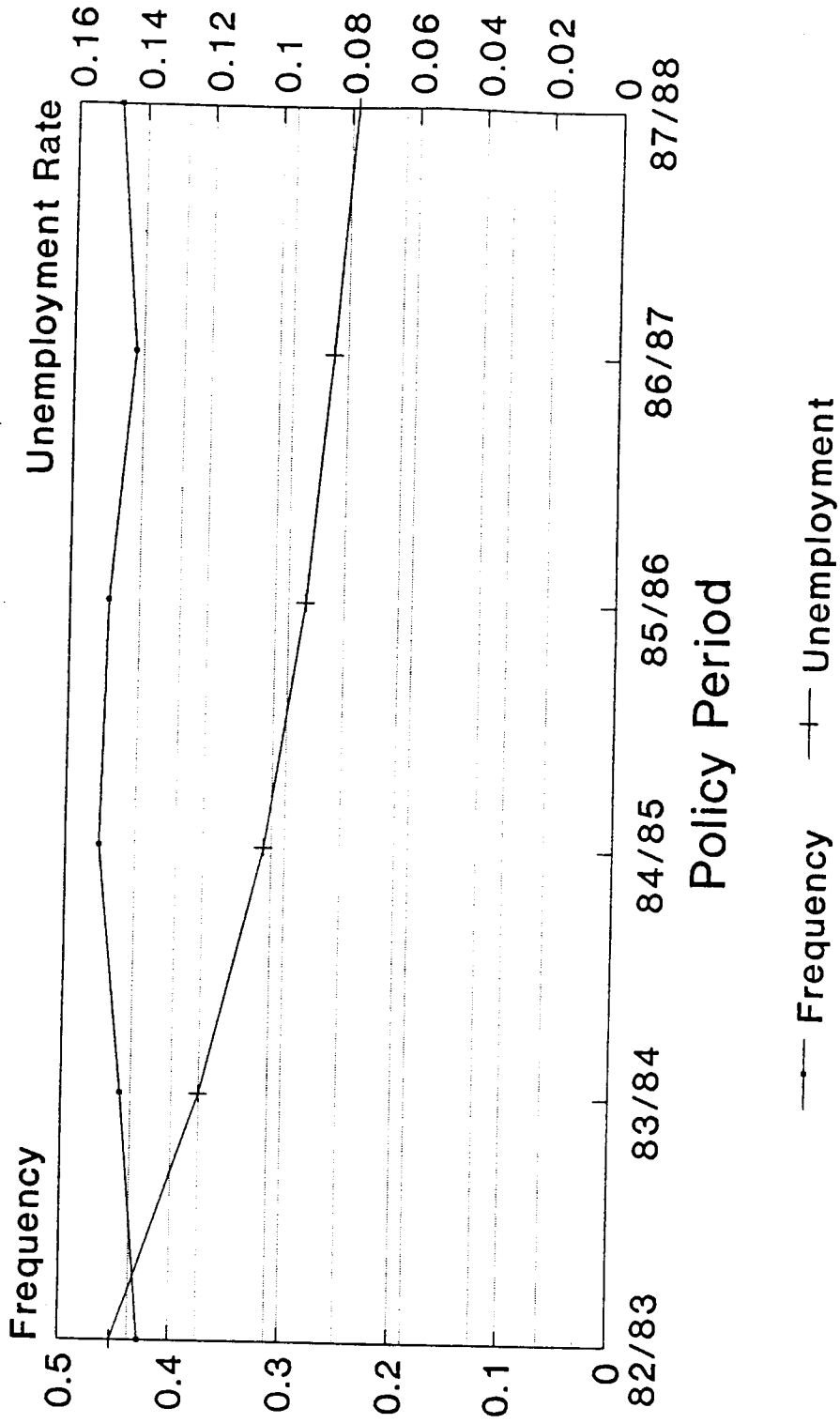
Illinois Total Indemnity Frequency



Louisiana Total Indemnity Frequency



Michigan Total Indemnity Frequency



**RATEMAKING PROCEDURES
EVALUATION OF RATEMAKING METHODOLOGIES**

**NCCI EXAMINATION
VOLUME VI - SECTION IIB - PART 4
CLASSIFICATION RATEMAKING**

November 26, 1991

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CLASSIFICATION RATEMAKING

I. INTRODUCTION

An integral aspect of the National Council on Compensation Insurance (NCCI) ratemaking efforts, as described in detail in Section IIA of this examination report, is the allocation of the overall rate level change to individual classifications. This step in the ratemaking process is important in determining the relative equity of the premiums to be charged to members of each rating class.

A commonly accepted goal of any ratemaking process is to be responsive to current conditions without introducing unnecessary instability in the rating structure. For classification ratemaking more emphasis is frequently placed on stability than on responsiveness. Therefore, a thorough evaluation of a classification ratemaking procedure must include an analysis of how equity and stability are balanced within the system of calculations.

Section IIB-4 of the National Association of Insurance Commissioners (NAIC) request for proposal to examine the NCCI specifically addresses the issues of equity and stability in the workers compensation ratemaking system. The NAIC request for proposal and M&R's response to that request, recognized the complex nature of the system and that all facets of the procedure are not equally important. Therefore, the examination was to concentrate on the following three objectives that are considered especially relevant to the issues of equity and stability:

Objective 4a - Study and recommend alternatives to NCCI's (1) current approach to credibility, (2) practice of using three years of data as a sole indicator for most national pure premium indications and as a basic unit for determining pure premiums at the state level, and (3) loss limitations used in those calculations.

Objective 4b - Determine if the NCCI's procedure for determining industry group relativities could be enhanced by using more years of data. The analysis also will address variances in approach between large and small states.

Objective 4c - Determine if the NCCI should adjust losses to a current or common level by trending individual years separately rather than by applying an aggregate trend factor to all years combined.

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We addressed these objectives theoretically and empirically. We first reviewed the theory underlying the current methodology to identify the procedures used and to understand their impact on NCCI rates. We then identified specific alternative procedures to be tested.

We then designed empirical tests of both the equity, measured in terms of the accuracy of forecasts relative to actual experience, and stability, measured by the consistency of the forecasts from year to year, to compare the performance of the current NCCI approach with that of those alternatives. In addition to supporting the conclusions reached in this examination, we believe that these empirical tests can be used by NCCI, regulators and other analysts as a framework for future tests of alternatives to the NCCI methodology.

In addition to the stated objectives 4a, 4b, and 4c, we have also reviewed the loss experience of classes that comprise the "All Other" industry group in several sample states. The objective of this supplemental analysis was to determine if the wide variety of exposures included in this group can be better segregated in a consistent manner to improve the accuracy of the ratemaking system. Finally, we identified a number of other areas for further review outside the scope of objectives 4a, 4b, 4c.

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II. CONCLUSIONS AND RECOMMENDATIONS

In our examination, we reviewed specific alternatives to the current NCCI classification ratemaking methodology in the following areas:

- A. Project Objective 4a:
 - 1. Credibility formula
 - 2. Length of the experience period
 - 3. Limitation of losses
- B. Project Objective 4b:
 - Industry group relativities
- C. Project Objective 4c:
 - Application of trend factors
- D. Other Specific Alternatives Relative to:
 - 1. Composition of "All Other" industry group
 - 2. National relativities in classification rating.

In addition to testing specific alternatives in the areas listed above, other subjects arose during the course of our review. These included:

- E. Other Items
 - 1. An apparent inconsistency of loss limits used in the various components of partial pure premiums
 - 2. Issues relating to the treatment of 'F' classifications
 - 3. Observations regarding the treatment of losses in excess of the limits used in state classification experience
 - 4. Weighting used in calculating test correction factors
 - 5. A review of additional calculations supplied by NCCI

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In this part of this section of this examination report, we will present a brief discussion of our conclusions in each of these areas followed by specific recommendations where appropriate. We direct readers to more complete discussions of those conclusions contained later in this section of this examination report.

A. Project Objective 4a

1. Credibility Formula

We tested several alternatives to NCCI's classification ratemaking credibility formulas. None of the alternatives tested proved to be generally more accurate or more consistent in identifying relative cost differences than the current formula.

A more detailed discussion of our conclusions in this area is found on pages 53 through 56.

2. Length of the Experience Period

Our tests indicated that increasing the length of the experience period used in calculating industry group differentials and indicated partial pure premiums from three to five years enhances the consistency of the ratemaking methodology in identifying relative loss cost differences among classes. Furthermore, our accuracy tests, which were necessarily limited to first report data for only one policy year and five states, suggest that this aspect of the ratemaking process would also improve with a longer experience period. Additional calculations provided by NCCI using other states, more mature data and adjusting for expected development generally appear to support these conclusions, though not unanimously. We recognize the possibility, however, that the tests using other policy years, more mature data and other states may result in different conclusions.

We recommend that NCCI increase the number of years of experience used in state classification ratemaking from three to five unless results of additional accuracy tests by NCCI using the methodology described here and incorporating data at second report and later, are not consistent with the results we obtained.

Our recommendation does not mean we believe five years is sufficient. We did not test longer experience periods due to practical limitations imposed by available data. NCCI should test the appropriateness of using more than five years of data, subject to data

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limitations and consideration of the relevancy of experience too distant from the ratemaking effective date.

A more detailed discussion of our conclusions in this area is found on pages 50 and 51.

3. Limitation of Losses

None of our alternatives to the current loss limitations proved to significantly improve upon the current methodology. However, use of half the current loss limitation may nominally increase the accuracy and consistency of the process assuming no change in the current treatment of losses above the limit. We understand that NCCI is currently considering basing the loss limitation on fifty times the average cost for all claims in a state as compared with the current limitation based on the average serious claim size. NCCI indicates that this new limitation will result in limits equal to roughly half the current limitation. We agree with this proposed course of action but recognize questions regarding treatment of losses above the limit.

A more detailed discussion of our conclusions in this area is found on pages 51 through 53 and 54 through 55.

B. Project Objective 4b - Industry Group Relativities

In contrast to our conclusions in Objective 4a, item 2 above, none of the alternative number of years of experience tested proved to generally provide more accurate identification of relative differences among industry groups than the others. We note that it is not uncommon to use successively more years of experience in property and casualty insurance ratemaking as the level of detail required increases. For example, using three years of experience for industry group differentials would not be inherently incompatible with using, say, five years of experience at the class level.

A more detailed discussion of our conclusions in this area is found on pages 62 through 64.

C. Project Objective 4c - Application of Trend Factors

We recommend that NCCI trend the losses for each policy year separately in the classification ratemaking methodology. This change is not technically complex to

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implement and any additional costs would be more than offset by the added consistency achieved by the change. If NCCI increases the number of years used in classification ratemaking as recommended above, it is likely that differences between the current and the alternative trend application would be more significant.

A more detailed discussion of our conclusions in this area is found on page 62.

D. Other Specific Alternatives

1. Composition of the "All Other" Industry Group

We reviewed the composition of the "All Other" industry group. We recommend that NCCI further investigate subdividing this industry group into smaller, more homogeneous industry groups. Given the size of the "All Other" group, we believe that the resulting sub-groups could result in industry groups large enough to have full statistical credibility.

A detailed discussion leading up to the above conclusions is presented on page 66. Using data from Maine, Michigan, and Pennsylvania, we show that a clerical office workers industry group could be created from the current "All Other" group. Both the new clerical group and the remaining "All Other" classes would be more homogeneous and large enough to warrant full credibility. We stress that other sub-groups are possible and could vary by state.

Although the scope of this study was the "All Other" industry group, this kind of analysis could be extended to the "Manufacturing" and "Contracting" industry groups to better segregate common occupational activities.

2. Alternate National Partial Pure Premiums

We tested an alternative to the current pure premiums indicated by national relativities. This alternative added a second component to the calculation of those partial pure premiums, giving the state's region more weight. We found, however, that this resulted in little change in final rates compared with the current methodology. We do not recommend changing the formula to reflect regional experience.

A more detailed discussion of our conclusions in this area is found on page 71.

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E. Other Areas

1. Consistency in Loss Limitations

NCCI uses limited losses to calculate two of the three components of partial pure premiums determined by formula while the third is not limited. This results in lower partial pure premiums for fully credible classes and higher partial pure premiums for non-fully credible classes compared to the result if limited losses were used in all three components.

We recommend that NCCI adopt a methodology that does not suffer from this potential bias. One alternative could be to replace the partial pure premiums used in the calculations by their relativities to statewide average partial pure premiums calculated using the experience period payrolls as weights. Another alternative that was suggested would be to limit the current on-level partial pure premiums to reflect the limitation of losses.

A more detailed discussion of our conclusions in this area is found on pages 26 through 28.

2. 'F' Classifications

The current NCCI approach does not include a provision for trend in loss costs for 'F' classifications but such trend can influence costs for these classes. We recommend that NCCI modify its procedure to reflect the effect of such trend.

We recommend that the F-Class financial calls either be enforced, validated and utilized in ratemaking, or be eliminated. This recommendation is similar to the corresponding recommendation contained in the Overall Rate Level portion of Volume III to Section I which addressed the evaluation of data collection and data quality. Page 2 of that reference identifies as one key weakness that "NCCI collects F-Class financial call data which is not used to determine rate level changes and is not currently validated". A key recommendation on page 2 is that: "NCCI should examine their current list of financial calls. Calls which are not validated or required should be eliminated." Pages 6 and 7 of that volume discuss the collection process for F-Class financial calls.

A more detailed discussion of our conclusions in this area is found in Appendix D.

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3. Losses in Excess of Limitations

Our tests indicate that different classes may have different expected losses above the loss limitation. Insurance spreads risk among various insureds, and as such must always strike a balance between pooling and equity for a specific insured or class. At one extreme, all insureds could be charged the same price. At the other, all could be charged different prices, each reflecting their own costs. The first extreme emphasizes pooling whereas the other equity.

The NCCI method of providing for losses in excess of the loss limitation in classification data spreads the provision for large losses almost uniformly among all classes in an industry group. The results of our review of losses above the limitation indicates that different classes may expect different losses in excess of the limitation. We recognize that these indications could change if these tests are conducted on a larger database than that used in this examination.

We thus recommend that NCCI take two steps:

- a. NCCI should further examine the extent that classes have different expected losses in excess of the limitation contained in classification ratemaking data.
- b. With this additional information, NCCI should determine whether to continue the present procedure of including uniform provision for excess losses by industry group or to revise its procedures to recognize differences, if any, in excess loss potential by class. These conclusions and recommendations may appear to be contradictory to those presented in the Limitation of Losses section on page 5 above. Those earlier recommendations are based on the premise that the current methodology for excess losses continues. The conclusions and recommendations here address whether or not actual losses seem to be consistent with that assumption.

A more detailed discussion of our conclusions in this area is found on page 76.

4. Weighting Used in Test Correction Factors

We recommend that the test correction factor be calculated using the latest available single year of on-level premium by class as weights. This will reduce the potential for failing to accurately achieve the targeted rate change in states with changing class distributions. This

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change is more important if the number of years used in classification ratemaking is increased.

A more detailed discussion of our conclusions in this area is found on page 30.

5. Additional Information Prepared by NCCI

In the later stages of this examination, NCCI prepared additional tests of the relative accuracy from the use of five years of data as compared with the current three years. We addressed this additional information in pages 77 through 79 of this examination report. The results of these additional tests seem generally to agree with the indications of our original tests.

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III. DISCUSSION OF ALTERNATIVES TO NCCI METHODOLOGY

Our report in Section IIA of the ratemaking part of this examination contains a complete and detailed description of the current NCCI classification methodology. We will not repeat the contents of that report here; rather we will highlight certain aspects of the methodology that pertain to this section of the examination.

The initial scope of our examination was limited to the following aspects of the current NCCI classification ratemaking methodology:

- A. Credibility formula
- B. Length of the experience period
- C. Limitation of losses
- D. Industry group relativities
- E. Application of trend
- F. Alternative to pure premiums indicated by national relativities

Our analysis of these components of workers compensation classification ratemaking involved a comparison of the accuracy and consistency of the current approach with that of specific alternatives to each. Our approach involved direct empirical testing of the current methodology with specific alternatives. To best isolate the effects of each alternative, our tests varied only one aspect of the current procedure at a time. As such, simultaneous implementation of two or more alternatives may not produce results parallel to the implementation of either of those alternatives separately.

In the course of this examination, the Examination Oversight Group asked us to address additional specific questions in the following areas:

- G. 'F' classifications
- H. Segregation of classes within the "All Other" industry group

In addition, we noticed other aspects of the current NCCI methodology that were worthy of comment in the following areas:

- I. Other aspects
 - 1. An apparent inconsistency of loss limits used in the various components of the partial pure premiums

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2. Losses in excess of limitations
3. Weighting used in calculating test correction factors
4. Development of losses incorporated in classification ratemaking
5. Volatility in classification rates arising from that in national experience
6. Swing limits

Our analysis of item F, above, also included empirical testing of specific alternatives similar to items A-E while our analysis of items G, H, and I did not include these tests.

The following paragraphs contain discussions of key aspects of the current NCCI methodology and alternatives to the NCCI methodology in the areas outlined above. Later portions of this section of this examination report will address data, the methodology and more complete conclusions of our analysis in each of these areas.

A. Credibility Formula

The purpose of credibility weighting in class, or other, ratemaking applications is recognition of the believability of the data or indications under review. Generally, averages taken from small volumes of data tend to be volatile while those taken from large volumes tend to be more stable. This is a reflection of the law of large numbers in statistics.

Credibility weights used by actuaries are a means to represent this concept in quantitative terms. In most applications the choice of the particular credibility formula is largely judgmental, reflecting a balance between stability and responsiveness in the ratemaking process. The rates for fully credible classes are affected by the credibility procedure because the weighted average of indicated changes for both fully credible and partly credible classes is balanced to the targeted overall rate change. Thus, use of a proper credibility procedure is important to all classifications.

In calculating the pure premiums derived by formula, NCCI uses a credibility weighting procedure. The credibility applied to an individual class depends on the volume of expected losses for that class. The credibility applied to pure premiums indicated by

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national relativity is based on the number of claims that were used in calculating that pure premium.

The formula that is used in both cases is:

$$\text{Credibility} = (\text{Volume/Full Credibility Standard})^{2/3}$$

where Volume indicates either expected losses for indicated pure premiums or number of claims for pure premiums indicated by national relativity and, in no case is the credibility allowed to exceed one. The credibility assigned to pure premiums indicated by national relativity is further limited to one-half of the complement of the credibility assigned to the indicated pure premium.

This formula indicates four essential properties of the current NCCI credibility procedure:

1. Credibility is based on the level of expected losses or, in the case of pure premiums indicated by national relativity, number of claims,
2. There is a full credibility standard; classes with expected losses or claim counts above that amount are given full, or 100%, credibility,
3. Partial credibility is assigned to classes with less than the full credibility level experience based on the ratio of the expected losses or number of claims to the full credibility standard,
4. The amount of credibility added by a dollar of added expected losses or a single claim decreases as the total amount of expected losses or claims increases. For example, if the full credibility standard were \$100, \$0 in expected losses would be given 0% credibility, \$1 in expected losses would be given 4% credibility, but \$2 in expected losses would be given 7% credibility. Here the first \$1 of expected losses increases credibility by 4%, the next \$1 increases it by 3%.

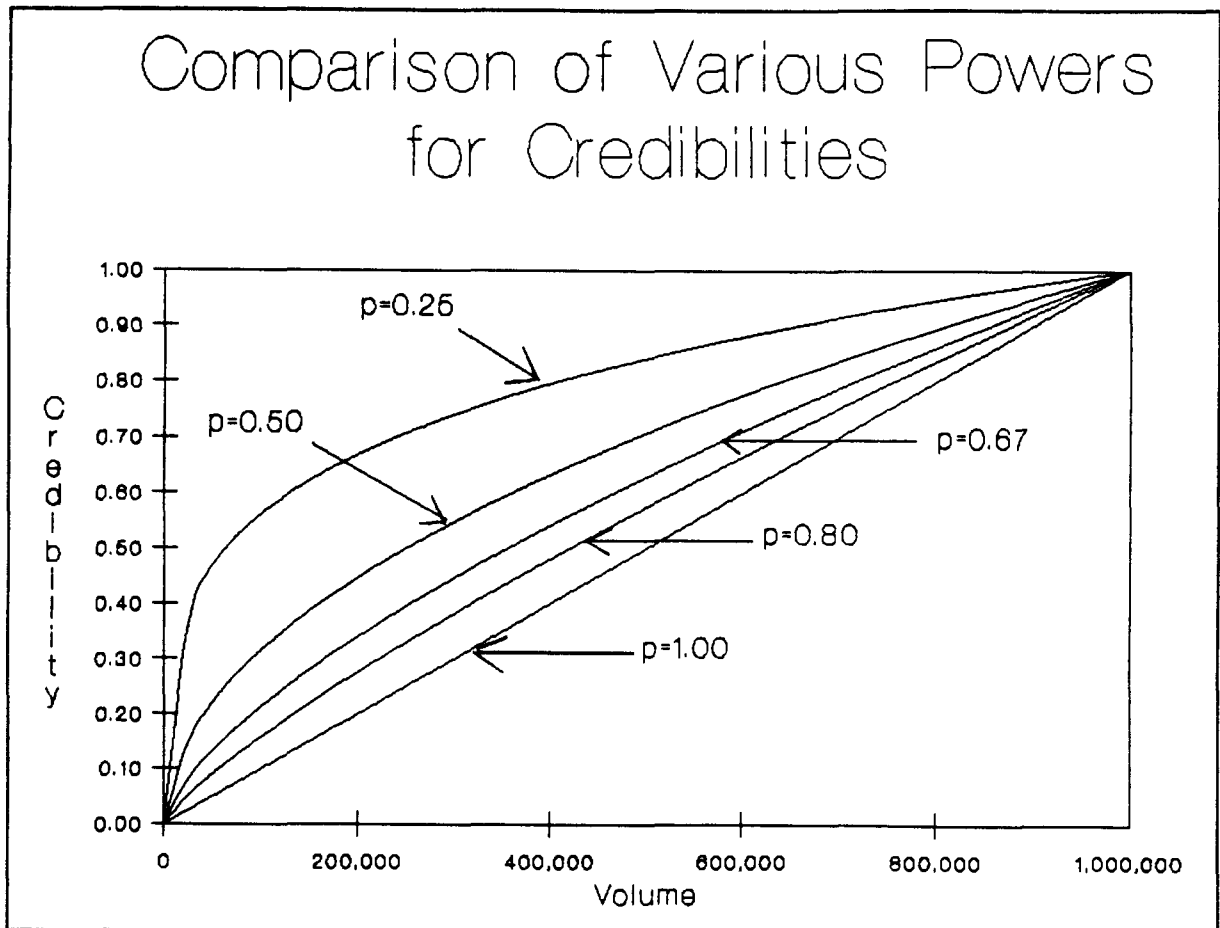
There have been numerous papers addressing credibility formulas and their application. The credibility formulas in use today seem to fall into two families. The first, to which the current NCCI formula belongs, which we will label classical credibility, is in the form:

$$\text{Credibility} = (\text{Volume/Full Credibility Standard})^P$$

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with the credibility limited to be between 0 and 1. The power used, p here, is usually taken to be between 0 and 1. This choice of power insures that the fourth property above holds.

The chart below compares the credibilities assigned to various volumes of experience for several values of p . In all cases we used the same arbitrary full credibility standard of \$1 million. For any value of p between 0 and 1, a lower value of p produces a higher credibility for any fixed volume of experience as long as the volume is below the full credibility standard.



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The well known statistical property known as the "law of large numbers" implies that the larger the sample size the less the sample average can be expected to vary from the underlying population average. Under rather broad assumptions the variance of the sample average is inversely proportional to the square root of the sample size. This leads to the common use of the square root in many credibility applications.

On the other hand, the power used by NCCI is 2/3. In our review, we were unable to find discussion or documentation from the NCCI of the origin of the 2/3 power. It is possible that it was selected for the balance between stability and responsiveness that it brings to the ratemaking methodology.

The second parameter in this general credibility formula is the full credibility standard. With suitable statistical assumptions, the full credibility standard can be set to result in sample averages that are within a certain tolerance of the true mean a certain percentage of the time. See, for example, An Introduction to Credibility Theory by L.H. Longley-Cook (1962). In practice, however, this value often reflects the ratemaker's judgment of the volume of experience sufficient to provide reasonably accurate estimates.

The NCCI full credibility standard for serious pure premiums is twenty-five times the average serious case, for non-serious pure premiums it is three hundred times the average non-serious case and for medical pure premiums it is 80% of the non-serious credibility standard. The full credibility standards for pure premiums indicated by national relativity are twenty-five serious cases for serious pure premiums, three hundred non-serious cases for non-serious pure premiums and three hundred total serious and non-serious cases for medical pure premiums.

We understand that these full credibility standards were judgmentally derived and have been consistently applied for a considerable amount of time. We have not, however, seen discussions regarding the rationale behind these full credibility selections.

Another form used in calculating credibilities, that we will label the ratio formula, can be expressed as:

$$Z = \text{Credibility} = \frac{n}{n+K}$$

where K is some constant and n is a measure of the volume of experience.

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Hans Bühlmann ("Experience Rating and Credibility", The Astin Bulletin, Volume IV, 1967) has shown that with the appropriate choice of the constant K, which he provides in that paper, Z provides the best linear approximation of the form:

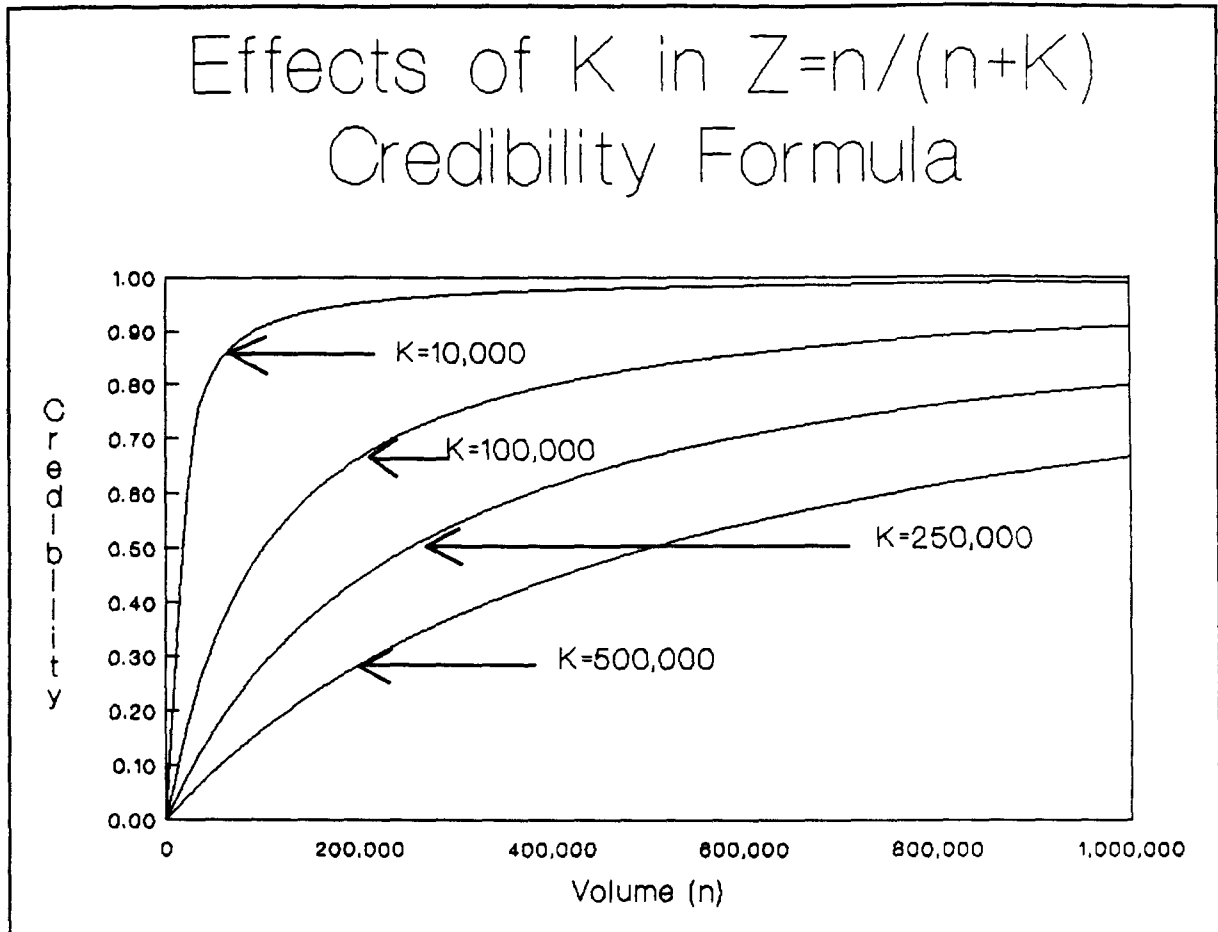
$$a + Z\bar{x}$$

to the expected value of the underlying distribution. Here \bar{x} is the average of the observed sample of size n.

As with the power form for credibility with the power between 0 and 1, each additional unit of volume results in successively less additional credibility. Unlike the power form described above, there will be no class whose experience will be fully credible. That is, the value of the credibility will be less than 1 if K is chosen to be any positive number. If K is selected to be 0 then all volumes of experience will be fully credible.

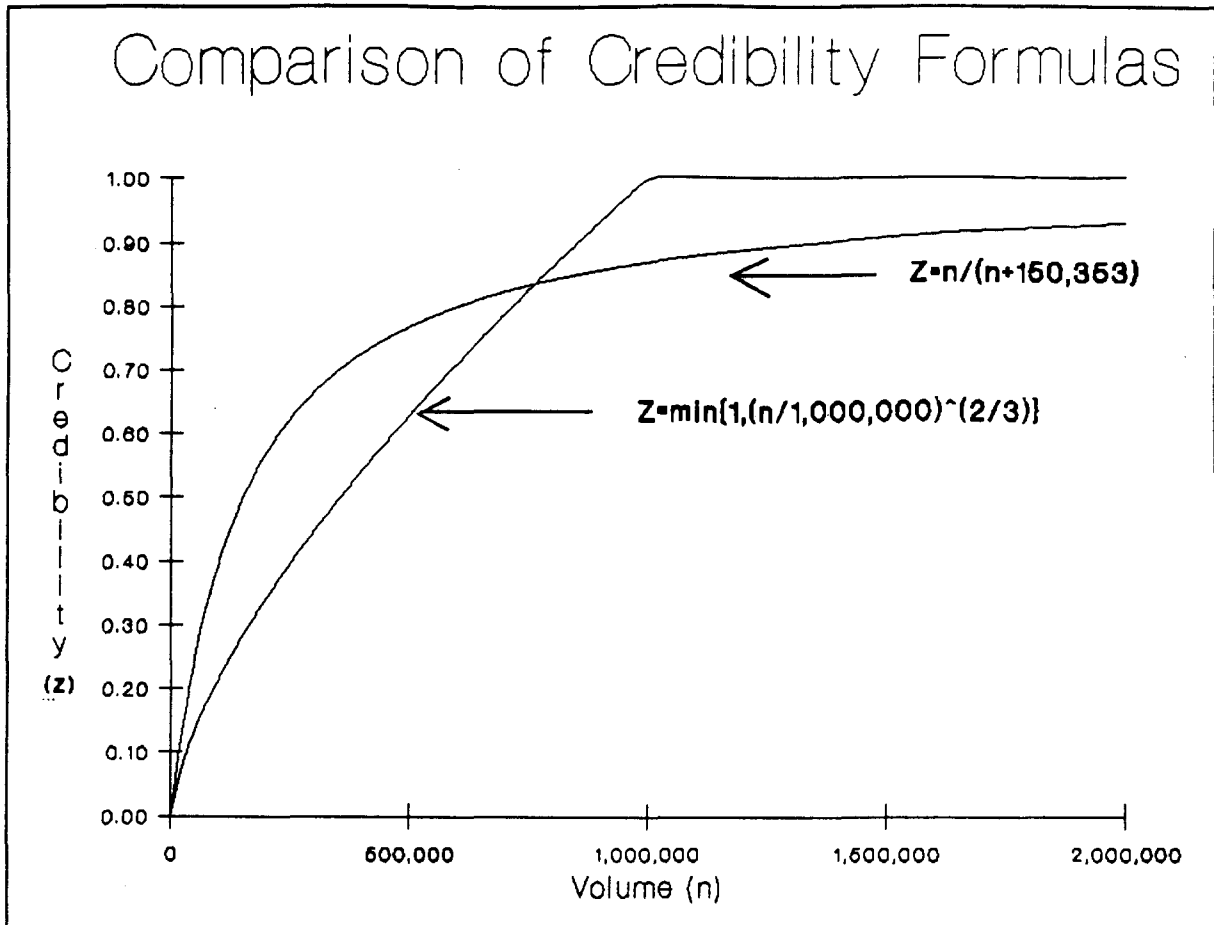
K, however, does affect the shape of the resulting credibility curve. If K is small, relatively small volumes of experience are required to reach specified credibility levels (less than 1). If K is large, relatively large volumes are required. The following chart compares the credibilities corresponding to various choices of the constant K:

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These two families of credibility formulas generally will produce different credibilities among the various sized classes, even if they give the same average credibility overall. This is shown in the chart:

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Here we arbitrarily selected a full credibility standard of 1,000,000 for the power formula and found the value of K of 150,353 that would result in the same average credibility over a uniform distribution of volumes between 0 and 2,000,000. As can be seen here, in this case, the power formula used by NCCI tends to give more credibility to larger volumes and less to smaller volumes than the ratio formula.

There are other approaches that have been used to calculate credibility. One family of approaches uses Bayesian statistical analysis with assumptions regarding underlying statistical distributions to derive best credibility formulas under various conditions. Such an approach was presented in a paper by G. Meyers "Empirical Bayesian Credibility for Workers' Compensation Classification Ratemaking", Proceedings of the Casualty Actuarial Society, Volume LXXI (1984), pages 96-121. The formula for the credibility Z presented in that

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paper follows the $n/(n+K)$ formula shown above, but corrected for bias. The resulting formula, however, will always result in credibility less than 1. The section of this examination dealing with trend contains additional discussion of various alternative credibility formulas. Included there are discussions of the classical credibility, the Bühlmann, and Bayesian approaches.

Our tests of alternatives to the current NCCI formulas did not include a specific test for the ratio formula. Reasons for this decision were primarily practical, though one reason does address consistency in methodology. We note, however, that this decision should not be interpreted as a judgement that the use of a ratio formula is inappropriate in classification ratemaking methodology.

One set of reasons stem from practical considerations. In addition to the question of selecting the constant K are practical considerations of the time and expense involved in calculating and testing additional alternatives. As can be seen from the above graphs, the two families of credibilities tend to have similar characteristics, with the exception that the ratio method does not allow for classes to be fully credible. As we will discuss more below, we included tests of the power method using exponents both above and below the current $2/3$ power used by NCCI. Since shapes of the various credibility curves tend to be similar we believe that this "bracketing" will provide similar indications to those of the ratio method.

As for the consistency reason, the current methodology generally assumes that a state's experience, at a certain volume, is fully credible. This assumption is implicit in the calculation of the industry group differentials. It appears then, that the use of the ratio formula with the current NCCI methodology would give inconsistent treatment to the same volume of experience at two different points. Specifically, through use of a ratio formula, a volume of experience could be fully credible at the industry group level but only partially credible at the individual class level.

The third characteristic of the classical formula for credibility is volume. NCCI uses the level of expected losses in a class as the measure of volume from which to calculate the credibility of the indicated pure premiums. In addition, NCCI uses claim counts to calculate the credibility of the pure premiums indicated by national relativities.

These represent two of the volume measures that have been used in this credibility formula. The approach in the Longley-Cook article looks at the variability in average cost per claim. Since the standard deviation is inversely proportional to the square root of the

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sample size, that article uses the number of claims as the credibility base. This credibility base is widely used in property and casualty ratemaking.

If we were to assume that all classes experience the same frequency of claims then the only difference between classes would be in the average cost per claim. We would then be concerned with how well the sample mean, represented by experience, approximates the true underlying expected average cost for the class. This then would suggest using claim counts as a credibility base.

However, if frequency varied from class to class then using claims as a credibility base would give less credibility to the experience of a large, low frequency class and more credibility to a possibly smaller, higher frequency class. The use of expected losses as a credibility base, as is currently the NCCI's practice for indicated pure premiums, overcomes this specific problem.

On the other hand, using expected losses as a credibility base causes a similar difficulty to arise at another place. Consider two classes of the same size, with one having higher expected losses than the other simply because it is a higher loss class. Then the indicated pure premium of the higher loss class would be assigned a greater credibility by this method than would the lower loss class.

In recognition of the above discussion we considered several specific alternatives to the credibility formulas used in classification ratemaking. As mentioned above, we did not consider ratio formulas since they were inconsistent with assumptions in the overall ratemaking approach. We thus concentrated on alternatives that followed the classical credibility approach.

From this review of credibility concepts, we explored the following specific alternatives to these credibility formulas:

- a. We replaced the current credibility formula:

$$Z = (\text{Volume/Full Credibility})^{2/3}$$

with the formula:

$$Z = (\text{Volume/Full Credibility})^{1/2}$$

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for the both indicated partial pure premiums and the partial pure premiums indicated by national relativities. In both cases we retained the full credibility standard used in the current NCCI formula. This corresponds to the more usual square root credibility formula discussed above. It increases the credibility of classes which are not fully credible relative to the current formula.

b. To test the sensitivity of the credibility formula to the full credibility standard we retained the current basic credibility formula but we used a full credibility standard that was double the current NCCI standard. This will reduce the number of fully credible classes and assign lower credibility in most cases compared with the current formula.

c. We replaced the current credibility formula:

$$Z = (\text{Volume/Full Credibility})^{2/3}$$

with the formula:

$$Z = (\text{Volume/Full Credibility})^{0.8}$$

for both indicated partial pure premiums and partial pure premiums indicated by national relativities. In both cases we retained the full credibility standard used in the current NCCI formula. This is intended to provide a "bracket" test of the current 2/3 factor and decreases the credibility assigned to any class which is not fully credible under the current standard while maintaining the current full credibility standard.

d. We replaced the expected loss credibility base by a payroll base for indicated pure premiums using this formula:

$$Z = (\text{Payroll/Full Credibility})^{1/2}$$

and for partial pure premiums indicated by national relativities:

$$Z = (\text{Number of Claims/Full Credibility})^{1/2}$$

For pure premiums indicated by national relativities, we retained the current NCCI full credibility standard. For state indicated pure premiums, we modified the full credibility standard to approximate the average amount of payroll necessary to achieve the current full credibility standard in terms of expected losses. The use of payroll as a volume measure

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increases the credibility for not fully credible classes with lower than average pure premiums and tends to decrease the credibility for classes with higher than average pure premiums.

e. For indicated partial pure premiums:

$$Z = (\text{Number of Claims/Full Credibility})^{1/2}$$

and for partial pure premiums indicated by national relativities:

$$Z = (\text{Number of Claims/Full Credibility})^{1/2}$$

In both cases, we used the full credibility standard that the NCCI currently uses for pure premiums indicated by national relativities. This was selected to test the current claim count based credibility approach used for other lines of insurance and reduces the credibility of low frequency, high severity classes.

A more complete discussion of these conclusions appears in part IV of this section of this examination report.

B. Experience Period

NCCI uses three years of experience to determine both the indicated partial pure premiums and the partial pure premiums indicated by national relativities. We explored the effect of increasing the experience period used in calculating indicated pure premiums to four or five years. In both cases we retained the partial pure premiums indicated by national relativities used in the current NCCI methodology.

C. Loss Limitations

The current NCCI classification ratemaking methodology calculates the indicated pure premiums for a class based on limited losses. The use of a loss limitation in property and casualty ratemaking is not uncommon. The intent of such limitation is to avoid destabilizing the rates for a small group of insureds due to the occurrence of a random large claim. The current NCCI approach attempts to distribute losses in excess of the per claim and per

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occurrence limitations uniformly to all classes within each industry group, through the test correction factor process.

The level of losses included in calculating the indicated pure premiums may affect the rates given to individual classes. The lower the loss limitation, the more losses are pooled within the industry group. Conversely, the higher the loss limitation, the greater the chance that a few large claims could influence the rates for a class and add unnecessarily to the volatility of class rates over time.

We considered specific alternatives to the loss limitations in the current NCCI procedure as follows:

- a. Losses limited to one-half of the current loss limitation,
- b. Losses unlimited, and
- c. Loss limitations varying between a. and b. above based on class size. The limitation in this case is described by the following formula:

$$\text{Limitation} = \frac{\text{Current}}{2(1 - \text{Credibility})}$$

"Current" refers to the loss limitation the NCCI currently uses for the class and credibility refers to the current smallest class partial pure premium credibility used by NCCI. In the case of a class of sufficient size for the credibility to be one, we use unlimited losses.

A more complete discussion of these conclusions appear in part IV of this section of this examination report.

Comments on the treatment of excess losses are included in Sub-Section III.1 below.

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D. Analysis of Industry Group Relativity Procedure

The current NCCI methodology uses three years of experience in calculating industry group relativities. We explored the effect of changing this exposure base to either four or five years.

E. Analysis of Trend Factor Application

The current NCCI methodology adjusts the indicated pure premiums to reflect the growth in loss costs per unit of exposure between the experience period used in the ratemaking methodology and the time for which the rates are applicable. In the current classification ratemaking methodology a single factor is used to adjust all indemnity losses, independent of the policy year. A separate factor is used to adjust medical losses.

If trend is positive, this procedure will overstate the estimated losses at future cost levels from later policy years and understate those estimates from earlier policy years. This will show significant systematic effect only on classes that experience significant change in volume over the experience period. We have tested the significance of this potential inconsistency as part of this examination.

F. Alternative to Pure Premiums Based on National Relativities

The pure premium indicated by national relativity is the third component of the pure premium derived by formula. We recognize that there has been a recent change in the calculation of these pure premiums. The original method was discovered to cause the pure premium indicated by national relativity to be overstated in the case that a state had a class or classes not present in one or more other states.

The current NCCI methodology corrects for this by calculating the adjustment factor applied to losses in other states using only classes existing both in the state under consideration and in the other states. In addition, we understand that the revised NCCI method now balances pure premiums indicated by national relativities by industry group within a state.

Some discussions regarding the current classification ratemaking methodology raise concerns with the applicability of pure premiums indicated by national relativity to class pure

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premiums for a particular state. We recognize these concerns and developed an alternative that keeps the current methodology but introduces a regional component to the pure premiums determined by national relativities.

This alternative calculates two separate sets of partial pure premiums and combines the two to replace the current pure premiums indicated by national relativity. The first set is simply the current pure premiums indicated by national relativity in the current ratemaking methodology.

The second set is calculated in a similar manner but includes only the states in the same NCCI region as the target state. The pure premiums indicated by national relativity are then replaced in the credibility weighted average of these two indications. The weight given to the regional partial pure premium is calculated using the same formula as used for pure premiums indicated by national relativity.

G. 'F' Classification

In the course of our examination several questions were raised by the Examination Oversight Group regarding Federal or 'F' classifications that are discussed in detail in Appendix D. As noted there, the current NCCI 'F' class methodology does not incorporate trend.

H. Segregation of Class in "All Other" Industry Group

Current ratemaking procedures stratify occupational classes into two specific industry groups (i.e. "Manufacturing" and "Contracting") and one miscellaneous category (i.e. "All Other"). We understand the original motivation for creating the two specific groups was to combine similar types of work activity for ratemaking purposes. Theoretically, the result of this stratification is increased homogeneity of risks within the ratemaking categories.

Given the current size of the "All Other" group and the diversity of classes within that group, the EOG requested that we analyze the feasibility and desirability of further stratification at this time. This is a particularly significant issue in light of the apparent transition to a service oriented economy in a number of jurisdictions. In this situation, the

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"All Other" group can include a wide variety of occupational activities ranging from heavy industrial to purely clerical.

This issue is discussed in section VII.

I. Other Areas

In the course of our examination, we identified the following additional areas that warrant additional comments:

1. An apparent inconsistency of loss limits used in the various components of the partial pure premiums
2. Losses in excess of limitation
3. Weighting used in calculating test correction factors
4. Development of losses incorporated in classification ratemaking
5. Volatility in classification rates arising from that in national experience
6. Swing limits

These are discussed below.

1. An apparent inconsistency of loss limits used in the various components of the partial pure premiums

The current NCCI methodology uses the weighted average of three pure premium components in determining the relative cost differences among the classes. One characteristic of this methodology is that if one of these three components is either inherently higher or lower than the others then the relative loss costs among the classes will be influenced. This could result in rates for larger, fully credible classes being affected in one way and rates for smaller, non-fully credible classes being affected in another.

An example that we identified of such an inherent difference between components is in the use of loss limitations in the current procedure. The losses used in calculating the indicated

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partial pure premiums and the partial pure premiums indicated by national relativities are both limited. On the other hand, the current on-level partial pure premiums appear to be calculated without loss limitation at the specific class level. The current NCCI procedure does provide for the distribution of industry group losses in excess of the limit among the classes comprising the group in each state.

Thus, in general, the partial pure premium derived by formula for fully credible classes is based completely on limited data. On the other hand, the partial pure premium for non-fully credible classes includes weight to the current on-level partial pure premiums which include a loading for large claims. The result is higher pure premiums derived by formula than would have resulted had the current on-level partial pure premiums been limited. Thus, final rates for fully credible classes are lower and final rates for non-fully credible classes are higher than would be the case if the current on-level partial pure premiums were limited. We do note that in both cases, the same overall average industry group and statewide rates are developed.

An example, though extreme, may help illustrate this concept. Suppose we have only two classes, 1 and 2, with the following pure premium components and corresponding credibilities. We limit ourselves to a single pure premium component to keep the calculations simple.

<u>Class</u>	<u>Indicated Pure Premium</u>	<u>Current On-Level Pure Premium</u>	<u>Pure Premium Indicated by National Relativities</u>	<u>Credibility for Indicated Pure Premium</u>	<u>Credibility for Pure Premium Indicated by National Relativities</u>	<u>Pure Premium Derived by Formula</u>
1	1.00	2.00	1.00	100%	0%	1.00
2	1.00	2.00	1.00	50%	25%	1.25

Both classes have the same pure premium components. The only difference is the credibility assigned to those components. Class 1 is a larger, fully credible, class while class 2 is smaller and not fully credible. The inherent difference between the example indicated pure premiums and the example present on-level pure premiums causes the final pure premium derived by formula for class 1 to be smaller than that for class 2, even though none of the pure premium components show any difference.

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This highlights a general characteristic of the current NCCI methodology. If the indicated pure premium is inherently lower than at least one of the other two components in the pure premiums derived by formula, then rates for fully credible classes tend to be understated while those for non-fully credible classes will tend to be overstated. Conversely, if the indicated pure premium is inherently higher than at least one of the other two components of the pure premium, then rates for fully credible classes will tend to be overstated while those for non-fully credible classes will tend to be understated. Thus it is important in the current procedure to assure that none of the three components is inherently larger or smaller than the others.

In summary, even if relative loss costs among classes within each of the three components is the same, relative differences between the components could influence the final rates for individual classes in the current NCCI classification methodology. We recommend that the NCCI consider alternatives to the current method that are not as sensitive to inconsistencies among the data elements.

One such alternative would be to use relativities to overall average partial pure premiums instead of the actual pure premiums when determining the pure premium derived by formula. For example, the medical indicated partial pure premium relativity for a class would be the medical indicated partial pure premium divided by the weighted average of all medical indicated partial pure premiums, using experience period payrolls as weights. Similarly, the medical current on-level partial pure premium relativity for a class would be the medical current on-level partial pure premium divided by the weighted average of all medical indicated partial pure premiums, using the same experience period payrolls as weights. This overcomes the inherent inconsistencies since the relativities, as opposed to the partial pure premiums themselves, should balance to unity in each component separately.

2. Losses in Excess of Limitations

The current NCCI methodology attempts to distribute losses in excess of the per claim and per occurrence limitations uniformly to all classes within industry group as included in the test correction factors. Methodologies often used in liability ratemaking correspond to the current NCCI approach in that losses above a certain limit are usually accounted for uniformly among classes. In fact, in many cases, the losses in excess of the limit are estimated using nationwide data.

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In addition, the loss limit used in overall rate calculations for those coverages is sufficiently low to result in a reasonably high probability that losses will exceed the limit. The practical need to calculate rates for coverage in any class at any loss limitation also requires separation of class ratemaking from increased limits ratemaking. Thus, the assumption is that excess losses are fortuitous and not directly related to class, and in many cases, geographical characteristics.

Any insurance classification and ratemaking methodology must strike a balance between the pooling of loss central to insurance and the responsiveness of rates to class differences. The liability approach to increased limits ratemaking inherently opts for pooling of losses above the loss limitation among the classes.

One alternative that has been suggested involves including a provision for claims in excess of the loss limitation in a class using a much larger number of years of experience in that class. This is similar to the procedure used in calculating catastrophe loads in property insurance, though the catastrophe loads are usually not calculated or applied at the class level.

There are several practical problems with this approach. Probably the most significant is that it assumes that the loss limitation will be consistent over a number of years. As with credibility concerns, the number of years required to obtain a reasonable estimate of the excess loss potential of a class will vary from class to class, with a significant number of years needed for the smaller classes.

Over such a time period, characteristics of the individual classes can change significantly. For example, without adjustment, a class could be penalized for many years for safety problems that have long since been remedied. Adjustments for such changes may be difficult but may be possible. More difficult, however, would be recognition of more subtle changes. As a result of these theoretical concerns and practical limitations, we did not specifically test this alternative.

This aspect of the current procedure was not anticipated in our original proposal for this examination or in our original data requests. We have, however, performed a limited test of the significance of differences in excess losses that may exist among classes. These are discussed in Section IX.

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3. Weighting Used in Calculating Test Correction Factors

One of the purposes of the test correction factor used in the current NCCI methodology is to ensure that the combined effect of rate changes by class equals the indicated overall rate change. Under current procedures, this balance is achieved using the distribution of exposures by class in the WCSP data used for classification ratemaking (i.e., the latest available three years). Ideally, the balance should be achieved using the distribution of exposures by class inherent in the Financial Call data used to develop the overall indication; however, exposures by class are not available in the Financial Call data.

The class distribution inherent in the Financial Call data would be better approximated by the latest available single year of WCSP exposure data. Using the latest year would be one year more current than the midpoint of the three year period currently used, and two years more current if the experience period were expanded to five years.

The impact of such a change on final rates is a function of the extent to which the exposure distribution is changing and the variation of rate changes by class. It is thus difficult to quantify at this time. It is likely that the difference would frequently be insignificant. However, we identified a number of states with rapidly changing class distributions, as described in this examination report in Volume V, Section IIB - Part 3; the section dealing with the analysis of trend. Thus, this change may have a significant impact in some cases. In any case, a change to using a single year of exposure data would probably be relatively easy to implement in the calculation of the test correction factor. In addition, it would generally provide a better match between the distribution of classes inherent in the overall rate level change indication and the distribution used in balancing the change for the individual classes.

4. Development of Losses

The Examination Oversight Group expressed concerns regarding the development of losses used in classification ratemaking. Though this area of exploration was not contemplated within the original scope of this project, we recognize the potential significance of this aspect of the methodology. We believe that the analytic tools we developed for this analysis can be used by NCCI to analyze the relative accuracy and consistency of specific alternatives to the current development methodology.

Two alternatives to the current approach have been mentioned in this regard. The first would use an additive component of expected future losses in place of the multiplicative

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development currently used. This is similar to the Bornhuetter-Ferguson approach. The second alternative would base the classification indication on a comparison of losses reported to date with the expected losses emerged to date. The expected emerged losses in turn would be determined using historical development and the expected losses underlying current rates. We caution that the consistency concepts discussed on pages 26 through 28 be recognized in the construction of any specific alternative in this area.

5. National Experience

In the course of our examination, the Examination Oversight Group expressed concerns regarding the impact of nationwide data in the current methodology. We also recognized this in our test of a regional alternative as discussed on pages 71 and 72. Limitations in available data limited our consideration to the use of only three years of data in calculating partial pure premiums indicated by national relativities used in this analysis. Other than the comments here, and our analysis of a single regional alternative, we have not explored this issue further in this examination.

It is possible that other approaches to incorporating national experience may be beneficial. One such alternative that was suggested is a stepped approach. This approach is similar to that used for statewide data in classification ratemaking for California workers compensation. This would use fewer years of national experience for large classes with increasing years used for smaller classes. Once again, NCCI could use the analytic methods we developed for this examination to evaluate alternatives in this area. Again, we caution that specific alternatives be reviewed in light of the consistency discussion in pages 26 through 28 of this part of this examination report.

6. Swing Limits

The request for proposal did not request any study of the use of swing limits by NCCI, and none was performed in this examination. Swing limits are limitations of the amount of change for specific classes. We understand that the reason for this omission in the request for proposal was that the participating states felt that swing limits are often used to overcome limitations in classification ratemaking methodology. Although, another view is that they are used to maintain price stability in the process. Instead of addressing swing limits as such, the request for proposal directed that significant resources be applied in researching credibilities, loss limitations and whether accuracy would be improved by using more years of data. It is likely that improvements in these areas could have the potential of significantly reducing the impact of swing limits.



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IV. EVALUATION OF CREDIBILITY FORMULA, EXPERIENCE PERIOD AND LOSS LIMITATION (Objective 4a)

In our review of specific alternatives, our first step was a review of the current approach used by the NCCI in determining class rates. This review was for the purpose of understanding the overall framework used by the NCCI, rather than exhaustive research regarding its application in each of the states in which the NCCI prepares filings.

We focused our analysis on the methodology for the classes considered by NCCI as having sufficient credible experience, i.e., the "reviewed classes." The methodology used for the other smaller, or "non-reviewed," classes and unique methodology used for special classifications were not analyzed by procedures described in this section.

The discussion in part III above identifies specific alternatives to NCCI procedures. As can be recognized from the description of current classification ratemaking methodology in Section IIA of our ratemaking report, that methodology is complex with many adjustments made to the data in the process. The interactions of various aspects of that methodology make a general theoretical review of particular aspects subject to the real possibility of missing significant interactions.

For this reason we selected an empirical approach to testing the impact of the various alternatives. For each alternative identified, we compared rates under both the current methodology and under the alternative methodology for selected states and, in most cases, for multiple rate filings.

In this review we intentionally selected alternative approaches that changed one aspect of the current ratemaking methodology at a time. For example, when considering the effects of changing the number of years used in the current methodology from three to, say, five, we left all other aspects of that methodology unchanged. Similarly, when we tested alternatives to the current credibility formula we used only three years of data, and so forth. In this way we could isolate the specific impact of each alternative considered.

We note that the various characteristics tested are not independent. As indicated earlier in this section of this examination report, we recommend that NCCI increase the experience period from three to at least five years unless subsequent tests noticeably differ from those presented in this report. It is thus likely that the effect of an alternative credibility formula or loss limitation applied to five years of data will differ from that of the same alternative used with three years of data.

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A. Data

The data for this portion of our analysis was several final rate calculations produced by NCCI. We requested that NCCI prepare rate estimates using its current methodology and the various specific alternatives, for various states and policy years. We did not independently audit the calculations of the NCCI in these tabulations.

Our requests to NCCI in this regard contained quite detailed and explicit instructions for NCCI to modify their current methodology to reflect the changes we wanted incorporated. Appendix A to this section of this examination report contains the correspondence. In addition to these letters, we discussed our requests with NCCI personnel to assure ourselves that they understood our requirements.

Though we did not perform a separate audit of those data, we did review the results for consistency and reasonableness. This review led to questions to NCCI and, in at least one instance, the re-calculation of rates for an alternative.

B. General Methodology

We believe the most important tests we were able to perform were comparisons of actual limited loss experience with that expected from each alternative. These tests were applied to all classes combined and to classes of various sizes. In addition, we developed tests to compare the consistency of various alternatives in identifying relative cost differences over time.

We selected tests against limited rather than unlimited losses because of the assumptions underlying the overall classification ratemaking approach. Losses are limited in the calculation of class rates to dampen the effect of a few large claims on the rates for individual classes. It is the intent of the current approach to spread the losses above these limits in each industry group among all classes in that group. We thus believe that it is more appropriate to test how well the classification ratemaking methodology or an alternative predicts the limited losses.

Since our analysis was concerned with how well the various methodologies performed in identifying relative loss differences among the classes, we compared the actual 1987 losses at first report with expected losses by class predicted according to each methodology,

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normalized to add to the total actual losses. We recognize potential limitations in relying solely on first report data. More mature data was not available to compare with all alternatives we considered.

The expected losses by class were calculated as the product of the payroll, manual rate calculated using a given methodology, and actual ratio of earned to manual premiums for the class, and then uniformly adjusted to total the same as the total reported losses for the year. That is, the expected loss for class i , state j and alternative rate calculation k , E_{ij}^k was calculated as:

$$E_{ij}^k = \frac{P_{ij} \times R_{ij}^k \times \frac{EP_{ij}}{MP_{ij}}}{\left[\frac{\sum_i P_{ij} \times R_{ij}^k \times \frac{EP_{ij}}{MP_{ij}}}{\sum_i L_{ij}} \right]}$$

Where P_{ij} denotes the payroll for class i , R_{ij}^k the rate for class i in state j calculated using the method k , MP_{ij} denotes the 1987 manual premiums for class i in state j ,

EP_{ij} denotes the actual 1987 earned premiums for class i in state j , and L_{ij} denotes the 1987 losses for class i in state j at first report, limited in the same manner that the losses are limited in the calculation of the indicated pure premiums and t runs over all classes.

We applied two statistical tests to identify which of two alternatives gave a more accurate estimate of the relative loss costs. One test uses the Wilcoxon signed rank test to measure the significance of differences in accuracy in forecasts for the various classes. The other test, termed the underwriting test, considers the combined relative accuracy for certain groups of classes.

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1. Wilcoxon Test on Accuracy

The Wilcoxon signed rank test is a fairly well known non-parametric statistical test to compare the equality of two distributions given samples from each. Its choice in this situation is primarily motivated by the lack of any clear choice of the statistical model for the distributions of the squared errors and by the lack of independence between the alternatives tested.

This statistic considers the square of the error resulting from the forecast. For each class i and state j , we define the square error for method k , SE_{ij}^k , as

$$SE_{ij}^k = E_{ij}^k \left[\frac{L_{ij}}{E_{ij}^k} - 1 \right]^2 = \frac{(L_{ij} - E_{ij}^k)^2}{E_{ij}^k}$$

The first part of this equation shows that the SE_{ij}^k is the square of the relative error

between the actual losses L_{ij} and the expected losses E_{ij}^k , weighted by the volume of expected losses. The second part simply rearranges and cancels terms. This latter term may be familiar to the reader as similar to terms in the chi-squared statistic sometimes used to test the goodness of fit for probability distributions.

Since the various alternate ratemaking methods are not independent and are based on the same data, and since the square errors do not necessarily follow a normal distribution, we selected the Wilcoxon signed rank statistical test to test whether the two methods are significantly different in forecasting the ultimate losses. For this, we define the intermediate statistic for each class i in state j , D_{ij}

$$D_{ij} = \text{Rank}(|SE_{ij}^1 - SE_{ij}^2|) \times \text{Sign}(SE_{ij}^1 - SE_{ij}^2)$$

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Here, Rank denotes the rank of the quantity in parenthesis when the quantities are listed in order, smallest to largest, and Sign denotes the sign of the quantity in parenthesis. The Wilcoxon Statistic related to these quantities is

$$W_j = \frac{\sum_{i=1}^n D_{ij}}{\sqrt{n(n+1)(2n+1)/6}}$$

where n is the number of classes. If $E[SE_{ij}^1] = E[SE_{ij}^2]$, then for large values of n , W_j has an approximate standard normal distribution. The hypothesis that alternative 2 is more accurate than alternative 1 (i.e. significantly lower differences between predicted and actual) can be accepted with confidence "p" if W_j is greater than the value shown in the table below:

Critical Values

<u>p</u>	<u>W_j Greater than</u>
90%	1.282
95%	1.645
99%	2.326

Source: Standard Normal Table

Since classification alternatives may affect different sized classes differently, we separately applied the Wilcoxon test to three groups of classes in each state; large, intermediate and small. To determine the size category for each class, we listed all classes in all states analyzed, ordered by premium volume. The label "large" was given to those classes, sorted in this manner, that comprised the first one-third of total premiums. The next one-third of total premium arises from the "intermediate" classes while we used "small" to denote the remaining classes. A class could be considered large in one state and small in another if

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the premium volume for that class in the two states is different. One state could have many large classes while another has few, or even none.

While other groupings are possible, the procedure is objective and consistent. The specific results obtained, of course, are influenced by these definitions but we recognized this in formulating the conclusions and recommendations for this section.

2. Underwriting Test

Another test that has been applied to identify differences in forecasts between classification rate methodologies has been termed an underwriting test (see the paper by G. Meyers referenced in Section III above).

For this test, the classes are divided into two groups: group 1 having classes with expected losses for the current method less than those for the alternate method being tested, and; group 2 all others. By construction, the ratios of actual to expected losses will be lower for the alternative method than for the current method in the first group and higher in the second.

If, however, one method produces ratios of actual to expected losses that are closer to 1.00 in both groups than the other, then that method can be considered to provide a better indication of the relative loss cost differences among classes. In such a case, the method with ratios closer to 1.00 would provide coverage to better classes for lower rates and worse classes for higher rates than the alternative, thus giving it a competitive advantage in the marketplace. This is the origin of the name for this test, the underwriting test.

The significance of the differences in underwriting ratios is tested by comparing ratios of actual to expected losses from similarly sized groups randomly selected from all groups using the "bootstrapping" technique. The bootstrapping approach is sometimes used in statistical analysis when the actual underlying distributions are either unknown or are too complex to analyze directly. The above-cited paper by G. Meyers contains a more complete description of this approach.

3. Consistency Test

Accuracy in forecasting relative cost differences is only one aspect of a good classification ratemaking methodology. Rate relativities should be consistent over time. We would have preferred to compare methods over many years. However, due to limitations in the

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number of years of data available, a more extensive test of this criterion was not possible for this report.

Any ratemaking methodology must balance stability and responsiveness. In order for insurance to be valuable to the consumer there should be some predictability in prices from one year to the next; prices should not increase substantially one year only to drop substantially the next. On the other hand, the price of insurance should respond to changes in the cost to provide that insurance. If the price is too slow to respond to changes the consumer could also lose, either by paying too high a price for the coverage or in buying coverage at too low a price from an insurer that subsequently cannot meet its obligations.

We thus devised another comparison of the current approach with alternatives that we term the consistency test. The goal of this test is to see how consistently a particular methodology identifies "good" or "bad" classes. Broadly, the concept compares the rate for a class in a state with the rate for that same class based on a broader cross-section of states, after adjustment to the target state's cost levels.

A desirable characteristic of a classification methodology is to consistently identify classes in individual states as better or worse than the broader average. Conversely, it is undesirable for a method to identify a class as much better than average one year and much worse the next. Such a methodology would result in an unnecessarily unstable rate for that individual class.

For this analysis, we define consistency as the ability of a classification methodology to consistently identify classes in individual states as better or worse than an average rate. We tested whether a method would identify a class as much better than average one year and much worse the next. Such a methodology would result in an unstable rate for that individual class.

We borrowed some of the concepts behind the pure premiums indicated by national relativities in constructing our average rate. Our consistency test for classes in a state begins with the average rates for those classes based on the experience of other states, adjusted to the target state's loss levels. We then compare the rates for the classes in the target state with the averages. If, over several policy years, this comparison shows wide fluctuations, that is, if a particular methodology identifies a class in a state as much better than average one year and much worse the next, we would conclude that methodology tended to result

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in inconsistent indications. If there were little fluctuations in the comparison, we would conclude that the method produced consistent indications.

We thus define the "consistency ratio" for class i in state j for classification ratemaking methodology k as:

$$C_{ij}^k = \frac{R_{ij}^k}{N_{ij}^k}$$

where R_{ij}^k represents the rate calculated by method k for class i in state j and N_{ij}^k represents the average for other states, adjusted to the same overall average as state j .

We calculate the N_{ij}^k values in three steps. To calculate N_{ij}^k for state 1, that is for $j=1$ we calculate the average rate over all classes, using the payroll in state 1 as weights:

$$A_j^k = \frac{\sum_{i \in I_j} P_{ij} R_{ij}^k}{\sum_{i \in I_j} P_{ij}}$$

for each state $j=2, 3, 4, \dots$, where I_j denotes the set of classes with payroll in both states 1 and j . We next calculate a similar average for the target state,

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$$B_j^{kl} = \frac{\sum_{i \in I_{ij}} P_{il} R_{ij}^k}{\sum_{i \in I_{ij}} P_{il}}$$

The value of N_{ij}^k is then calculated as the weighted average of the rates for class i in state j ($j = 2, 3, \dots$) and method k using the premiums in the various states as weights:

$$N_{il}^k = \frac{\sum_{j=2}^m P_{ij} \times R_{ik}^k \times \frac{B_j^{kl}}{A_j^k}}{\sum_{j=2}^m P_{ij}}$$

Similar calculations would follow for the remaining states. In those situations, however, the summations over j would run from 1 through m (the number of states) and exclude the target state. In these calculations "other" states represent all other states for which the alternate calculations were performed. This is not the same as what the NCCI would refer to as nationwide.

We then analyzed the variance of the "consistency ratios" for each class over time and used the Wilcoxon Statistic to test the significance of the difference between the consistency of the current and alternate methods.

Although the Wilcoxon Statistic is calculated using the same information as the average variance in the consistency test, it gives different weights to the various observations. In particular, large "outliers" have a more significant affect on the average variance than on the Wilcoxon Statistic. Thus, it is possible for a raw comparison of the average variance to provide one indication and the Wilcoxon Statistic to provide another, as happened when comparing the current credibility formula with the use of 0.5 power. The Wilcoxon test permits us to identify statistically significant differences whereas the raw comparison does not.

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4. Degree of Impact

Up to this point, the tests we described were focused on one of two basic areas, accuracy and consistency. In each case the focus was a comparison of the current approach with a single alternative. There was no comparison of the degree of impact that one alternative may have relative to another.

We therefore formulated an index to quantify the impact of a particular change and to compare with the impact of other changes. Rather than testing whether an alternative is "better" or "worse" as compared with the current procedure, this index is designed to tell whether one alternative produces "more" change from the current approach than another.

The index Q_j , referred to later as the "square difference index," for state j is calculated as:

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$$\begin{aligned}
 Q_j &= 100 \times \frac{\sum_{i=1}^n P_{ij} (R_{ij}^1 - R_{ij}^2)^2}{\sum_{i=1}^n P_{ij}} \\
 &= 100 \times \frac{\sum_{i=1}^n P_{ij} R_{ij}^1}{\sum_{i=1}^n P_{ij}} \\
 &= 100 \times \frac{\sum_{i=1}^n P_{ij} (R_{ij}^1 - R_{ij}^2)^2}{\sum_{i=1}^n P_{ij} R_{ij}^1} \\
 &= 100 \times \frac{\sum_{i=1}^n P_{ij} \times R_{ij}^1 \times \frac{(R_{ij}^1 - R_{ij}^2)^2}{R_{ij}^1}}{\sum_{i=1}^n P_{ij} R_{ij}^1}
 \end{aligned}$$

The first of the three equations shows the origin of Q_j . The numerator of the large fraction is the weighted average of the square of the differences between the rates of the two methods using the payrolls in state j as the weights. The difficulty of this measure in comparing states is that states with different average rates would be expected to have different average square differences due only to the differences in the overall average rates.

We thus normalize Q_j by dividing it by the state j average rate under the current methodology. The multiplication by 100 expresses the resulting ratio as a percent.

The second of the two equations is an easier way of calculating the index and follows from the first since the denominators of the two fractions cancel. The third equation is shown to

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link Q_j with the SE_{ij}^k terms discussed above in relation to the Wilcoxon test. The ratio in the sum of the numerator is in the same form as SE_{ij}^k (page 36) if we replace the actual losses L_{ij}^k by the rate R_{ij}^2 and the expected losses E_{ij}^k by the rate R_{ij}^1 . As noted above, this is a term in the chi-squared statistic often used for statistical tests. The last equation shows that Q_j is a weighted average of these relative square differences, using the total premium by class as weights.

Comparison of these ratios for two alternatives in the same, or even different, states indicates which of the alternatives results in more change from the current procedure. The larger the value of Q_j , the more classes and premium volume would change due to the alternative.

5. Charts

The Q_j statistic does not provide any information as to which alternative is more accurate or more consistent. This statistic also does not indicate how many classes are affected by an alternative or which are affected more. In order to provide more insight to the answers of these questions we have prepared a series of graphs, one for each pair of alternatives for which calculations were provided by NCCI. These are contained in Appendix F to this section.

The charts show the number of classes plotted by percentage impact and summarize the information developed from the tests described above for each alternative compared to the current NCCI procedure.

Each chart is composed of a bar graph and a line graph. In all cases the horizontal or x-axis indicates the size of the difference calculated as:

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$$\frac{R_{ij}^2 - R_{ij}^1}{R_{ij}^1}$$

The bars and the left axis of the charts represent the number of classes whose differences are in the indicated range. For example, for Colorado, comparing the change between the current classification methodology and one which uses five years of experience in calculating 1987 rates, we see there are 135 classes for which the change is less than 1%, there are 73 classes whose rates would decrease between 1% and 3%, 56 classes whose rates will increase between 1% and 3%, and so forth.

The line graph on the same chart represents the total premium, calculated as 1987 rate times the payrolls for policies written from March, 1984 through February, 1985. This was the most recent WCSP data available for the analysis of the 1987 rates. The amounts are shown in millions on the scale at the right of the chart. Thus, the classes that experienced less than 1% change between the two methods had a total of \$45 million in premiums. This is compared with \$63 million for classes experiencing a decrease of between 1% and 3% and \$46 million for classes having increases of between 1% and 3%, and so forth.

This particular chart shows that the largest volume of premium arises from classes for whom the alternate methodology provides lower rates, with some high volume classes experiencing decreases of between 5% and 9%. This latter observation follows from the high values of the line graphs over this range and the relatively low count of classes affected. On the other hand, even though many classes experience changes of less than 1%, the premium volume for these classes tends, on the average, to be smaller.

Also shown on the chart is the value of Q_j , labelled as the "square difference index." In this case the index is almost 13, that is, the weighted average square difference between methods is almost 13% of the overall average state pure premium.

Each graph includes the Wilcoxon Statistic used to test the significance of the difference between methodologies on a class-by-class basis. We also included approximate normal values corresponding to the calculated Wilcoxon Statistic. These probabilities represent the approximate probability, under the assumption that the two alternatives are not different, that the Wilcoxon Statistic will not exceed the indicated value. Thus probability values near either 0 or 1 indicate significant differences between the two alternatives.

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C. Credibility Methodology

We requested that NCCI calculate alternate rate revisions, all using three years of data for classification ratemaking, with alternate credibility formulas described in Part III.A.

Alternate a - The first test maintained the current expected pure premium, and the current full credibility standard, but replaced the current $2/3$ power used by NCCI with the square root or $1/2$ power. We requested this test for Florida, Maine and Nebraska for 1987 through 1990 rates.

Alternate b - Partial credibility in the classical credibility pure premiums is also sensitive to the full credibility standard. We tested this sensitivity by requesting that NCCI calculate alternate rates using double the current full credibility standard, but leaving the power unchanged for 1987 through 1990 rates in Colorado, Connecticut, Florida, Illinois, Maine, Nebraska and Oregon.

Alternate c - As shown in the first chart above, the use of the $1/2$ power gives more partial credibility than the current NCCI method at any level of expected losses. To bracket the results we also requested that NCCI calculate rates using the $4/5$ or 0.80 power. This request was for Florida and Maine for policy years 1987 through 1990.

Alternate d - As mentioned above, under suitable, rather general, assumptions, the standard deviation of the mean of a sample is inversely proportional to the square root of the sample size. If we consider the observed experience for a class as a sample, then a natural credibility base would be the number of exposures making up that sample. This credibility base overcomes the difficulties mentioned with both claims and expected losses as credibility bases.

To test the impact of this alternative, we asked that NCCI calculate 1987 through 1990 rates in Colorado, Connecticut, Florida, Illinois, Maine, Nebraska and Oregon using the power formula with the square root of payroll as a credibility base for indicated pure premiums.

In this case, the state full credibility standard was calculated as twenty-five times the average statewide serious loss per dollar of statewide payroll for use with serious cases, and three hundred times the average non-serious or medical loss per dollar of statewide payroll

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for non-serious and medical pure premiums, respectively. For national relativities, the credibility was based on number of claims and used $p=1/2$.

Alternate e - To consider the number of claims as a credibility base, we asked NCCI to test the power formula using the square root of the number of claims reported. This request was for Florida and Maine for 1987 through 1990 rates. In this case we used the same full credibility standard as is currently used by the NCCI for credibility for pure premium indicated by national relativity. In particular we used a full credibility standard of twenty-five serious cases, three hundred non-serious cases and three hundred combined serious and non-serious cases for serious, non-serious and medical partial pure premiums, respectively.

D. Experience Period Methodology

By far the largest portion of the analysis for this section involved the effects of adding to the number of years used in classification ratemaking. The current methodology uses the three most recent available policy years of WCSP data for calculation of industry group differentials, indicated pure premiums and pure premiums indicated by national relativity.

Data availability limited the alternatives that we could explore. The most recent WCSP data available is generally for the 1987 policy year at first report. NCCI retains data for the most recent five filings, generally 1986 through 1990 at the time of this study.

The 1990 rates are based on policy years 1985 through 1987, the 1986 rates were based on 1981 through 1983 WCSP data, etc. Thus the earliest data we could be assured of was for 1981 policies. If we were to use four years of data, 1987 would be the earliest year for which we could be assured rates could be calculated. If we were to use five years of data, 1988 would be the earliest year. For some states, however, earlier data were available and NCCI was able to calculate alternate 1987 rates using five years of data. Thus, we restricted our accuracy tests to comparing with policy year 1987 experience.

Given these limitations, we did not believe we could effectively explore the effect of including more than five years of WCSP data in the classification ratemaking methodology. This is a practical limitation and should not be taken as a statement of the maximum number of years that we believe should be included in the methodology. However, we recognize that there may be a point where the age of data reduces its relevancy for

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estimating relative loss cost differences among classes. This latter consideration could be addressed by assigning declining weights by age of data.

We requested that NCCI calculate final rates using five years of WCSP data for the following twelve states: Colorado, Connecticut, Florida, Illinois, Louisiana, Maine, Michigan, Nebraska, North Carolina, Oregon, Wisconsin, and Utah. Although we obtained calculations for these twelve states, actual loss data corresponding to rates calculated using five years of data were only available for five; Colorado, Connecticut, Illinois, Maine, and Nebraska.

To test the sensitivity of incorporating four years, we also asked NCCI to perform the calculations using four years of WCSP data for Florida and Maine.

The number of years used affects many of the steps in the classification methodology. This is in contrast to other aspects reviewed here, for example the application of trend or credibility formula, that enter at limited points in the calculations.

We provided detailed instructions to NCCI staff for incorporation of additional years in the methodology. Appendix A to this section contains our letters to NCCI that detail the changes that we believed would need to be made to modify the current methodology.

We understand that NCCI followed their current methodology, with the changes detailed in Appendix A, to calculate alternative rates using four or five years of WCSP data. In the course of the analysis, however, practical considerations led to some changes in the methodology from that indicated in Appendix A.

Notably, WCSP data being available through fifth report, allowed the development to be calculated from the most recent report available to ultimate. This compares with the approximation in Appendix A assuming that only third report data were captured.

Another notable difference is in the calculation of the pure premiums indicated by national relativity. In discussions among project team members subsequent to our letter to NCCI, we believed a more balanced approach would be to have the pure premiums indicated by national relativities calculated using three years of data. This corresponds to a common practice in property and casualty ratemaking in using more experience at a finer level of detail and less experience at courser levels. This is also the case in the overall NCCI methodology where the indication from one policy year and one accident year are used to estimate the overall rate level change, but several years are used for estimating class rates.

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This modification also fits well with data availability from NCCI. The database that NCCI uses for the calculation of pure premiums indicated by national relativity maintains total summaries for three policy years and not individual policy year detail.

E. Loss Limitation Methodology

We asked NCCI to calculate 1987 through 1990 rates for Florida and Maine using unlimited losses. We asked NCCI to calculate 1987 through 1990 rates in Colorado, Connecticut, Florida, Illinois, Maine, Nebraska and Oregon using half the current loss limitation and also the sliding scale loss limitation.

F. Conclusions

The exhibits in Appendix B to this section provide a complete summary of the results of these tests. There are four sets of exhibits contained in that appendix.

The first, Exhibit B-1, provides a summary of the square difference indices for all alternatives tested, sorted by state and policy year. These indices are measures of the overall difference between the current method and each specified alternative. As can be seen from the graphs in Appendix F to this section, the Wilcoxon Statistic in this case indicates that almost all of these differences are significant.

Exhibits B-2 and B-3 summarize the results of the accuracy and consistency tests, respectively. We have separate sorts, one showing all the alternatives tested within a single state and the other showing all states tested for each alternative.

Exhibit B-2 shows the indications of the underwriting test and the corresponding mean square errors for large, medium and small classes and for the entire state combined. The information provided for the underwriting test summarizes the number of classes that fall into each group, the actual and expected losses for each group and the resulting ratios of actual to expected losses by group.

The approximate significance (based on the boot-strapping approach) of difference in the loss ratios are also shown in that exhibit.

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The mean square error sections of these exhibits show the mean square error for the corresponding groups of classes for both the current and the alternative method. Also shown is the value of the Wilcoxon Statistic. We then used a normal approximation to estimate the significance level for that statistic where there were at least 10 classes. In cases where there were less than ten classes, we showed the exact probability calculation.

Exhibit B-3 summarizes the results of the consistency tests for the various alternatives. The first two pages of that exhibit show the results for all classes combined while the remaining pages show separate results for various sizes of classes within each state.

In all cases we show the weighted average variance of the ratios of the individual state's relative loss cost differentials by class to the relative loss cost differentials for all other states combined. A small variance would indicate that the corresponding method was consistent at identifying classes that are better or worse than the overall average.

Also shown are the Wilcoxon Statistics corresponding to the various alternatives. The statistics are calculated in such a way that a positive value indicates that the alternative method produced more consistent results than the current method and a negative value indicates the converse.

Also included in that exhibit are approximate probabilities that, under the hypothesis of no difference between the variances, a randomly selected random variable will exceed the given Wilcoxon Statistic. Values close to 0% indicate a high confidence that the alternative method is more consistent at identifying relative loss cost differences among classes than the current method. However, a value close to 100% indicates that the current method is more consistent.

In the remainder of this section, we discuss the results for the alternative tested, ranked generally in order of the significance of the results.

1. Experience Period -- Five Years of Data

Of the alternatives discussed in part III above, the use of five years of data in classification ratemaking appears to produce the largest differences from the current methodology. With the data available, five years appears to provide more accurate indications of actual differences in relative class loss costs. In every case tested, the mean square error of the relative loss costs using five years of experience was less than that using the current methodology. In every case the corresponding Wilcoxon Statistic was positive, again

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denoting a closer approximation using five years of data. The difference was significant at the 95% confidence level in one of the cases and significant at more than 80% confidence in the remaining four cases tested. In addition, the underwriting test indicated that this alternative was more accurate than the current method at 95% confidence in four of the five cases tested and at 90% confidence in the fifth.

Except for the significance of the Wilcoxon test, these results are mirrored in every state but Connecticut for small classes. There are also general improvements relative to the current methodology in most of the comparisons for medium and large classes, though some situations also exist where the current methodology may provide slightly closer estimates in those classes.

The consistency tests reflect similar indications. This should not be surprising since the use of more years of experience automatically adds to the number of years necessary to completely replace the data used in the methodology. In fact, in every comparison but two, the weighted average variance resulting from using five years of data was less than that under the current methodology.

In all cases the Wilcoxon Statistic indicated that using five years of experience resulted in smaller variances from class to class in the consistency test than the current method. In all states but Maine these differences were significant at the 90% confidence level.

2. Experience Period -- Fours Years of Data

The use of four years also seems to improve the mean square error of the forecast class relativities. The apparent improvement in accuracy over the current methodology does not appear to be as substantial as the gain from using five years of data.

The results of the consistency test were mixed in using four years of experience. In the two states tested the current method gave a lower average variance in one (Maine) and higher in the other (Florida). In both cases the Wilcoxon Statistic indicated that the alternative methodology produced lower variances but was significant only in Maine. The results for various sized classes generally follow the same pattern.

3. Loss Limitation -- One-Half Current Limit

The differences noted with the five credibility alternatives and three loss limitation alternatives are not as marked as those in using five years of data. Of the credibility and

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loss limitation alternatives, using losses limited at one-half the current limitation seems to provide the most significant improvement in indications of relative differences in costs among the classes.

The tests for this loss limitation alternative are not as unanimous as were the indications for the use of five years of data. In comparing the square difference index over time, this alternative seemed to produce a greater impact than all alternatives other than adding to the experience period and one of the credibility alternatives.

Five of the six states tested had lower mean square errors using half the current loss limitation compared to the current methodology with the corresponding Wilcoxon Statistic significant only in one. In four of those five states, however, the Wilcoxon Statistic indicated that the current method tended to provide closer estimates, with none of the results significant with 90% or more confidence.

The underwriting test indicates that this alternative provides more accurate estimates than the current method in five of the six states tested. In four of these the difference is significant at the 95% confidence level. The differences in the other two states are not statistically significant.

These results carry over to small classes. In fact, in every state tested, there is an improvement in the mean square error for small classes using this loss limitation as compared to the current method. On the other hand, the corresponding Wilcoxon Statistics gave conflicting indications with the current method indicated as more accurate in five states and the alternative in the other state. In only two of the cases are the differences significant at more than 90% confidence, one in favor of each method.

Differences for medium sized classes are similar. Again, using half the current loss limit produced lower mean square errors in four of the six cases with equally split indications from the Wilcoxon Statistic. In this case none of the Wilcoxon Statistics are significant at the 90% confidence level.

This alternative tended to reduce the variances in our consistency test for six of the seven states tested and was unchanged in the seventh. The resulting Wilcoxon Statistics also indicated that this alternative produced lower variances than the current methodology. In four of the seven states tested this difference was significant at the 90% confidence level.

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With only two exceptions, the use of half the current loss limit resulted in smaller average variances for all state and class sizes. Those exceptions were for large classes in Connecticut and Illinois. The Wilcoxon Statistics were positive in all cases and significant for small classes in Connecticut, Florida, Illinois, Maine and Nebraska. These statistics were significant for medium classes in Florida, Illinois, and Nebraska but were not significant for large classes where we used the normal approximation for the Wilcoxon Statistic.

4. Credibility Formula -- Double Current Full Credibility Standard

After the alternatives of using five years of data and of using half the current loss limitation, the next most noticeable difference from the current methodology appears to arise from doubling the full credibility standard. In all states tested, this alternative gave lower mean square errors than the current methodology. For all but two states the Wilcoxon Statistic indicated that the alternative using double the current full credibility standard gave more accurate indications of future relative loss costs than the current methodology. The differences were significant at greater than 90% confidence in four of those cases.

The underwriting test also indicated that using double the current full credibility standard produced more accurate indications of relative cost differences by class in all of the seven states analyzed. In four of these the difference was significant at 95% confidence while the differences in the remaining three states were not significant at this confidence level.

Using double the current full credibility standard also produced lower mean square errors for small and medium sized classes in six of the seven states reviewed. The Wilcoxon Statistics, however, indicate that the current method is more accurate in three of the states for small classes and in one state for medium classes. Two of the differences for small classes are significant at the 90% confidence level while for medium classes in five of the states the Wilcoxon Statistic is significant. In these latter four states, the statistic indicated that using double the current full credibility standard produced more accurate indications of relative cost differences among the classes.

In all seven states tested, doubling the current full credibility standard reduced the average variance in our consistency test. In every case the Wilcoxon Statistic lead to the same conclusion and was significant at greater than a 99% confidence level.

As with the use of five years of data, this result should not be surprising. Lessening the credibility given to an individual class increases that given to the current on-level pure premiums, thereby introducing added stability in the indications.

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There are some differences by class size. Using double the current full credibility standard produced smaller average variances for small classes in all seven states tested. In medium classes, the variance is smaller in all but one state. However, the average variance for large classes in Colorado, Connecticut and Florida, all large states, increased when double the current full credibility standard was used.

In none of the cases was the Wilcoxon Statistic negative, that is, in no case did that statistic indicate that the current method resulted in generally lower variances than using double the current full credibility standard. As with the overall indications, the differences were significant for small classes in all states but were not significant for medium sized classes in Colorado, Illinois and Nebraska. Significance of the differences for large classes were mixed.

5. Credibility Formula -- Payroll Based Credibility

Using payroll as a credibility base generally produces less change from the current methodology than the alternatives discussed to this point. In four of the seven states reviewed, this alternative produced a smaller mean square error than the current method. In four cases, however, the Wilcoxon Statistic indicated that the current method produced more accurate results, with the difference significant at the 90% confidence level in one state. In the remaining three states where the Wilcoxon Statistic indicated that using payroll based credibility gave more accurate results, the difference is significant at the 90% confidence level in two.

The underwriting test also gave quite mixed results. That test indicated that using payroll based credibility improved accuracy in five states, two significant at the 90% level. On the other hand it also indicated that the current method is more accurate in two states, both of which are significant at the 90% level.

In five of the seven states the mean square error for payroll based credibility projections in small classes is less than that of the current method. In two cases the Wilcoxon Statistic confirms this difference at the 90% confidence level. Only three of the Wilcoxon Statistics indicate the current method is more accurate and only one of the differences are significant at this level.

The current method seems to be more accurate at forecasting relative cost differences for medium sized classes. The mean square error is less for the current method than for payroll based credibility in four states, with the Wilcoxon Statistic in two of these states

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significant at the 90% confidence level. In only one state is using payroll based credibility significantly more accurate at this level using the Wilcoxon Statistic.

In two cases the use of payroll based credibility reduced the average variance in our consistency test. In every case the Wilcoxon Statistic was positive, indicating that this alternative reduced the variance of the various classes. In four of our test states, Colorado, Connecticut, Florida and Illinois, the statistic was significant at greater than the 99% confidence level. In the remaining three test states, Maine, Nebraska and Oregon, the difference is not significant.

Maine and Nebraska are the smallest of the states tested. It seems, then, that using payroll based credibility may improve consistency in larger states more than in the case of smaller states.

For smaller classes, the payroll based credibility reduced the average variance in all states and three of the states are significant at the 99% level, though the indication for Florida is significant at the 90% confidence level but not at the 95% level. For medium sized classes, however, Nebraska shows a smaller variance for the current method, though both variances are quite small. The Wilcoxon Statistics are all positive and are significant in Colorado, Florida, Illinois, and Oregon.

In the consistency test, the average variances for large classes are increased only in Connecticut relative to the current methodology. In Florida and Illinois, the difference was significant at more than a 98% confidence level.

6. Other Credibility Formulas -- 0.5 Power, 0.8 Lower, and Claim Count for Volume

The differences in forecast accuracy for the remaining three credibility alternatives did not appear to be as significant as those discussed to this point. In many cases the alternatives produced lower mean square errors than the current methodology. However, in only one case was the difference in the Wilcoxon Statistic significant. These cases were both for the alternative of using the square root, or .5 power, in place of the 2/3 power in the current credibility formula.

In Maine the Wilcoxon Statistic indicated that the alternative was more accurate than the current method at the 90% confidence level while the test for Nebraska indicated the reverse at the same confidence level. These same patterns held for small classes in both states.

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For this alternative the underwriting test provided conflicting results. That test indicated that the current method was more accurate in all three states tested with the difference significant at the 90% confidence level in Maine and Nebraska.

In only one other case, that of using 0.8 power in the current formula, was the difference indicated by the underwriting test significant. In that case, Florida, the alternative was indicated to produce more accurate results.

The use of the square root, or .5 power, in the credibility formula tended to increase the variance of the consistency test relative to the current method for all class sizes in one state. In the other two states, the results were mixed.

The Wilcoxon Statistic for the consistency test was positive in all cases, indicating that the .5 power in the credibility formula was more consistent at identifying relative loss cost differences than the current NCCI methodology. The differences were significant at more than the 99% confidence level in all cases. Similar results held for small classes in all states tested. For medium classes the significance of the differences were more than 98% and, where we used the normal approximation, greater than 95% for large classes.

The remaining alternative credibility formulas reviewed, the use of .8 power and the use of claim count based credibility, both resulted in lower average variances in the consistency test and in positive Wilcoxon Statistics that were significant at greater than the 99% confidence level.

Similar results generally held for small, medium and large classes. For medium classes, however, the results were not significant in Maine. For both Florida and Maine, the results for large classes were not significant.

7. Other Loss Limitations

The remaining alternative loss limitations did not appear to noticeably improve the accuracy of predicting relative loss cost differences among classes. In none of the cases were differences noted by the underwriting test significant at the 90% confidence level.

Generally, for Florida both the other loss limitation alternatives produced higher mean squared errors than using half the current limit or even the current methodology. In fact, the Wilcoxon Statistic indicates that the current methodology is more accurate than using

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unlimited losses at an 80% confidence level. Results for small and medium sized classes are similar but not as statistically significant.

In Maine the sliding scale alternative resulted in higher mean squared errors than using half the current loss limitation. In both cases, however, the Wilcoxon Statistic indicates that both are significantly more accurate than the current methodology. The corresponding results for small classes are the same while for medium classes the Wilcoxon Statistics seem to indicate that the current method provides more accurate results and, in one case, significantly so.

The use of unlimited losses and of the sliding scale loss limitation in classification ratemaking produced a higher average variance in Florida and a lower variance in Maine in our consistency tests. In all cases the Wilcoxon Statistic were positive, indicating that the alternative methodology was more consistent than the current NCCI methodology. In the case of unlimited losses, the differences were not significant for either state while for the sliding scale limitation, the differences were significant at greater than a 99% confidence limit.

All sized classes in Florida experienced higher average variances under both of these alternative loss limitations than under the current methodology. In Maine, small and large sized classes had lower average variances under both alternatives and medium classes had a lower average variance.

In all cases the Wilcoxon Statistics are positive and are significant at above the 95% confidence level in Florida for small, medium and large sized classes for both alternatives except for small classes under the sliding scale alternative. It is also significant for small classes in Maine under the sliding scale loss limitation.

We again remind readers that the accuracy tests for the various loss limitations were conducted using losses at those limits. These conclusions thus refer to the relative accuracy and consistency of the current methodology in projecting losses at those limits. In the end, though some expected improved relative accuracy and consistency using a sliding scale loss limitation, this expectation was not borne out by our test. This could possibly be due to the choice of scaling, the limitations used here, or the states used for the tests. As in other areas, we believe that the methods developed in this examination can be used by NCCI to test other alternatives.

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V. EVALUATION OF INDUSTRY GROUP DIFFERENTIAL PROCEDURES (Objective 4b)

A. Data Sources

This portion of our analysis was based on data in the format of Appendix A-VII from NCCI filings. These data were prepared in conjunction with our request for alternative rate calculations using four or five years of data and reflect that added experience. We also received similar exhibits based on the current NCCI three-year methodology.

We were able to compare actual policy year 1987 losses at first report with the expected losses based on three and five years of data for Colorado, Connecticut, Illinois, Maine, and Nebraska, actual policy year 1988 losses for Utah with expected losses based on three and five years of data and actual policy year 1987 losses with expected losses based on three and four years of data for Florida and Maine.

B. Methodology

NCCI assumes that three years of experience for the individual industry groups is fully credible. The request for proposals asked us to address the question as to whether use of more years in calculating industry group differentials would improve the methodology.

It is not unusual in property and casualty ratemaking to use progressively more years of experience as the level of detail required increases. This is one characteristic of the current NCCI methodology in that the overall indication for a state is based on one policy year and one accident year of data but classification rates explicitly make use of three years of experience. Therefore, the use of five or more years of classification experience does not preclude the use of three years of industry group experience.

The tests applied here differ from those for the alternatives mentioned so far. Rather than testing the impact of an alternative on the rates of individual classes, we considered the impact of changing the number of years on the industry group differentials.

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In this case, the expected losses E_{ij}^k for industry group i , state j and alternative k equals the premium P_{ij}^k times the loss ratio for all industry groups combined for state j . This assumes that all of the industry groups will achieve the same loss ratio. The variations from this assumption measure the error from the objective of the industry group ratemaking process. We tested alternatives to measure whether they reduce the error.

The tests of the alternatives included (1) an accuracy test using (a) the Wilcoxon Statistic and (b) the mean square error and (2) consistency test similar to the one used for analyzing classification ratemaking alternatives.

The underwriting test was not used because there are only three industry groups, not the hundreds of classifications to which the test was applied in the previous sections of this report. The impact statistic is also not specifically calculated because with only three groups, the difference in indicated industry group relativity gives an immediate measure of the impact of the change.

We tested the significance of tests using the Wilcoxon Statistic:

$$W_j^* = \sum_{i=1}^3 D_{ij}$$

where D_{ij} is defined as:

$$D_{ij} = \text{Rank}(|SE_{ij}^1 - SE_{ij}^2|) \times \text{Sign}(SE_{ij}^1 - SE_{ij}^2)$$

The statistic W_j^* can only take on the values -6, -4, -2, 0, 2, 4, and 6. Under the null hypothesis that the corresponding square errors are not different, the probability that this

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statistic is equal to 0 is 0.25 while the probability it takes on any of the other six possible values is 0.125.

In addition to calculating the Wilcoxon Statistic for these years and states we also calculated the mean square error, defined as:

$$MSE_j^k = \frac{\sum_{i=1}^3 P_{ij}^k SE_{ij}^k}{\sum_{i=1}^3 P_{ij}^k}$$

This is the weighted average of the corresponding square errors using the adjusted manual premiums from the particular alternative as weights.

We were thus able to make these comparisons of 1987 losses with the expected losses given three and five years of data for Colorado, Connecticut, Illinois, Maine, and Nebraska and with 1988 losses for Utah. We also compared the expected losses with the 1987 losses in the 1990 revision given three and four years of data for Florida and Maine.

The consistency test is similar to that used for classifications. The overall average differential was calculated by combining premiums and losses for all available states. This information was based on the expected and adjusted losses from the second pages of NCCI Exhibits A-VII corresponding to the various states, years and alternatives.

As with the analysis discussed in section IV above, we then compared the industry group differentials for a given state with the combined differential for the same year. If there were little difference in the relationship from one year to the next, we concluded that the corresponding method was relatively stable. On the other hand, if there were wide differences from year to year, we concluded that the corresponding method is unstable.

To test this, we calculated the ratios of the industry group differential in a state and a year with that of the combined experience for the same industry group and year. We then calculated the variance of the resulting ratios over time for the same state. As with the comparison of actual with expected losses, we used the Wilcoxon Statistic to test the

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significance of differences indicated. In this case, rather than comparing the square errors of the alternative approaches, we compared the corresponding variances.

Appendix C to this section contains examples of these calculations.

C. Conclusions

The accuracy tests give a mixed result. In five of the eight cases tested, the current method gave a lower mean squared error than the alternative with more years of experience. The Wilcoxon statistic, which we used to test the significance of the differences, also provided mixed results.

The following table summarizes the resulting mean square errors (MSE) and Wilcoxon Statistics, where comparisons were available. Note that for all states but Utah, the comparison was based on 1987 data while 1988 was used for Utah.

Comparison of Mean Square Errors for Industry Group Differentials

<u>State</u>	<u>Alternative</u>	<u>3 Year MSE</u>	<u>Alternate MSE</u>	<u>Wilcoxon Statistic</u>
Colorado	5 Years	21,882	297,140	-4
Connecticut	5 Years	1,788,346	2,009,125	-2
Florida	4 Years	1,968,718	2,274,558	-2
Illinois	5 Years	438,892	240,558	6
Maine	4 Years	467,866	586,205	0
Maine	5 Years	467,866	341,499	2
Nebraska	5 Years	63,674	53,470	2
Utah	5 Years	26,001	41,108	-4

Recalling that the maximum value that the Wilcoxon Statistic can take is 6 in this case, a result of 6 would lead to the rejection, with the most confidence possible with this test, of the null hypothesis that the square errors of the corresponding alternatives are equal.

The negative values for Colorado, Connecticut, Florida (4 years), and Utah indicate that, based on the Wilcoxon Statistic, the three year approach gives a better approximation than

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the alternatives. If the null hypothesis is true there is a 12.5% chance of obtaining a value of -6 and a 25% chance of obtaining values of -4 or -6.

The following table, similar to the one above, summarizes the results of the comparison of the consistency of the two alternatives:

Comparison of Average Variances for Industry Group Differentials

<u>State</u>	<u>Alternate</u>	<u>Average Variance for 3 Year</u>	<u>Average Variance for Alternate</u>	<u>Wilcoxon Statistic</u>
Colorado	5 Years	0.00027	0.00017	4
Connecticut	5 Years	0.00172	0.00203	-4
Florida	4 Years	0.00154	0.00222	-6
Florida	5 Years	0.00045	0.00026	6
Illinois	5 Years	0.00021	0.00047	-2
Louisiana	5 Years	0.00099	0.00011	6
Maine	4 Years	0.00319	0.00210	6
Maine	5 Years	0.00119	0.00142	0
Michigan	5 Years	0.00042	0.00033	2
Nebraska	5 Years	0.00088	0.00055	6
North Carolina	5 Years	0.00095	0.00005	6
Oregon	5 Years	0.00065	0.00035	4
Utah	5 Years	0.00246	0.00070	6
Wisconsin	5 Years	0.00021	0.00025	-4

Here the comparisons with 5 years of data were made using all the listed states as a benchmark. For comparisons with 4 years of data, only Florida and Maine, which were the only states for which 4 years were run, were used.

Except for Wisconsin, for which only two rate revisions were available, and Illinois, using five years of data results in a lower variance in the relativities. Many of the comparisons resulted in Wilcoxon Statistics of 6, the highest possible, leading to the rejection of the null hypothesis with the most confidence possible. However, there are cases where the difference in variances is not as significant.

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The stability apparently gained by using five years of data should not be surprising. Results from one year to the next should be expected to be correlated, since, in the case of five years of data, each successive revision uses four years of policy year experience that were used in the previous revision.

As we mentioned above, we believe that at least as many years should be used in calculating classification relativities as are used in estimating industry group differentials. We have seen, at least from these indications, that using five years of data appears to provide more consistent and closer estimates than the current three years.

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VI. EVALUATION OF ALTERNATE TREND APPLICATION (Objective 4c)

A. Data Sources

As with the analysis for Objective 4a above, this portion of our analysis was based on rate revisions for a single policy year in several states. The underlying rate revisions were provided by the NCCI.

B. Methodology

The current NCCI methodology adjusts the indicated pure premiums to reflect the trend in loss costs per unit of exposure between the experience period used in the ratemaking methodology and the time for which the rates are applicable. In the current classification ratemaking methodology a single factor is used to adjust all indemnity losses, independent of the policy year. A separate factor is used to adjust medical losses.

In order to test the impact of possible bias introduced by this procedure, we asked the NCCI to calculate 1990 rates in Colorado, Connecticut, Florida, Illinois, Maine, Nebraska and Oregon using a separate trend factor for each policy year of data.

C. Conclusions

We would expect bias in the current methodology if a particular class shows marked increase or decrease in volume over the experience period. A comparison of the square difference index that we developed shows that calculating separate trend factors by policy year makes the least difference of all tested alternatives in all but one state. In that single exception, the alternative trend method gave the second lowest square difference index of the forty-two tested alternatives.

On the other hand, the change is relatively easy to make, it is theoretically more correct, some classes may have significant changes in rates, and the change will be more significant if five or more years of data are used. Therefore, we recommend that NCCI apply trend on a year by year basis.

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VII. EVALUATION OF "ALL OTHER" INDUSTRY GROUP COMPOSITION

During the course of this examination, the Examination Oversight Committee expressed some concerns regarding the content of the "All Other" industry group. The discussion in this section presents our analysis of that industry group and the conclusions that we reached.

A. Data Sources

We reviewed data from two states, Michigan and Pennsylvania, which have undergone changes in their heavy industrial economies. We also included Maine since the make-up of the "All Other" category is currently a significant issue in that state.

We analyzed payroll and present on rate level pure premiums for these three states using information from 1991 rate filings. The Maine data was taken from Appendix B-II (pgs. 75 through 110) of the NCCI filing. The Michigan data source was Appendix B-II (pgs. 56 through 90) of the Compensation Advisory Organization of Michigan filing. The Pennsylvania data was from the Pennsylvania Compensation Rating Bureau filing classbook (including large risks), pages 191 to 346.

B. Methodology

Our review was undertaken with three guiding principles:

1. Each new industry group should be statistically reliable. In this respect, expected losses and payroll can be compared to the smallest existing industry group (i.e., "Contracting").
2. Each new industry group should have less dispersion of class pure premiums about the new group average pure premium than the original group.
3. The occupational classes within the new industry groups should be more homogeneous. That is, the occupations within each group should have some sort of common characteristics.

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Principle 1 is intended to assure that the credibility of the industry groupings within a state will not be diminished significantly as a result of modification. In the case of office employees, the following table compares the contracting classes, the office employee class and the all other class excluding office employees.

<u>State</u>	<u>Industry Group</u>	<u>Payroll (Millions)</u>	<u>Ratio to "Contracting"</u>	<u>Expected Losses (Millions)</u>	<u>Ratio to "Contracting"</u>
ME	ALL OTHER (excluding office)	\$ 7,769	5.26	\$306	1.48
	OFFICE EMPLOYEES (8810)	3,682	2.49	15	0.07
	CONTRACTING	1,478	1.00	207	1.00
MI	ALL OTHER (excluding office)	\$ 45,906	6.81	\$1,047	1.98
	OFFICE EMPLOYEES (8810)	32,056	4.75	93	0.18
	CONTRACTING	6,743	1.00	530	1.00
PA	ALL OTHER (excluding office)	\$146,271	7.78	\$2,440	2.34
	OFFICE EMPLOYEES (953)	81,801	4.35	186	0.18
	CONTRACTING	18,798	1.00	1,043	1.00

It is seen that the office employees class has significantly higher payrolls than the entire contracting industry group. While the losses are significantly less, substantial credibility will still exist with expected loss volumes of \$15 million, \$93 million and \$186 million.

Principle 2 is intended to assure that equity value is gained from any change; i.e. that there is statistical evidence that greater homogeneity of risks within the new ratemaking categories is achieved. For this analysis, we have used the dispersion of class pure premiums about the corresponding industry group pure premium as a medium for evaluating relative homogeneity of each group.

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A commonly used measure of relative variation within different populations is the coefficient of variation (c.v.). The c.v. in this example is the standard deviation of the class pure premiums divided by the industry group pure premium. Ideally, the c.v. should be reduced by any modifications in industry groups that are intended to increase homogeneity.

From a purely statistical standpoint, the c.v. could be reduced to zero by simply creating a separate industry group for each class. However, by stratifying the ratemaking data, Principle 1 would soon be violated.

The table below presents the c.v.'s inherent in the current "All Other" group and a hypothetical "All Other - Excluding Office Employees" group. Significantly, the c.v. of the new miscellaneous category is reduced.

<u>Payroll State</u>	<u>Industry Group</u>	<u>(Millions)</u>	<u>c.v.</u>
Maine	ALL OTHER	\$ 11,451	1.60
	ALL OTHER - EXCLUDING OFFICE EMPLOYEES	7,769	1.23
Michigan	ALL OTHER	\$ 77,962	1.50
	ALL OTHER - EXCLUDING OFFICE EMPLOYEES	45,906	1.12
Pennsylvania	ALL OTHER	\$228,072	1.46
	ALL OTHER - EXCLUDING OFFICE EMPLOYEES	145,271	1.16

Principle 3 is intended to assure that any new industry group is created under the same premise as the existing industry groups. As we are discussing only the office employees occupational class, this principle is obviously not violated.

C. Conclusions

We recommend that NCCI pursue the feasibility of creating new, more homogeneous industry groups from the existing "All Other" group. These groups should be created without violating any of the three principles described above.

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As shown with the preceding example, it is feasible and desirable to segregate the "Office Employees" class as an industry group separate from "All Other." The class is large and different enough to warrant such a modification. Also, as shown in Appendix E to this section of the examination report, many of the classes that would remain in the "All Other" group suggest work activity that may be similar to office employment (e.g. attorneys, physicians including clerical and accounting). We expect that the c.v. of the new miscellaneous category would be further reduced by transferring some additional classes to the "Office Employees" industry group. However, the "All Other" group should not be diminished to the extent that Principle 1 is violated.

We stress that other sub-groups are possible and could vary by state.

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VIII. EVALUATION OF AN ALTERNATE TO NATIONAL RELATIVITY

A. Data Sources

As with the analysis in sections IV and VI, we based our analysis on a comparison of rates calculated under the current methodology and a single alternative.

B. Methodology

The pure premium indicated by national relativity is the third component of the pure premium derived by formula. We recognize that there has been a recent change in the calculation of these pure premiums. The original method was discovered to cause the pure premium indicated by national relativity to be overstated in the case that a state had a class or classes not present in one or more other states.

We understand that the current NCCI methodology corrects for this by calculating the adjustment factor applied to losses in other states using only classes existing both in the state under consideration and in the other state. In addition, we understand that the revised NCCI method now balances pure premiums indicated by national relativities by industry group within a state.

Some discussions regarding the current classification ratemaking methodology raise concerns with the applicability of pure premiums indicated by national relativity to class pure premiums for a particular state. We recognized these concerns and developed an alternative that keeps the current methodology but introduces a regional component to the pure premiums determined by national relativities.

This alternative calculates two separate sets of partial pure premiums and combines the two to replace the current pure premiums indicated by national relativity. The first set is simply the current pure premiums indicated by national relativity in the current ratemaking methodology.

The second set is calculated in a similar manner but includes only the states in the same NCCI region as the target state. The pure premiums indicated by national relativity are then replaced by the credibility-weighted average of these two indications. The weight

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given to the regional partial pure premium is calculated using the same formula as used for pure premiums indicated by national relativity. We asked the NCCI to calculate 1990 rates in Colorado, Connecticut, Florida, Illinois, Maine, Nebraska and Oregon using this alternative.

C. Conclusions

This regional pure premium application generally showed small differences with the current methodology in most situations. In fact, in most states, the square difference index for this alternative was second smallest only to that for the alternative trend application. There appears to be little evidence to support making any change in this direction at this time.

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IX. EXCESS LOSS ANALYSIS

During the course of our analysis a question arose regarding the treatment of losses in excess of the loss limitation in the NCCI classification ratemaking procedure. Currently, such losses are implicitly included in the off-balance correction factor which, except for swing limitations, is uniform for all classes in an industry group. We analyzed whether, given available data, there are significant differences in excess experience among classes in the various industry groups.

A. Data

We compared unlimited losses with those limited to the current NCCI loss limits for three policy years of data. We used Schedule Z data tabulations from the NCCI as the source of the unlimited losses and the corresponding NC235 data tabulations as the source of limited losses. These tabulations contained data for policy years 1985 at third report, 1986 at second report and 1987 at first report and were available for Connecticut, Florida, Illinois, Maine, Michigan, Nebraska, North Carolina, Oregon, Utah and Wisconsin.

B. Methodology

The goal of this section's test is to determine if a class or classes have significantly different expected losses above the loss limitation than the remaining classes. If this is a case, the current NCCI methodology may introduce subsidies in the classification rates.

To this end, we calculated the following two statistics for each class i and policy year j :

$$GILF_{ij} = \frac{\sum_{k \neq i} UL_{kj}}{\sum_{k \neq i} LL_{kj}}$$

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$$ILF_{ij} = \frac{UL_{ij}}{LL_{ij}}$$

Here UL_{ij} denotes the unlimited losses for class i in policy year j and LL_{ij} denotes the corresponding limited losses. In addition, ILF_{ij} is the excess loss factor implied by the data for class i in year j and $GILF_{ij}$ denotes the industry group excess loss factor. The summation is taken over all other classes in the industry group containing class i . This latter restriction reflects the current NCCI procedure of balancing rate level indications by industry group in determining the off-balance factors.

We will conclude that one class is expected to experience excess losses that are significantly different from the others in the industry group if the above factors are significantly different. We would expect the excess loss factors to be greater than 1.00 and, at least theoretically, unlimited.

We thus assumed for each class i that $GILF_{ij}-1$ and $ILF_{ij}-1$ are both independent random samples of size 3 from independent lognormal distributions. These assumptions result in statistics that have the properties identified at the end of the previous paragraph.

The natural logarithm of a lognormal variable is normal, and we can test the significance of the difference between the corresponding factors by testing the significance of the difference between the sample means:

$$GM_i = 1/3 \sum_{j=1}^3 \ln(GILF_{ij}-1)$$

$$M_i = 1/3 \sum_{j=1}^3 \ln(ILF_{ij}-1)$$

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The above assumptions lead to the conclusion that $\ln(GILF_{ij}-1)$ and $\ln(ILF_{ij}-1)$ form independent random samples from normal distributions with possibly different variances. Under the null hypothesis that the two underlying means are equal:

$$H_0: E[GM_i] = E[M_i]$$

The difference between class excess losses and industry excess can be tested by the following statistic which has a t distribution with 2 degrees of freedom:

$$T_i = \frac{GM_i - M_i}{S_{z_i} / \sqrt{3}}$$

where

$$Z_{ij} = \ln(GILF_{ij}-1) - \ln(ILF_{ij}-1),$$

$$\bar{Z}_i = 1/3 \sum_{j=1}^3 Z_{ij}, \text{ and}$$

$$S_{z_i}^2 = 1/2 \sum_{j=1}^3 (Z_{ij} - \bar{Z}_i)^2$$

We can conclude that class excess losses are significantly different from the industry group excess losses with confidence p if $|T_i|$ exceeds the values shown in the table below:

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Critical Values

p	<u>T_i greater than</u>
90%	2.920
95%	4.303
99%	9.925

Source: Standard Table for t Statistics

With only three policy years available, we recognize the possibility that a class will experience no losses in excess of the limit. In such cases we calculated UL_{ij} as $LL_{ij}+1$. We also excluded all classes with no losses experienced in any policy year.

C. Conclusions

As shown in Exhibit B-4, a substantial proportion of classes in nearly every state and industry group combination differ significantly from the average for the remainder of the industry group. The reader should exercise caution in interpreting the results shown in Exhibit B-4 for several reasons. First, these indications are based on three years of experience; one at first report, one at second and one at third. It is likely that this may not be sufficient for large losses to emerge for smaller classes or in smaller states and such losses if they do emerge may have an undue influence on the results. This may explain the results shown for Nebraska and Utah for some industry groups.

Second, the differences shown are between a class and the rest of the classes in the particular industry group. If only few classes in an industry group experience excess losses then the many "clean" classes could have test statistics indicating significant difference from the remainder of the group. Again, the lack of experience available limits the conclusions we can draw from these results. We have, however, developed a method that NCCI can use to further test the extent of difference that may exist.

CLASSIFICATION RATEMAKING

X. ADDITIONAL INFORMATION PREPARED BY NCCI

A. Introduction

In the later stages of this examination, NCCI used the methodology described in pages 34 through 36 to perform additional tests of the relative accuracy of the use of five years of data as compared with the current three years.

We have not been able to perform a detailed review of all the calculations NCCI used for this additional information. We have, however, been able to duplicate their results in a few test cases, including the use of first report for Colorado, Connecticut, Illinois, Maine, and Nebraska, and both the use of manual premiums and the use of development from first report for Illinois. Due to time constraints, we have not verified the remaining calculations.

B. Description of Tests

We understand that NCCI followed the methodology described in this examination report to obtain mean square error and Wilcoxon statistics comparing relative accuracy at first report for six additional states; Florida, Louisiana, Michigan, North Carolina, Oregon and Utah. We also understand that they extended this test to using second report data in the five states we tested using first report data; Colorado, Connecticut, Illinois, Maine and Nebraska.

In addition to extending the number of states and maturity of loss data, NCCI also made two modifications to our tests. The first modification removed our adjustment for the difference between manual and standard earned premiums.

The second modification replaced actual losses by developed losses. We understand that NCCI applied age to ultimate development factors to adjust actual losses to their expected ultimate level. Separate development was applied for serious indemnity, non-serious indemnity, serious medical and non-serious medical losses, using uniform development factors among the classes for each type of loss. For example, the same development factor was used for all classes to develop serious indemnity losses while a different factor was used to develop non-serious indemnity losses, and so forth.

CLASSIFICATION RATEMAKING

The development factors used were those that were used in the rate filing where those losses were at first report. For example, 1987 losses at first report were used in the calculation of 1990 rates. The 1987 losses were then developed to their estimated ultimate level using the first report to ultimate factors from the corresponding 1990 filing.

C. Discussion of Results

Appendix G to this section of the examination report presents the calculations supplied by NCCI. Though the mean square errors and Wilcoxon statistics are not unanimous as in our original tests, the general indications of our initial tests still appear to be supported by these additional calculations. In most cases, the mean square errors for the five year alternative are less than those for the corresponding tests using three years of data. In most cases the Wilcoxon statistics are positive and are significant in many, while negative values are only significant in one state.

For example, in the eleven states using first report data developed to ultimate, two of the Wilcoxon statistics were negative and nine were positive. Only one of the negative statistics was significant at the 80% level while six of the positive ones were significant at that same level.

For the most part, the additional NCCI tests performed using data for the five original states; Colorado, Connecticut, Illinois, Maine, and Nebraska, yielded results parallel to our original tests, though the Wilcoxon statistics are not quite as significantly positive. Thus, the adjustments made by NCCI do not appear to substantially affect the general indications derived from our tests.

We also note that we did not rely solely on the mean squared errors and Wilcoxon statistics in forming our conclusions. Probably the stronger indications arose from the application of the underwriting tests. In this case, the use of five years was significantly more accurate in identifying relative loss cost differences at the 90% confidence level for all states we tested.

Due to time constraints, NCCI has not been able to run similar tests for all the comparisons they provided. However, they did run these additional tests for the additional six states using first report, undeveloped losses. In these cases, the use of five years was significantly more accurate at the 80% confidence level in all states but Utah and Florida.

CLASSIFICATION RATEMAKING

Again, these results seem generally to follow the indications of our original tests.

(As part of an NAIC examination of NCCI, Milliman & Robertson, Inc. has completed a study of the classification ratemaking of the NCCI. The purpose of this appendix is to provide supporting data and calculations underlying the study).

**RATEMAKING PROCEDURES
EVALUATION OF RATEMAKING METHODOLOGIES**

**NCCI EXAMINATION
VOLUME VI - SECTION IIB - PART 4
CLASSIFICATION RATEMAKING
APPENDIX**

November 26, 1991

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CLASSIFICATION RATEMAKING

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APPENDIX A

CLASSIFICATION RATEMAKING

Appendix A

Calculations Requested of the NCCI

The letters included in this appendix summarize our instructions to the NCCI for various alternative rate calculations. This appendix is intended to be reviewed in conjunction with the discussions in part IV of this section of this examination report. That part also describes various modifications to these requests that occurred in the course of this examination.



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November 30, 1990

Mr. Robert S. Yenke
Director Classification Ratemaking
National Council on Compensation Insurance
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RE: DATABASE AND DATA REQUEST - SECTION IIB4 CLASSIFICATION
RATEMAKING

Dear Mr. Yenke:

We are at the stage of our project where a database will be needed to test various assumptions and alternatives to the classification ratemaking system used by NCCI. We would like a database comprised of the attached list of states and national pure premiums to be compiled for test purposes. We believe supporting data for the last five rate filings (seven if possible) will be needed to provide a sufficient base to test alternatives. Data should be in adequate detail to provide testing of the following types of alternatives:

1. Varying the number of years up to five used in each class,
2. Different credibility formula,
3. Different credibility base,
4. Different adjustment factors,
5. Different loss limitations.

We realize retaining individual claimant detail at all report levels for the seven plus policy years involved is not feasible. We believe item 5 can only be tested using individual detail. Thus we may only be able to use the most recent filing to quantify the impact of change for that item. For the other items we could test the impact of the proposal changes using actual experience.

In addition to the availability of this data base we would like a list of critical values for the serious/non-serious split by state along with a procedural definition to calculate those values for each of the past seven years. It would be helpful if we could obtain this information within the next week.

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In his letter to Mr. Berquist, Mr. Hager mentioned several enhancements to ratemaking methodologies. Two of these in particular appeared to deal with classification ratemaking, namely "Industry Group Differentials - improved method approved by Actuarial Committee (2Q, '90)" and "Investigation of Credibility Standards for National and State Pure Premiums used in Class Ratemaking (3Q, '90)."

Please include available written description and supporting discussion for these enhancements. As with the definitions of serious and non-serious, we would appreciate this information within the next week.

We will be talking to you at greater length in the next week to ten days to further clarify database requirements. In the meantime if you have any questions do not hesitate to call.

Best regards,

Roger M. Hayne

RMH:llr

cc: R. Hilton, NCCI
J. Berquist, M&R
E. F. Fossa, M&R
M. A. McMurray, M&R

States For Classification Ratemaking Analysis

Colorado

Connecticut

Florida

Illinois

Louisiana

Maine

Michigan

Nebraska

North Carolina

Oregon

Wisconsin

Utah



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December 19, 1990

Mr. Robert S. Yenke
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750 Park of Commerce Drive
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RE: CLASSIFICATION RATEMAKING INFORMATION, NAIC PROJECT,
SECTION IIB4

Dear Bob:

This letter is to request additional information regarding the classification ratemaking procedures employed by the NCCI and to present a more complete description of some of the analyses we will be requesting to be run. The first part of this letter addresses the request for additional information, and the second portion addresses the requested analyses.

Information Request

As you indicated, the Michigan filing seemed to present a fairly complete description of the classification ratemaking methodology. We believe we understand most of the procedures described, however we do, have a few detailed questions that we could not find answered in that filing.

1. In Section F of Appendix B-I-A we see how the losses for industry groups are adjusted for development, law changes, assessment changes and wage trend differentials. It is not clear from this section, however, where these loss totals come from. In fact, the total losses from Section F of Appendix B-I-A are close to but slightly less (within less than 1%) than the corresponding totals by policy year from the accompanying report titled "Undeveloped Losses and Cases by Type of Injury". That report appears to summarize the loss data that is used for the "A-Sheet" calculations. How do the losses in Section F of Appendix B-I-A relate to the data used for individual class ratemaking for individual classes included in the "Undeveloped Losses and Cases by Injury Type" report?
2. Also in Section F of Appendix B-I-A, it is not immediately clear how the pure premiums in column (1) of Part 1 are calculated. Are they the product of the "Underlying

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Present Pure Premium" (for example, column (7) from Appendix B-I-B) and the payroll column (10) from that same appendix)? If not, how are these values calculated?

3. In our telephone conversation, you indicated that the national pure premiums were calculated using the NCCI's overall data base. Harwayne, in his 1977 paper in the Proceedings of the Casualty Actuarial Society, described the process used to adjust the countrywide experience. Specifically, that approach uses losses and payroll from the individual states to derive a single adjusted nationwide class pure premium for the state under review. In particular, current rates or resulting underlying pure premiums are not used in that calculation. Does the NCCI currently calculate the national pure premiums in this manner? How are trend adjustments made, if any?
4. We recognize that, to some extent, each state is unique. We understand that there may be exceptions to the class ratemaking procedure. Are such exceptions made? If so, what state(s) are affected? Are there class(es) that have exceptions? If so, what class(es) and in what state(s)?
5. The Michigan filing gives a detailed description of the full credibility standard and how partial credibilities are assigned. What is not clear is the reason for that particular formula. Does some description for the derivation of that formula exist? If so, please forward a copy to us.
6. The filings appear reasonably clear as to what loss limitations are used in the data and how those limitations are calculated. What is not clear is the rationale behind the selected limitations. What are the actual (dollar amount) limitations used, both currently and over the past seven years, by state?
7. We have not yet received the three items of documentation we requested in the top two paragraphs, page 2, of our November 30, 1990 letter.

Requested Analysis -- Years of Experience

As we previously discussed, one of the goals of our analysis is to review the impact of varying the number of years of experience used in classification ratemaking. What follows is a broad outline of how we envision that analysis would be accomplished. Due to limitations in the data available, some approximations have been necessary.

Please review this outline carefully to be sure we have given you sufficient direction to appropriately accomplish the desired goal. We welcome any questions or suggestions that will allow us to accomplish our goal as efficiently as possible.

We recognize that your detailed, day-to-day experience with this portion of the ratemaking methodology gives you a unique insight into the interaction of the various portions and the detailed data necessary for those calculations.

Thus, we need to be aware of any ambiguities or omissions in this outline that may affect the analysis. Therefore, we would appreciate the benefit of any insights you may offer in this regard.

We understand that the NCCI has readily available data from five (5) rate filings for the states we specified in our previous letter. As will become clearer below, the presence of additional data will greatly improve the results we will be able to obtain.

We thus understand that these readily available data sets will have loss and exposure data for the most recent seven (7) policy years. The most recent policy year is at the first report, the next is at the second report and the remaining five policy years are at the third (or possibly later) report. The third report would be available from the most mature policy year in each of the five retained filings.

We will assume in the following outline that later reports (fourth or fifth) are not available in classification detail by injury type (death, PT, ...). If, however, those additional data are available, we will modify our approach accordingly.

For the sake of discussion, we will denote these policy years as 1982 through 1988 respectively. By 1988 we denote the most recent policy year whose experience is available (at first report). Similarly 1987 denotes the year that is at second report in the most current filing, and so forth.

Our goal will be to use policy years 1982 through 1987 to provide forecasts for 1988. We would then compare those forecasts with the actual 1988 policy year experience that has emerged as a test of relative accuracy of the approaches.

We understand that the limitations in the data allow us to only directly test the impact of using four (4) years of experience, since only policy years 1982 through 1985 would be available to make rates for the 1988 policy year. We request that the NCCI perform the corresponding classification rate estimates to provide the basis for these comparisons.

Additional experience data for policy years 1981 and prior, using the above naming conventions, would substantially increase the value of this analysis. For example, if 1981 were available we would have two comparisons of the impact of four years versus the current three; 1981 through 1984 to forecast 1987 and 1982 through 1985 to forecast 1988, as well as a test for five years versus the current 3.

We also propose additional tests. We would like to test the amount of fluctuation in rates from one year to the next using four or five years of data as compared with the current three years. For this we will use five (or four) years from 1982 (1983) through 1986 to estimate 1989 classification rates. Similarly, we would use 1983 (1984) through 1987 to estimate 1990 classification rates and 1984 (1985) through 1988 to estimate 1991 classification rates.

We would then compare the changes by class to those resulting from the current methodology. Here again we request that the NCCI calculate the classification rate indications for comparison with the current methodology.

Adjustment of Loss Experience

Given our understanding of available data, and current methodology, several steps are necessary to adjust losses to proper levels for class ratemaking. These adjustments include:

1. Adjustments for benefit changes,
2. Adjustments for changes in assessments (where appropriate),
3. Loss development,
4. Inclusion of loss adjustment expenses,
5. Trend, and
6. Adjustment to calendar-accident year indications.

1 & 2. Benefit and Assessment Changes. The combined available data should provide sufficient detail to adjust past policy year losses to the benefit and assessment levels appropriate in the various rate calculations, even if the individual policy years were not used in the particular filing. Thus, for example, using the naming conventions defined above, the 1982 policy year data could be adjusted to a 1988 level by using the changes as evaluated in the filings for 1987 and 1988 rates, since 1982 would last be used to estimate 1987 rates in the current methodology.

3. Loss Development. We would prefer to have development history and experience to five reports available for development. If such history is available, for the purpose of these tests, use the development from fifth report to ultimate from the current filing but modify the development for policy periods making use of data at fifth and fourth reports for the most mature policy years. For example, if we are using 1982 through 1986, we would use 1982 at fifth report, 1983 at fourth report, 1984 at third report, 1985 at second report and 1986 at first report and use fifth-to-ultimate, fourth-to-ultimate, etc. factors.

We recognize that fourth and fifth report experience may not be readily available. As an alternative to this preferred approach we would have the NCCI apply the third-to-ultimate development to third report data for the most mature three policy years (two if a four-year alternative is tested). We would maintain the current approach for development of years at first and second report.

4. Loss Adjustment Expenses. The current procedure of applying a single factor could be used to include loss

adjustment expenses.

5. Trend. For the purpose of this exercise we propose to use the current procedure of a single trend factor for all policy years. A different portion of our analysis would incorporate different trends for each policy year. In this case, however, the trend would be calculated adjusting the average experience date to the midpoint for the experience used.

6. Calendar-Accident Year Adjustment. We understand that this factor is used to adjust for differences between the calendar-accident year experience used in the overall rate level indications and the policy year unit statistical data used for classification ratemaking. If more than three years of experience is used for classification ratemaking, then a precise adaptation of the current methodology would calculate this factor for using more than three years of experience. We recognize that sufficient data to accomplish this may not be available. If that is the case we then would approximate this factor by using the same adjustment factor as used in the three-year analysis.

Adjustment of Current Pure Premiums

We recognize that several adjustments are made to the last-approved "A-Sheet" pure premiums calculated by formula to derive the "Present On Level Pure Premium" used in the classification ratemaking. We understand these adjustments include:

1. Composite factor from the last approved filing by industry group (manufacturing, contracting, and other),
2. Effect of law and assessment changes by loss type (serious, non-serious and medical),
3. Effect of some subsequent benefit changes by loss type,
4. Adjustment to exclude loss adjustment expenses, uniform for all industry groups and loss types,
5. Adjustment for the change in the ratio of manual to earned premiums between the current rates and the proposed rates, uniform for all industry groups and loss types,
6. Adjustment for differential in wage trend among industry groups, and
7. Adjustment for industry group experience.

1. Through 5. The first five (5) adjustments do not appear to depend on the number of years of experience used in the analysis. The last two items, however, do.

6. Wage Trend Differential. We understand that the current methodology takes this trend adjustment from the midpoint of the experience period. As with the trend question above, we defer consideration of different trends until we analyze the

affects of changes in trend methodology later. At this juncture, then, we would calculate a single factor for each industry group similar to the current approach, but incorporating the full extended experience period, four or five years.

7. Industry Group Experience. We note separate factors are used to adjust prior pure premiums to reflect industry group experience. This is accomplished by comparing adjusted losses by industry group to expected losses by industry group. We propose to calculate these factors using the current approach, but incorporating the most recent four (or five) policy years of experience.

The loss portion would be adjusted for development and changes in law level and assessments. As with the development section above, we would prefer to use fifth and fourth reports for the two most mature policy years if the data are readily available. As an approximation we would use third-to-ultimate factors for each of the most mature three policy years. The separate adjustment noted above for the wage trend differentials would be used in this portion of the analysis.

The expected loss portion would be calculated using exposure from each of the four (five) years. The final adjustment factors would be based on the combined four (five) years of experience.

National Pure Premiums

The specific approach to be used here will depend on the answer to question 3 in the first part of this letter. If losses are used, we would use four (five) years of nationwide class losses in the analysis. Conceptually, this is little different from the current approach, except that more years are being used.

Credibility

This phase of our analysis will not separately consider the form or the basis for credibility factors. We would thus use the current credibility formula, but based on four (five) years of combined experience. Other phases of our study will address the question of credibility.

Derivation of Manual Rates

We would then request that final manual rates be calculated using the current methodology. We propose maintaining the same limitation to change contained in the current procedure. We would need to know, however, the classes that are affected by that limitation in the current method as compared to each of the alternatives as well as the difference in indicated changes in class pure premiums.

Requested Output

For each alternative outlined above we will need a computer diskette (IBM-PC/AT Compatible) and hard copy back-up containing at least the following information for each class:

1. Class number,
2. Total Payroll, (most recent year),
3. Derived by Formula Pure Premium by Loss Type (serious, non-serious, and medical) -- Current Method,
4. Derived by Formula Pure Premium by Loss Type (serious, non-serious, and medical) -- Alternative Method,
5. Final Manual Rate -- Current Method,
6. Final Manual Rate -- Alternative Method, and
7. In the case of the test using the first four years of experience, 1982 through 1985 to estimate 1988 rates in the above notation, also include:
 - a. Actual unlimited policy year 1988 losses,
 - b. Actual limited policy year 1988 losses and
 - c. Actual policy year 1988 exposure.

In addition to the impact on class rates, we will explore the impact of varying the number of years on industry group differentials. Thus, for each alternative we also request summaries of resulting experience similar to those contained in Section F of Appendix B-I-A of the Council's most recent Michigan filing.

Requested Analysis -- Application of Trend

An additional phase of our study includes reviewing the affect of changing the application of trend adjustments. For the purpose of this phase, we will maintain the current three-year experience base and only vary the application of trend. Keeping with this spirit, and recognizing that the approach used to quantify trend is the subject for a separate portion of our overall study, we also request that the current methodology be used to quantify trend.

The difference will be the calculation of three separate adjustment factors, one for each policy year of data used in the analysis. We would make a similar adjustment in calculating the factors for wage trend differentials used in adjusting industry group experience.

In both cases, the three factors would represent the change from the midpoint of the respective policy years rather than from the midpoint of the entire experience period. These

separate factors would be used to adjust losses for both class and industry group experience.

We request the same output information as requested in the above section regarding the number of years of experience to be used.

Other Items

You may be aware that our classification ratemaking portion of the examination will also deal with alternative credibility approaches and different loss limitations in the data. To some extent the descriptions of those approaches will depend on answers to questions at the beginning of this letter.

Thank you for your time in this matter. Please contact us to clarify any questions you may have.

Best regards,

Roger M. Hayne

RMKH:11r

cc: R. Hilton, NCCI
J. Bergquist, M&R
E. F. Fossa, M&R
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February 14, 1991

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750 Park of Commerce Drive
Boca Raton, Florida 33487

RE: PROCESSING REQUESTS - NAIC PROJECT, CLASSIFICATION
RATEMAKING (IIB-4a-c)

Dear Bob:

This letter follows our phone conversation on Monday, February 11, 1991 in which you requested that we consider reducing the level of "A-Sheet" processing requests, due to the volume of processing involved. After discussion with the project team, we have assembled the following revised listing of processing requests which reduces the initial request by more than one-half.

In order to keep this letter to a manageable size, we will briefly describe the various processing requests and then indicate the number of states and years for which we are requesting the analysis.

1. Use of five years of data for classification ratemaking. States: All initially requested; Years: 5.
2. Use of four years of data for classification ratemaking. States: FL, ME; Years: 5.
3. Application of trend to individual years rather than the current single factor. States: CO, CT, FL, IL, ME, NE, OR; Years: 1 (Only most recent filing).
4. Alternate credibility, square root using expected pure premium. States: FL, ME, NE; Years: 4.
5. Alternate credibility, square root using payroll. States: All initially requested; Years: 4.
6. Alternate credibility, .8 power using expected pure premium. States: FL, ME; Years: 4.

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7. Alternate credibility, current formula but double full credibility standard. States: All initially requested; Years: 4.
8. Alternate credibility, square root using claim counts. States: FL, ME; Years: 4.
9. Alternate loss limit, unlimited. States: FL, ME; Years: 4.
10. Alternate loss limit, 2.5 times current. Omit.
11. Alternate loss limit, .5 times current. States: All initially requested; Years: 4.
12. Alternate loss limit, sliding scale. States: FL, ME; Years: 4.
13. Regional Pure Premiums. States: All initially requested; Years: 1 (only most recent filing).

Please do not hesitate to call if any of these summaries are unclear.

Best regards,

Roger M. Hayne

RMH:11r

cc: R. Hilton, NCCI
J. Bergquist, M&R
E. F. Fossa, M&R
M. McMurray, M&R



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January 25, 1991

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RE: ADDITIONAL PROCESSING REQUESTS - NAIC PROJECT, CLASSIFICATION
RATEMAKING (IIB-4a-c)

Dear Bob:

This letter follows our earlier discussions and is intended to provide you with additional details regarding calculations supporting our investigation of classification ratemaking in section IIB-4a-c of our proposal to the NAIC. The areas of additional calculation will treat the credibility formula used, how it is applied in classification ratemaking and the loss limitation used in the data.

Before we go into the details of these requests, we would like to clarify the following three items from our letter of December 19, 1990:

1. We provided details regarding the use of more than three years in classification ratemaking and requested certain output from that exercise. In reviewing our proposal, you may also notice that we will consider the effect of varying the number of years used in the industry group calculations. We assume that you will need to assemble the workpapers for the industry group relativities in that process. In addition to the output requested in our December 19, 1990 letter, we request that you also provide us with the background to the group relativities similar in detail to what is contained in Section F of Appendix B-I-A of the Michigan filing. We will use this to address item IIB4b in our proposal.
2. Included in our December 19, 1990 letter was a request to have the classification rates recalculated using a different trend procedure (see pages 7 and 8 of that letter). Our earlier discussions did not specifically mention this item. Therefore, we would like to verify that this item

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did not get "lost in the shuffle" with the focus on the larger project discussed in that letter.

3. In response to our request in item 4 (page 2) you suggested a sample of states with exceptions to the classification ratemaking procedure. We agreed to a sampling in our phone conversation. I recall that you were preparing such a sample and were going to send it fairly soon. We have not yet received that sample. If you need further guidance from us regarding that sample, please let us know.

Requested Analyses - General Comments

For the analyses outlined below we request output as described in our December 19, 1990 letter for Colorado, Connecticut, Florida, Illinois, Maine, Nebraska and Oregon. Those calculations should use policy years 1982 through 1984 to estimate 1987 rates (using the naming convention in that letter) and policy years 1983 through 1985 to estimate 1988 rates. In these cases we request "actual" experience also be included with the output, also as described in our earlier letter. This will allow us two comparisons of projected losses to "actual" losses with which to test the various credibility formulae.

To review relative stability we also request calculations using policy years 1984 through 1986 and 1985 through 1987. You will note that we are using three years of data in this request. As we discussed, our approach will be to restrict actual tests to varying one parameter at a time. We assume, from discussions, that analyses for these latter two filings should require much less additional effort than the analyses for the first two sets of years. If it turns out that substantial extra effort would be involved, resulting in a significant delay in providing results, then we could continue the analysis without these latter two sets of data. We would prefer to have the additional experience, however, to quantify the effect of years "rolling off" of the experience base for classification ratemaking.

We recognize that you may have detailed claim data available only for the most recent filing. Thus, you may only be able to provide calculations for one filing in response to our request regarding alternative loss limitations.

Requested Analysis -- Credibility

Our initial review of available and practical formulae generally used for credibility resulted in two general families:

$$Z = E/(E+K), \text{ and}$$

$$Z = \min\{1, (E/K)^p\}$$

where the notation x^p indicates x raised to the power p . The current credibility used by the National Council for experience rating is of the first type, while that used for classification ratemaking is of the second type. After review and discussion,

we have concluded that, as a practical matter, there are classes with sufficient experience to be fully credible by themselves. Unfortunately, unmodified, the first family of credibility formulae will never give full credibility ($Z=1$). Therefore, our request will concentrate on alternative credibility formulae that fall in the second family.

We request these tests using the following alternative credibility formulae:

1. For class experience use $Z = (\text{Expected Pure Premium}/N)^{.5}$, where N is the current full credibility standard by state and by loss type (serious, nonserious and medical). This is the "square root" rule applied to the current credibility base of expected pure premium. Base credibility for nationwide pure premiums using the same 25 and 300 claim full credibility standard, as is currently used, except use the square root instead of the current $2/3$ power in that formula.
2. For class experience use $Z = (\text{Payroll}/N)^{.5}$. For serious losses N is calculated as 25 times the average statewide serious loss per dollar of statewide payroll. For non-serious and medical losses N is calculated as 300 times the average statewide non-serious (medical) loss per dollar of statewide payroll. This replaces expected losses by payroll in alternative 1 above but attempts to maintain the same "average" full credibility standard. Base credibility for nationwide pure premiums using the same 25 and 300 claim full credibility standard, as is currently used, except use the square root instead of the current $2/3$ power in that formula.
3. For class experience use $Z = (\text{Expected Pure Premium}/N)^{.8}$, where N is the current full credibility standard by state and by loss type (serious, nonserious and medical). This variant of alternative 1 gives less credibility to small classes than the current NCCI "2/3 power" formula. Base credibility for nationwide pure premiums using the same 25 and 300 claim full credibility standard, as is currently used, except use the 0.8 power instead of the current $2/3$ power in that formula.
4. For class experience use $Z = (\text{Expected Pure Premium}/N)^{(2/3)}$, where N is double the current full credibility standard by state and by loss type (serious, non-serious and medical). This tests the sensitivity of the process to an increase in the full credibility standard. Base credibility for nationwide pure premiums using 50 and 600 claims for the full credibility standard using the current $2/3$ power in that formula.
5. For class experience use $Z = (\text{Number of Claims}/N)^{.5}$, where N is 25 for serious claims and 300 for nonserious and medical claims. This corresponds to the current credibility formula used for national partial pure premiums except using the square root. Base credibility for nationwide pure premiums using the same 25 and 300 claim full credibility standard, as is currently used, except use the square root instead of the current $2/3$ power in that formula.

Requested Analysis -- Loss Limitation

Loss limitations can affect the classification ratemaking procedure. We recognize that detailed claim data required to modify the loss limitation may not be available but for the most current filing. Thus, we limit our request in this regard to only the years for which such are available.

We request that the following limitation be tested:

1. No limit. Here all losses, without limit, are included in the classification ratemaking calculations.
2. 2.5 times the current loss limitation. This corresponds to limiting losses to 50% of the self-rating point, as compared to the current 20%.
3. 0.5 times the current loss limitation or double the revised state experience rating loss limitation point whichever is more convenient for you.
4. A sliding scale calculated as:

$$\text{limitation} = (.5 \times \text{current}) / (1 - Z)$$

where "current" denotes the current loss limitation and Z denotes the smallest class partial pure premium credibility using the current credibility formula. In this case large and fully credible classes do not have any loss limitation since as Z approaches 1 the formula for loss limitation gets arbitrarily large. On the other hand, small classes will tend to have lower limitations, approaching one-half the current limitation as Z approaches 0.

Requested Analysis -- Regional Pure Premium

For this analysis we wish to test an alternative to the nationwide partial pure premiums. This alternative is intended to give recognition to the partial pure premium indications in surrounding states.

For this alternative we request that you first calculate regional partial pure premiums, R, using the same procedure used for national pure premiums, except limiting states used to states in the same region as the state under review. For simplicity at this stage, please use the National Council's regions; North, South, and West.

We then request that you replace the national partial pure premium used in the "A Sheet" calculations by

$$Z \times R + (1 - Z) \times N, \text{ where}$$

$$Z = (\text{Claim Counts} / 25 \text{ or } 300)^{(2/3)}, \text{ and}$$

$$N = \text{Current Nationwide Partial Pure Premium}$$

January 25, 1991

Here, as in assigning credibility to nationwide pure premiums, the full credibility standard is 25 claims for serious and 300 for non-serious and medical. In this case, however, the number of claims is based on the number of claims in the region.

Bob, we hope that the above provides you with sufficient detail to complete the processing requests for this section of our analysis. Please call at your convenience to discuss any questions you may have regarding this or any other request.

Best regards,

Roger M. Hayne

RMH:11r

cc: R. Hilton, NCCI
J. Bergquist, M&R
E. F. Fossa, M&R
M. McMurray, M&R

APPENDIX B

CLASSIFICATION RATEMAKING

Appendix B

Summary of Accuracy, Consistency, and Impact Tests

This appendix contains exhibits that present detailed summaries of the results of various tests performed in comparing NCCI methodology with the various specific alternatives considered in this examination.

Exhibit B-1 presents a summary of the square difference indices for each of the alternatives tested. The definition of this statistic can be found on page 43 of this examination report. It is intended to measure the difference between the current NCCI methodology and the specific alternative. It does not provide any indication as to which is more accurate or more consistent.

In addition to showing the square difference indices, Exhibit B-1 also shows all of the alternative classification procedures considered in this portion of this examination. The states and years used for each alternative will be represented by a non-blank cell on that exhibit.

We selected the states to incorporate in the tests of various alternatives with an eye toward the volume of processing our requests would require. Our initial requests were for five consecutive rate filings for each of the twelve states using four and five years of data. In addition, we requested the remaining alternatives to be calculated for four consecutive rate filings for seven of the twelve target states.

After discussions with NCCI, given the volume for work this initial request required, we reduced the scope of our original request. The goal of this reduction was to decrease the overall work load while analyzing as wide a range of alternatives as possible.

Since actual loss data is only available for 1987 at first report, 1986 at second report and 1985 at third report, we were only able to apply our accuracy tests for alternatives having calculations for 1987. Thus, for example, we were only able to use Colorado, Connecticut, Illinois, Maine and Nebraska for the accuracy test in using five years of data even though this alternative was calculated for at least two years in all twelve of our sample states.

Similarly, the availability of data affected the consistency tests that we could perform. In the alternative with five years of data, we have three different sets of tests. The first represents those states for which alternative calculations were available for all four years,

CLASSIFICATION RATEMAKING

1987 through 1990, the second is for those having alternatives for 1988 through 1990 and the third for all twelve states. The remaining alternatives generally had data available for the same years for all states tested so that we only included one set of consistency tests. The results of all of these tests are shown in Exhibits B-2 through B-4.

Exhibit B-2 presents a summary of the results of the various comparisons of relative loss costs between classes and the actual amounts experienced for policy year 1987 at first report. Two tests of accuracy are shown in this exhibit.

The top portion presents the results of the underwriting test. For this test, indicated ratios of actual to expected losses close to 100% indicate greater overall relative accuracy. The approximate significance of differences is shown as "P[Type II Error]".

Small probabilities indicate a small estimated probability of showing this level of difference assuming that the two distributions are the same. Thus small probabilities can be interpreted as indicating that the specific alternative method is significantly more accurate than the current NCCI method. On the other hand, large probabilities, close to 100%, indicate that the current method is significantly more accurate at predicting relative loss cost differences.

The remainder of the exhibit summarizes mean square error and corresponding Wilcoxon tests. These tests were conducted for various size classes separately and for all classes combined, in the last section. The class size groups are based on the volume of premiums generated by the various classes when ranked for all states and all classes combined.

Smaller mean square errors indicate generally more accurate forecasts of relative loss cost differences than larger ones. We also included a Wilcoxon Statistic to test the difference between the two methods, again by class size and for all classes in a state combined.

A positive Wilcoxon Statistic indicates that the alternative method tended to be more accurate than the current method while a negative statistic indicates the opposite result. Again, probabilities close to 0% or 100% indicate significant differences, the former indicating that the alternative method is more accurate and the latter indicating that the current method is.

Exhibit B-3 provides a similar summary for the consistency tests. In this case we calculated the variances of the ratios of the class rate with an overall average rate based on other

CLASSIFICATION RATEMAKING

states available for that class, year and alternative. Small variances indicate more consistent identification of differences between the state and a larger average.

As with the mean square error and Wilcoxon Statistics in Exhibit B-2, we tested the differences for large, medium and small classes separately as well as for all classes combined. Interpretations of the Wilcoxon Statistics and the corresponding probabilities described in connection with Exhibit B-2 also apply in Exhibit B-3.

Exhibit B-4 summarizes the results of our tests regarding losses in excess of the loss limitation used in classification ratemaking. For each state tested, this exhibit shows the number of classes in each industry group and the number of classes that show differences at the indicated confidence levels.

For example, in Connecticut there are 192 Manufacturing classes. Of these each of 51 were significantly different from the remainder at a 90% confidence level. If the required confidence level were to increase to 95% the number of classes drops to 46, and so forth.

Comparison of Square Difference Indices

Alternative	Colorado			Connecticut			Florida			Illinois		
	87	88	89	90	87	88	89	90	87	88	89	90
4 Years Experience	12.864	13.708	12.686	12.272	7.277	13.493	12.692	9.349	3.099	3.071	3.829	5.395
5 Years Experience				0.082				0.052		4.979	7.876	10.472
Alternate Trend Application												0.036
Credibility with 0.5 Power									0.055	0.168	0.203	0.216
Payroll Based Credibility	2.884	5.149	14.874	10.096	4.270	6.995	11.217	8.745	1.393	3.429	5.270	10.719
Credibility with 0.8 Power									0.027	0.059	0.141	0.128
Double Current Full Credibility Std	0.701	1.319	2.778	2.558	1.400	1.784	2.483	1.768	0.292	0.547	1.058	1.247
Claim Count Based Credibility									0.336	0.714	2.066	0.978
Unlimited Losses									2.723	3.313	6.673	7.965
Half Current Loss Limit	1.357	1.642	1.309	1.242	2.115	2.563	2.024	1.238	0.539	0.942	1.383	1.375
Sliding Scale Loss Limitation									2.827	2.582	5.434	3.828
Alternate National Pure Premiums				0.375				0.174				0.199

Alternative	Louisiana			Maine			Michigan			Nebraska		
	87	88	89	90	87	88	89	90	87	88	89	90
4 Years Experience					3.170	11.388	12.550	8.389				
5 Years Experience				9.649	3.280	19.337	21.178	18.632		4.201	8.503	6.548
Alternate Trend Application							0.026					
Credibility with 0.5 Power					0.244	0.658	1.275	1.660				
Payroll Based Credibility					1.704	6.125	8.320	11.313		0.184	0.274	0.310
Credibility with 0.8 Power					0.105	5.303	0.642	1.102		0.869	0.850	1.018
Double Current Full Credibility Std					1.047	7.079	4.627	6.976		0.491	0.751	0.886
Claim Count Based Credibility					1.070	2.108	5.546	5.649				
Unlimited Losses					3.004	15.101	47.819	39.926				
Half Current Loss Limit					0.532	6.138	11.614	25.083		0.673	1.093	0.751
Sliding Scale Loss Limitation					1.451	11.298	16.789	11.108				
Alternate National Pure Premiums								0.619				0.486

Alternative	North Carolina			Oregon			Utah			Wisconsin					
	87	88	89	90	87	88	89	90	88	89	90	87	88	89	90
4 Years Experience															
5 Years Experience				2.739											
Alternate Trend Application															
Credibility with 0.5 Power															
Payroll Based Credibility					0.693	1.395	0.977	1.297							
Credibility with 0.8 Power															
Double Current Full Credibility Std					0.721	1.325	1.001	0.992							
Claim Count Based Credibility															
Unlimited Losses															
Half Current Loss Limit					0.627	1.783	1.908	1.980							
Sliding Scale Loss Limitation															
Alternate National Pure Premiums								0.388							

NCCI
ACTUAL VS. EXPECTED TEST
4 Years of Data

State/Test	Florida	Maine
Underwriting Test		
No. Group 1 Classes	215	194
No. Group 2 Classes	295	215
Total Classes	510	409
Group 1 Actual Loss	\$355,312,827	\$56,595,414
Group 1 Current Expected	\$345,662,714	\$51,826,076
Group 1 Alternate Expected	\$358,578,460	\$54,370,994
Grp. 1 Act./Grp. 1 Cur.	103	109
Grp. 1 Act./Grp. 1 Exp.	99	104
Group 2 Actual Loss	\$417,416,265	\$94,550,191
Group 2 Current Expected	\$427,066,378	\$99,319,529
Group 2 Alternate Expected	\$414,150,632	\$96,774,611
Grp. 2 Act./Grp. 2 Cur.	98	95
Grp. 2 Act./Grp. 2 Exp.	101	98
P[Type II Error]	20.0%	2.0%
Mean Square Error Test		
No. of Large Classes	36	7
MSE Current Method	385,152	128,730
MSE Alternate Method	416,855	134,382
Wilcoxon Statistic	-0.15	-0.52
P[Type I Error]	55.9%	65.6%
No. of Medium Classes	82	27
MSE Current Method	407,557	218,496
MSE Alternate Method	386,453	216,290
Wilcoxon Statistic	1.00	0.71
P[Type I Error]	16.0%	24.0%
No. of Small Classes	387	374
MSE Current Method	166,480	259,435
MSE Alternate Method	167,632	249,161
Wilcoxon Statistic	-0.02	2.12
P[Type I Error]	50.6%	1.7%
All Classes	510	409
MSE Current Method	219,775	254,715
MSE Alternate Method	219,490	245,227
Wilcoxon Statistic	0.50	2.14
P[Type I Error]	30.8%	1.6%

NCCI
ACTUAL VS. EXPECTED TEST
5 Years of Data

Exhibit B-2
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State/Test	Colorado	Connecticut	Illinois	Maine	Nebraska
Underwriting Test					
No. Group 1 Classes	217	214	274	189	217
No. Group 2 Classes	269	250	249	220	210
Total Classes	486	464	523	409	427
Group 1 Actual Loss	\$125,544,720	\$162,338,399	\$364,403,590	\$57,365,037	\$37,811,187
Group 1 Current Expected	\$115,990,692	\$141,703,060	\$356,160,064	\$53,111,868	\$35,307,025
Group 1 Alternate Expected	\$125,521,712	\$150,696,771	\$376,888,301	\$55,581,103	\$38,018,556
Grp. 1 Act./Grp. 1 Cur.	108	115	102	108	107
Grp. 1 Act./Grp. 1 Exp.	100	108	97	103	99
Group 2 Actual Loss	\$127,503,459	\$143,518,532	\$423,726,202	\$93,780,568	\$40,287,722
Group 2 Current Expected	\$137,057,488	\$164,153,871	\$431,969,728	\$98,033,737	\$42,791,884
Group 2 Alternate Expected	\$127,526,467	\$155,160,160	\$411,241,491	\$95,564,502	\$40,080,353
Grp. 2 Act./Grp. 2 Cur.	93	87	98	96	94
Grp. 2 Act./Grp. 2 Exp.	100	92	103	98	101
P[Type II Error]	2.0%	2.0%	10.0%	2.5%	5.0%
Mean Square Error Test					
No. of Large Classes	7	10	27	7	1
MSE Current Method	247,532	3,617,630	169,055	128,730	116,113
MSE Alternate Method	256,190	2,471,459	212,703	127,467	49,617
Wilcoxon Statistic	0.34	2.43	-0.96	-0.10	1.00
P[Type I Error]	34.4%	0.8%	83.2%	53.1%	NA
No. of Medium Classes	28	37	58	27	2
MSE Current Method	105,979	232,676	256,779	218,496	3,975
MSE Alternate Method	97,363	232,079	254,632	216,154	20,223
Wilcoxon Statistic	0.70	1.16	1.30	0.77	-1.34
P[Type I Error]	24.3%	12.2%	9.7%	21.9%	75.0%
No. of Small Classes	448	414	438	374	424
MSE Current Method	75,186	68,699	132,311	259,435	115,411
MSE Alternate Method	71,309	69,935	126,580	252,559	114,184
Wilcoxon Statistic	0.55	0.04	0.86	2.26	1.06
P[Type I Error]	29.2%	48.4%	19.6%	1.2%	14.4%
All Classes	486	464	523	409	427
MSE Current Method	79,379	150,258	148,011	254,715	114,891
MSE Alternate Method	75,420	129,097	145,227	248,232	113,592
Wilcoxon Statistic	0.91	1.12	0.98	2.29	0.99
P[Type-I Error]	18.0%	13.1%	16.3%	1.1%	16.0%

NCCI
ACTUAL VS. EXPECTED TEST
Credibility -- Expected Losses to .5 Power

State/Test		Florida	Maine	Nebraska
Underwriting Test				
No. Group 1 Classes		129	42	130
No. Group 2 Classes		381	367	297
Total Classes		510	409	427
Group 1 Actual Loss		\$294,433,054	\$23,231,852	\$31,815,981
Group 1 Current Expected		\$298,348,147	\$27,146,768	\$35,611,853
Group 1 Alternate Expected		\$299,374,023	\$27,503,281	\$36,045,970
Grp. 1 Act./Grp. 1 Cur.		99	86	89
Grp. 1 Act./Grp. 1 Exp.		98	84	88
Group 2 Actual Loss		\$478,296,038	\$127,913,753	\$46,282,928
Group 2 Current Expected		\$474,380,946	\$123,998,837	\$42,487,056
Group 2 Alternate Expected		\$473,355,069	\$123,642,324	\$42,052,939
Grp. 2 Act./Grp. 2 Cur.		101	103	109
Grp. 2 Act./Grp. 2 Exp.		101	103	110
P[Type II Error]		70.0%	90.0%	98.0%
Mean Square Error Test				
No. of Large Classes		35	7	1
MSE Current Method		385,152	128,730	116,113
MSE Alternate Method		385,309	131,749	123,460
Wilcoxon Statistic		-0.51	-1.15	-1.00
P[Type I Error]		69.4%	85.2%	NA
No. of Medium Classes		82	27	2
MSE Current Method		407,557	218,496	3,975
MSE Alternate Method		407,796	218,468	4,380
Wilcoxon Statistic		-1.02	-1.89	-0.45
P[Type I Error]		84.6%	97.1%	50.0%
No. of Small Classes		387	374	424
MSE Current Method		166,480	259,435	115,411
MSE Alternate Method		167,752	261,723	115,990
Wilcoxon Statistic		0.50	2.29	-1.34
P[Type I Error]		30.8%	1.1%	91.0%
All Classes		510	409	427
MSE Current Method		219,775	254,715	114,891
MSE Alternate Method		220,807	256,855	115,485
Wilcoxon Statistic		-0.34	1.51	-1.45
P[Type I Error]		63.2%	6.5%	92.7%

NCCI
ACTUAL VS. EXPECTED TEST
Credibility -- Payroll Based

State/Test	Colorado	Connecticut	Florida	Illinois	Maine	Nebraska	Oregon
Underwriting Test							
No. Group 1 Classes	229	285	327	233	48	163	188
No. Group 2 Classes	257	179	183	290	361	264	271
Total Classes	486	464	510	523	409	427	459
Group 1 Actual Loss	\$157,845,867	\$230,329,551	\$476,403,223	\$467,454,621	\$19,735,070	\$37,846,930	\$179,070,470
Group 1 Current Expected	\$151,934,611	\$224,357,215	\$469,348,542	\$450,390,685	\$22,759,190	\$39,382,333	\$177,700,518
Group 1 Alternate Expected	\$154,129,013	\$227,902,378	\$473,061,307	\$455,848,133	\$23,597,690	\$40,271,955	\$179,668,870
Grp. 1 Act./Grp. 1 Cur.	104	103	102	104	87	96	101
Grp. 1 Act./Grp. 1 Exp.	102	101	101	103	84	94	100
Group 2 Actual Loss	95,202,312	\$75,527,380	\$296,325,869	\$320,675,171	\$131,410,535	\$40,251,979	\$124,265,200
Group 2 Current Expected	101,113,568	\$81,499,716	\$303,380,550	\$337,739,107	\$128,386,415	\$38,716,576	\$125,635,153
Group 2 Alternate Expected	98,919,167	\$77,954,553	\$299,667,786	\$332,281,659	\$127,547,915	\$37,826,954	\$123,666,800
Grp. 2 Act./Grp. 2 Cur.	94	93	98	95	102	104	99
Grp. 2 Act./Grp. 2 Exp.	96	97	99	97	103	106	100
P[Type II Error]	10.0%	40.0%	20.0%	5.0%	90.0%	90.0%	50.0%
Mean Square Error Test							
No. of Large Classes	7	10	36	27	7	1	7
MSE Current Method	247,532	3,617,630	385,152	169,055	128,730	116,113	1,036,953
MSE Alternate Method	236,559	3,530,936	370,080	158,265	147,123	132,178	1,039,216
Wilcoxon Statistic	1.35	1.36	0.66	2.50	-1.15	-1.00	-0.34
P[Type I Error]	7.8%	8.7%	25.6%	0.6%	85.2%	NA	59.4%
No. of Medium Classes	28	37	82	58	27	2	26
MSE Current Method	105,979	232,676	407,557	256,779	218,496	3,975	630,149
MSE Alternate Method	108,004	243,041	400,242	250,214	220,937	7,900	627,558
Wilcoxon Statistic	-1.27	-1.48	1.35	-0.15	-1.34	-1.34	0.83
P[Type I Error]	89.9%	93.0%	8.8%	56.0%	91.0%	75.0%	20.5%
No. of Small Classes	448	414	387	438	374	424	423
MSE Current Method	75,186	68,999	166,480	132,311	259,435	115,411	77,614
MSE Alternate Method	74,480	69,544	165,664	129,677	262,176	115,762	79,094
Wilcoxon Statistic	0.01	-0.30	0.12	1.56	2.21	-1.30	-0.64
P[Type I Error]	49.7%	61.7%	45.3%	5.9%	1.4%	90.4%	74.0%
All Classes	486	464	510	523	409	427	459
MSE Current Method	79,379	150,258	219,775	148,011	254,715	114,891	123,388
MSE Alternate Method	78,677	150,144	216,949	144,520	257,665	115,295	124,646
Wilcoxon Statistic	-0.17	-0.48	0.71	2.07	1.52	-1.51	-0.55
P[Type I Error]	56.7%	68.4%	23.8%	1.9%	6.4%	93.4%	70.8%

NCCI
ACTUAL VS. EXPECTED TEST
 Credibility --- Expected Losses to .8 Power

Exhibit B-2
 Page 5 of 17

State/Test	Florida	Maine
Underwriting Test		
No. Group 1 Classes	407	111
No. Group 2 Classes	103	298
Total Classes	510	409
Group 1 Actual Loss	\$619,596,363	\$13,304,076
Group 1 Current Expected	\$606,511,786	\$13,525,552
Group 1 Alternate Expected	\$608,439,954	\$13,763,638
Grp. 1 Act./Grp. 1 Cur.	102	98
Grp. 1 Act./Grp. 1 Exp.	102	97
Group 2 Actual Loss	\$153,132,729	\$137,841,529
Group 2 Current Expected	\$166,217,306	\$137,620,053
Group 2 Alternate Expected	\$164,289,138	\$137,381,967
Grp. 2 Act./Grp. 2 Cur.	92	100
Grp. 2 Act./Grp. 2 Exp.	93	100
P[Type II Error]	5.0%	60.0%
Mean Square Error Test		
No. of Large Classes	36	7
MSE Current Method	385,152	128,730
MSE Alternate Method	371,408	127,548
Wilcoxon Statistic	0.46	0.10
P[Type I Error]	32.3%	46.9%
No. of Medium Classes	82	27
MSE Current Method	407,557	218,496
MSE Alternate Method	405,772	218,833
Wilcoxon Statistic	1.68	0.02
P[Type I Error]	4.7%	49.1%
No. of Small Classes	387	374
MSE Current Method	166,480	259,435
MSE Alternate Method	165,261	257,560
Wilcoxon Statistic	-0.34	0.17
P[Type I Error]	63.3%	43.2%
All Classes	510	409
MSE Current Method	219,775	254,715
MSE Alternate Method	217,607	253,001
Wilcoxon Statistic	0.78	0.20
P[Type I Error]	21.7%	42.1%

NCCI
ACTUAL VS. EXPECTED TEST
Credibility -- Double Full Credibility Standard

State/Test	Colorado	Connecticut	Florida	Illinois	Maine	Nebraska	Oregon
Underwriting Test							
No. Group 1 Classes	221	300	357	321	108	172	267
No. Group 2 Classes	265	164	153	202	301	255	191
Total Classes	486	464	510	523	409	427	458
Group 1 Actual Loss	\$55,729,971	\$139,531,008	\$418,512,609	\$432,116,147	\$22,127,980	\$30,903,711	\$142,641,376
Group 1 Current Expected	\$50,229,550	\$130,922,380	\$405,374,066	\$415,517,292	\$21,173,233	\$29,669,303	\$137,581,408
Group 1 Alternate Expected	\$52,171,441	\$133,339,443	\$409,149,467	\$419,301,620	\$22,077,294	\$30,495,634	\$140,081,741
Grp. 1 Act./Grp. 1 Cur.	111	107	103	104	105	104	104
Grp. 1 Act./Grp. 1 Exp.	107	105	102	103	100	101	102
Group 2 Actual Loss	\$197,318,208	\$166,325,923	\$354,216,483	\$356,013,645	\$129,017,625	\$47,195,198	\$160,694,294
Group 2 Current Expected	\$202,818,629	\$174,934,551	\$367,355,026	\$372,612,500	\$129,972,372	\$48,429,606	\$165,754,262
Group 2 Alternate Expected	\$200,876,738	\$172,517,488	\$363,579,625	\$368,828,172	\$129,068,311	\$47,603,275	\$163,253,929
Grp. 2 Act./Grp. 2 Cur.	97	95	96	96	99	97	97
Grp. 2 Act./Grp. 2 Exp.	98	96	97	97	100	99	98
PType II Error]	2.0%	2.5%	2.0%	2.0%	25.0%	20.0%	20.0%
Mean Square Error Test							
No. of Large Classes	7	10	36	27	7	1	7
MSE Current Method	247,532	3,617,630	385,152	169,055	128,730	116,113	1,037,004
MSE Alternate Method	255,409	3,618,534	369,856	166,590	123,588	115,184	1,029,999
Wilcoxon Statistic	-1.01	0.41	0.33	1.92	0.10	1.00	0.51
PType I Error]	81.3%	33.9%	37.2%	2.7%	46.9%	NA	28.9%
No. of Medium Classes	28	37	82	58	27	2	26
MSE Current Method	105,979	232,676	407,557	256,779	218,496	3,975	630,132
MSE Alternate Method	104,241	224,466	404,281	250,098	214,989	5,826	621,397
Wilcoxon Statistic	1.71	2.29	1.83	2.58	0.57	-0.45	2.48
PType I Error]	4.4%	1.1%	3.3%	0.5%	28.5%	50.0%	0.7%
No. of Small Classes	448	414	387	438	374	424	422
MSE Current Method	75,186	68,699	166,480	132,311	259,435	115,411	77,612
MSE Alternate Method	74,234	69,213	162,205	130,509	255,113	111,028	77,403
Wilcoxon Statistic	1.02	-2.25	0.03	-0.44	1.57	-0.54	1.37
PType I Error]	15.4%	98.8%	48.8%	66.9%	5.8%	70.4%	8.5%
All Classes	486	464	510	523	409	427	458
MSE Current Method	79,379	150,258	219,775	148,011	254,715	114,891	123,640
MSE Alternate Method	78,510	150,103	214,903	145,634	250,437	110,545	122,844
Wilcoxon Statistic	1.31	-1.07	1.32	0.82	1.57	-0.54	2.06
PType I Error]	9.5%	85.8%	9.4%	20.5%	5.8%	70.5%	2.0%

NCCI
ACTUAL VS. EXPECTED TEST
 Credibility -- Claim Count Basis

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State/Test		Florida		Maine
Underwriting Test				
No. Group 1 Classes		366		94
No. Group 2 Classes		144		315
Total Classes		510		409
Group 1 Actual Loss		\$498,292,078		\$16,892,348
Group 1 Current Expected		\$490,047,549		\$17,513,733
Group 1 Alternate Expected		\$493,358,817		\$18,303,188
Grp. 1 Act./Grp. 1 Cur.		102		96
Grp. 1 Act./Grp. 1 Exp.		101		92
Group 2 Actual Loss		\$274,437,014		\$134,253,257
Group 2 Current Expected		\$282,681,543		\$133,631,872
Group 2 Alternate Expected		\$279,370,275		\$132,842,417
Grp. 2 Act./Grp. 2 Cur.		97		100
Grp. 2 Act./Grp. 2 Exp.		98		101
P[Type II Error]		15.0%		70.0%
Mean Square Error Test				
No. of Large Classes		36		7
MSE Current Method		385,152		128,730
MSE Alternate Method		371,014		123,327
Wilcoxon Statistic		0.88		0.10
P[Type I Error]		18.8%		46.9%
No. of Medium Classes		82		27
MSE Current Method		407,557		218,496
MSE Alternate Method		411,366		220,063
Wilcoxon Statistic		0.42		-0.20
P[Type I Error]		33.7%		58.1%
No. of Small Classes		387		374
MSE Current Method		166,480		259,435
MSE Alternate Method		165,414		261,658
Wilcoxon Statistic		-1.57		-0.04
P[Type I Error]		94.2%		51.6%
All Classes		510		409
MSE Current Method		219,775		254,715
MSE Alternate Method		218,587		256,781
Wilcoxon Statistic		-0.89		-0.11
P[Type I Error]		81.5%		54.5%

NCCI
ACTUAL VS. EXPECTED TEST
 Loss Limitation -- Unlimited

State/Test	Florida	Maine
Underwriting Test		
No. Group 1 Classes	302	15
No. Group 2 Classes	208	394
Total Classes	510	409
Group 1 Actual Loss	\$364,171,512	\$16,441,901
Group 1 Current Expected	\$362,727,214	\$19,517,760
Group 1 Alternate Expected	\$372,743,335	\$20,622,239
Grp. 1 Act./Grp. 1 Cur.	100	84
Grp. 1 Act./Grp. 1 Exp.	98	80
Group 2 Actual Loss	\$436,592,549	\$138,212,259
Group 2 Current Expected	\$438,036,847	\$135,136,400
Group 2 Alternate Expected	\$428,020,726	\$134,031,921
Grp. 2 Act./Grp. 2 Cur.	100	102
Grp. 2 Act./Grp. 2 Exp.	102	103
P[Type II Error]	50.0%	75.0%
Mean Square Error Test		
No. of Large Classes	36	7
MSE Current Method	398,705	123,913
MSE Alternate Method	445,934	133,612
Wilcoxon Statistic	-1.43	-0.52
P[Type I Error]	92.3%	65.6%
No. of Medium Classes	82	27
MSE Current Method	835,928	283,969
MSE Alternate Method	838,057	293,440
Wilcoxon Statistic	-0.16	-1.07
P[Type I Error]	56.5%	85.8%
No. of Small Classes	387	374
MSE Current Method	223,436	268,523
MSE Alternate Method	226,877	270,055
Wilcoxon Statistic	-0.74	4.04
P[Type I Error]	76.9%	0.0%
All Classes	510	409
MSE Current Method	332,742	267,459
MSE Alternate Method	338,980	269,654
Wilcoxon Statistic	-0.99	3.32
P[Type I Error]	83.8%	0.0%

NCCI

ACTUAL VS. EXPECTED TEST

Loss Limitation -- Half Current Standard

State/Test	Colorado	Connecticut	Florida	Maine	Nebraska	Oregon
Underwriting Test						
No. Group 1 Classes	342	267	312	133	324	429
No. Group 2 Classes	146	199	203	278	105	33
Total Classes	488	466	515	411	429	462
Group 1 Actual Loss	\$139,982,061	\$181,807,495	\$329,050,394	\$20,615,394	\$50,626,991	\$189,268,789
Group 1 Current Expected	\$134,770,396	\$176,607,979	\$315,479,432	\$20,715,749	\$48,762,639	\$171,941,024
Group 1 Alternate Expected	\$138,195,903	\$179,790,080	\$322,225,687	\$21,277,733	\$49,779,192	\$174,830,302
Grp. 1 Act./Grp. 1 Cur.	104	103	104	100	104	110
Grp. 1 Act./Grp. 1 Exp.	101	101	102	97	102	108
Group 2 Actual Loss	\$112,959,157	\$112,386,864	\$433,057,620	\$127,508,686	\$27,123,762	\$109,654,893
Group 2 Current Expected	\$118,170,883	\$117,586,380	\$446,628,583	\$127,408,331	\$28,988,114	\$126,982,658
Group 2 Alternate Expected	\$114,745,316	\$114,404,279	\$439,882,327	\$126,846,347	\$27,971,561	\$124,093,380
Grp. 2 Act./Grp. 2 Cur.	96	96	97	100	94	86
Grp. 2 Act./Grp. 2 Exp.	98	98	98	101	97	88
PTType II Error]	2.0%	40.0%	2.0%	60.0%	5.0%	2.0%
Mean Square Error Test						
No. of Large Classes	8	10	38	7	1	7
MSE Current Method	245,981	3,590,955	376,113	145,584	136,621	1,133,411
MSE Alternate Method	229,176	3,590,189	362,546	140,504	105,629	1,018,905
Wilcoxon Statistic	1.18	-0.06	-0.10	-0.10	1.00	2.03
PTType I Error]	12.5%	52.4%	53.9%	53.1%	NA	1.6%
No. of Medium Classes	30	39	83	28	2	27
MSE Current Method	86,008	248,313	378,683	209,745	2,494	643,945
MSE Alternate Method	81,760	241,949	374,256	209,017	7,004	639,648
Wilcoxon Statistic	-0.57	0.65	0.91	0.27	-0.45	0.72
PTType I Error]	71.7%	25.9%	18.1%	39.3%	50.0%	23.5%
No. of Small Classes	448	414	389	375	426	422
MSE Current Method	69,192	66,004	161,435	254,675	71,687	74,721
MSE Alternate Method	66,940	65,540	160,040	253,409	71,183	72,268
Wilcoxon Statistic	-0.71	-0.36	-0.24	-1.43	-0.72	3.40
PTType I Error]	76.0%	64.0%	59.6%	92.4%	76.5%	0.0%
All Classes	488	466	515	411	429	462
MSE Current Method	72,727	148,949	211,450	249,912	71,516	122,350
MSE Alternate Method	70,148	147,998	208,697	248,628	70,964	118,112
Wilcoxon Statistic	-0.39	-0.28	0.29	-1.20	-0.68	3.76
PTType I Error]	65.2%	61.1%	38.7%	88.4%	75.1%	0.0%

NCCI
ACTUAL VS. EXPECTED TEST
 Loss Limitation -- Sliding Scale

State/Test	Florida	Maine
Underwriting Test		
No. Group 1 Classes	235	12
No. Group 2 Classes	275	399
Total Classes	510	411
Group 1 Actual Loss	\$307,235,421	\$15,210,961
Group 1 Current Expected	\$300,617,306	\$17,811,728
Group 1 Alternate Expected	\$310,635,626	\$18,726,413
Grp. 1 Act./Grp. 1 Cur.	102	85
Grp. 1 Act./Grp. 1 Exp.	99	81
Group 2 Actual Loss	\$481,525,054	\$139,526,092
Group 2 Current Expected	\$488,143,169	\$136,925,325
Group 2 Alternate Expected	\$478,124,850	\$136,010,640
Grp. 2 Act./Grp. 2 Cur.	99	102
Grp. 2 Act./Grp. 2 Exp.	101	103
P[Type II Error]	20.0%	70.0%
Mean Square Error Test		
No. of Large Classes	36	7
MSE Current Method	398,124	125,264
MSE Alternate Method	446,995	141,702
Wilcoxon Statistic	-1.90	-1.15
P[Type I Error]	97.1%	85.2%
No. of Medium Classes	82	28
MSE Current Method	426,626	285,041
MSE Alternate Method	426,262	293,836
Wilcoxon Statistic	0.32	-1.37
P[Type I Error]	37.5%	91.5%
No. of Small Classes	387	375
MSE Current Method	162,345	249,741
MSE Alternate Method	163,206	249,801
Wilcoxon Statistic	0.70	4.15
P[Type I Error]	24.1%	0.0%
All Classes	510	411
MSE Current Method	220,500	250,415
MSE Alternate Method	224,461	251,330
Wilcoxon Statistic	0.20	3.24
P[Type I Error]	42.3%	0.1%

NCCI
ACTUAL VS. EXPECTED TEST
 Colorado

Methodology/Test	5 Years of Data	.5 Power w/ Payroll	Double Credibility	.5 Limit Loss
Underwriting Test				
No. Group 1 Classes	217	229	221	342
No. Group 2 Classes	269	257	265	146
Total Classes	486	486	486	488
Group 1 Actual Loss	\$125,544,720	\$157,845,867	\$55,729,971	\$139,982,061
Group 1 Current Expected	\$115,990,692	\$151,934,611	\$50,229,550	\$134,770,336
Group 1 Alternate Expected	\$125,521,712	\$154,129,013	\$52,171,441	\$138,195,903
Grp. 1 Act./Grp. 1 Cur.	108	104	111	104
Grp. 1 Act./Grp. 1 Exp.	100	102	107	101
Group 2 Actual Loss	\$127,503,459	\$95,202,312	\$197,318,208	\$112,959,157
Group 2 Current Expected	\$137,057,488	\$101,113,568	\$202,818,629	\$118,170,883
Group 2 Alternate Expected	\$127,526,467	\$98,919,167	\$200,876,738	\$114,745,316
Grp. 2 Act./Grp. 2 Cur.	93	94	97	96
Grp. 2 Act./Grp. 2 Exp.	100	96	98	98
P[Type II Error]	2.0%	10.0%	2.0%	2.0%
Mean Square Error Test				
No. of Large Classes	7	7	7	8
MSE Current Method	247,532	247,532	247,532	245,981
MSE Alternate Method	256,190	236,559	255,409	229,176
Wilcoxon Statistic	0.34	1.35	-1.01	1.18
P[Type I Error]	34.4%	7.8%	81.3%	12.5%
No. of Medium Classes	28	28	28	30
MSE Current Method	105,979	105,979	105,979	86,008
MSE Alternate Method	97,363	108,004	104,241	81,760
Wilcoxon Statistic	0.70	-1.27	1.71	-0.57
P[Type I Error]	24.3%	89.9%	4.4%	71.7%
No. of Small Classes	448	448	448	448
MSE Current Method	75,186	75,186	75,186	69,192
MSE Alternate Method	71,309	74,480	74,234	66,940
Wilcoxon Statistic	0.55	0.01	1.02	-0.71
P[Type I Error]	29.2%	49.7%	15.4%	76.0%
All Classes	486	486	486	488
MSE Current Method	79,379	79,379	79,379	72,727
MSE Alternate Method	75,420	78,677	78,510	70,148
Wilcoxon Statistic	0.91	-0.17	1.31	-0.39
P[Type I Error]	18.0%	56.7%	9.5%	65.2%

NCCI
ACTUAL VS. EXPECTED TEST
 Connecticut

Methodology/Test	5 Years of Data	.5 Power w/ Payroll	Double Credibility	.5 Limit Loss
Underwriting Test				
No. Group 1 Classes	214	285	300	267
No. Group 2 Classes	250	179	164	199
Total Classes	464	464	464	466
Group 1 Actual Loss	\$162,338,399	\$230,329,551	\$139,531,008	\$181,807,495
Group 1 Current Expected	\$141,703,060	\$224,357,215	\$130,922,380	\$176,607,979
Group 1 Alternate Expected	\$150,696,771	\$227,902,378	\$133,339,443	\$179,790,080
Grp. 1 Act./Grp. 1 Cur.	115	103	107	103
Grp. 1 Act./Grp. 1 Exp.	108	101	105	101
Group 2 Actual Loss	\$143,518,532	\$75,527,380	\$166,325,923	\$112,386,864
Group 2 Current Expected	\$164,153,871	\$81,499,716	\$174,934,551	\$117,586,380
Group 2 Alternate Expected	\$155,160,160	\$77,954,553	\$172,517,488	\$114,404,279
Grp. 2 Act./Grp. 2 Cur.	87	93	95	96
Grp. 2 Act./Grp. 2 Exp.	92	97	96	98
P[Type II Error]	2.0%	40.0%	2.5%	40.0%
Mean Square Error Test				
No. of Large Classes	10	10	10	10
MSE Current Method	3,617,630	3,617,630	3,617,630	3,590,955
MSE Alternate Method	2,471,459	3,530,936	3,618,534	3,590,189
Wilcoxon Statistic	2.43	1.36	0.41	-0.06
P[Type I Error]	0.8%	8.7%	33.9%	52.4%
No. of Medium Classes	37	37	37	39
MSE Current Method	232,676	232,676	232,676	248,313
MSE Alternate Method	232,079	243,041	224,466	241,949
Wilcoxon Statistic	1.16	-1.48	2.29	0.65
P[Type I Error]	12.2%	93.0%	1.1%	25.9%
No. of Small Classes	414	414	414	414
MSE Current Method	68,699	68,699	68,699	66,004
MSE Alternate Method	69,935	69,544	69,213	65,540
Wilcoxon Statistic	0.04	-0.30	-2.25	-0.36
P[Type I Error]	48.4%	61.7%	98.8%	64.0%
All Classes	464	464	464	466
MSE Current Method	150,258	150,258	150,258	148,949
MSE Alternate Method	129,097	150,144	150,103	147,998
Wilcoxon Statistic	1.12	-0.48	-1.07	-0.28
P[Type I Error]	13.1%	68.4%	85.8%	61.1%

NCCI
ACTUAL VS. EXPECTED TEST
Florida

Methodology/Test	4 Years of Data	.5 Power Credibility	.5 Power w/ Payroll	.8 Power Credibility	Double Credibility	.5 Power w/ Claims	Unlimited Loss	.5 Limit Loss	Sliding Scale
Underwriting Test									
No. Group 1 Classes	215	129	327	407	357	366	302	312	235
No. Group 2 Classes	295	381	183	103	153	144	208	203	275
Total Classes	510	510	510	510	510	510	510	515	510
Group 1 Actual Loss	\$355,312,827	\$294,433,054	\$476,403,223	\$619,596,363	\$418,512,609	\$498,292,078	\$364,171,512	\$329,050,394	\$307,235,421
Group 1 Current Expected	\$345,662,714	\$298,348,147	\$469,348,542	\$606,511,786	\$405,374,066	\$490,047,549	\$362,727,214	\$315,479,432	\$300,617,306
Group 1 Alternate Expected	\$358,578,460	\$299,374,023	\$473,061,307	\$608,439,954	\$409,149,467	\$493,358,817	\$372,743,335	\$322,225,687	\$310,635,626
Grp. 1 Act./Grp. 1 Cur.	103	99	102	102	103	102	100	104	102
Grp. 1 Act./Grp. 1 Exp.	99	98	101	102	102	101	98	102	99
Group 2 Actual Loss	\$417,416,265	\$478,296,038	\$296,325,869	\$153,132,729	\$354,216,483	\$274,437,014	\$436,592,549	\$433,057,620	\$481,525,054
Group 2 Current Expected	\$427,066,378	\$474,380,946	\$303,380,550	\$166,217,306	\$367,355,026	\$282,681,543	\$438,036,847	\$446,628,583	\$488,143,169
Group 2 Alternate Expected	\$414,150,632	\$473,355,069	\$299,667,786	\$164,289,138	\$363,579,625	\$279,370,275	\$428,020,726	\$439,882,327	\$478,124,850
Grp. 2 Act./Grp. 2 Cur.	98	101	98	92	96	97	100	97	99
Grp. 2 Act./Grp. 2 Exp.	101	101	99	93	97	98	102	98	101
P[Type II Error]	20.0%	70.0%	20.0%	5.0%	2.0%	15.0%	50.0%	2.0%	20.0%
Mean Square Error Test									
No. of Large Classes	36	35	36	36	36	36	36	38	36
MSE Current Method	385,152	385,152	385,152	385,152	385,152	385,152	398,705	376,113	398,124
MSE Alternate Method	416,855	385,309	370,080	371,408	369,856	371,014	445,934	362,546	446,995
Wilcoxon Statistic	-0.15	-0.51	0.66	0.46	0.33	0.88	-1.43	-0.10	-1.90
P[Type I Error]	55.9%	69.4%	25.6%	32.3%	37.2%	18.8%	92.3%	53.9%	97.1%
No. of Medium Classes	82	82	82	82	82	82	82	83	82
MSE Current Method	407,557	407,557	407,557	407,557	407,557	407,557	835,928	378,683	426,626
MSE Alternate Method	386,453	407,796	400,242	405,772	404,281	411,366	838,057	374,256	426,262
Wilcoxon Statistic	1.00	-1.02	1.35	1.68	1.83	0.42	-0.16	0.91	0.32
P[Type I Error]	16.0%	84.6%	8.8%	4.7%	3.3%	33.7%	56.5%	18.1%	37.5%
No. of Small Classes	387	387	387	387	387	387	387	389	387
MSE Current Method	166,480	166,480	166,480	166,480	166,480	166,480	223,436	161,435	162,345
MSE Alternate Method	167,632	167,752	165,664	165,261	162,205	165,414	226,877	160,040	163,206
Wilcoxon Statistic	-0.02	0.50	0.12	-0.34	0.03	-1.57	-0.74	-0.24	0.70
P[Type I Error]	50.6%	30.8%	45.3%	63.3%	48.8%	94.2%	76.9%	59.6%	24.1%
All Classes	510	510	510	510	510	510	510	515	510
MSE Current Method	219,775	219,775	219,775	219,775	219,775	219,775	332,742	211,450	220,500
MSE Alternate Method	219,490	220,807	216,949	217,607	214,903	218,587	338,980	208,697	224,461
Wilcoxon Statistic	0.50	-0.34	0.71	0.78	1.32	-0.89	-0.99	0.29	0.20
P[Type I Error]	30.8%	63.2%	23.8%	21.7%	9.4%	81.5%	83.8%	38.7%	42.3%

NCCI
ACTUAL VS. EXPECTED TEST
 Illinois

Methodology/Test	5 Years of Data	.5 Power w/ Payroll	Double Credibility
Underwriting Test			
No. Group 1 Classes	274	233	321
No. Group 2 Classes	249	290	202
Total Classes	523	523	523
Group 1 Actual Loss	\$364,403,590	\$467,454,621	\$432,116,147
Group 1 Current Expected	\$356,160,064	\$450,390,685	\$415,517,292
Group 1 Alternate Expected	\$376,888,301	\$455,848,133	\$419,301,620
Grp. 1 Act./Grp. 1 Cur.	102	104	104
Grp. 1 Act./Grp. 1 Exp.	97	103	103
Group 2 Actual Loss	\$423,726,202	\$320,675,171	\$356,013,645
Group 2 Current Expected	\$431,969,728	\$337,739,107	\$372,612,500
Group 2 Alternate Expected	\$411,241,491	\$332,281,659	\$368,828,172
Grp. 2 Act./Grp. 2 Cur.	98	95	96
Grp. 2 Act./Grp. 2 Exp.	103	97	97
P[Type II Error]	10.0%	5.0%	2.0%
Mean Square Error Test			
No. of Large Classes	27	27	27
MSE Current Method	169,055	169,055	169,055
MSE Alternate Method	212,703	158,265	166,590
Wilcoxon Statistic	-0.96	2.50	1.92
P[Type I Error]	83.2%	0.6%	2.7%
No. of Medium Classes	58	58	58
MSE Current Method	256,779	256,779	256,779
MSE Alternate Method	254,632	250,214	250,098
Wilcoxon Statistic	1.30	-0.15	2.58
P[Type I Error]	9.7%	56.0%	0.5%
No. of Small Classes	438	438	438
MSE Current Method	132,311	132,311	132,311
MSE Alternate Method	126,580	129,677	130,509
Wilcoxon Statistic	0.86	1.56	-0.44
P[Type I Error]	19.6%	5.9%	66.9%
All Classes	523	523	523
MSE Current Method	148,011	148,011	148,011
MSE Alternate Method	145,227	144,520	145,634
Wilcoxon Statistic	0.98	2.07	0.82
P[Type I Error]	16.3%	1.9%	20.5%

NCCI
ACTUAL VS. EXPECTED TEST
Maine

Methodology/Test	4 Years of Data	5 Years of Data	.5 Power Credibility	.5 Power w/ Payroll	.8 Power Credibility	Double Credibility	.5 Power w/ Claims	Unlimited Loss	.5 Limit Loss	Sliding Scale
Underwriting Test										
No. Group 1 Classes	194	189	42	48	111	108	94	15	133	12
No. Group 2 Classes	215	220	367	361	298	301	315	394	278	399
Total Classes	409	409	409	409	409	409	409	409	411	411
Group 1 Actual Loss	\$56,595,414	\$57,365,037	\$23,231,852	\$19,735,070	\$13,304,076	\$22,127,980	\$16,892,348	\$16,441,901	\$20,615,394	\$15,210,961
Group 1 Current Expected	\$51,826,076	\$53,111,868	\$27,146,768	\$22,759,190	\$13,525,552	\$21,173,233	\$17,513,733	\$19,517,760	\$20,715,749	\$17,811,728
Group 1 Alternate Expected	\$54,370,994	\$55,581,103	\$27,503,281	\$23,597,690	\$13,763,638	\$22,077,294	\$18,303,188	\$20,622,239	\$21,277,733	\$18,726,413
Grp. 1 Act./Grp. 1 Cur.	109	108	86	87	98	105	96	84	100	85
Grp. 1 Act./Grp. 1 Exp.	104	103	84	84	97	100	92	80	97	81
Group 2 Actual Loss	\$94,550,191	\$93,780,568	\$127,913,753	\$131,410,535	\$137,841,529	\$129,017,625	\$134,253,257	\$138,212,259	\$127,508,686	\$139,526,092
Group 2 Current Expected	\$99,319,529	\$98,033,737	\$123,998,837	\$128,396,415	\$137,620,053	\$129,972,372	\$133,631,872	\$135,136,400	\$127,408,331	\$136,925,325
Group 2 Alternate Expected	\$96,774,611	\$95,564,502	\$123,642,324	\$127,547,915	\$137,381,967	\$129,068,311	\$132,842,417	\$134,031,921	\$126,846,347	\$136,010,640
Grp. 2 Act./Grp. 2 Cur.	95	96	103	102	100	99	100	102	100	102
Grp. 2 Act./Grp. 2 Exp.	98	98	103	103	100	100	101	103	101	103
P[Type II Error]	2.0%	2.5%	90.0%	90.0%	60.0%	25.0%	70.0%	75.0%	60.0%	70.0%
Mean Square Error Test										
No. of Large Classes	7	7	7	7	7	7	7	7	7	7
MSE Current Method	128,730	128,730	128,730	128,730	128,730	128,730	128,730	123,913	145,584	125,264
MSE Alternate Method	134,382	127,467	131,749	147,123	127,548	123,588	123,327	133,612	140,504	141,702
Wilcoxon Statistic	-0.52	-0.10	-1.15	-1.15	0.10	0.10	0.10	-0.52	-0.10	-1.15
P[Type I Error]	65.6%	53.1%	85.2%	85.2%	46.9%	46.9%	46.9%	65.6%	53.1%	85.2%
No. of Medium Classes										
MSE Current Method	218,496	218,496	218,496	218,496	218,496	218,496	218,496	283,969	209,745	285,041
MSE Alternate Method	216,290	216,154	218,468	220,937	218,833	214,989	220,063	293,440	209,017	293,836
Wilcoxon Statistic	0.71	0.77	-1.89	-1.34	0.02	0.57	-0.20	-1.07	0.27	-1.37
P[Type I Error]	24.0%	21.9%	97.1%	91.0%	49.1%	28.5%	58.1%	85.8%	39.3%	91.5%
No. of Small Classes										
MSE Current Method	259,435	259,435	259,435	259,435	259,435	259,435	259,435	268,523	254,675	249,741
MSE Alternate Method	249,161	252,559	261,723	262,176	257,560	255,113	261,658	270,055	253,409	249,801
Wilcoxon Statistic	2.12	2.26	2.29	2.21	0.17	1.57	-0.04	4.04	-1.43	4.15
P[Type I Error]	1.7%	1.2%	1.1%	1.4%	43.2%	5.8%	51.6%	0.0%	92.4%	0.0%
All Classes										
MSE Current Method	254,715	254,715	254,715	254,715	254,715	254,715	254,715	267,459	249,912	250,415
MSE Alternate Method	245,227	248,232	256,855	257,665	253,001	250,437	256,781	269,654	248,628	251,330
Wilcoxon Statistic	2.14	2.29	1.51	1.52	0.20	1.57	-0.11	3.32	-1.20	3.24
P[Type I Error]	1.6%	1.1%	6.5%	6.4%	42.1%	5.8%	54.5%	0.0%	88.4%	0.1%

NCCI
ACTUAL VS. EXPECTED TEST
 Nebraska

Exhibit B-2
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Methodology/Test	5 Years of Data	.5 Power Credibility	.5 Power w/ Payroll	Double Credibility	.5 Limit Loss
Underwriting Test					
No. Group 1 Classes	217	130	163	172	324
No. Group 2 Classes	210	297	264	255	105
Total Classes	427	427	427	427	429
Group 1 Actual Loss	\$37,811,187	\$31,815,981	\$37,846,930	\$30,903,711	\$50,626,991
Group 1 Current Expected	\$35,307,025	\$35,611,853	\$39,382,333	\$29,669,303	\$48,762,639
Group 1 Alternate Expected	\$38,018,556	\$36,045,970	\$40,271,955	\$30,495,634	\$49,779,192
Grp. 1 Act./Grp. 1 Cur.	107	89	96	104	104
Grp. 1 Act./Grp. 1 Exp.	99	88	94	101	102
Group 2 Actual Loss	\$40,287,722	\$46,282,928	\$40,251,979	\$47,195,198	\$27,123,762
Group 2 Current Expected	\$42,791,884	\$42,487,056	\$38,716,576	\$48,429,606	\$28,988,114
Group 2 Alternate Expected	\$40,080,353	\$42,052,939	\$37,826,954	\$47,603,275	\$27,971,561
Grp. 2 Act./Grp. 2 Cur.	94	109	104	97	94
Grp. 2 Act./Grp. 2 Exp.	101	110	106	99	97
P[Type II Error]	5.0%	98.0%	90.0%	20.0%	5.0%
Mean Square Error Test					
No. of Large Classes	1	1	1	1	1
MSE Current Method	116,113	116,113	116,113	116,113	136,621
MSE Alternate Method	49,617	123,460	132,178	115,184	105,629
Wilcoxon Statistic	1.00	-1.00	-1.00	1.00	1.00
P[Type I Error]	NA	NA	NA	NA	NA
No. of Medium Classes	2	2	2	2	2
MSE Current Method	3,975	3,975	3,975	3,975	2,494
MSE Alternate Method	20,223	4,380	7,900	5,826	7,004
Wilcoxon Statistic	-1.34	-0.45	-1.34	-0.45	-0.45
P[Type I Error]	75.0%	50.0%	75.0%	50.0%	50.0%
No. of Small Classes	424	424	424	424	426
MSE Current Method	115,411	115,411	115,411	115,411	71,687
MSE Alternate Method	114,184	115,990	115,762	111,028	71,183
Wilcoxon Statistic	1.06	-1.34	-1.30	-0.54	-0.72
P[Type I Error]	14.4%	91.0%	90.4%	70.4%	76.5%
All Classes	427	427	427	427	429
MSE Current Method	114,891	114,891	114,891	114,891	71,516
MSE Alternate Method	113,592	115,485	115,295	110,545	70,964
Wilcoxon Statistic	0.99	-1.45	-1.51	-0.54	-0.68
P[Type I Error]	16.0%	92.7%	93.4%	70.5%	75.1%

NCCI
ACTUAL VS. EXPECTED TEST
Oregon

Methodology/Test	.5 Power w/ Payroll	Double Credibility	.5 Limit Loss
Underwriting Test			
No. Group 1 Classes	188	267	429
No. Group 2 Classes	271	191	33
Total Classes	459	458	462
Group 1 Actual Loss	\$179,070,470	\$142,641,376	\$189,268,789
Group 1 Current Expected	\$177,700,518	\$137,581,408	\$171,941,024
Group 1 Alternate Expected	\$179,668,870	\$140,081,741	\$174,830,302
Grp. 1 Act./Grp. 1 Cur.	101	104	110
Grp. 1 Act./Grp. 1 Exp.	100	102	108
Group 2 Actual Loss	\$124,265,200	\$160,694,294	\$109,654,893
Group 2 Current Expected	\$125,635,153	\$165,754,262	\$126,982,658
Group 2 Alternate Expected	\$123,666,800	\$163,253,929	\$124,093,380
Grp. 2 Act./Grp. 2 Cur.	99	97	86
Grp. 2 Act./Grp. 2 Exp.	100	98	88
P[Type II Error]	50.0%	20.0%	2.0%
Mean Square Error Test			
No. of Large Classes	7	7	7
MSE Current Method	1,036,953	1,037,004	1,133,411
MSE Alternate Method	1,039,216	1,029,999	1,018,905
Wilcoxon Statistic	-0.34	0.51	2.03
P[Type I Error]	59.4%	28.9%	1.6%
No. of Medium Classes	26	26	27
MSE Current Method	630,149	630,132	643,945
MSE Alternate Method	627,558	621,397	639,648
Wilcoxon Statistic	0.83	2.48	0.72
P[Type I Error]	20.5%	0.7%	23.5%
No. of Small Classes	423	422	422
MSE Current Method	77,614	77,612	74,721
MSE Alternate Method	79,094	77,403	72,268
Wilcoxon Statistic	-0.64	1.37	3.40
P[Type I Error]	74.0%	8.5%	0.0%
All Classes	459	458	462
MSE Current Method	123,388	123,640	122,350
MSE Alternate Method	124,646	122,844	118,112
Wilcoxon Statistic	-0.55	2.06	3.76
P[Type I Error]	70.8%	2.0%	0.0%

NCCI
COMPARISON OF CONSISTENCY TEST RESULTS
All Classes

Test/State	Colorado	Connecticut	Florida	Illinois	Louisiana	Maine	Michigan	Nebraska	North Carolina	Oregon	Utah	Wisconsin
Five Years of Data												
Years 87-90												
Variance - Current	0.0259	0.0507		0.0092		0.1552		0.0038				
Variance - Alternate	0.0190	0.0394		0.0073		0.1489		0.0016				
Wilcoxon Statistic	5.1245	4.7351		4.2323		0.2930		4.0187				
Approximate Probability	0.0%	0.0%		0.0%		38.5%		0.0%				
Years 88-90												
Variance - Current	0.0201	0.0488	0.2533	0.0132	0.0084	0.1435	0.0077	0.0036	0.0013	0.0125	0.0038	
Variance - Alternate	0.0160	0.0416	0.2409	0.0113	0.0069	0.1136	0.0058	0.0036	0.0010	0.0111	0.0032	
Wilcoxon Statistic	1.6061	2.5189	1.6254	2.8685	1.6619	0.6484	3.0852	1.9783	2.3462	1.8968	3.9228	
Approximate Probability	5.4%	0.6%	5.2%	0.2%	4.8%	25.8%	0.1%	2.4%	0.9%	2.9%	0.0%	
Years 89-90												
Variance - Current	0.0082	0.0132	0.0247	0.0030	0.0035	0.0412	0.0048	0.0012	0.0004	0.0057	0.0028	0.0030
Variance - Alternate	0.0060	0.0080	0.0165	0.0026	0.0023	0.0353	0.0037	0.0011	0.0002	0.0048	0.0017	0.0036
Wilcoxon Statistic	2.9682	3.5965	3.0595	1.7480	2.1772	0.8636	2.9226	2.4198	3.6836	3.2855	5.5881	2.7432
Approximate Probability	0.1%	0.0%	0.1%	4.0%	1.5%	19.4%	0.2%	0.8%	0.0%	0.1%	0.0%	0.3%
Four Years Data												
Variance - Current			0.0699			0.2267						
Variance - Alternate			0.0715			0.2055						
Wilcoxon Statistic			0.6337			2.0278						
Approximate Probability			26.3%			2.1%						
Credibility with .5 Power												
Variance - Current			0.2082			0.2658		0.0082				
Variance - Alternate			0.2241			0.2904		0.0086				
Wilcoxon Statistic			9.0171			6.0366		4.9666				
Approximate Probability			0.0%			0.0%		0.0%				
Payroll Based Credibility												
Variance - Current	0.0223	0.0535	0.1929	0.0006		0.1032		0.0017		0.0042		
Variance - Alternate	0.0175	0.0485	0.2263	0.0008		0.1280		0.0052		0.0186		
Wilcoxon Statistic	5.0220	5.0602	3.4512	4.9831		0.9119		0.3740		1.1565		
Approximate Probability	0.0%	0.0%	0.0%	0.0%		18.1%		35.4%		12.4%		

NCCI
COMPARISON OF CONSISTENCY TEST RESULTS
All Classes

Test/State	Colorado	Connecticut	Florida	Illinois	Louisiana	Maine	Michigan	Nebraska	North Carolina	Oregon	Utah	Wisconsin
Credibility with .8 Power												
Variance - Current			0.0699			0.2260						
Variance - Alternate			0.0676			0.2135						
Wilcoxon Statistic			7.5276			4.1216						
Approximate Probability			0.0%			0.0%						
Double Current Full Standard												
Variance - Current	0.0207	0.0530	0.1941	0.0162		0.1367		0.0040		0.0072		
Variance - Alternate	0.0177	0.0489	0.1916	0.0153		0.1207		0.0034		0.0059		
Wilcoxon Statistic	10.0616	7.8094	4.9110	8.3544		10.3487		9.4254		12.0333		
Approximate Probability	0.0%	0.0%	0.0%	0.0%		0.0%		0.0%		0.0%		
Claim Count Based Credibility												
Variance - Current			0.0699			0.2260						
Variance - Alternate			0.0652			0.2088						
Wilcoxon Statistic			5.1802			3.0721						
Approximate Probability			0.0%			0.1%						
Unlimited Losses												
Variance - Current			0.0700			0.2260						
Variance - Alternate			0.0783			0.2230						
Wilcoxon Statistic			0.9102			0.1550						
Approximate Probability			18.1%			43.8%						
Half Current Limit												
Variance - Current	0.0223	0.0535	0.1909	0.0166		0.1360		0.0041		0.0072		
Variance - Alternate	0.0204	0.0509	0.1854	0.0160		0.1284		0.0037		0.0072		
Wilcoxon Statistic	0.5436	2.0543	2.3138	4.3921		0.6900		1.3523		0.9020		
Approximate Probability	29.3%	2.0%	1.0%	0.0%		24.5%		8.8%		18.4%		
Sliding Scale Limitation												
Variance - Current			0.0699			0.2259						
Variance - Alternate			0.0796			0.2037						
Wilcoxon Statistic			5.4648			4.6842						
Approximate Probability			0.0%			0.0%						

NCCI
COMPARISON OF CONSISTENCY TEST RESULTS
Large Classes

Test/State	Colorado	Connecticut	Florida	Illinois	Louisiana	Maine	Michigan	Nebraska	North Carolina	Oregon	Utah	Wisconsin
Five Years of Data												
Years 87-90												
Variance - Current	0.0085	0.0545		0.0049		0.2654		0.0006				
Variance - Alternate	0.0046	0.0508		0.0033		0.2286		0.0001				
Wilcoxon Statistic	1.6903	0.6516		2.5959		1.1531		1.0000				
Approximate Probability	3.9%	24.8%		0.5%		10.9%		NA				
Years 88-90												
Variance - Current	0.0148	0.0354	0.2276	0.0114	0.0099	0.1196	0.0023	0.0005	0.0001	0.0014		
Variance - Alternate	0.0127	0.0269	0.2152	0.0098	0.0097	0.0525	0.0011	0.0000	0.0003	0.0015		
Wilcoxon Statistic	0.4045	1.5213	0.5862	0.5171	1.0000	1.8257	1.0690	1.0000	1.0000	0.3651		
Approximate Probability	31.3%	5.5%	27.9%	30.3%	0.0%	0.0%	12.5%	NA	0.0%	31.3%		
Years 89-90												
Variance - Current	0.0010	0.0108	0.0127	0.0018	0.0027	0.0373	0.0010	0.0000	0.0001	0.0015		0.0001
Variance - Alternate	0.0013	0.0031	0.0063	0.0012	0.0001	0.0060	0.0001	0.0000	0.0001	0.0014		0.0001
Wilcoxon Statistic	0.6742	2.0284	2.1905	1.1254	1.0000	1.8257	1.6036	1.0000	1.0000	0.7303		0.0000
Approximate Probability	21.9%	1.6%	1.4%	13.0%	0.0%	0.0%	0.0%	NA	0.0%	18.8%		62.5%
Four Years Data												
Variance - Current			0.0549			0.2312						
Variance - Alternate			0.0587			0.1997						
Wilcoxon Statistic			1.0032			0.5241						
Approximate Probability			15.8%			28.1%						
Credibility with .5 Power												
Variance - Current			0.1363			0.2638		0.0036				
Variance - Alternate			0.1424			0.2631		0.0036				
Wilcoxon Statistic			4.8352			1.5724		1.0000				
Approximate Probability			0.0%			4.7%		NA				
Payroll Based Credibility												
Variance - Current	0.0069	0.0448	0.1736	0.0109		0.2740		0.0009		0.0005		
Variance - Alternate	0.0066	0.0452	0.1692	0.0108		0.2522		0.0008		0.0005		
Wilcoxon Statistic	1.1832	0.4201	4.0376	2.2088		1.1531		1.0000		0.3145		
Approximate Probability	10.9%	32.0%	0.0%	1.4%		10.9%		NA		34.4%		

NCCI
COMPARISON OF CONSISTENCY TEST RESULTS
Large Classes

Test/State	Colorado	Connecticut	Florida	Illinois	Louisiana	Maine	Michigan	Nebraska	North Carolina	Oregon	Utah	Wisconsin
Credibility with .8 Power												
Variance - Current			0.0549			0.2312						
Variance - Alternate			0.0539			0.2305						
Wilcoxon Statistic			0.7769			0.3145						
Approximate Probability			21.9%			34.4%						
Double Current Full Standard												
Variance - Current	0.0077	0.0439	0.1792	0.0105		0.2749		0.0008		0.0004		
Variance - Alternate	0.0078	0.0466	0.1819	0.0105		0.2732		0.0009		0.0005		
Wilcoxon Statistic	0.1690	2.2404	2.3566	0.0228		0.3145		1.0000		0.9435		
Approximate Probability	40.6%	0.8%	0.9%	49.1%		34.4%		NA		15.6%		
Claim Count Based Credibility												
Variance - Current			0.0549			0.2312						
Variance - Alternate			0.0548			0.2301						
Wilcoxon Statistic			0.8675			0.7338						
Approximate Probability			19.3%			21.9%						
Unlimited Losses												
Variance - Current			0.0549			0.2312						
Variance - Alternate			0.0603			0.5241						
Wilcoxon Statistic			2.8136			0.5241						
Approximate Probability			0.2%			28.1%						
Half Current Limit												
Variance - Current	0.0069	0.0448	0.1736	0.0109		0.2740		0.0009		0.0005		
Variance - Alternate	0.0058	0.0487	0.1722	0.0112		0.2688		0.0007		0.0005		
Wilcoxon Statistic	1.8593	1.4003	1.0526	0.6831		1.5724		1.0000		0.1048		
Approximate Probability	2.3%	7.4%	14.6%	24.7%		4.7%		NA		42.2%		
Sliding Scale Limitation												
Variance - Current			0.0549			0.2312						
Variance - Alternate			0.0620			0.2431						
Wilcoxon Statistic			2.6627			1.1531						
Approximate Probability			0.4%			10.9%						

NCCI
COMPARISON OF CONSISTENCY TEST RESULTS
Medium Classes

Test/State	Colorado	Connecticut	Florida	Illinois	Louisiana	Maine	Michigan	Nebraska	North Carolina	Oregon	Utah	Wisconsin
Five Years of Data												
Years 87-90												
Variance - Current	0.0188	0.0376		0.0093		0.1247		0.0008				
Variance - Alternate	0.0141	0.0185		0.0070		0.1134		0.0007				
Wilcoxon Statistic	2.5049	3.9229		3.3933		0.8889		0.4472				
Approximate Probability	0.6%	0.0%		0.0%		18.7%		25.0%				
Years 88-90												
Variance - Current	0.0100	0.0116	0.2772	0.0137	0.0049	0.0610	0.0052	0.0018	0.0007	0.0168		
Variance - Alternate	0.0066	0.0130	0.2559	0.0107	0.0037	0.0494	0.0045	0.0012	0.0006	0.0133		
Wilcoxon Statistic	2.0986	1.4371	0.3849	3.0318	1.3491	1.3034	0.4171	1.0000	0.1704	1.7173		
Approximate Probability	1.8%	7.5%	35.0%	0.1%	8.9%	9.6%	33.8%	NA	43.2%	4.3%		
Years 89-90												
Variance - Current	0.0041	0.0092	0.0443	0.0041	0.0017	0.0331	0.0015	0.0002	0.0211	0.0050		0.0013
Variance - Alternate	0.0022	0.0044	0.0259	0.0005	0.0007	0.0273	0.0009	0.0002	0.0001	0.0044		0.0007
Wilcoxon Statistic	1.1862	3.5275	3.6428	1.0900	1.6332	0.6778	2.4351	1.0000	2.2151	1.4560		1.5323
Approximate Probability	11.8%	0.0%	0.0%	13.8%	5.1%	24.9%	0.7%	NA	1.3%	7.3%		6.3%
Four Years Data												
Variance - Current			0.0549			0.2312						
Variance - Alternate			0.0587			0.1997						
Wilcoxon Statistic			1.0032			0.5241						
Approximate Probability			15.8%			28.1%						
Credibility with .5 Power												
Variance - Current			0.2659			0.1227		0.0016				
Variance - Alternate			0.2901			0.1207		0.0016				
Wilcoxon Statistic			5.0128			2.1142		0.4472				
Approximate Probability			0.0%			1.7%		25.0%				
Payroll Based Credibility												
Variance - Current	0.0136	0.0379	0.2176	0.0234		0.0776		0.0009		0.0183		
Variance - Alternate	0.0133	0.0347	0.2045	0.0226		0.0762		0.0016		0.0164		
Wilcoxon Statistic	1.7306	0.1813	1.8238	1.5891		0.4953		1.3416		2.6571		
Approximate Probability	4.2%	42.8%	3.4%	5.6%		31.0%		0.0%		0.4%		

NCCI
COMPARISON OF CONSISTENCY TEST RESULTS
Medium Classes

Test/State	Colorado	Connecticut	Florida	Illinois	Louisiana	Maine	Michigan	Nebraska	North Carolina	Oregon	Utah	Wisconsin
Credibility with .8 Power												
Variance - Current			0.0913			0.0997						
Variance - Alternate			0.0875			0.0992						
Wilcoxon Statistic			3.0142			0.0455						
Approximate Probability			0.1%			48.2%						
Double Current Full Standard												
Variance - Current	0.0138	0.0377	0.2206	0.0232		0.0787		0.0009		0.0180		
Variance - Alternate	0.0137	0.0353	0.2144	0.0227		0.0766		0.0009		0.0163		
Wilcoxon Statistic	0.0683	1.6025	1.4759	1.1553		2.4763		0.4472		2.8571		
Approximate Probability	47.3%	5.5%	7.0%	12.4%		0.7%		25.0%		0.2%		
Claim Count Based Credibility												
Variance - Current			0.0913			0.0997						
Variance - Alternate			0.0794			0.1014						
Wilcoxon Statistic			6.2734			0.9564						
Approximate Probability			0.0%			16.9%						
Unlimited Losses												
Variance - Current			0.0914			0.0997						
Variance - Alternate			0.1098			0.1066						
Wilcoxon Statistic			1.9259			1.2069						
Approximate Probability			2.7%			11.4%						
Half Current Limit												
Variance - Current	0.0136	0.0379	0.2177	0.0234		0.0776		0.0009		0.0183		
Variance - Alternate	0.0129	0.0350	0.2051	0.0226		0.0750		0.0008		0.0178		
Wilcoxon Statistic	1.0930	0.6018	2.8732	1.5448		1.1302		1.3416		0.0857		
Approximate Probability	13.7%	27.4%	0.2%	6.1%		12.9%		0.0%		46.6%		
Sliding Scale Limitation												
Variance - Current			0.0914			0.0997						
Variance - Alternate			0.1112			0.1032						
Wilcoxon Statistic			5.2768			0.5465						
Approximate Probability			0.0%			29.2%						

NCCI
COMPARISON OF CONSISTENCY TEST RESULTS
Small Classes

Test/State	Colorado	Connecticut	Florida	Illinois	Louisiana	Maine	Michigan	Nebraska	North Carolina	Oregon	Utah	Wisconsin
Five Years of Data												
Years 87-90												
Variance - Current	0.0480	0.0418		0.0226		0.3044		0.0062				
Variance - Alternate	0.0371	0.0388		0.0188		0.3305		0.0050				
Wilcoxon Statistic	4.4137	3.7994		3.2163		0.7800		3.8787				
Approximate Probability	0.0%	0.0%		0.1%		21.8%		0.0%				
Years 88-90												
Variance - Current	0.0336	0.0372	0.3179	0.0202	0.0133	0.2527	0.0124	0.0052	0.0021	0.0231	0.0038	
Variance - Alternate	0.0270	0.0453	0.3178	0.0185	0.0107	0.2160	0.0091	0.0051	0.0014	0.0204	0.0032	
Wilcoxon Statistic	1.4051	1.4371	1.3552	1.9775	2.0535	0.1268	3.6119	1.7638	2.6453	1.9609	3.9228	
Approximate Probability	8.0%	7.5%	8.8%	2.4%	2.0%	45.0%	0.0%	3.9%	0.4%	2.5%	0.0%	
Years 89-90												
Variance - Current	0.0155	0.0119	0.0527	0.0085	0.0064	0.0635	0.0087	0.0020	0.0008	0.0125	0.0028	0.0096
Variance - Alternate	0.0117	0.0108	0.0556	0.0075	0.0048	0.0647	0.0070	0.0016	0.0005	0.0106	0.0017	0.0118
Wilcoxon Statistic	2.6106	1.7783	0.6172	1.2723	2.1725	0.1889	2.1797	2.2241	3.2961	2.8165	5.5881	2.3511
Approximate Probability	0.5%	3.8%	26.9%	10.2%	1.5%	42.5%	1.5%	1.3%	0.0%	0.2%	0.0%	0.9%
Four Years Data												
Variance - Current			0.0674			0.3992						
Variance - Alternate			0.0691			0.3798						
Wilcoxon Statistic			0.3263			0.4362						
Approximate Probability			37.2%			33.1%						
Credibility with .5 Power												
Variance - Current			0.3590			0.4664		0.0114				
Variance - Alternate			0.4021			0.5489		0.0120				
Wilcoxon Statistic			7.0018			6.0421		5.2457				
Approximate Probability			0.0%			0.0%		0.0%				
Payroll Based Credibility												
Variance - Current	0.0451	0.0496	0.2222	0.0216		0.2531		0.0060		0.0181		
Variance - Alternate	0.0319	0.0425	0.2128	0.0174		0.2284		0.0052		0.0166		
Wilcoxon Statistic	4.5295	5.4503	1.6056	4.5512		0.2690		0.3292		0.2830		
Approximate Probability	0.0%	0.0%	5.4%	0.0%		39.4%		37.1%		38.9%		

NCCI
COMPARISON OF CONSISTENCY TEST RESULTS
Small Classes

Test/State	Colorado	Connecticut	Florida	Illinois	Louisiana	Maine	Michigan	Nebraska	North Carolina	Oregon	Utah	Wisconsin
Credibility with .8 Power												
Variance - Current			0.0669			0.3970						
Variance - Alternate			0.0622			0.3591						
Wilcoxon Statistic			6.0548			4.2480						
Approximate Probability			0.0%			0.0%						
Double Current Full Standard												
Variance - Current	0.0387	0.0491	0.2170	0.0209		0.2540		0.0059		0.0183		
Variance - Alternate	0.0300	0.0422	0.1912	0.0166		0.1961		0.0049		0.0127		
Wilcoxon Statistic	10.3769	8.3206	5.1440	8.8880		9.6823		9.6300		11.5976		
Approximate Probability	0.0%	0.0%	0.0%	0.0%		0.0%		0.0%		0.0%		
Claim Count Based Credibility												
Variance - Current			0.0669			0.3969						
Variance - Alternate			0.0554			0.3415						
Wilcoxon Statistic			5.7444			2.8795						
Approximate Probability			0.0%			0.2%						
Unlimited Losses												
Variance - Current			0.0675			0.3967						
Variance - Alternate			0.0686			0.3857						
Wilcoxon Statistic			6.5412			0.6527						
Approximate Probability			0.0%			25.7%						
Half Current Limit												
Variance - Current	0.0451	0.0496	0.2221	0.0214		0.2535		0.0060		0.0181		
Variance - Alternate	0.0409	0.0461	0.2091	0.0190		0.2292		0.0054		0.0177		
Wilcoxon Statistic	0.4742	3.5276	1.8685	5.3486		1.4639		1.3482		0.3155		
Approximate Probability	31.8%	0.0%	3.1%	0.0%		7.2%		8.9%		37.6%		
Sliding Scale Limitation												
Variance - Current			0.0669			0.3967						
Variance - Alternate			0.0690			0.3191						
Wilcoxon Statistic			0.8233			4.0262						
Approximate Probability			20.5%			0.0%						

INCREASED LIMIT FACTOR TEST

Number of Classes at Confidence Level XX

State	Classes per Industry Group	Confidence Level			
		90.0%	95.0%	97.5%	99.0%
Connecticut					
Manufacturer	192	51	46	34	26
Contractor	54	6	4	3	3
Other	142	25	17	11	11
Florida					
Manufacturer	214	168	154	129	99
Contractor	64	27	24	20	19
Other	165	107	100	96	93
Illinois					
Manufacturer	258	212	204	188	174
Contractor	72	38	36	33	29
Other	157	109	105	98	89
Maine					
Manufacturer	122	74	56	17	3
Contractor	51	36	34	23	19
Other	138	120	110	92	78
Michigan					
Manufacturer	180	157	151	141	125
Contractor	60	40	39	36	34
Other	159	123	119	117	113
North Carolina					
Manufacturer	228	203	190	163	136
Contractor	58	40	38	36	32
Other	149	127	119	111	97
Nebraska					
Manufacturer	128	2	0	0	0
Contractor	59	50	47	39	29
Other	139	118	109	91	83
Oregon					
Manufacturer	177	145	136	119	98
Contractor	59	48	44	41	35
Other	156	126	126	117	109
Utah					
Manufacturer	145	1	0	0	0
Contractor	59	41	29	14	5
Other	152	2	1	0	0
Wisconsin					
Manufacturer	215	193	184	155	122
Contractor	60	45	45	42	38
Other	162	140	138	130	122

NCCI
INCREASED LIMIT FACTOR TEST
 Percentage of Classes at Confidence Level XX

State	Classes per Industry Group	Confidence Level			
		90.0%	95.0%	97.5%	99.0%
Connecticut					
Manufacturer	192	26.6%	24.0%	17.7%	13.5%
Contractor	54	11.1%	7.4%	5.6%	5.6%
Other	142	17.6%	12.0%	7.7%	7.7%
Florida					
Manufacturer	214	78.5%	72.0%	60.3%	46.3%
Contractor	64	42.2%	37.5%	31.3%	29.7%
Other	165	64.8%	60.6%	58.2%	56.4%
Illinois					
Manufacturer	258	82.2%	79.1%	72.9%	67.4%
Contractor	72	52.8%	50.0%	45.8%	40.3%
Other	157	69.4%	66.9%	62.4%	56.7%
Maine					
Manufacturer	122	60.7%	45.9%	13.9%	2.5%
Contractor	51	70.6%	66.7%	45.1%	37.3%
Other	138	87.0%	79.7%	66.7%	56.5%
Michigan					
Manufacturer	180	87.2%	83.9%	78.3%	69.4%
Contractor	60	66.7%	65.0%	60.0%	56.7%
Other	159	77.4%	74.8%	73.6%	71.1%
North Carolina					
Manufacturer	228	89.0%	83.3%	71.5%	59.6%
Contractor	58	69.0%	65.5%	62.1%	55.2%
Other	149	85.2%	79.9%	74.5%	65.1%
Nebraska					
Manufacturer	128	1.6%	0.0%	0.0%	0.0%
Contractor	59	84.7%	79.7%	66.1%	49.2%
Other	139	84.9%	78.4%	65.5%	59.7%
Oregon					
Manufacturer	177	81.9%	76.8%	67.2%	55.4%
Contractor	59	81.4%	74.6%	69.5%	59.3%
Other	156	80.8%	80.8%	75.0%	69.9%
Utah					
Manufacturer	145	0.7%	0.0%	0.0%	0.0%
Contractor	59	69.5%	49.2%	23.7%	8.5%
Other	152	1.3%	0.7%	0.0%	0.0%
Wisconsin					
Manufacturer	215	89.8%	85.6%	72.1%	56.7%
Contractor	60	75.0%	75.0%	70.0%	63.3%
Other	162	86.4%	85.2%	80.2%	75.3%

APPENDIX C

CLASSIFICATION RATEMAKING

Appendix C

Example Calculations for Tests of Industry Group Differentials

Exhibits C-1 through C-4 provide examples of the calculations used to derive the results described in part V of this section of this examination report. The basic data, from Appendix A-VII of the NCCI filings, are summarized in Exhibit C-1. These data include the expected losses, indicated losses, ratio of indicated to expected losses and the indicated industry group differentials.

Exhibit C-2 shows the corresponding sums for all of the states for which data were available. The ratios of indicated to expected losses and the indicated industry group differentials are calculated as in Appendix A-VII of the NCCI filings.

Exhibit C-3 shows the calculation of the mean square error for the Colorado filing. Columns (1), (2), (4), and (5) are taken from the first page of Appendix A-VII prepared by the NCCI for the two alternatives. The expected losses assume the same total as the actual losses, but distribute them to the industry groups in the same proportion as the 1987 manual premium. The square errors, difference and corresponding Wilcoxon Statistic are calculated as described in part V.B of this section of this examination report.

Exhibit C-4 shows the calculations for the consistency test. The relativities in column (2) are the relativities to "Overall" in Exhibit C-1 and are the ratios of the Colorado industry group differentials to those in Exhibit C-2. The variances for each industry group are shown as the arithmetic averages on that exhibit and the calculation of the Wilcoxon Statistic is also shown on that exhibit.

Colorado Industry Group Experience

Industry Group	3 Year Experience					5 Year Experience					Relativity to "Overall"	
	Expected Losses	Indicated Losses	Ratio: Indicated/Expected	Indicated Differential	Relativity to "Overall"	Expected Losses	Indicated Losses	Ratio: Indicated/Expected	Indicated Differential			
					Policy Year 1987							
Manufacturing	142,070,326	198,162,957	1.395	1,064	1.016	242,801,181	341,880,279	1.408	1,074	1.023		
Contracting	410,174,161	536,074,748	1.307	0.997	1.020	706,845,270	888,462,297	1.257	0.959	1.021		
All Other	590,979,379	764,844,953	1.294	0.987	0.995	1,021,928,521	1,354,759,920	1.326	1.011	1.004		
Total	1,143,223,866	1,499,082,658	1.311	1.000		1,971,574,972	2,585,102,496	1.311	1.000			
					Policy Year 1988							
Manufacturing	185,473,102	190,288,049	1.026	1.025	1.051	321,364,662	323,773,649	1.007	1.008	1.033		
Contracting	485,286,801	503,533,537	1.038	1.037	0.985	822,803,159	870,314,381	1.058	1.059	1.005		
All Other	733,720,402	711,515,597	0.970	0.989	0.984	1,316,753,370	1,264,678,128	0.960	0.961	0.977		
Total	1,404,480,305	1,405,337,183	1.001	1.000		2,460,921,191	2,458,766,158	0.999	1.000			
					Policy Year 1989							
Manufacturing	196,454,729	187,984,564	0.957	0.952	0.973	320,653,632	314,630,332	0.981	0.975	1.005		
Contracting	465,920,387	493,577,210	1.059	1.054	1.012	803,046,874	822,144,682	1.024	1.018	0.982		
All Other	740,657,856	728,780,799	0.984	0.979	0.989	1,216,665,599	1,217,357,531	1.001	0.995	0.999		
Total	1,403,032,972	1,410,342,573	1.005	1.000		2,340,366,105	2,354,132,545	1.006	1.000			
					Policy Year 1990							
Manufacturing	199,480,844	197,497,559	0.990	0.994	0.998	338,268,278	339,275,278	1.003	1.006	1.009		
Contracting	454,298,938	439,975,365	0.968	0.972	0.979	809,488,994	798,176,757	0.986	0.989	0.987		
All Other	767,632,676	778,393,778	1.014	1.018	1.012	1,310,706,627	1,314,357,385	1.003	1.006	1.005		
Total	1,421,412,458	1,415,866,702	0.996	1.000		2,458,463,899	2,451,809,420	0.997	1.000			

Exhibit C-3

Calculation of Accuracy Test for Colorado

	(1)	(2)		(3)	(4)	(5)		(6)
	1987 Manual Premiums	3 Years Experience 1987 Actual Losses		1987 Expected Losses	1987 Manual Premiums	5 Years Experience 1987 Actual Losses		1987 Expected Losses
Manufacturing	92,445,789	73,116,795	71,864,332	93,254,111	73,116,795	72,409,120		
Contracting	172,687,778	135,619,739	134,241,828	164,331,156	135,619,739	127,598,389		
All Other	345,459,114	265,918,238	268,548,612	353,712,163	265,918,238	274,647,263		
Total	610,592,681	474,654,772	474,654,772	611,297,430	474,654,772	474,654,772		
	(7)		(8)	(9)		(10)		
	3 Year Square Error		5 Year Square Error	Difference (7)-(8)		Rank((9))		
Manufacturing	21,828		6,916	14,912		3		
Contracting	14,143		504,254	-490,111		1		
All Other	25,764		277,432	-251,668		2		
Mean Square Error	21,882		297,140					
Wilcoxon Statistic								0

Calculation of Consistency Test for Colorado

Policy Year	(1) 3 Years Experience		(2) 5 Years Experience		(3) Difference Squared	(4) Expected Losses	(5) Relativity	(6) Difference Squared	(7) Difference (3)-(6)	(8) Rank((7))
	Expected Losses	Relativity	Expected Losses	Relativity						
1987	142,070,326	1.016	242,801,181	1.023	0.00004	Manufacturing	0.00003			
1988	185,473,102	1.051	321,364,662	1.033	0.00172		0.00024			
1989	196,454,729	0.973	320,653,632	1.005	0.00133		0.00016			
1990	199,480,844	0.998	338,288,278	1.009	0.00013		0.00007			
Arithmetic Average		1.010		1.018	0.00081		0.00012	0.00068		3
1987	410,174,161	1.020	706,845,270	1.021	0.00044	Contracting	0.00050			
1988	485,286,801	0.985	822,803,159	1.005	0.00020		0.00004			
1989	465,920,387	1.012	803,046,874	0.982	0.00017		0.00028			
1990	454,298,938	0.979	809,488,994	0.987	0.00040		0.00014			
Arithmetic Average		0.999		0.999	0.00030		0.00024	0.00006		2
1987	590,979,379	0.995	1,021,928,521	1.004	0.00000	All Other	0.00006			
1988	733,720,402	0.984	1,316,753,370	0.977	0.00012		0.00037			
1989	740,657,856	0.989	1,216,665,599	0.999	0.00004		0.00001			
1990	767,632,676	1.012	1,310,706,627	1.005	0.00029		0.00008			
Arithmetic Average		0.995		0.996	0.00011		0.00013	-0.00002		1
Weighted Average Variance					0.00027		0.00017			
Wilcoxon Statistic										4

APPENDIX D

CLASSIFICATION RATEMAKING

Appendix D

Discussion of Questions Regarding 'F' Classes

This appendix includes an evaluation of current NCCI 'F' class ratemaking methodology and is in direct response to the March 1991 request of the Examination Oversight Committee. Section IIA of this examination describes the current NCCI 'F' class ratemaking procedures in terms of differences between ratemaking for industrial classes and for 'F' classes. The discussion in this appendix addresses some of the major differences and considers some alternatives.

The format is that of question and answer. 'LHWCA' denotes the U.S. Longshore and Harbor Workers' Compensation Act. 'State Act' refers to a state's workers' compensation statutes.

Observations are based upon NCCI documentation and interviews with NCCI personnel. We also reviewed five rate filings: Michigan (1/1/91), Maine (1/1/91), Florida 1/1/90), South Dakota (3/1/91), and Arizona (10/1/88).

QUESTION:

Is it a reasonable alternative to make 'F' class ratemaking more consistent with industrial class ratemaking by deriving an overall rate level change for a state and then allocating the change to classes?

DISCUSSION:

Based upon a review of NCCI methodology and five state rate filings, we conclude that the current approach to 'F' class ratemaking is reasonable. Because the 'F' class financial call experience is not credible for deriving loss ratios and 'F' class experience by individual state is sparse, using an overall rate level change approach for an individual state like the industrial classes is not reasonable.

The ratemaking methodology for 'F' classes uses a pure premium method which derives the rate for each class based upon WCSP data. For industrial classes, the NCCI utilizes a loss ratio approach to identify the overall rate level change which is then allocated to classes using a pure premium method. Financial call experience supports the overall rate level change and WCSP data is used to allocate the overall rate level change to classes.

CLASSIFICATION RATEMAKING

The pure premium approach and the loss ratio approach are both well documented and their equivalence is demonstrated in actuarial literature. Assuming that consistency in methodology is preferable, we considered (1) whether current 'F' class data will support the more consistent approach, and (2) whether the consistent approach will provide indications at least as reasonable as the current methodology.

The NCCI considers the earned premium data in the 'F' class financial calls for policy year and calendar year to be unusable due to data quality problems. This precludes the use of the loss ratio approach for 'F' classes. The NCCI documented attempts to utilize the data between 1978 and 1980, and in 1986, and concluded that carriers were unable to report the requested earned premium and loss information.

Sparse 'F' class data on an individual state by state basis provides low credibility for indicated rate level changes. The NCCI considers the countrywide 'F' class experience in aggregate to be equivalent in volume to a medium-sized state. Thus, except for Louisiana which is the state with the largest amount of data, the volume of 'F' class experience for most states is sparse. A review of five rate filings confirms that observation. For example, for policy years 1982 to 1984, there were a total of only 13 'F' class claims reported in Michigan. For policy years 1984 to 1986, there were a total of only 31 'F' class claims in Maine. Thus, even if accurate data was available to support a loss ratio approach, the indications would be questionable for most states. The use of a countrywide indicated rate level change is not feasible because of the impact of benefits under the different state statutes discussed in the next question.

QUESTION:

Is the calculation of countrywide 'F' class rates a reasonable alternative?

DISCUSSION:

A review of the basic NCCI methodology and five state rate filings indicates that it is not reasonable to derive 'F' class rates (or loss costs) for direct use countrywide. 'F' class rates must be developed on a state by state basis to recognize the impact of benefits under each state's statutes as well as benefits under the LHWCA. For each state, there is a unique mix of loss experience under the State Act and LHWCA. State-specific ratemaking components include benefit levels, assessments, loss adjustment expenses, and payroll limitation.

CLASSIFICATION RATEMAKING

The 'F' class risk is a combination of risk under each State's Act and risk under the LHWCA. Therefore, the rates must reflect that blend. In each state, 'F' class claimants can elect to receive compensation under the State Act or the LHWCA at the time that the claim is reported. Usually, claimants choose the benefits most advantageous at that time. NCCI estimates that for countrywide 'F' class data, approximately 70% of the losses are under the LHWCA because the benefits under the LHWCA are generally higher. However, the proportion can differ greatly by individual state. For example, in Maine, only 32% of the losses are under the LHWCA. In states with much lower state benefit levels, the proportion under the LHWCA is much higher.

Assessment rates differ between states and the LHWCA. The Special Fund assessment rates under the LHWCA are substantially higher than the states' assessment rates. The Special Fund assessments have also increased significantly during the past ten years, primarily driven by second injury claims which accounted for 87% of Special Fund expenditures in federal fiscal year 1987. The current Federal assessment rate of 31.2% is applied to indemnity payments and NCCI estimates that the impact is equivalent to a 24.2% rate on total losses. In 1979, the federal assessment rate was 4.3% but has been above 11% since 1982. In the reviewed state filings, state assessments ranged from 0% to 1.9% of total losses. The impact of assessments depends upon the proportions of affected losses which differ by state as well as the assessment rates.

Benefit levels differ between the State Acts and the LHWCA. The impact of the benefit level difference in each state also depends upon the proportion of losses affected.

In addition, some states mandate their own factor for loss adjustment expenses. Louisiana still has a payroll limitation.

QUESTION:

Is the current use of pure premium indicated by national relativity reasonable?

DISCUSSION:

A review of the documented formulas and methodology and state rate filings indicates that the approach is reasonable. NCCI derives a formula pure premium similar to that calculated for industrial classes. The major difference is the need to reflect the impact of the State Act as well as the LHWCA in the use of a pure premium indicated by national relativity.

CLASSIFICATION RATEMAKING

For a given state, there may be many 'F' classes with no or very low credibility for the state's indicated pure premium. For example, Michigan had only 4 of 16 classes with credibility above 10% in the latest rate filing. Maine had only 2 of 16 with credibility greater than 11%. Therefore, it is important to have some current indications to complement the pure premium underlying present rate. For most 'F' classes, the formula pure premium will be the average of the pure premiums from the national indication and the underlying rate with some relatively small adjustment for indicated state experience, if any.

To efficiently accommodate all of the individual state rate filings, NCCI first aggregates the experience for all states except Louisiana to produce interim pure premiums indicated by national relativity. These interim values contain federal losses brought to the appropriate federal level of benefits and assessments. Losses under each State Act are converted from their state's benefit level to the federal benefit level.

Then, a state's national pure premiums are calculated. The interim national pure premiums are multiplied by factors to reflect the specific impact of losses under the State Act. Conversion addresses state benefit levels, state assessments, the state's loss adjustment factor, and state payroll limitation.

QUESTION:

Should there be provision for trend?

DISCUSSION:

We believe that there should be provision for trend in the 'F' class rate calculations. Medical inflation continues and medical benefits have been increasing as a proportion of total benefits. Indemnity trends should be investigated. The NCCI had already targeted the inclusion of trend as a task to be addressed for the new cycle of rate filings to be completed for 1992.

The 1990 'F' class rate filings incorporated no provision for trend. NCCI concluded that the WCSP trend indications were distorted by major statutory changes in 1984, and the search for alternative sources was postponed because more emphasis was placed on rate filings for the industrial classes. The 1984 changes included capping of the rate of escalation for the first time and elimination of survivorship benefits for spouses of permanent total claimants.

CLASSIFICATION RATEMAKING

It should be noted that beginning in 1990, NCCI reinstated annual 'F' class rate filings after developing a new 'F' class ratemaking system. There had been only one set of 'F' class rate filings between 1984 and 1989 which was the period during which NCCI moved to the Florida location and resources were needed for industrial class ratemaking.

We believe that the 'F' class financial calls can provide some insight into at least the medical trends. NCCI has considered the 'F' class financial calls to be unusable for ratemaking because of data quality problems but we understand that the greatest problem has been with the reported standard premium. Trend indications based upon reported losses will at least permit some evaluation of the use of medical trends for industrial classes in a state. We understand that NCCI is investigating the use of 'F' class financial call data as well as seeking other sources.

QUESTION:

Is the NCCI seeking an alternative source for loss development factors from the fifth report to ultimate?

DISCUSSION:

NCCI is seeking a source of loss development factors from the fifth report to ultimate. In the latest 'F' class rate filings, experience from the District of Columbia's Workers' Compensation Act (DCCA) was used to provide the loss development factors after the fifth report. However, the benefit levels under DCCA ceased to be the same as the benefit levels for the LHWCA in 1982.

We understand that NCCI is investigating the use of 'F' class financial call data and seeking other sources. We believe that the 'F' class financial calls can provide some insight into loss development patterns to at least permit some evaluation of the use of loss development factors derived from industrial class experience in a state.

APPENDIX E

CLASSIFICATION RATEMAKING

Appendix E

Subdivision of the "All Other" Industry Group

As indicated in part VII of this section of this examination report, our analysis of the "All Other" industry group indicated that this industry group could be further subdivided to increase homogeneity and yet with each subgroup having substantial experience. Specifically, an example was discussed showing that the current "All Other" industry group could be divided into an "Office Employees" industry group and an "All Other - Excluding Office Employees" industry group. Exhibits E-1 through E-3 present the first twenty, ranked by payroll volume, of the classes that remain after the exclusion of the "Office Employees" class from the "All Other" industry group. Also shown for informational purposes are the losses corresponding to these classes.

NCCI
TOP TWENTY MAINE PAYROLL CLASSES WITHIN
THE "ALL OTHER" INDUSTRY GROUP
 (Excluding Office Employees)

	(1) Payroll (millions)	(2) Losses (millions)
1. 8868 - Colleges or Schools Professional Employees	\$1,159	\$6.4
2. 8742 - Salesmen, Collectors or Messengers Outside	845	8.4
3. 9079 - Restaurants	490	16.9
4. 8833 - Hospitals Professional Employees	478	10.4
5. 8832 - Physicians Include Clerical	300	2.0
6. 8829 - Convalescent or Nursing Homes - All Employees	275	22.0
7. 8017 - Store Risks Retail N.O.C.	259	4.4
8. 8380 - Automobile Service or Repair Center & Drivers	242	10.7
9. 7219 - Truckmen N.O.C.	237	34.2
10. 8820 - Attorney - All Employees & Clerical, Messengers, Drivers	192	1.1
11. 8033 - Meat Combined Grocery and Provision Stores Retail	165	5.6
12. 8008 - Clothing or Dry Goods Retail	153	2.0
13. 7380 - Chaffeurs Drivers and Their Helpers N.O.C.	151	14.0
14. 9101 - Colleges or Schools - All Other Employees	136	6.4
15. 9052 - Hotels	134	5.3
16. 8039 - Department Stores Retail	125	3.2
17. 8232 - Lumber Yards No Second Hand All Other Employees	109	10.3
18. 8601 - Engineers or Architects Consulting	104	1.4
19. 8010 - Hardware Stores	104	1.6
20. 7539 - Electric Light or Power Companies N.O.C.	102	2.4

NOTES:

- For comparison purposes, the Office Employees class payroll is \$3,682 million, and the corresponding losses are \$23.3 million; the Contracting industry group's payroll is \$1,478 million, and the corresponding losses are \$204.4 million.
- Columns (1) and (2) include policy years 1985, 1986 and 1987.

NCCI
TOP TWENTY MICHIGAN PAYROLL CLASSES WITHIN
THE "ALL OTHER" INDUSTRY GROUP
 (Excluding Office Employees)

	(1) Payroll (millions)	(2) Losses (millions)
1. 8742 – Salespersons, Collectors or Messengers Outside	\$8,780	\$33.5
2. 8868 – Colleges or Schools Professional Employees	3,879	8.1
3. 9079 – Restaurants	3,036	58.4
4. 8832 – Physicians Include Clerical	2,668	6.1
5. 8017 – Store Risks Retail N.O.C.	2,014	24.0
6. 7380 – Chaffeurs Drivers and Their Helpers N.O.C.	1,957	91.4
7. 8033 – Meat Combined Grocery and Provision Stores Retail	1,401	40.8
8. 8395 – Automobile Repair Facility	1,376	41.6
9. 9015 – Buildings N.O.C. Operation by Owner or Lessee	1,033	36.5
10. 8008 – Clothing or Dry Goods Stores Retail	958	8.7
11. 8820 – Attorney – All Employees & Clerical, Messengers, Drivers	923	3.1
12. 8010 – Hardware Stores	890	12.3
13. 8803 – Traveling Auditors, Accountants or Office Systematizers	685	1.1
14. 5191 – Office Machine or Appliance Installation	646	7.1
15. 7208 – Drivers – Trucking – N.O.C.	623	53.9
16. 8387 – Auto Accessories Service Stations	542	16.8
17. 8748 – Automobile Salespersons	530	2.8
18. 8833 – Hospitals Professional Employees	522	5.2
19. 8039 – Department Stores Retail	509	5.9
20. 8018 – Store Risks Wholesale or Combined N.O.C.	472	21.5

NOTES:

- For comparison purposes, the Office Employees class payroll is \$32,056 million, and the corresponding losses are \$68.3 million; the Contracting industry group's payroll is \$6,743 million, and the corresponding losses are \$427.3 million.
- Columns (1) and (2) include policy years 1985, 1986 and 1987.

NCCI
TOP TWENTY PENNSYLVANIA PAYROLL CLASSES WITHIN
THE "ALL OTHER" INDUSTRY GROUP
 (Excluding Office Employees)

	(1) Payroll <u>(millions)</u>	(2) Losses <u>(millions)</u>
1. 965 - Colleges and Schools	\$25,008	\$101.4
2. 951 - Salesmen	22,003	100.7
3. 961 - Hospitals	13,716	126.7
4. 957 - Physician or Dentist	7,436	19.8
5. 975 - Restaurants	6,719	109.3
6. 917 - Grocery Stores	4,708	123.6
7. 928 - Retail Stores, N.O.C.	3,417	37.2
8. 956 - Attorneys	3,184	3.4
9. 818 - Automobile Dealers	2,934	54.8
10. 914 - Department Stores	2,888	31.8
11. 811 - Truckmen	2,847	239.2
12. 960 - Nursing Homes - Skilled	2,784	117.4
13. 955 - Consulting Engineers	2,442	8.2
14. 971 - Buildings	2,317	69.4
15. 916 - Dry Goods Stores	2,128	18.7
16. 815 - Automobile Service Centers	1,876	43.7
17. 819 - Automobile Salesmen	1,762	9.5
18. 924 - Wholesale Stores, N.O.C.	1,534	47.1
19. 980 - Cities, Towns	1,465	51.5
20. 927 - Drugstores	1,448	8.2

NOTES:

- For comparison purposes, the Office Employees class payroll is \$81,801 million, and the corresponding losses are \$174.3 million; the Contracting industry group's payroll is \$18,798 million, and the corresponding losses are \$886.6 million.
- Columns (1) and (2) include manual years 1983 through 1987.

APPENDIX F

CLASSIFICATION RATEMAKING

Appendix F

Summaries of Differences Between Current and Alternative Methods

This appendix contains a series of charts that summarize the differences in final rates between the current NCCI methodology and the specified alternatives considered in this examination. Each chart contains two graphs and three summary statistics while the first is a summary of the states and policy years for which alternate rates were calculated.

The horizontal, or "x" axis of the charts represents various ranges of percent differences between the current and the indicated alternative method, calculated as:

$$\frac{R_{ij}^2 - R_{ij}^1}{R_{ij}^1}$$

Here R_{ij}^1 denotes the final rate for class i in state j using the current NCCI methodology

and R_{ij}^2 denotes the final rate for the same class and state but using the specified alternative methodology.

The bar graph, which is enumerated using the left vertical axis, shows the number of classes having differences in the indicated range. The line graph, which is enumerated using the right vertical axis, shows the total premium volume of those classes. This premium volume is expressed as the rate using the current NCCI methodology times the payroll in the class for the most recent year used in calculating the classification rates.

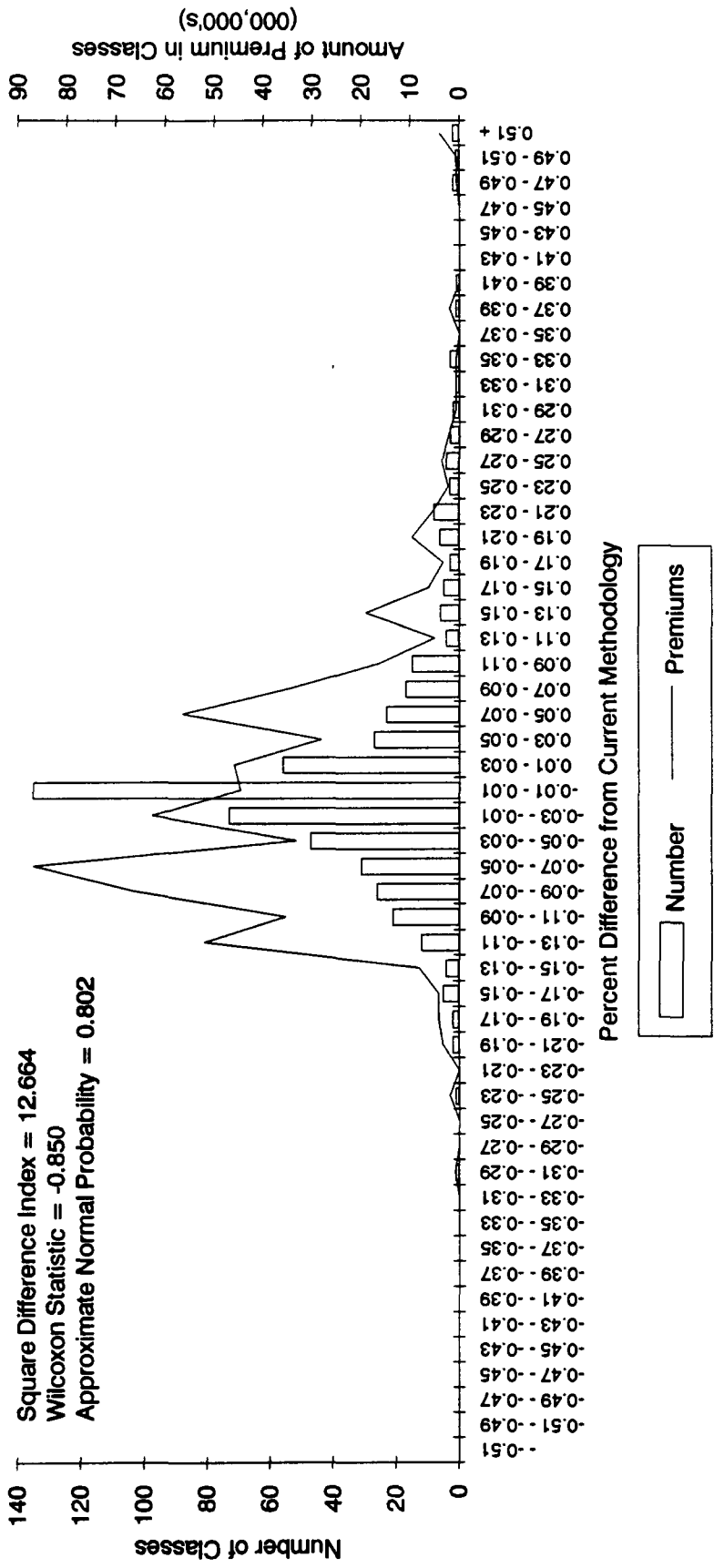
The three numbers indicated in each graph indicate the square difference index as described in part IV of this section of this examination report, the Wilcoxon Statistic used to test the significance of differences on a class by class basis and an approximate normal probability corresponding to that statistic. Discussions of this statistic can also be found in part IV.

CLASSIFICATION RATEMAKING

Briefly, if the value of the Wilcoxon Statistic shown in the graphs is close to zero, differences between final rates by class would not be viewed as significantly different than zero. Statistics with large absolute values may indicate significant differences. In terms of the approximate normal probabilities, probabilities close to 50% indicate little significance while values close to 0% or 100% indicate significant difference.

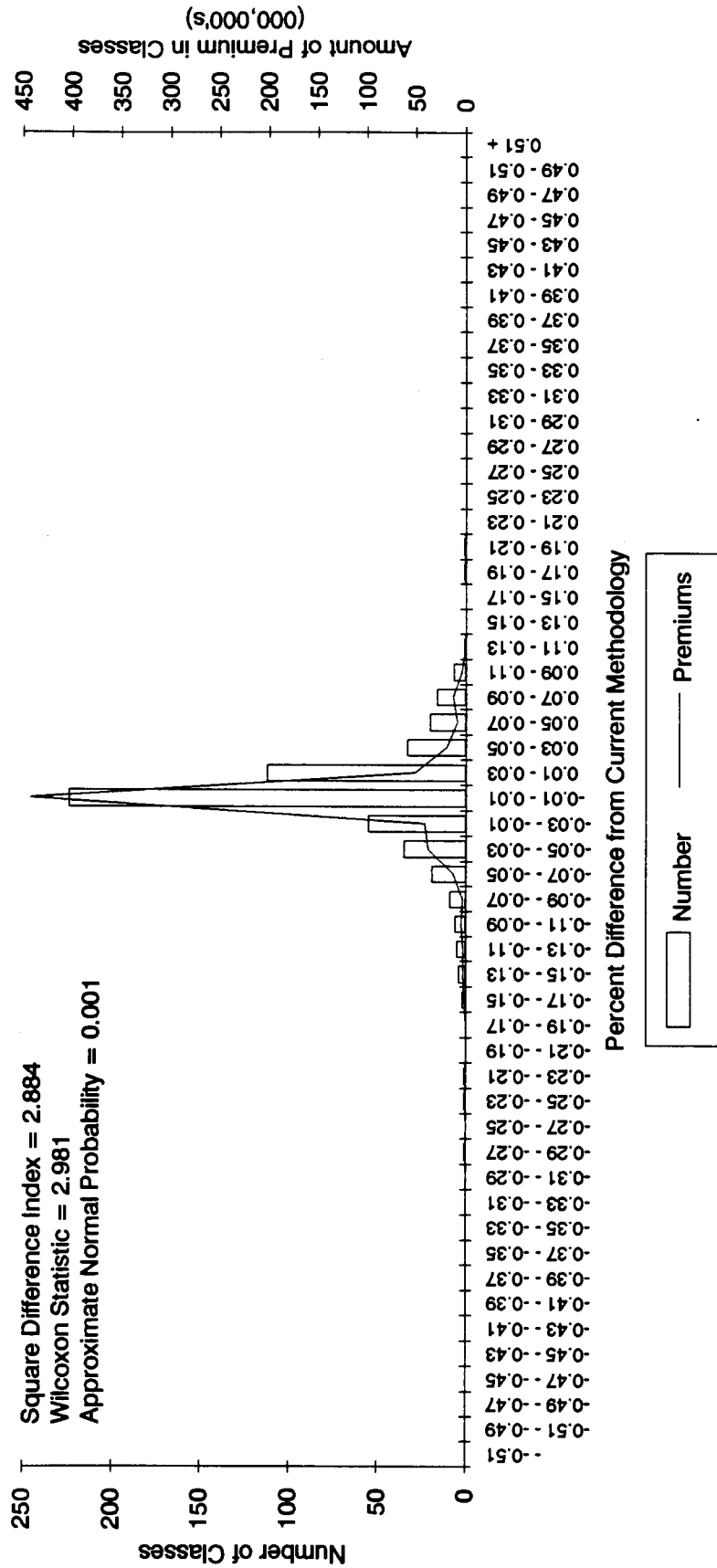
The significance of the difference is measured by how close to 0% or 100% the probabilities are. For example, probabilities of less than 5% or greater than 95% would indicate differences significant at approximately the 95% confidence level.

Colorado, 1987 Revision
Five Years of Data

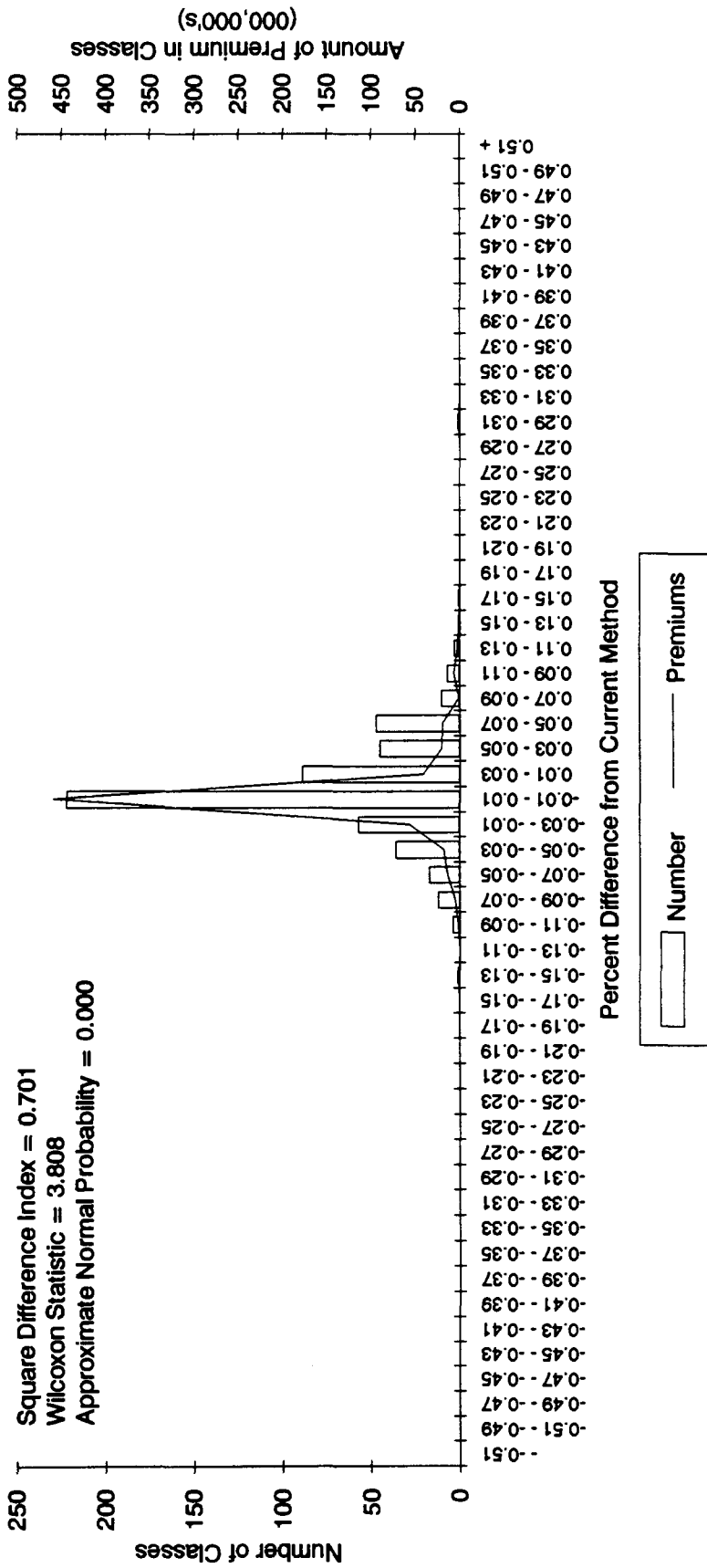


Colorado, 1987 Revision
Payroll Based Credibility

Square Difference Index = 2.884
Wilcoxon Statistic = 2.981
Approximate Normal Probability = 0.001

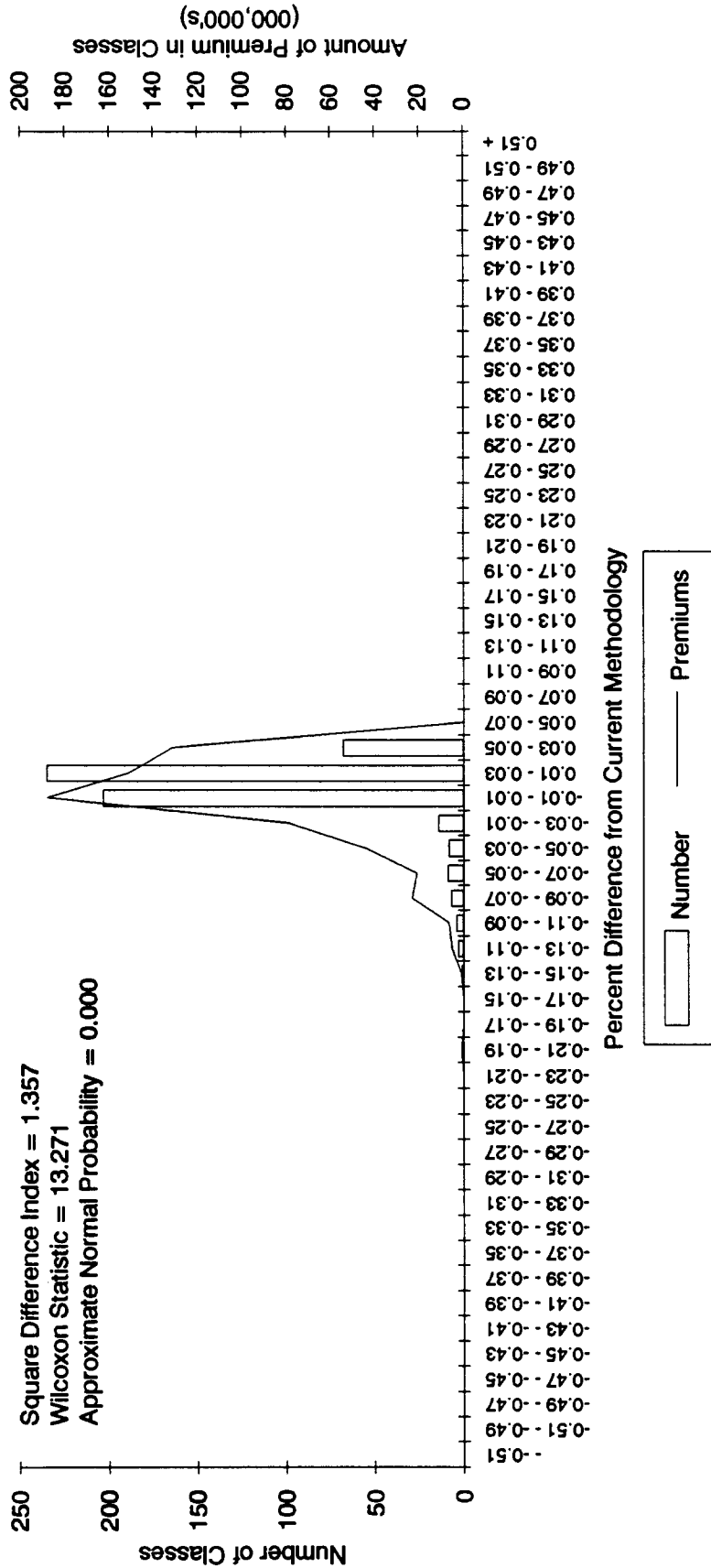


Colorado, 1987 Revision
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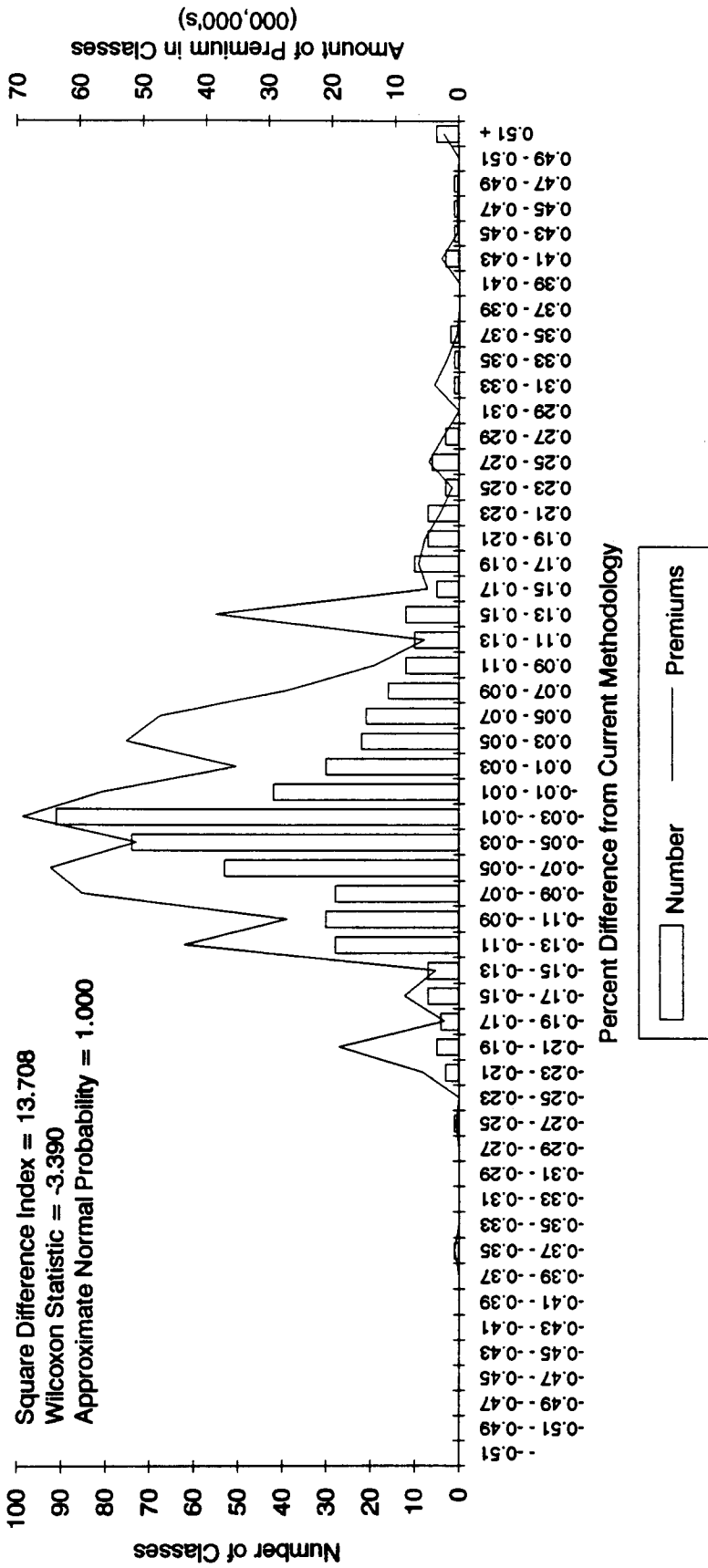


Colorado, 1987 Revision
Half Current Loss Limitation

Square Difference Index = 1.357
Wilcoxon Statistic = 13.271
Approximate Normal Probability = 0.000

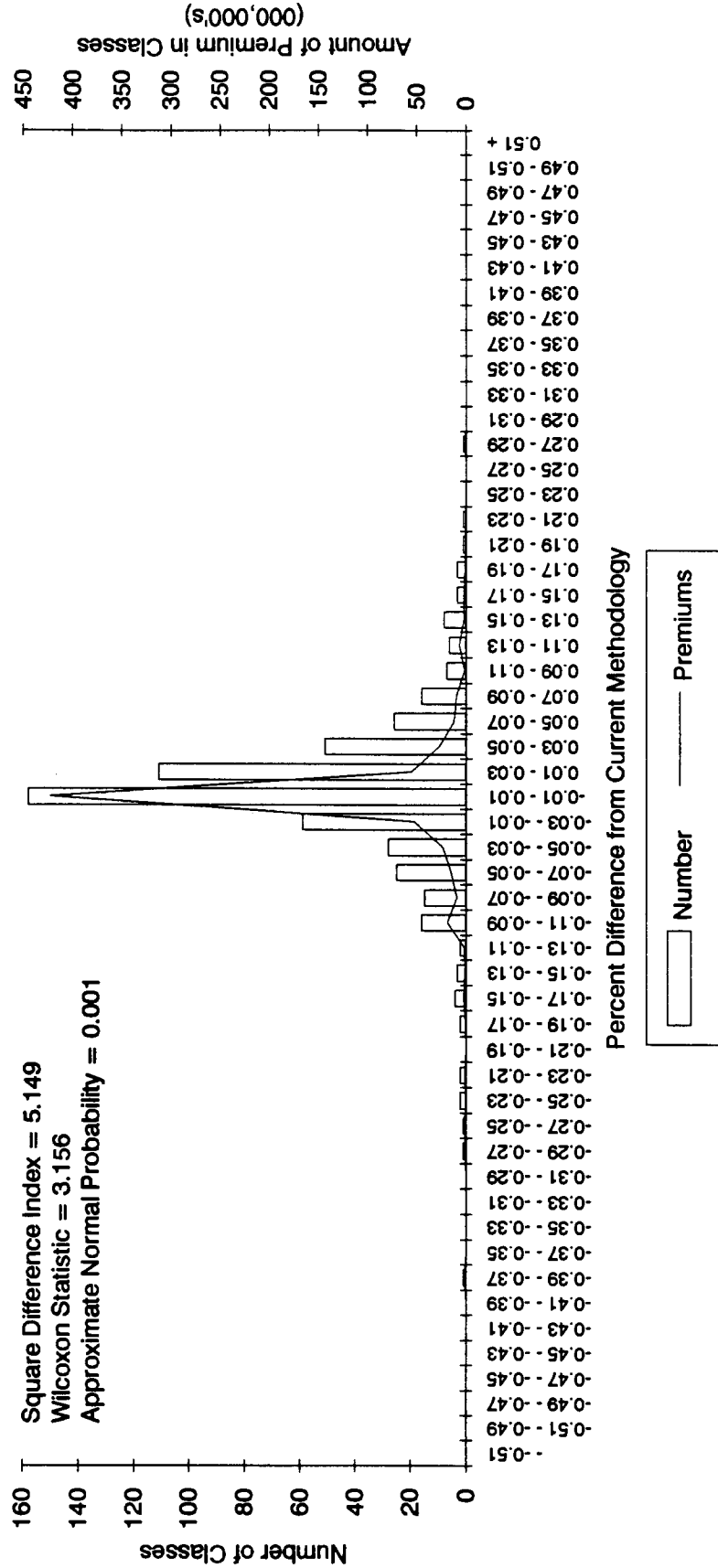


Colorado, 1988 Revision
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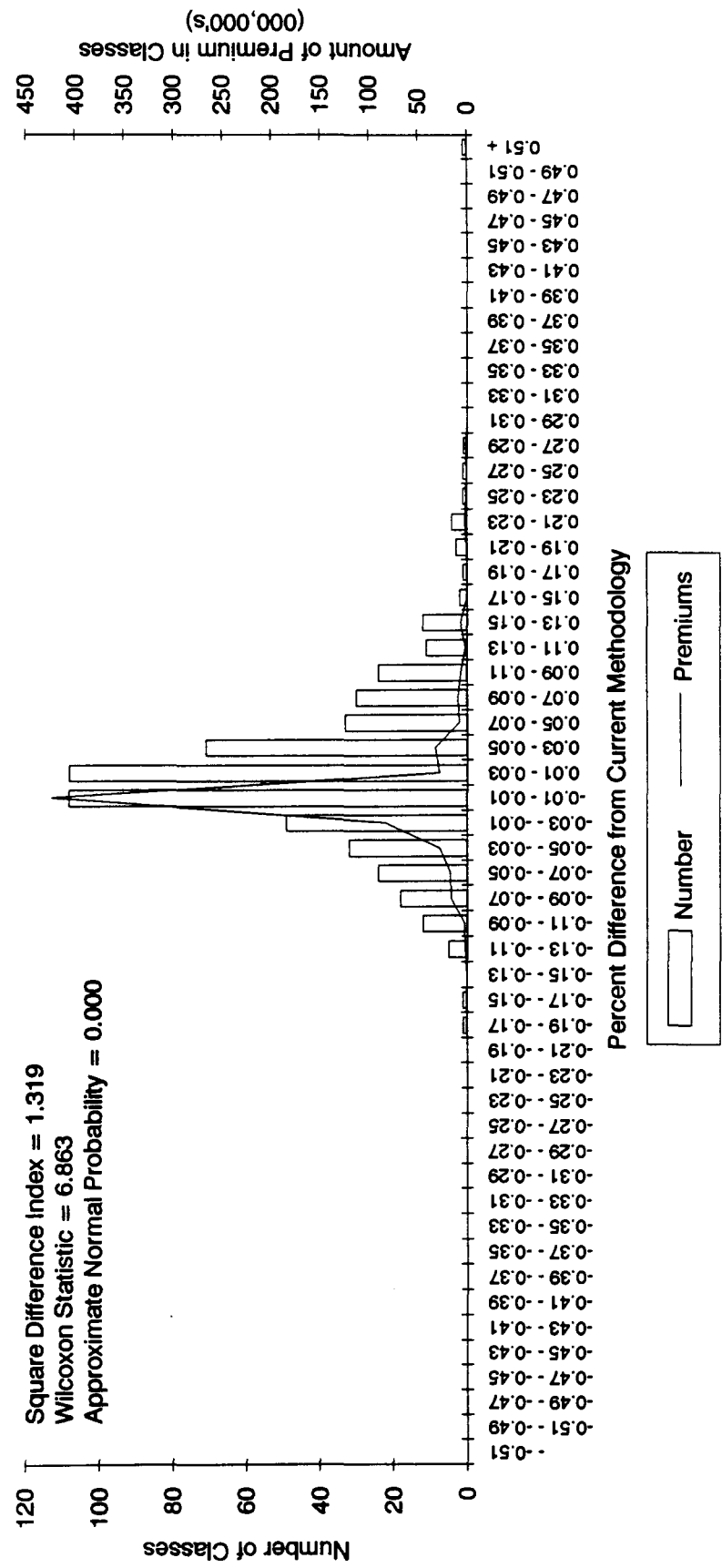


Colorado, 1988 Revision
Payroll Based Credibility

Square Difference Index = 5.149
Wilcoxon Statistic = 3.156
Approximate Normal Probability = 0.001

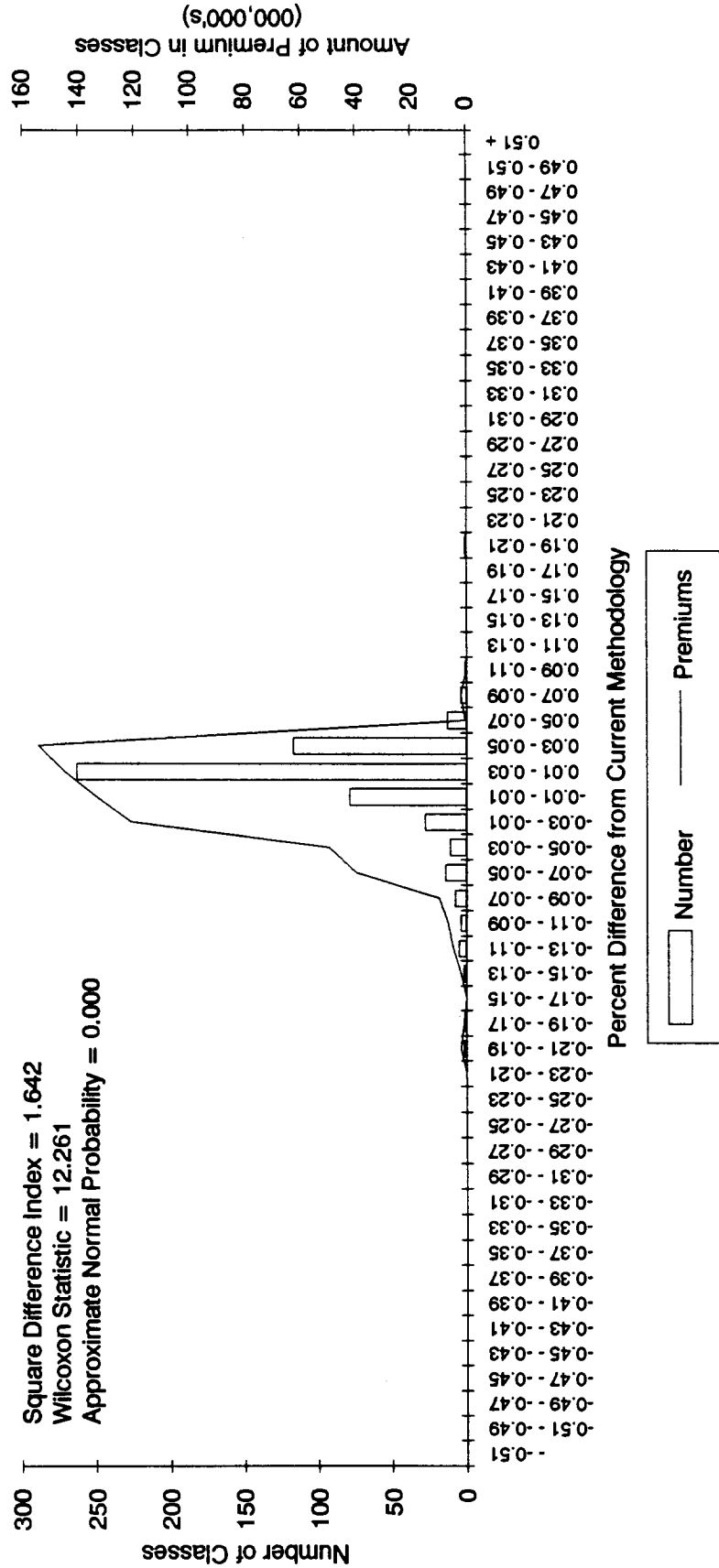


**Colorado, 1988 Revision
Double Full Credibility Standard**

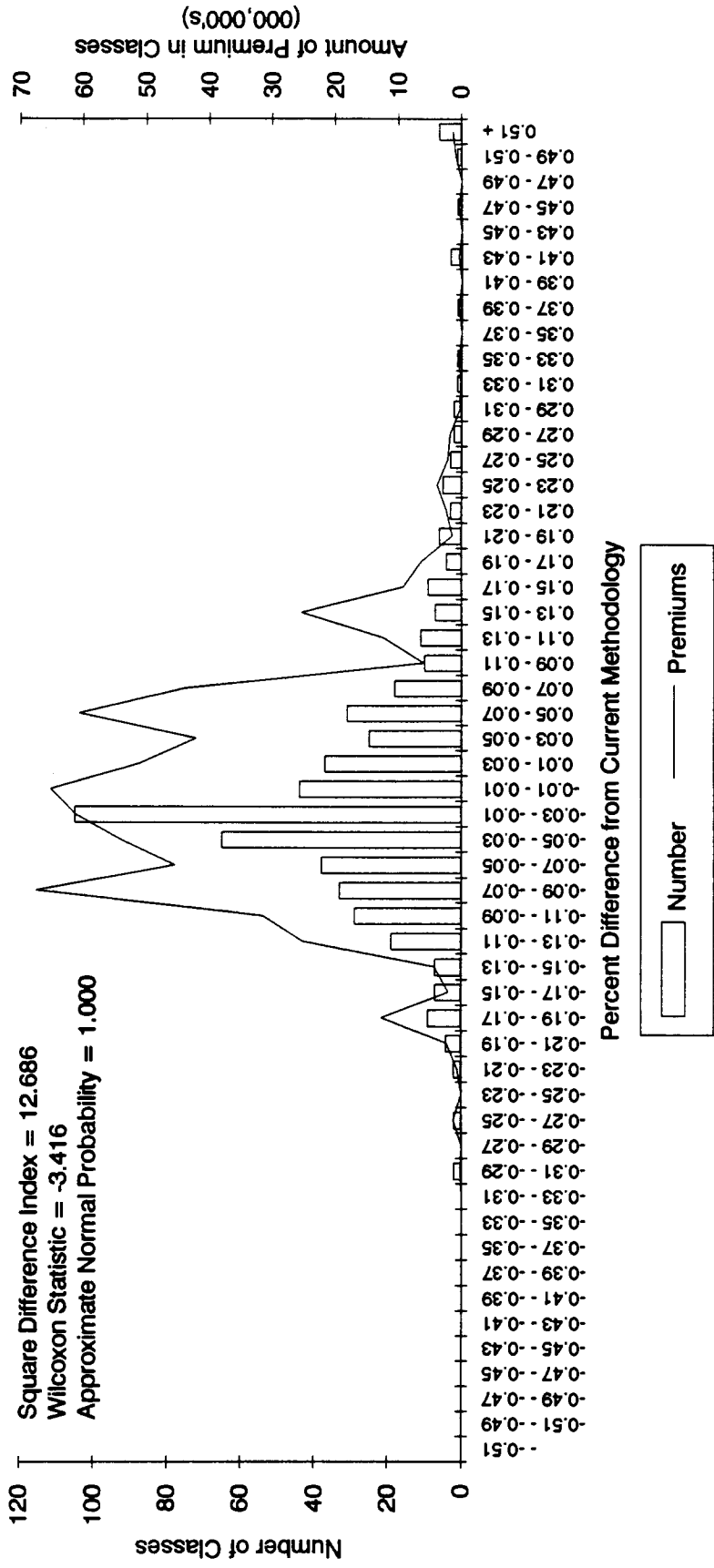


Colorado, 1988 Revision
Half Current Loss Limitation

Square Difference Index = 1.642
Wilcoxon Statistic = 12.261
Approximate Normal Probability = 0.000

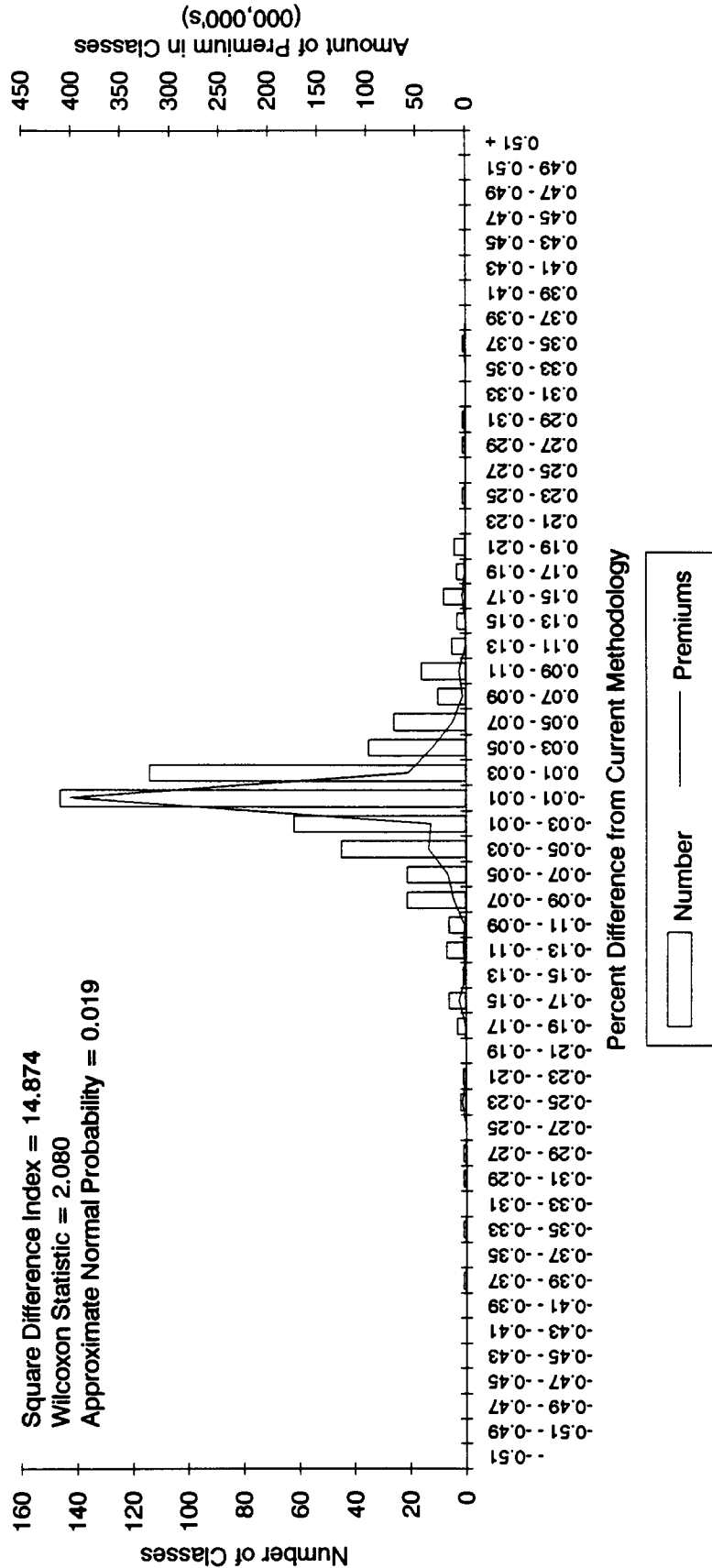


Colorado, 1989 Revision
Five Years of Data

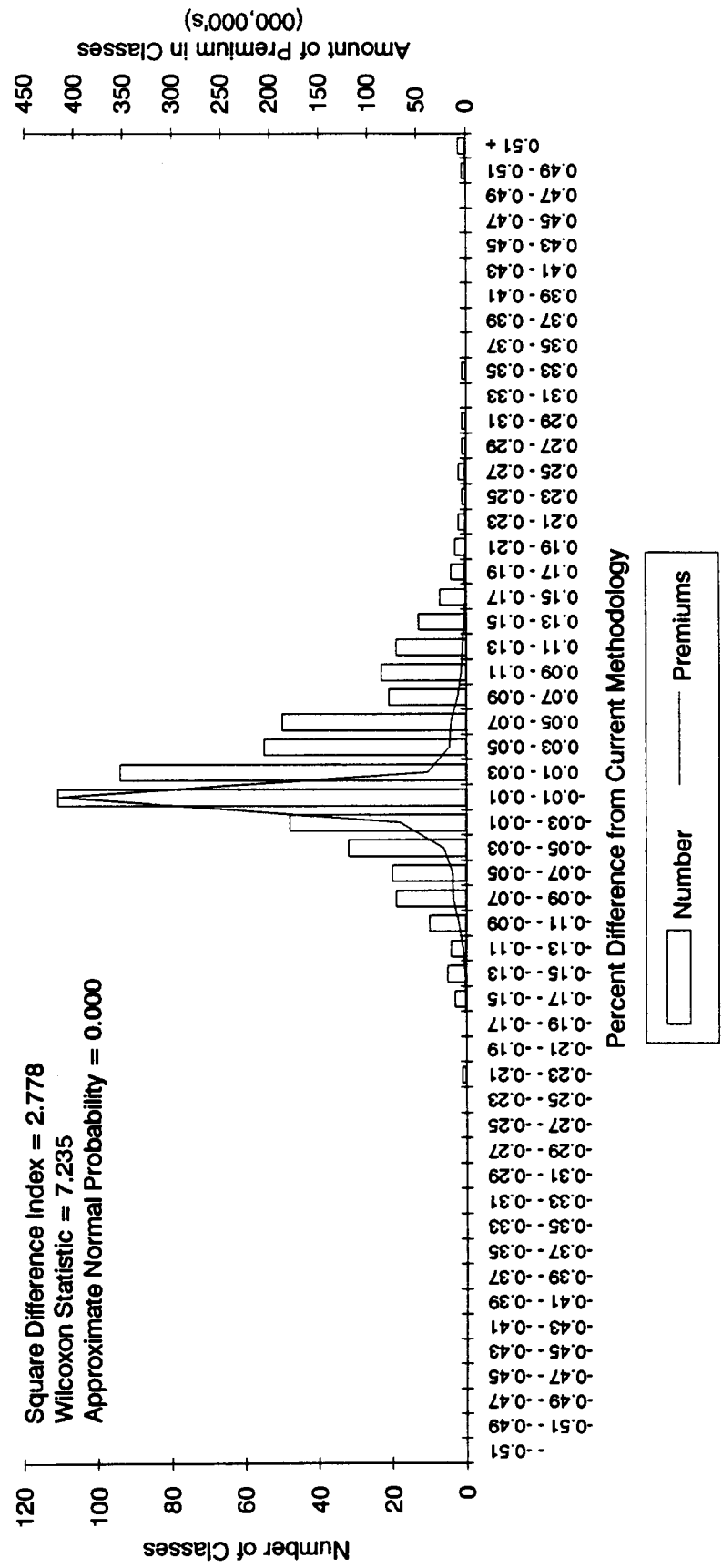


Colorado, 1989 Revision
Payroll Based Credibility

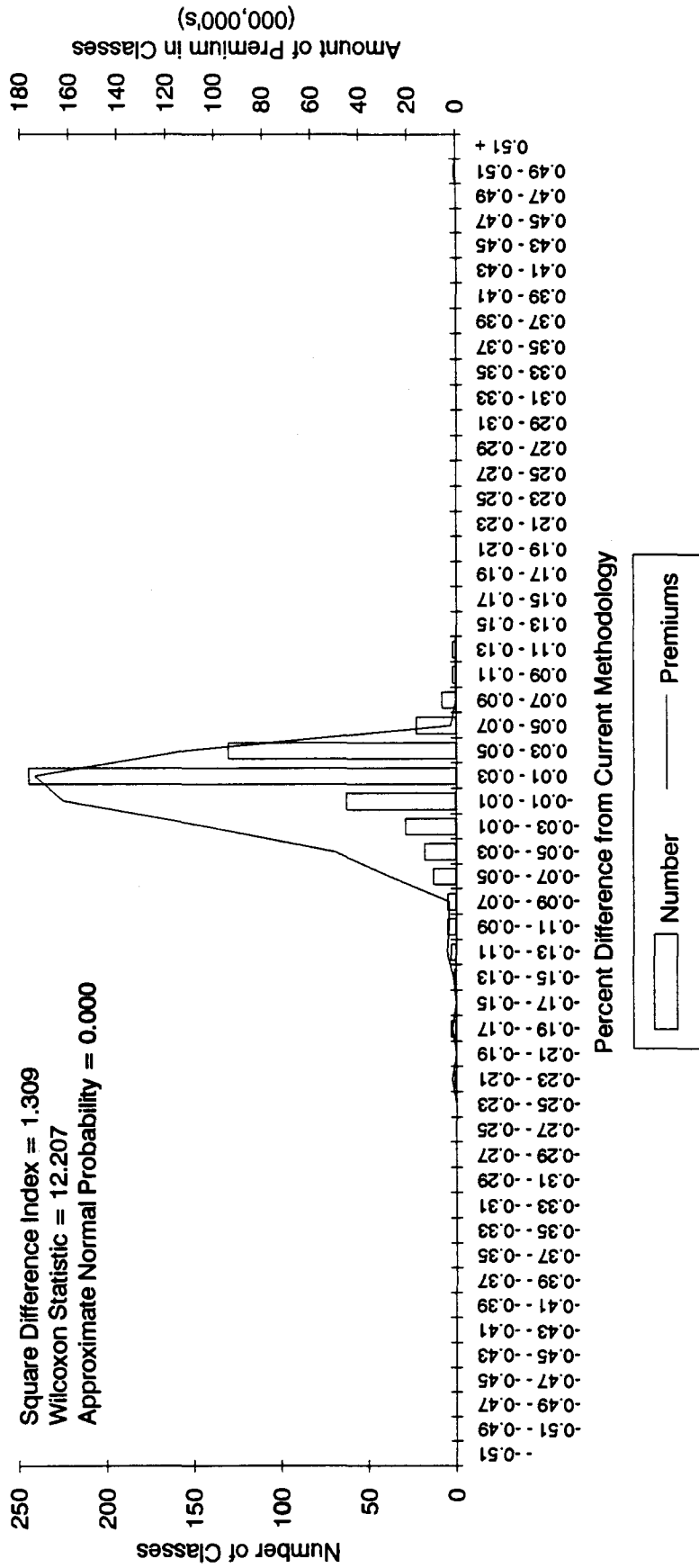
Square Difference Index = 14.874
 Wilcoxon Statistic = 2.080
 Approximate Normal Probability = 0.019



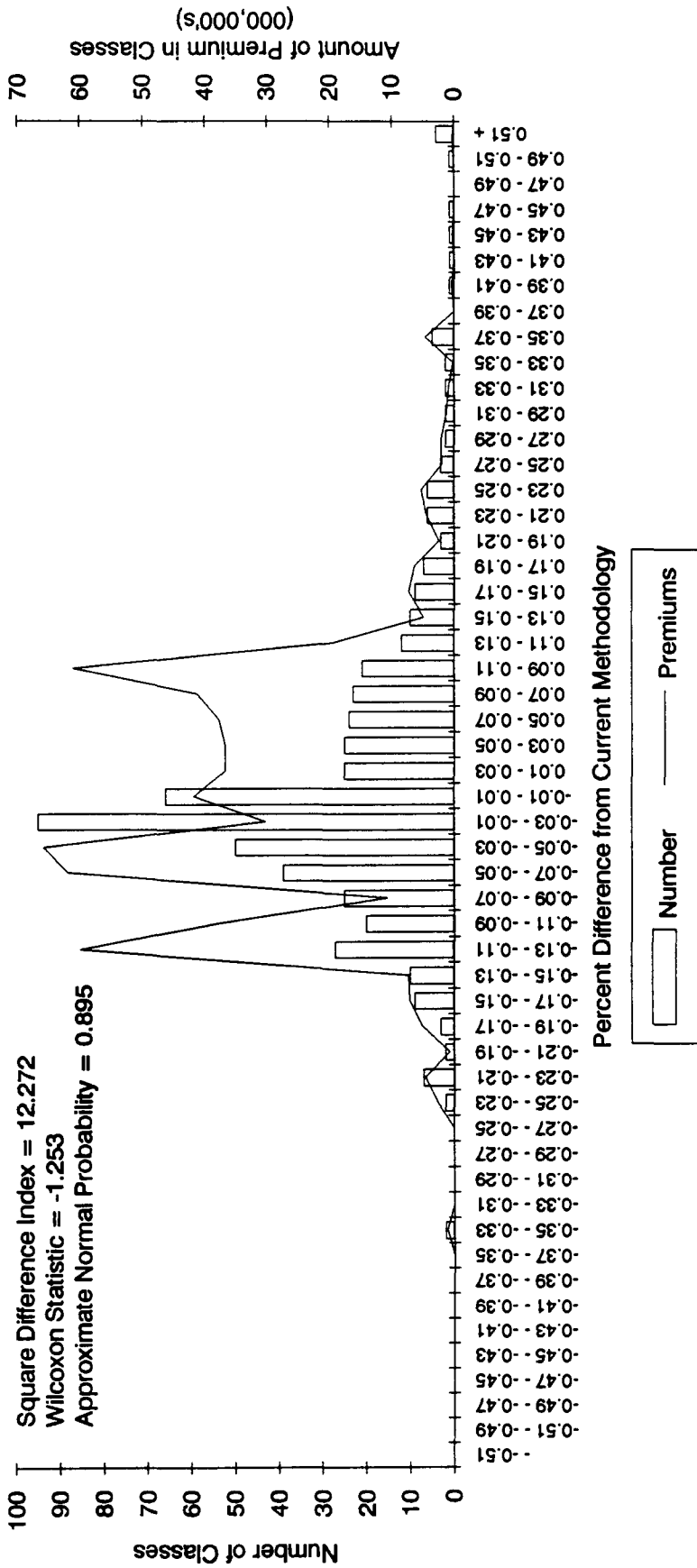
**Colorado, 1989 Revision
Double Full Credibility Standard**



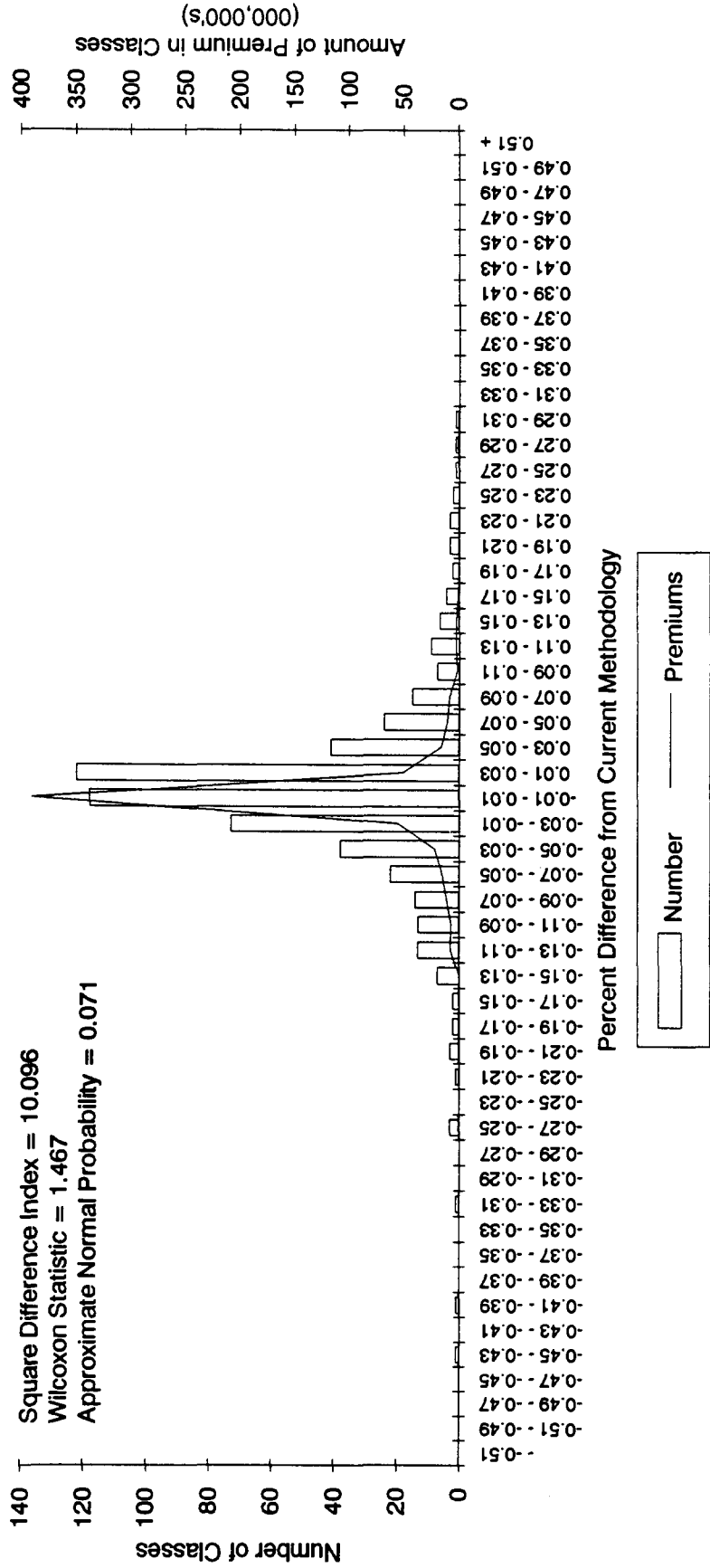
Colorado, 1989 Revision
Half Current Loss Limitation



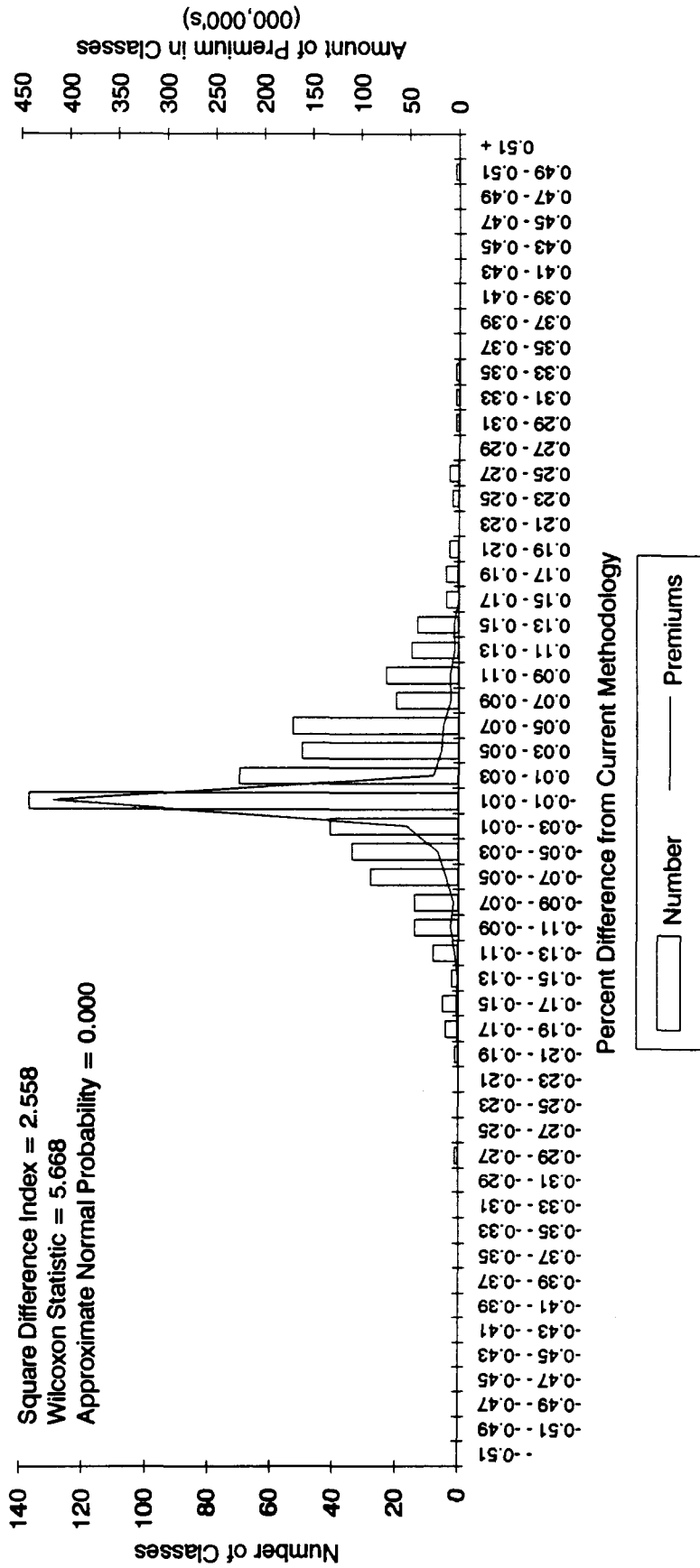
Colorado, 1990 Revision
Five Years of Data



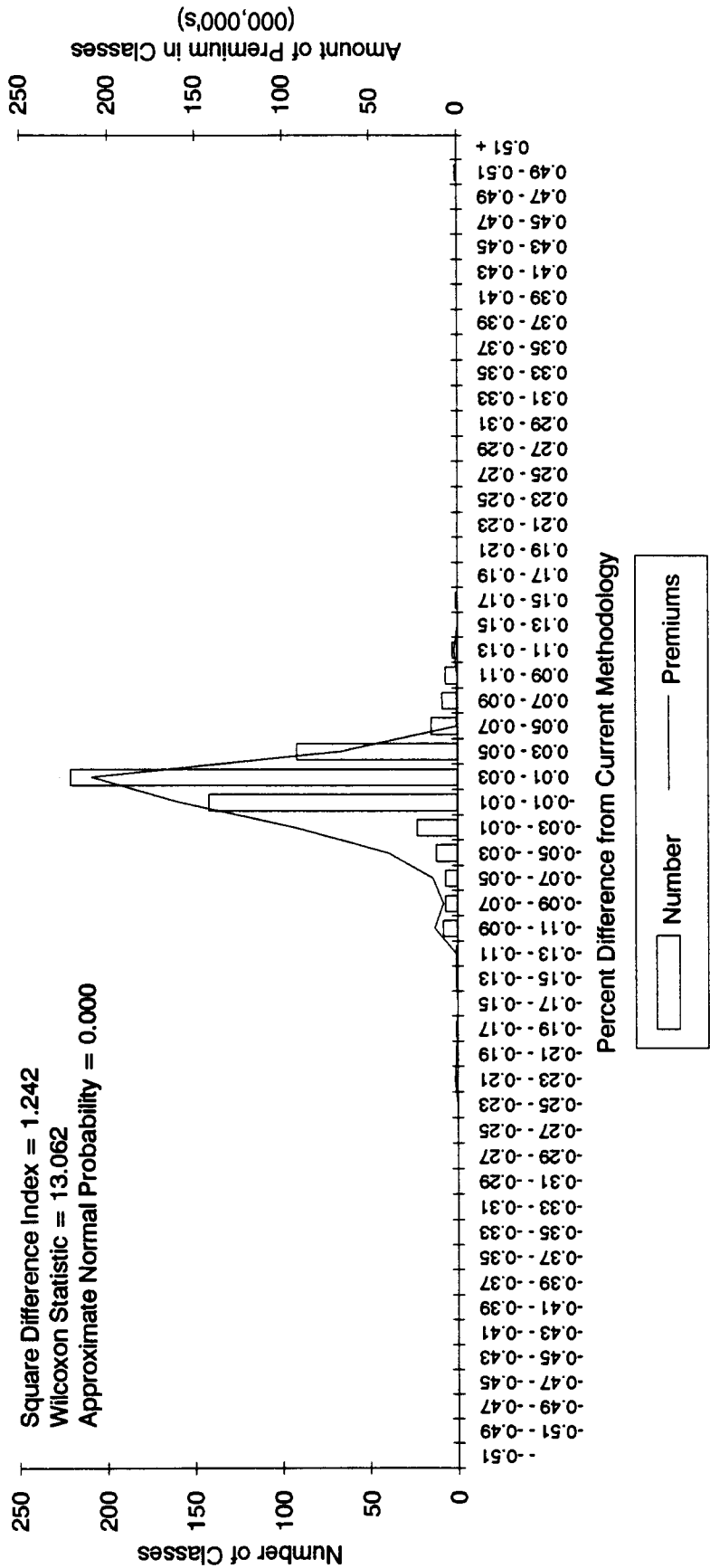
Colorado, 1990 Revision
Payroll Based Credibility



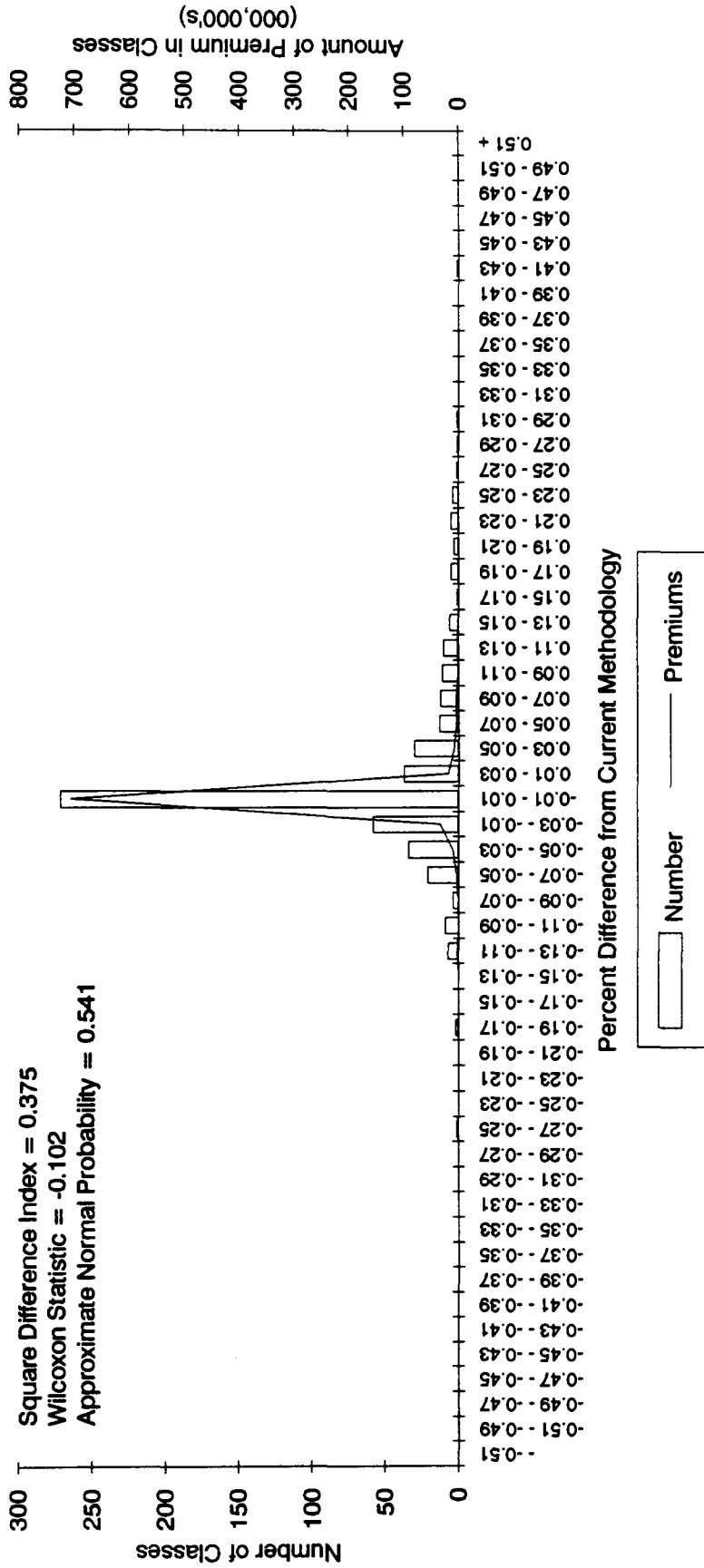
Colorado, 1990 Revision
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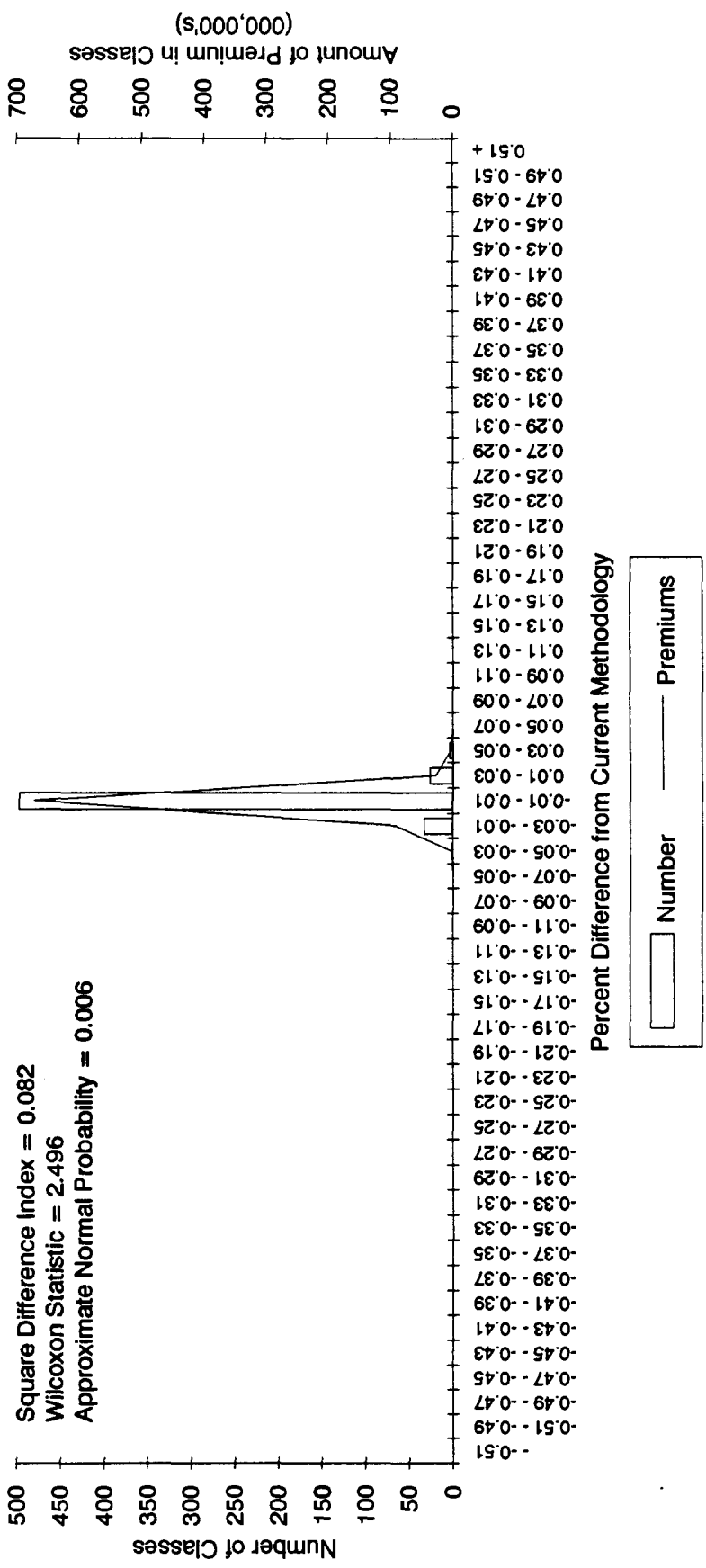
Colorado, 1990 Revision
Half Current Loss Limitation



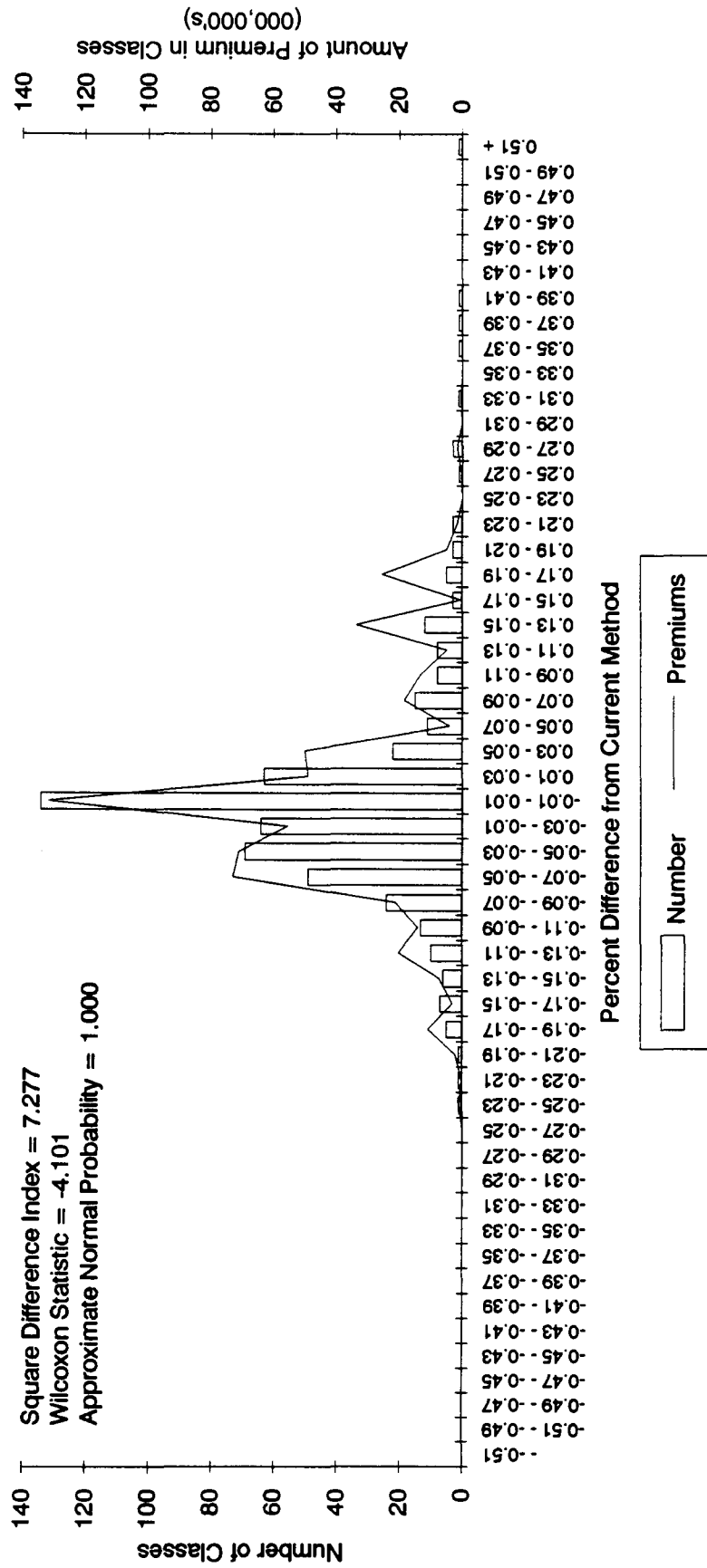
**Colorado, 1990 Revision
Alternate Regional Pure Premiums**



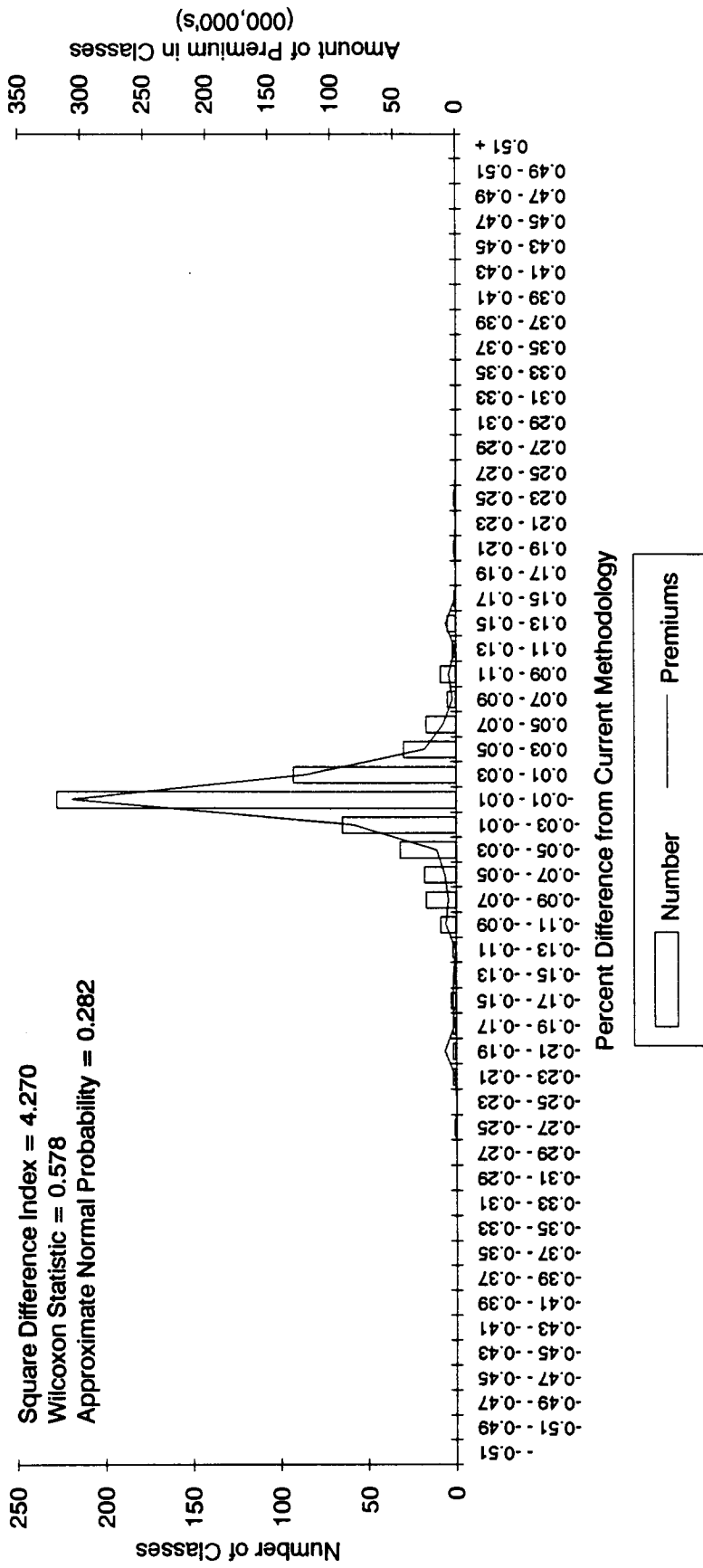
Colorado, 1990 Revision
Alternate Trend Application



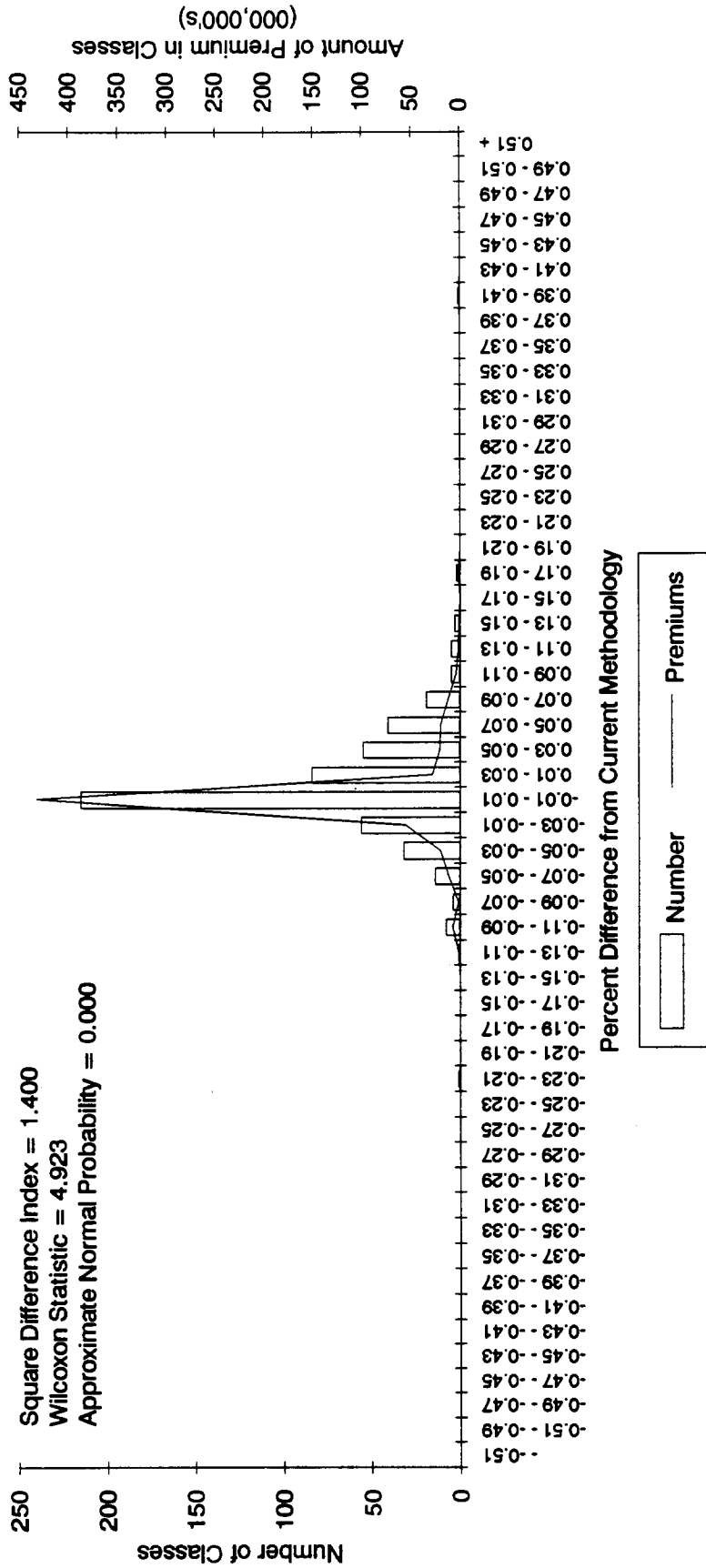
Connecticut, 1987 Revision
Five Years of Data



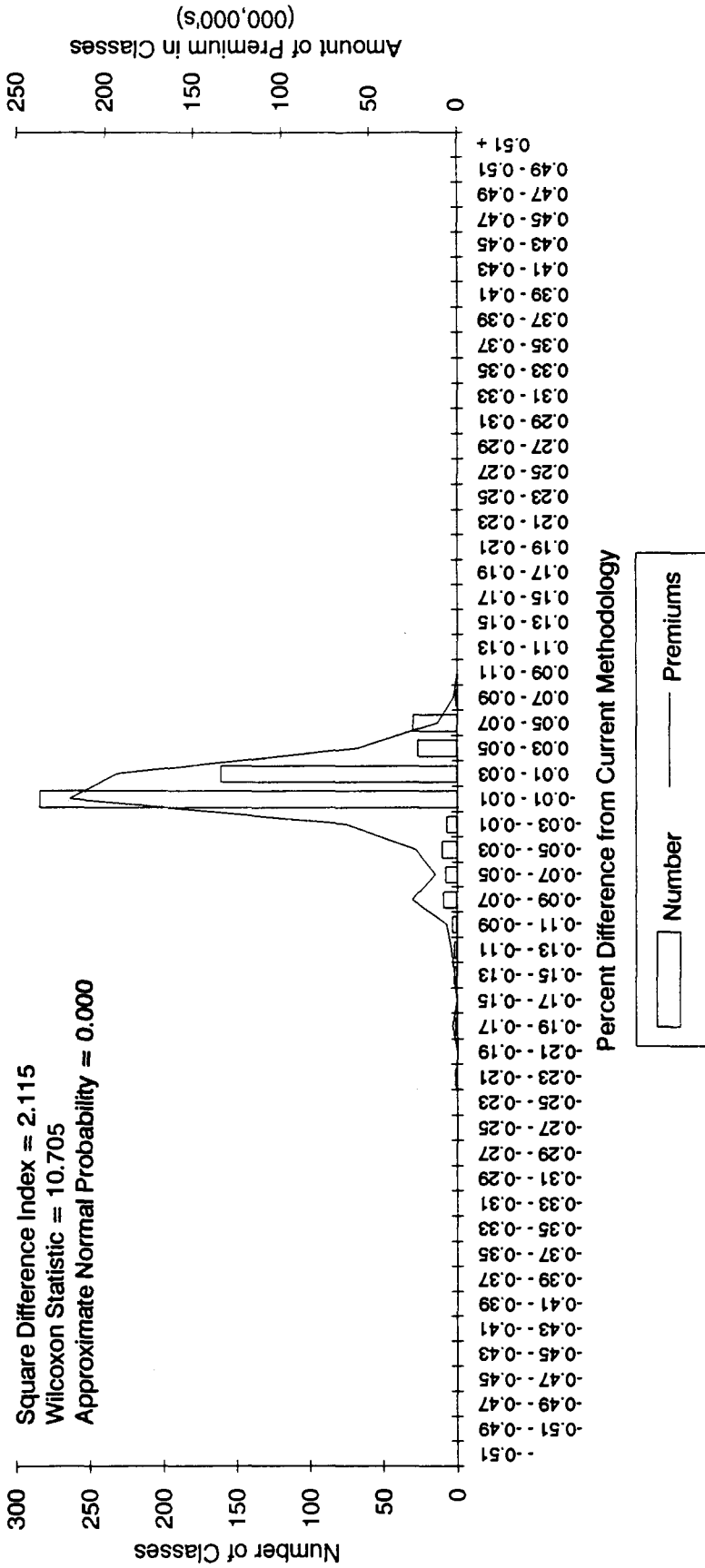
Connecticut, 1987 Revision
Payroll Based Credibility



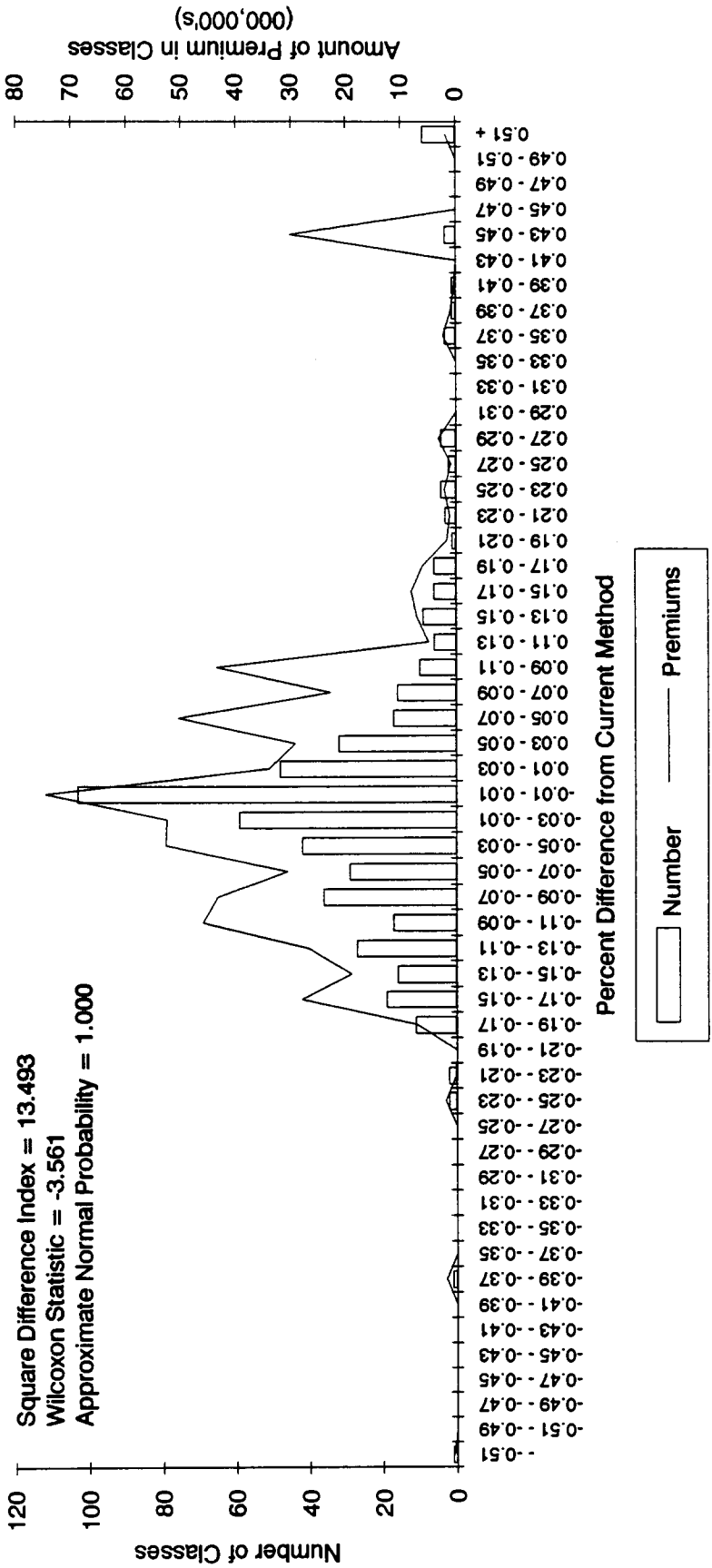
**Connecticut, 1987 Revision
Double Full Credibility Standard**



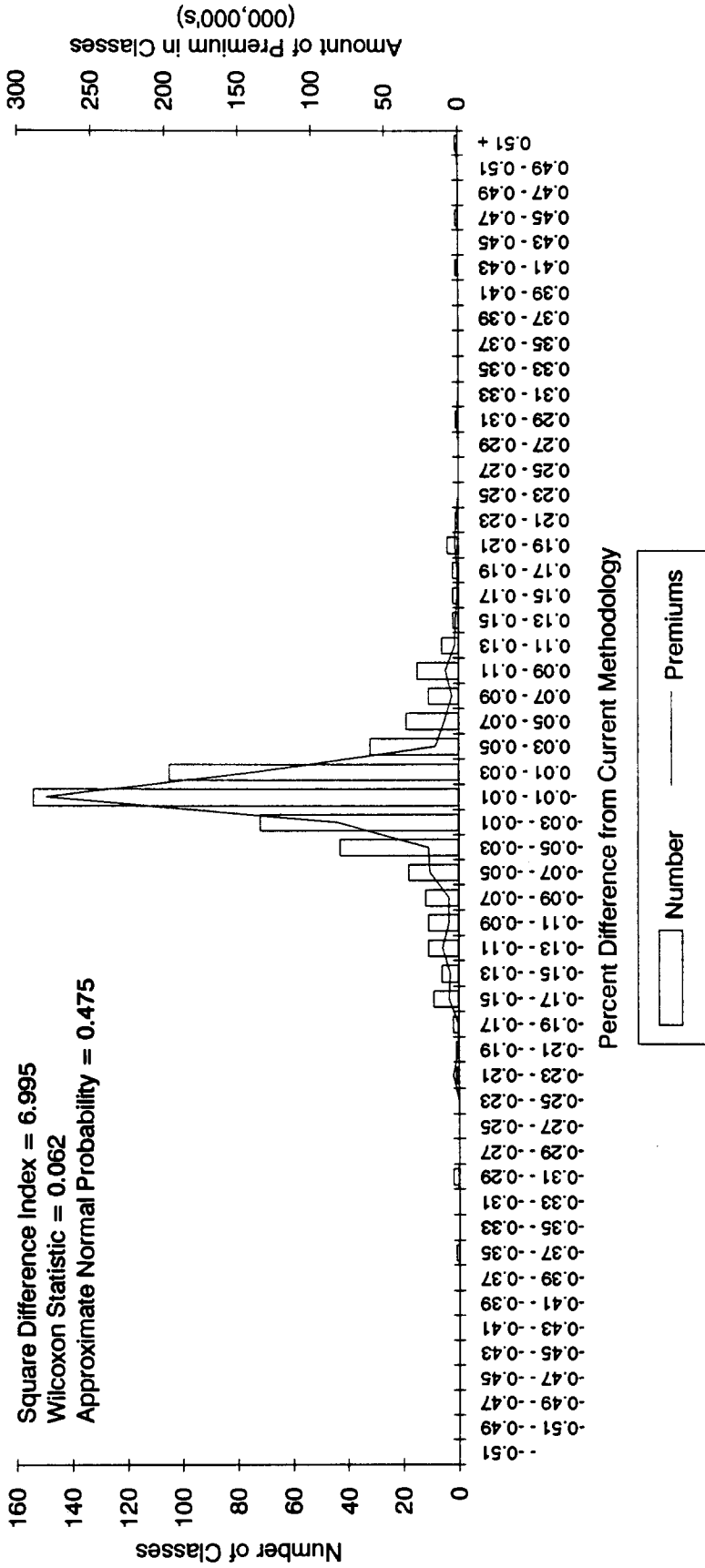
Connecticut, 1987 Revision
Half Current Loss Limitation



**Connecticut, 1988 Revision
Five Years of Data**

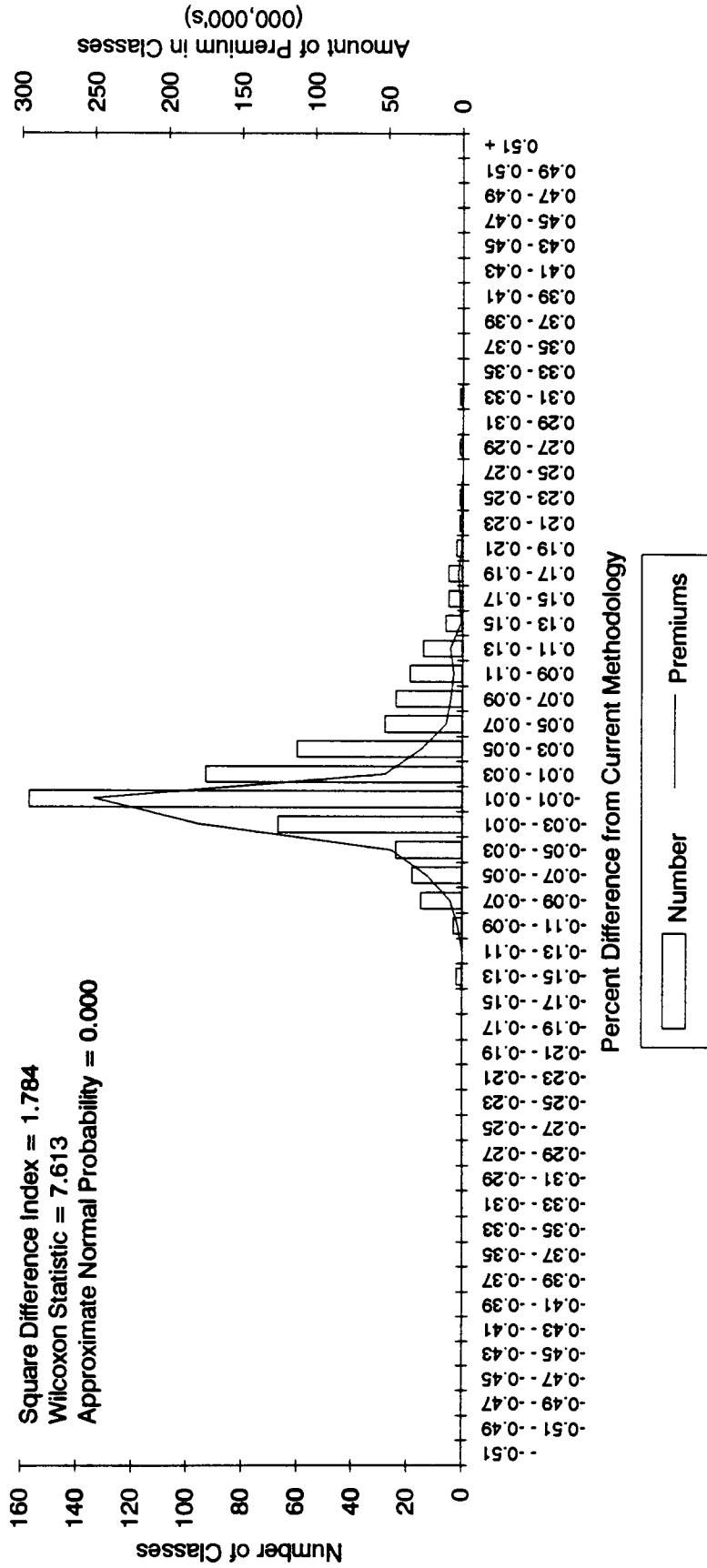


**Connecticut, 1988 Revision
Payroll Based Credibility**



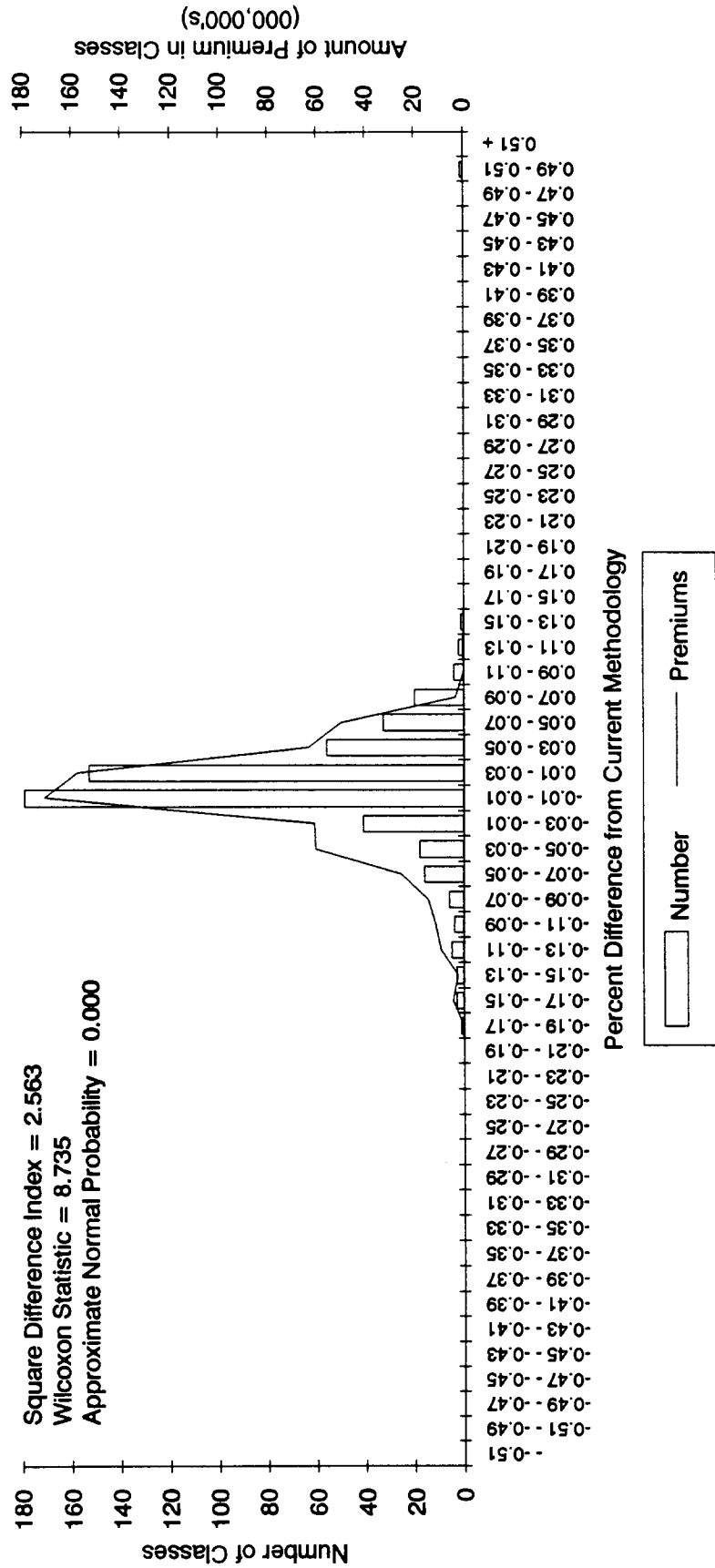
**Connecticut, 1988 Revision
Double Full Credibility Standard**

Square Difference Index = 1.784
 Wilcoxon Statistic = 7.613
 Approximate Normal Probability = 0.000

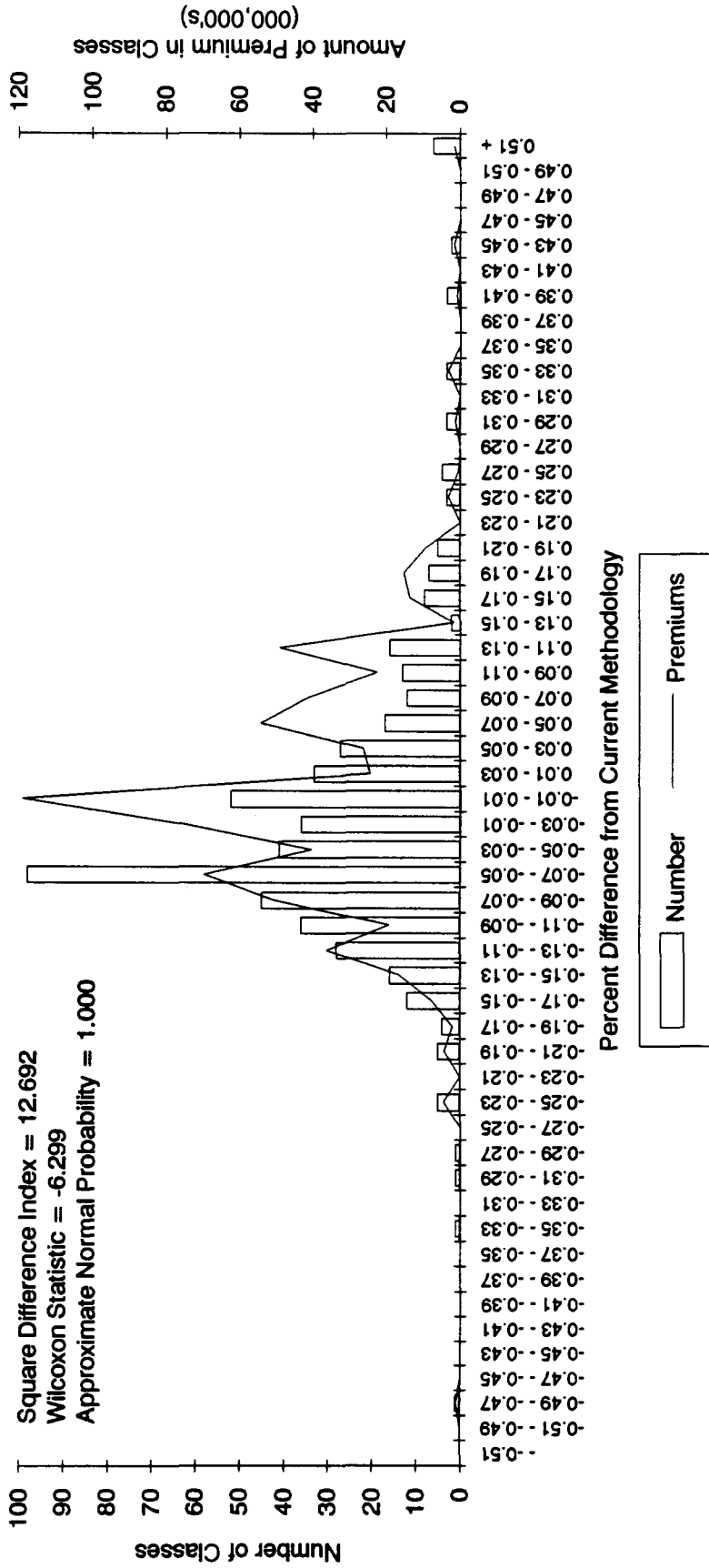


Connecticut, 1988 Revision
Half Current Loss Limitation

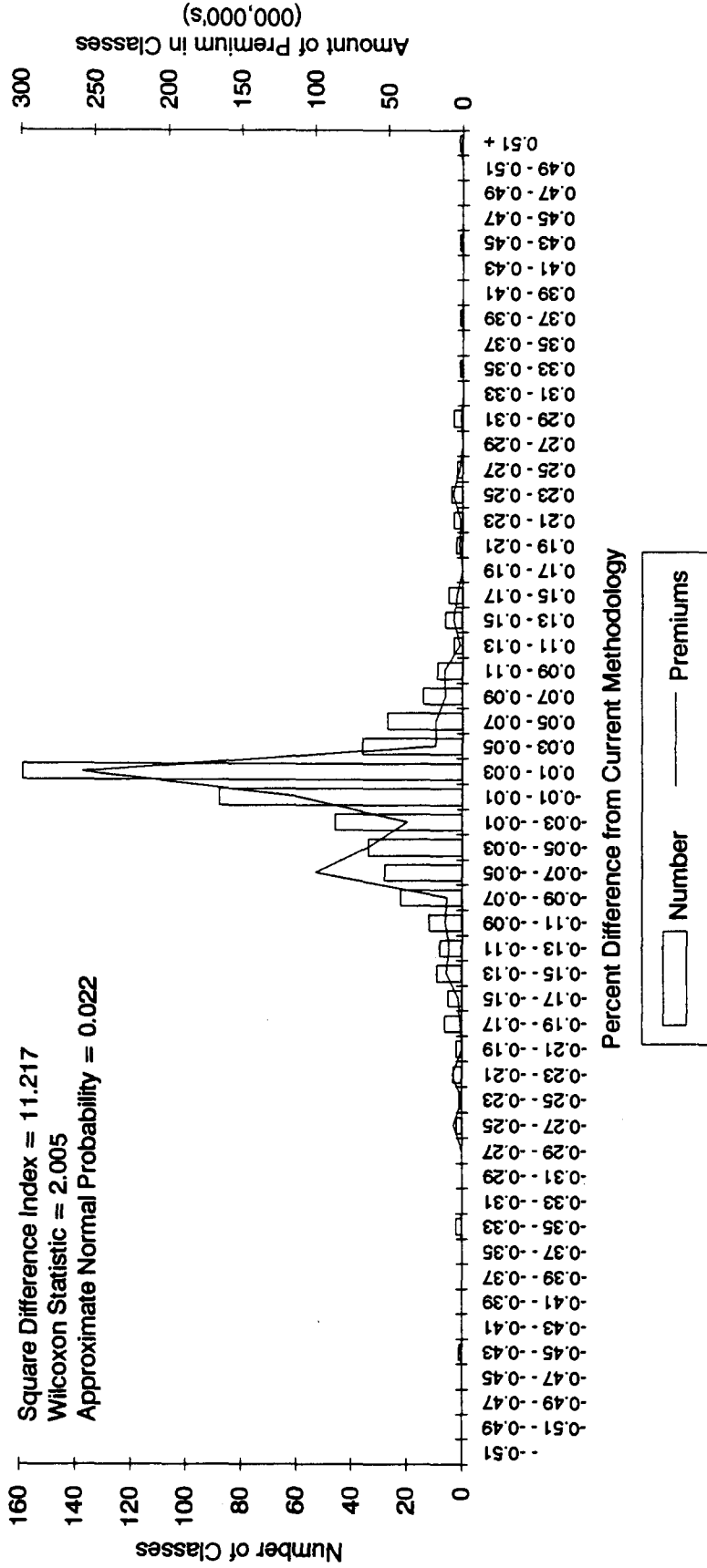
Square Difference Index = 2.563
Wilcoxon Statistic = 8.735
Approximate Normal Probability = 0.000



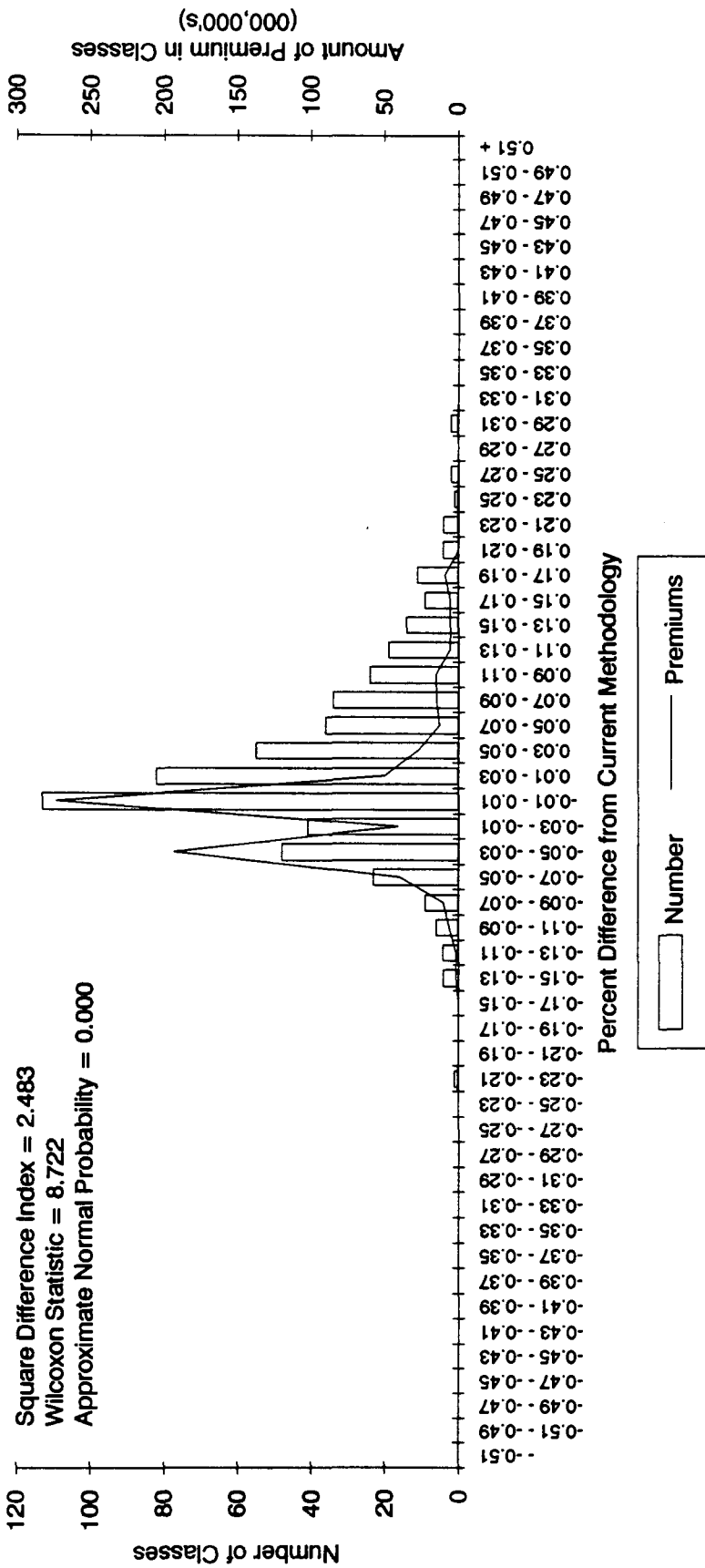
Connecticut, 1989 Revision
Five Years of Data



Connecticut, 1989 Revision
Payroll Based Credibility

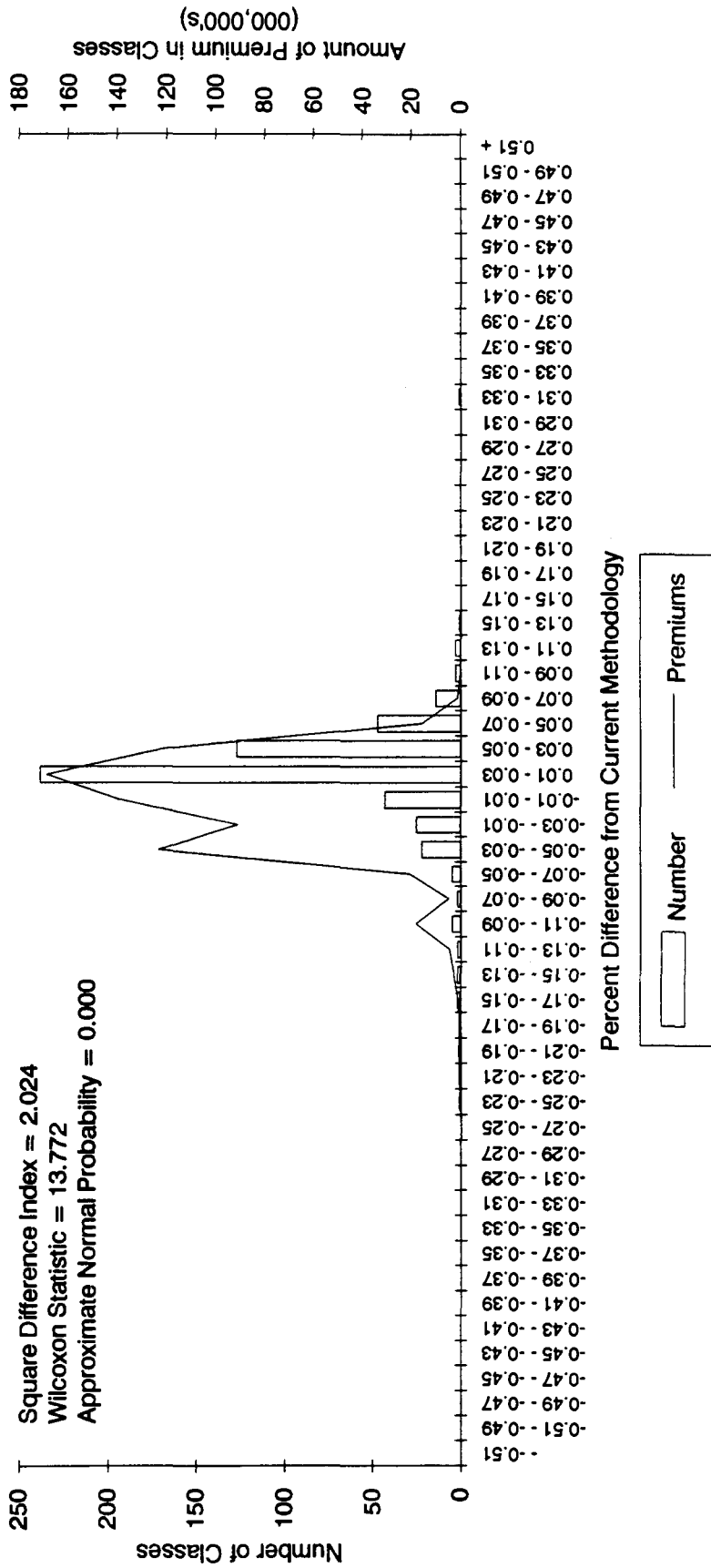


**Connecticut, 1989 Revision
Double Full Credibility Standard**

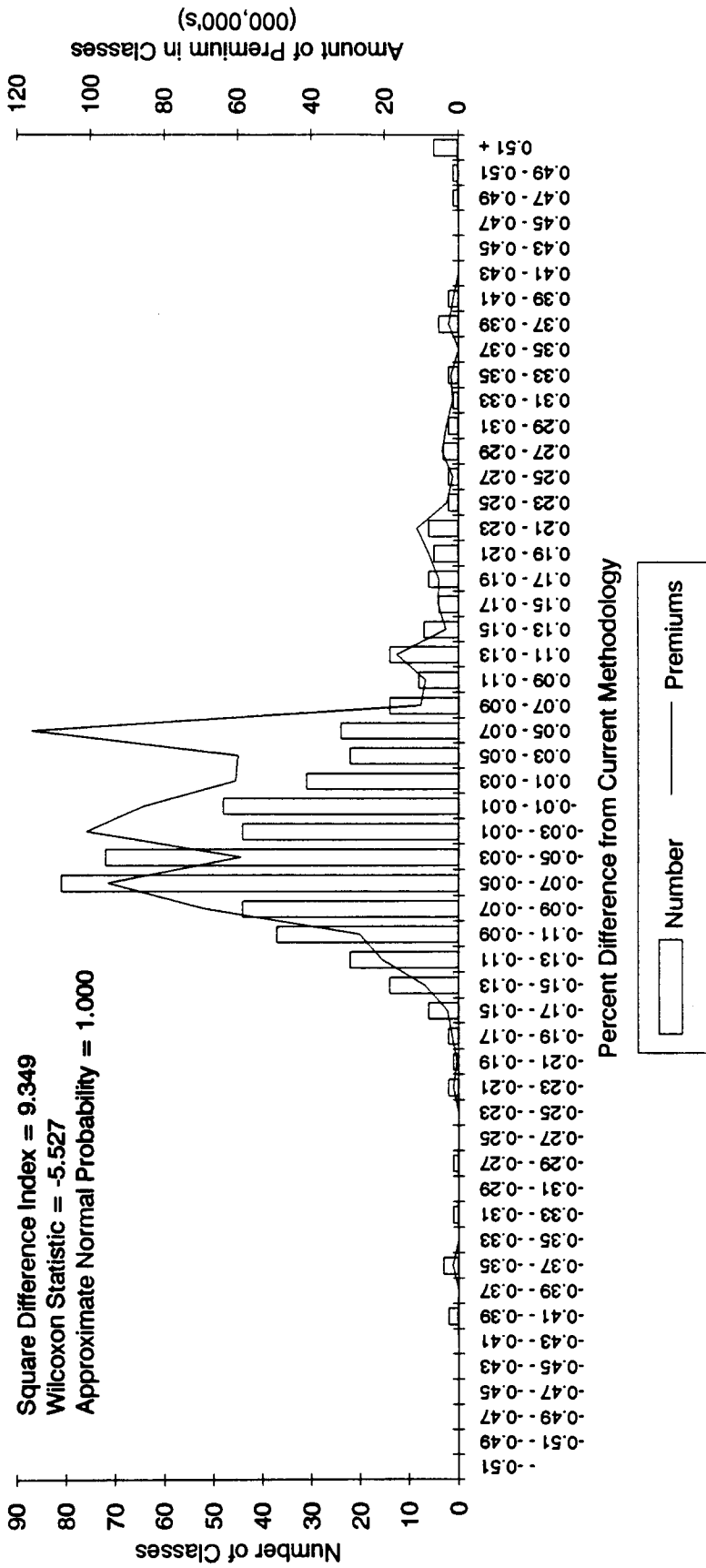


Connecticut, 1989 Revision
Half Current Loss Limitation

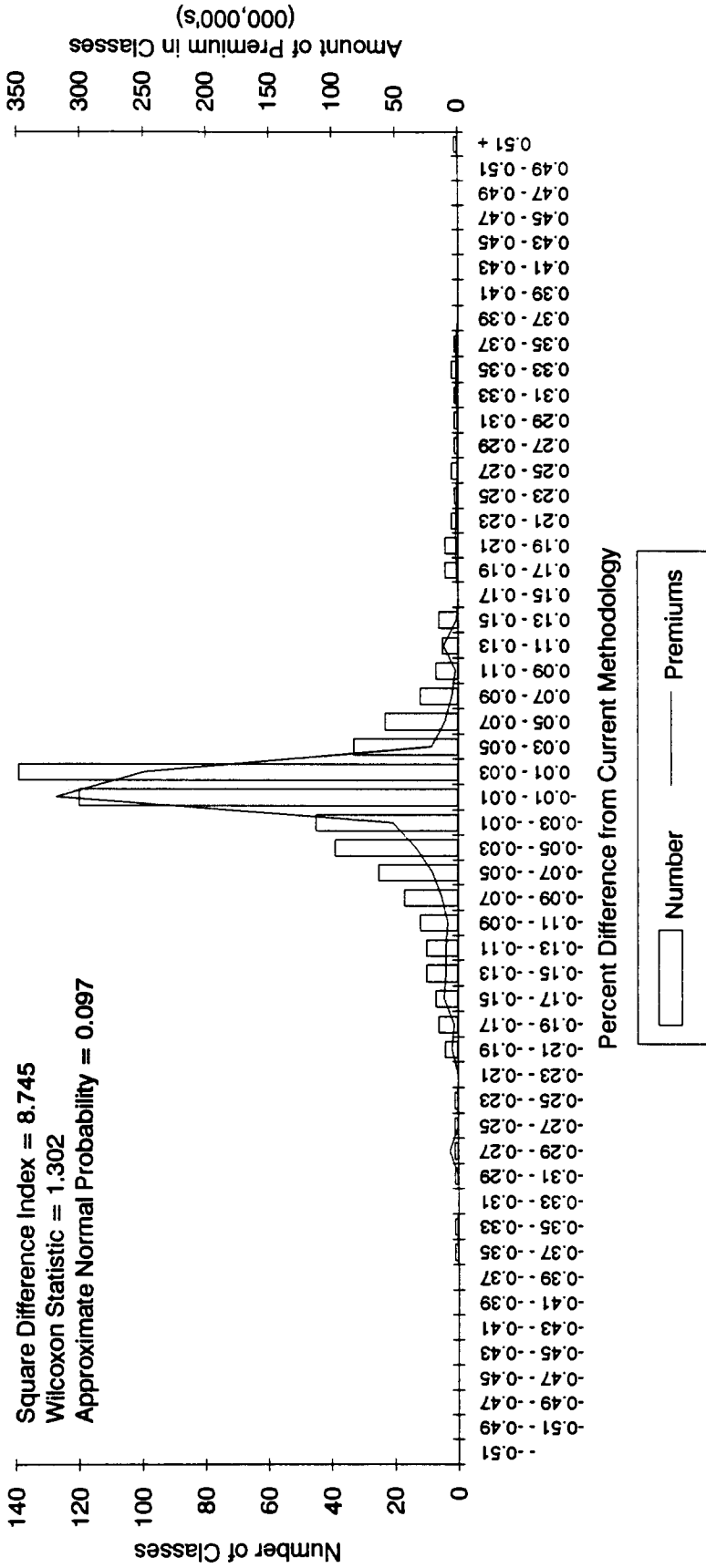
Square Difference Index = 2.024
Wilcoxon Statistic = 13.772
Approximate Normal Probability = 0.000



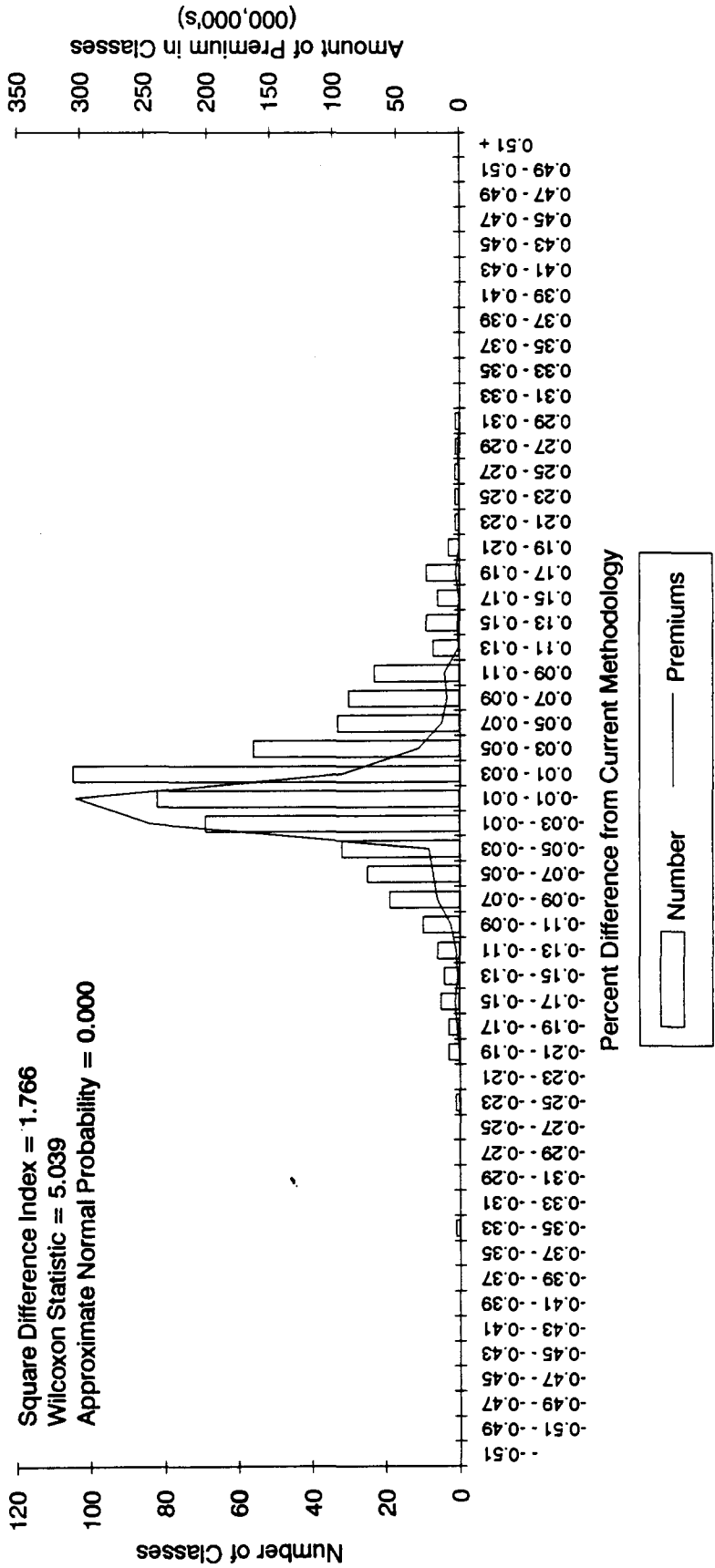
**Connecticut, 1990 Revision
Five Years of Data**



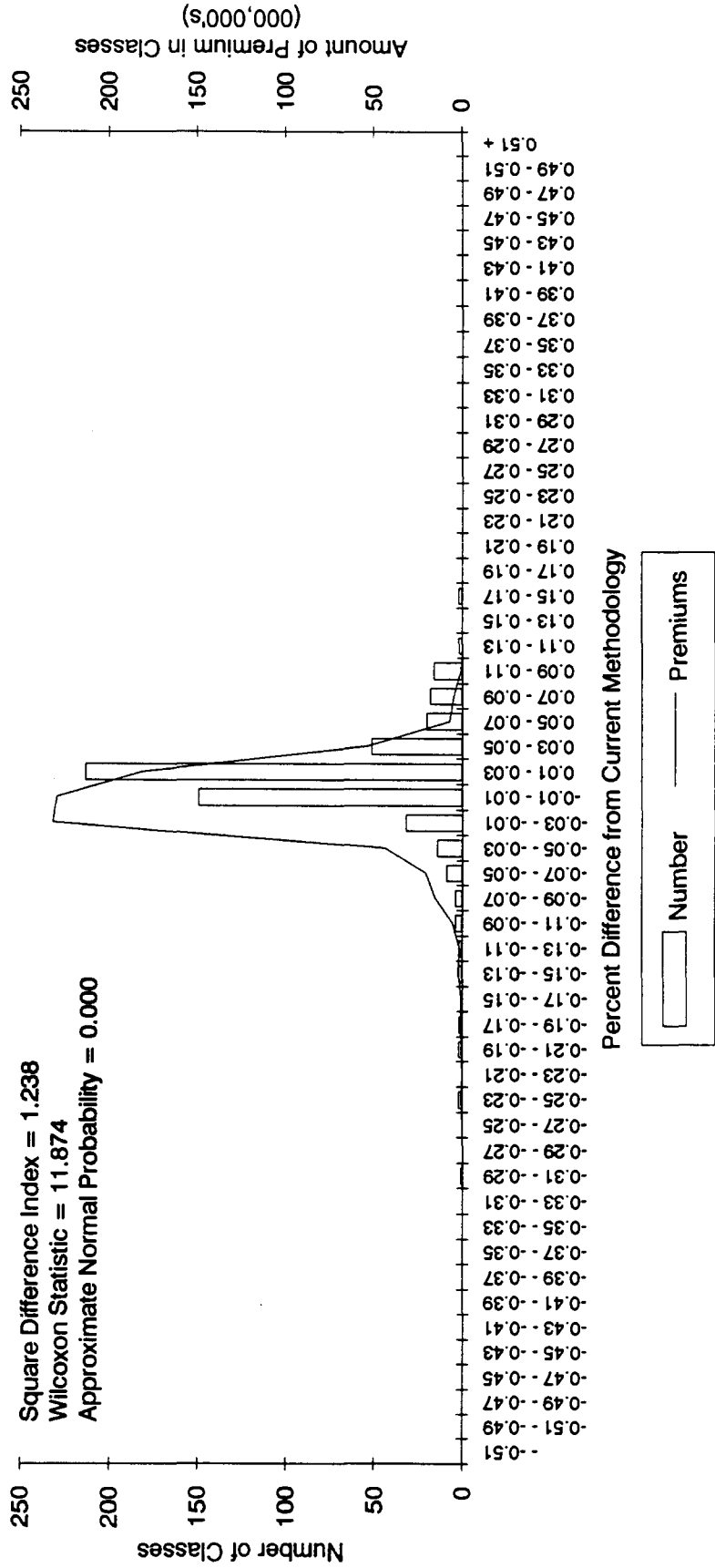
Connecticut, 1990 Revision
Payroll Based Credibility



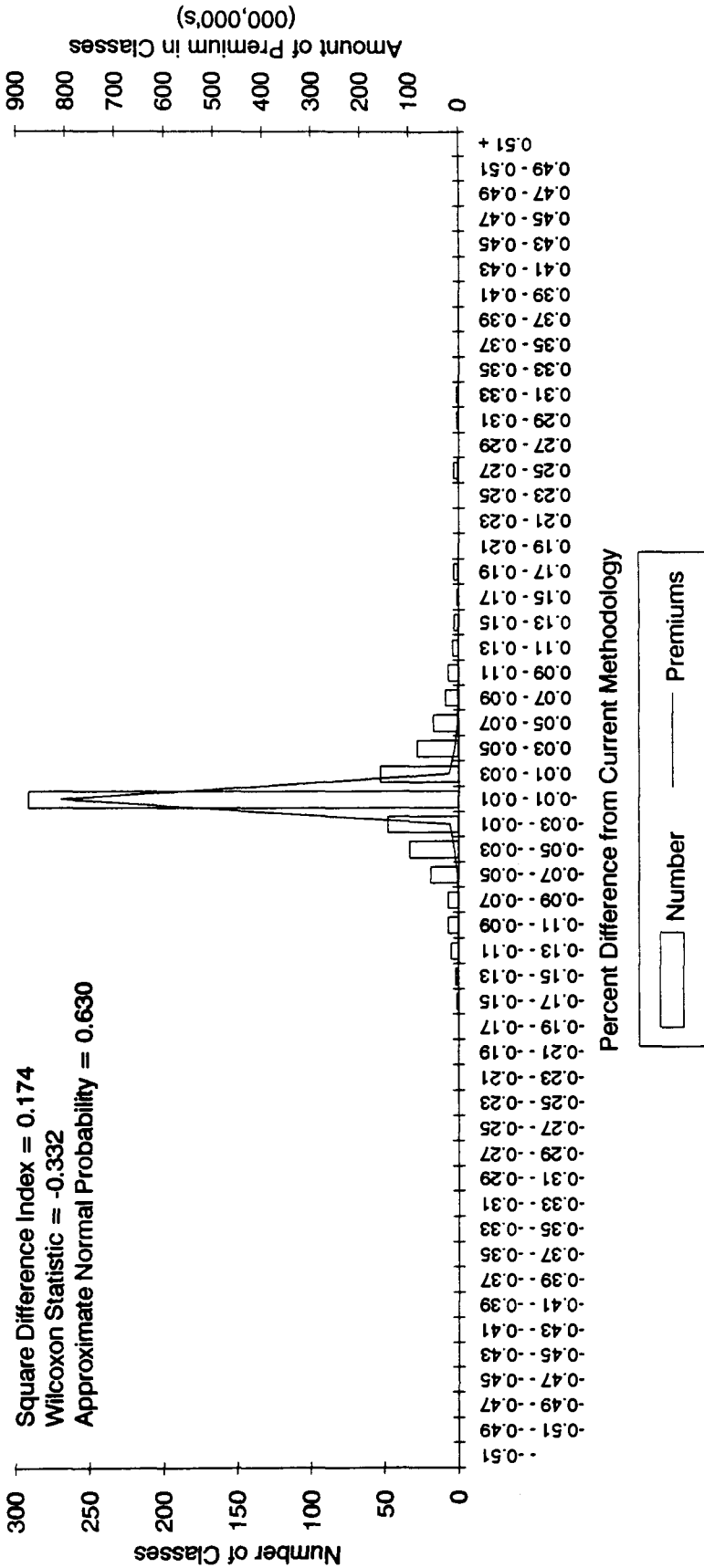
**Connecticut, 1990 Revision
Double Full Credibility Standard**



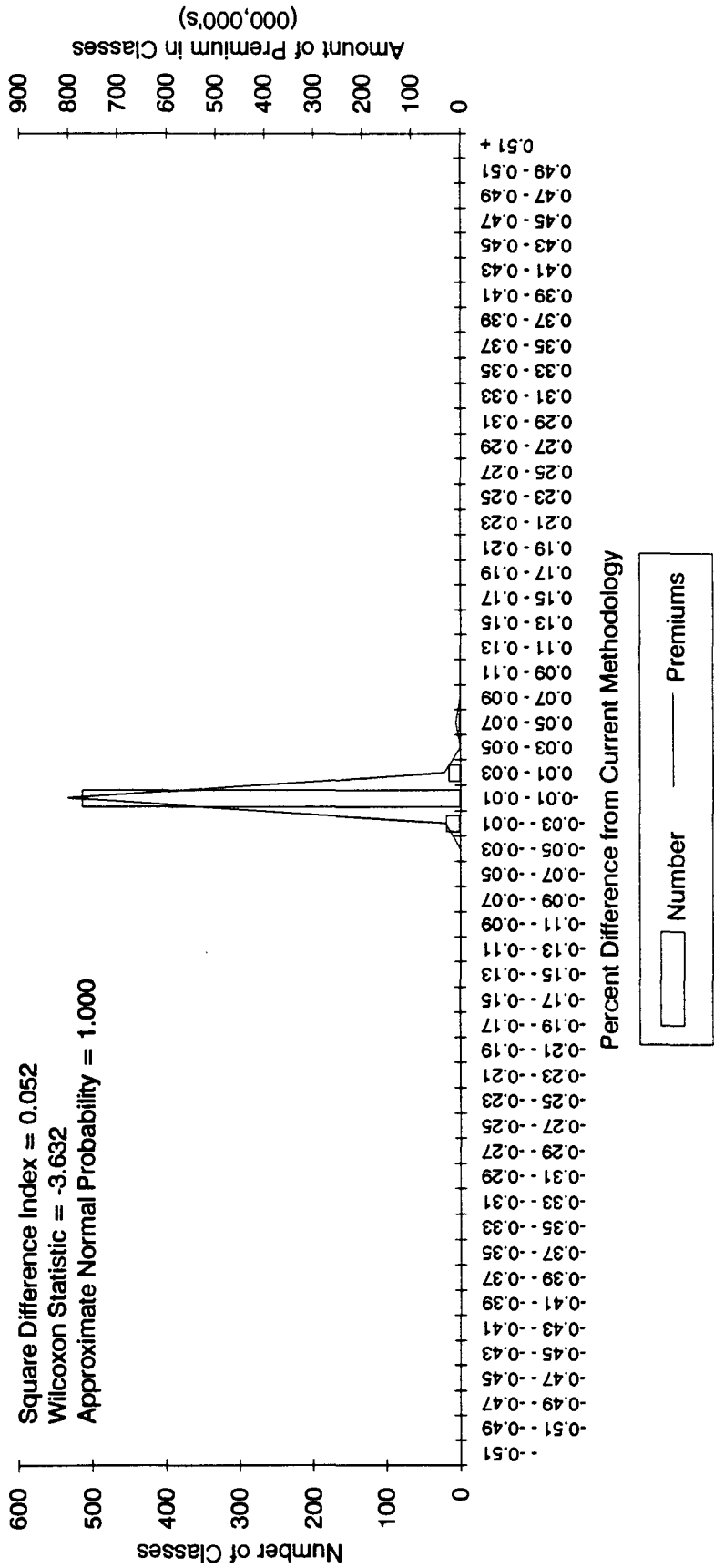
Connecticut, 1990 Revision
Half Current Loss Limitation



**Connecticut, 1990 Revision
Alternate Regional Pure Premiums**

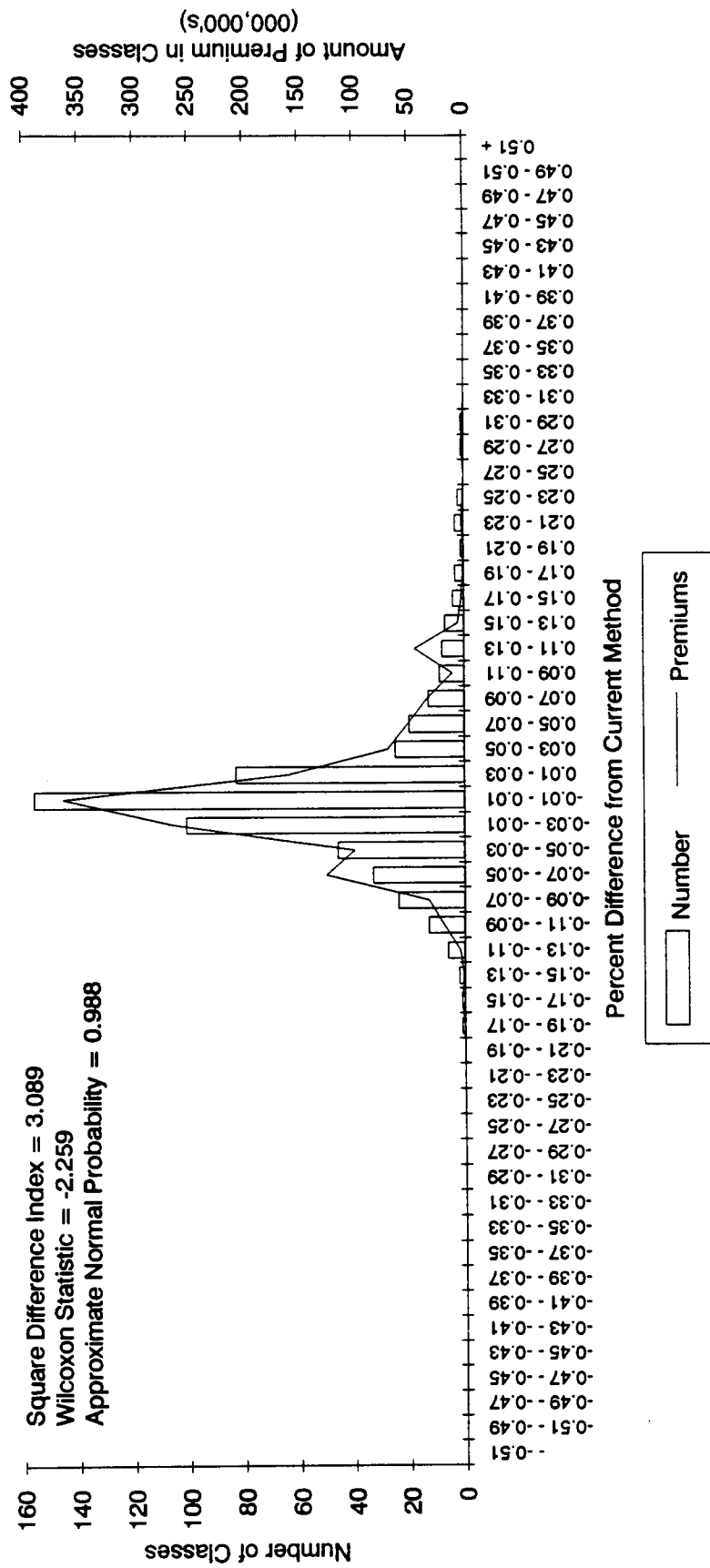


Connecticut, 1990 Revision
Alternate Trend Application



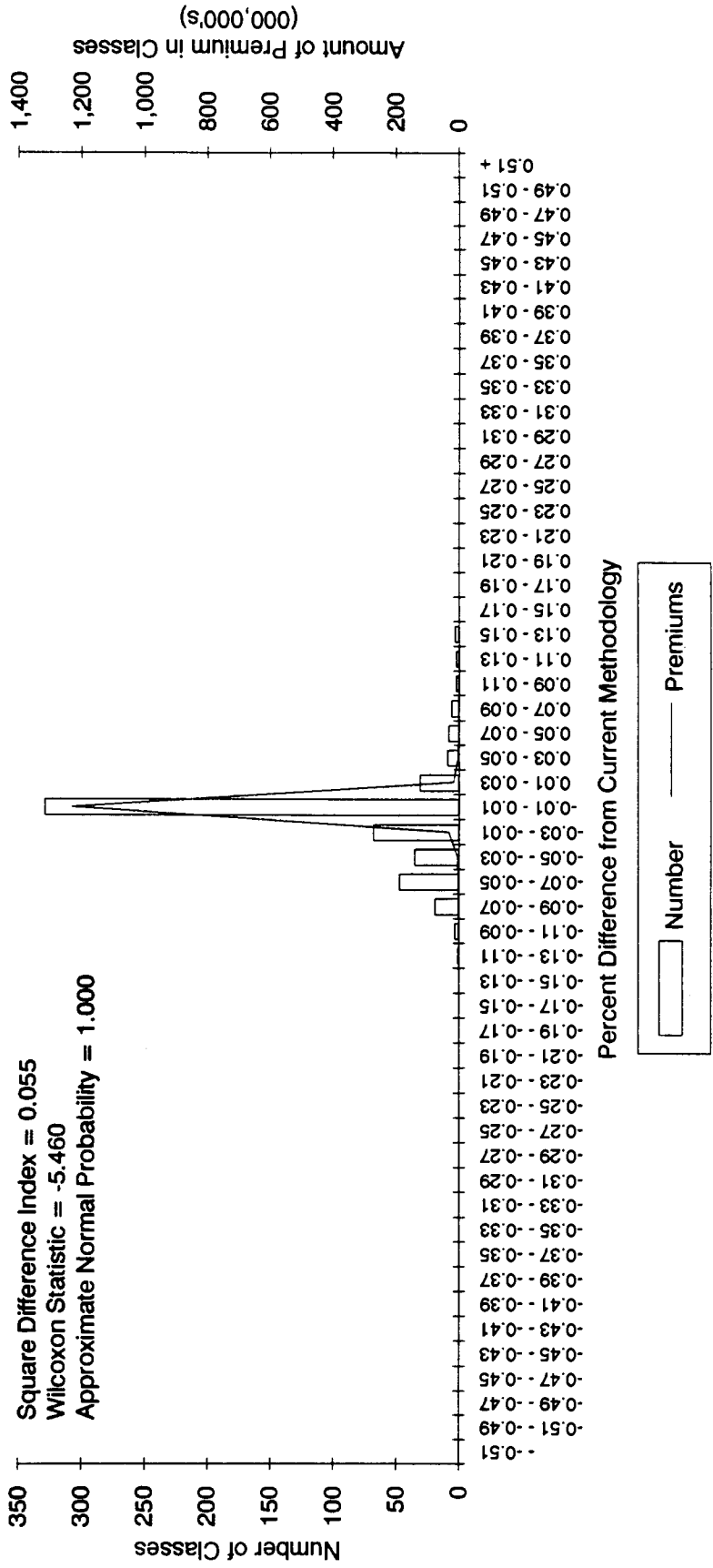
Florida, 1987 Revision
Four Years of Data

Square Difference Index = 3.089
Wilcoxon Statistic = -2.259
Approximate Normal Probability = 0.988



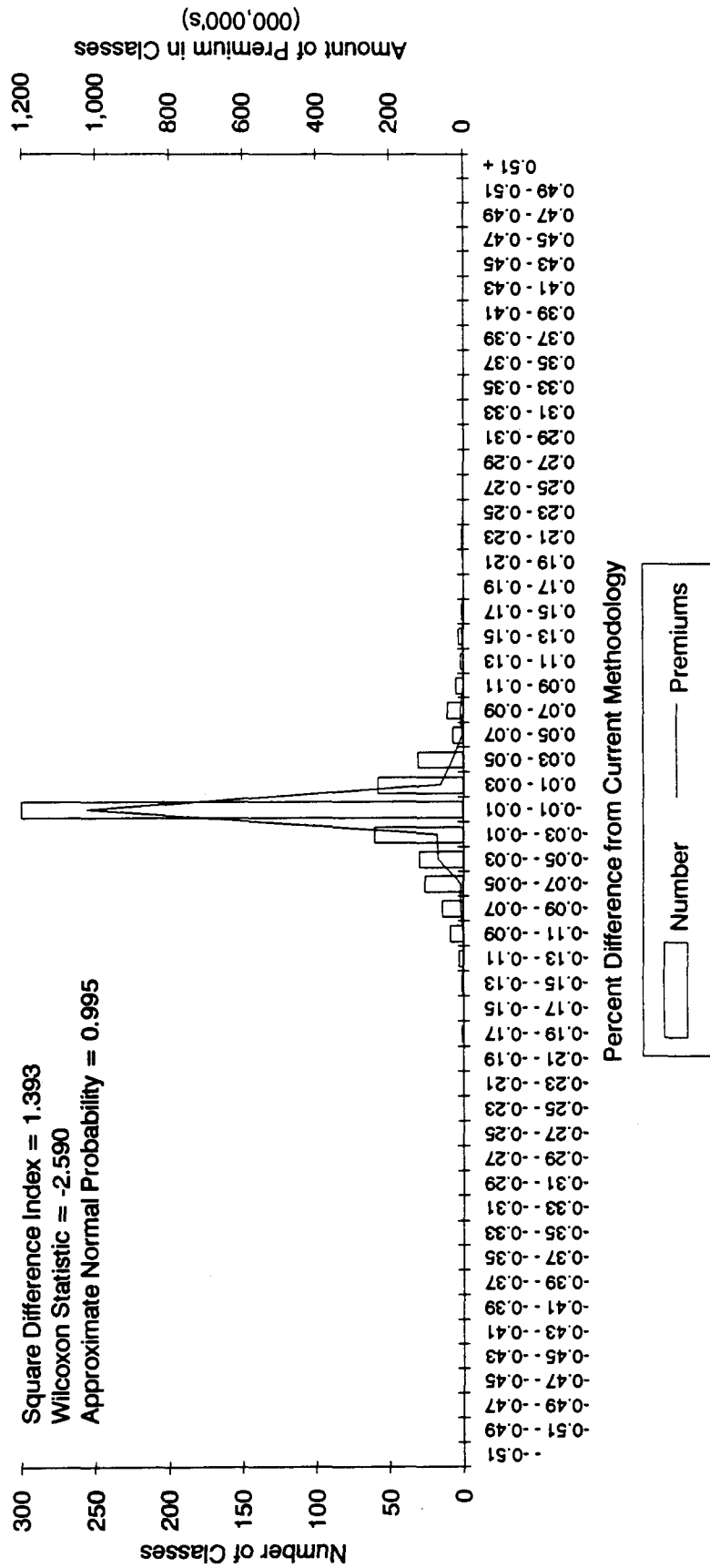
Florida, 1987 Revision
Credibility Using .5 Power

Square Difference Index = 0.055
Wilcoxon Statistic = -5.460
Approximate Normal Probability = 1.000



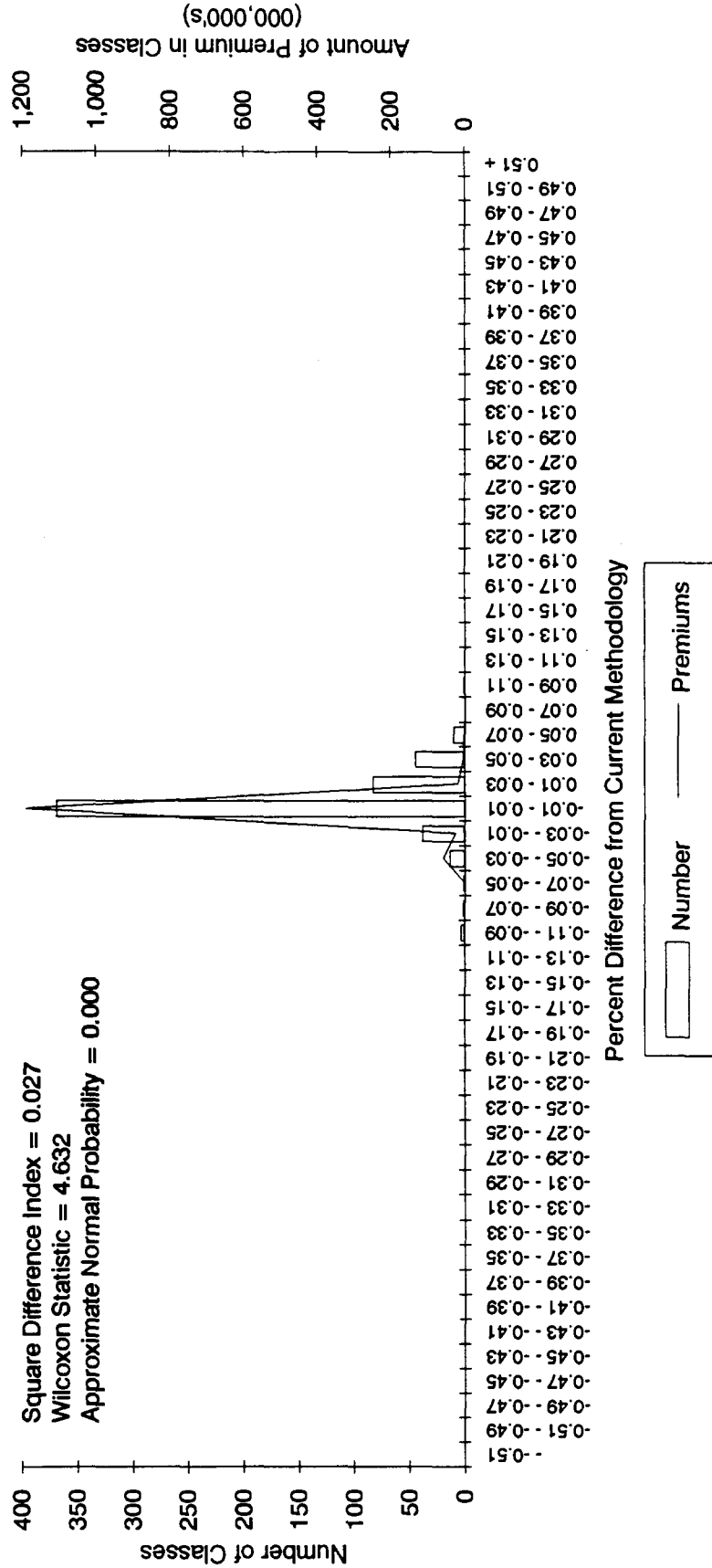
Florida, 1987 Revision
Payroll Based Credibility

Square Difference Index = 1.393
Wilcoxon Statistic = -2.590
Approximate Normal Probability = 0.995

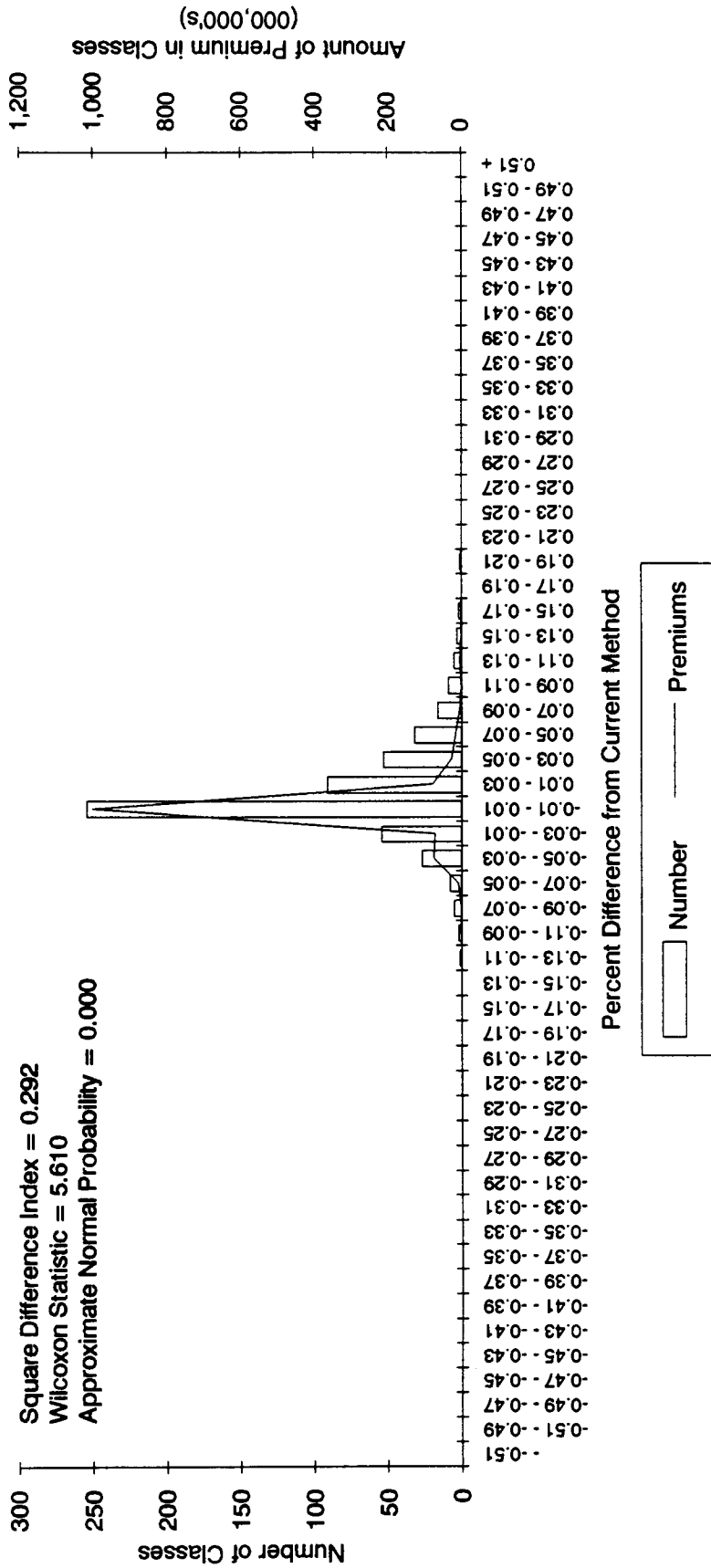


Florida, 1987 Revision
Credibility Using .8 Power

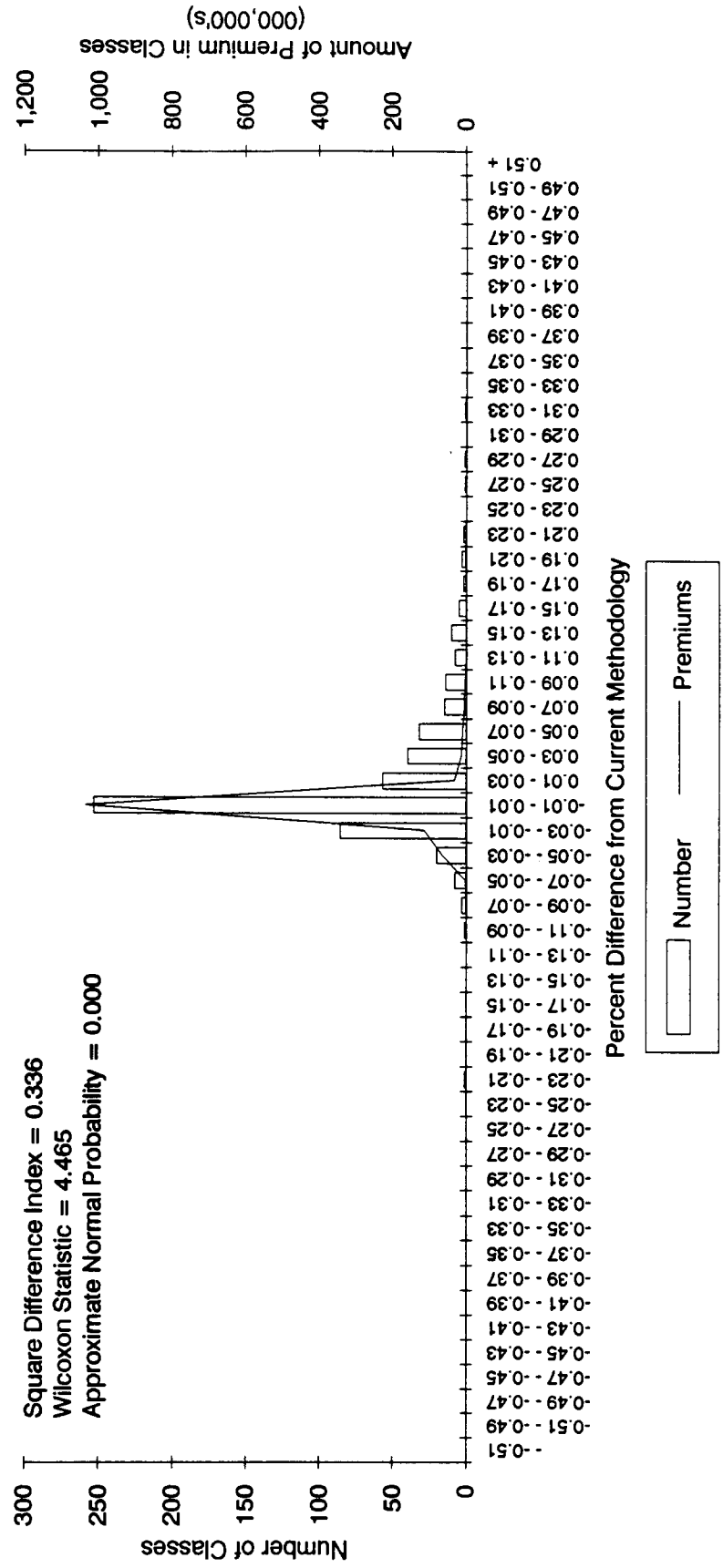
Square Difference Index = 0.027
Wilcoxon Statistic = 4.632
Approximate Normal Probability = 0.000



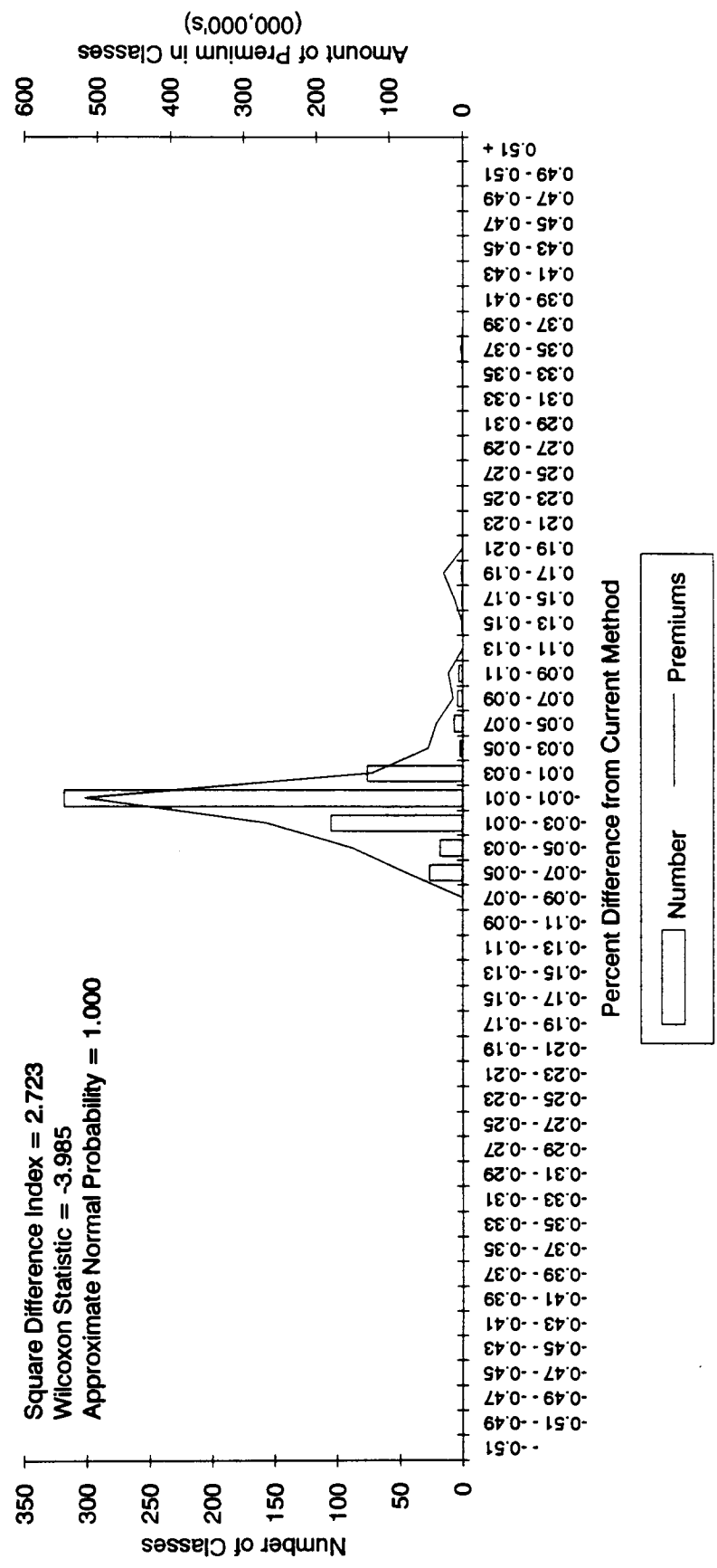
**Florida, 1987 Revision
Double Full Credibility Standard**



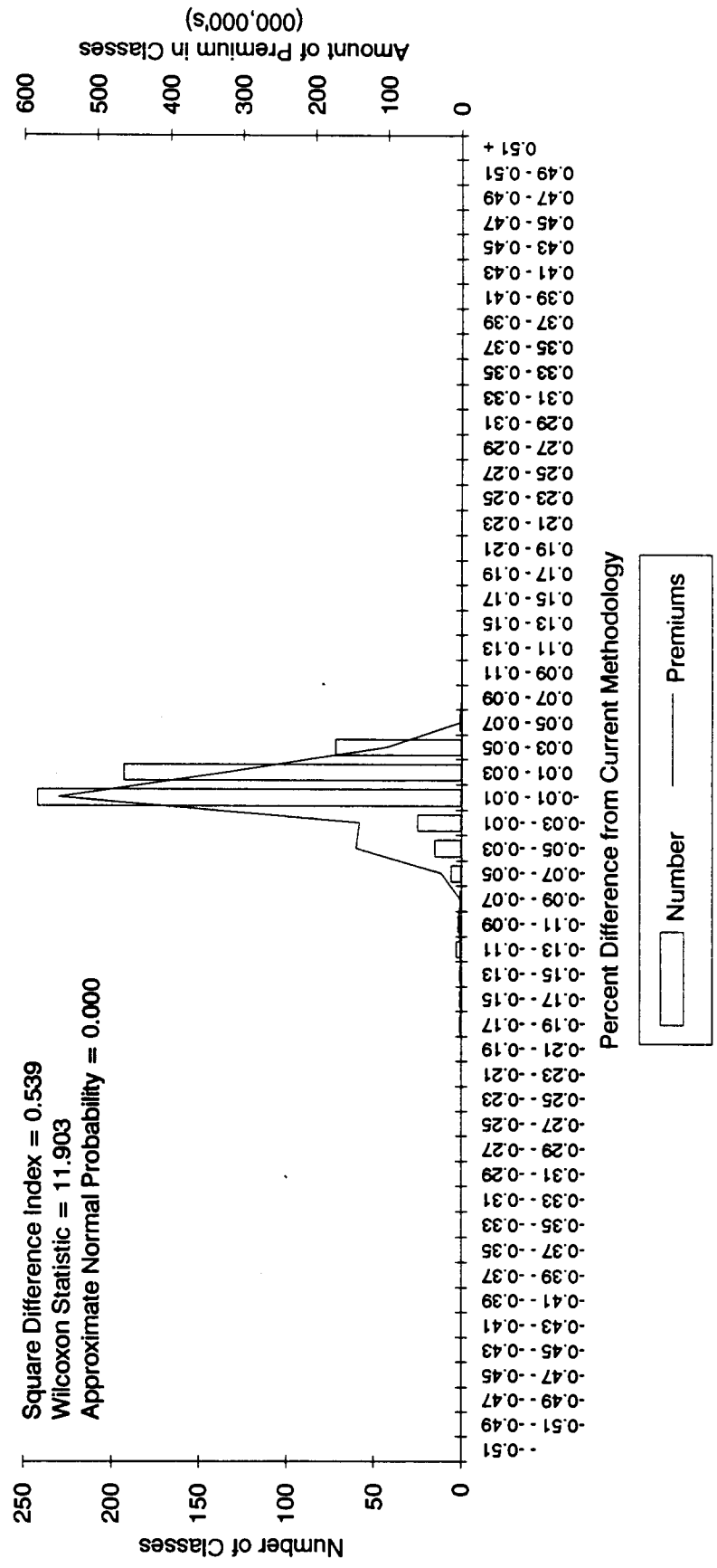
**Florida, 1987 Revision
Claim Count Based Credibility**



Florida, 1987 Revision
Unlimited Losses

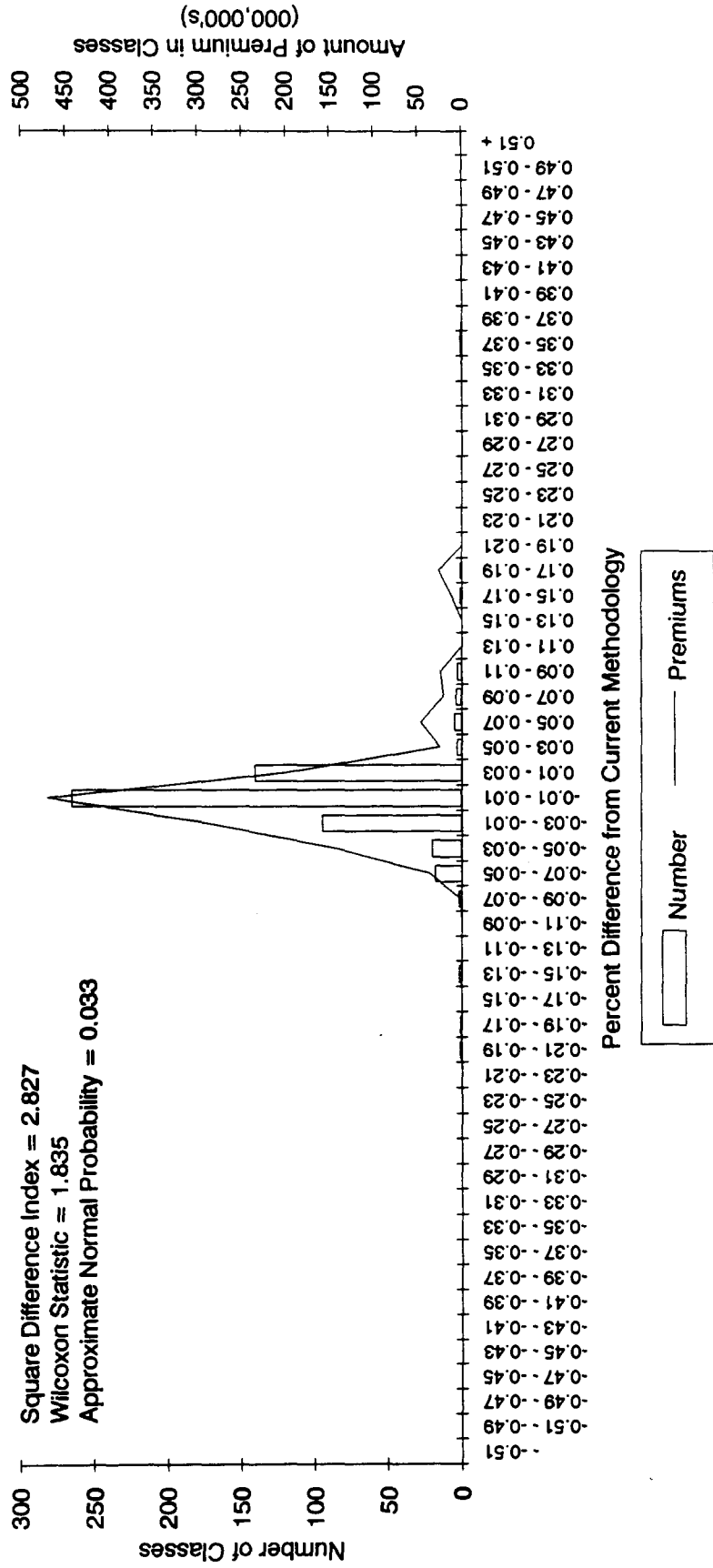


Florida, 1987 Revision
Half Current Loss Limitation

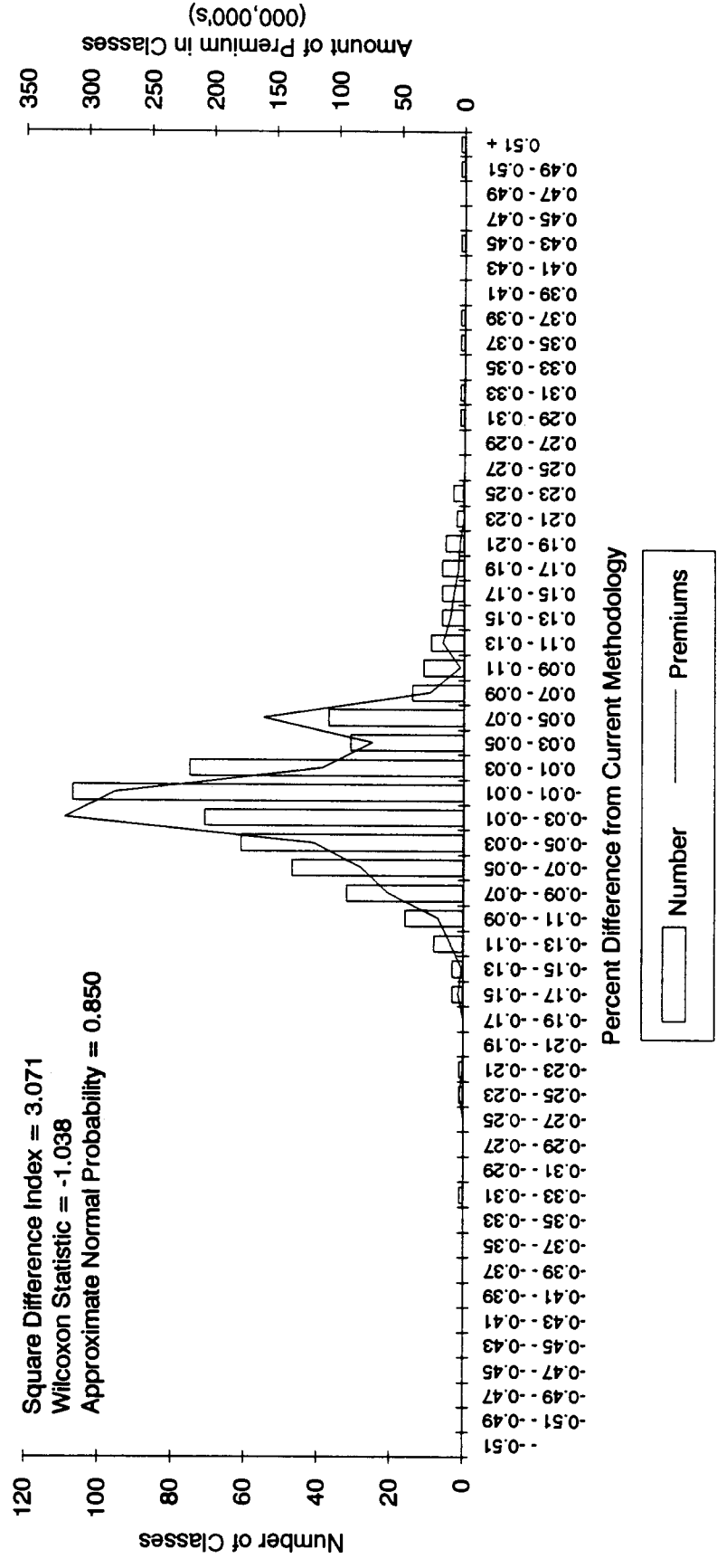


**Florida, 1987 Revision
Sliding Scale Loss Limitation**

Square Difference Index = 2.827
 Wilcoxon Statistic = 1.835
 Approximate Normal Probability = 0.033

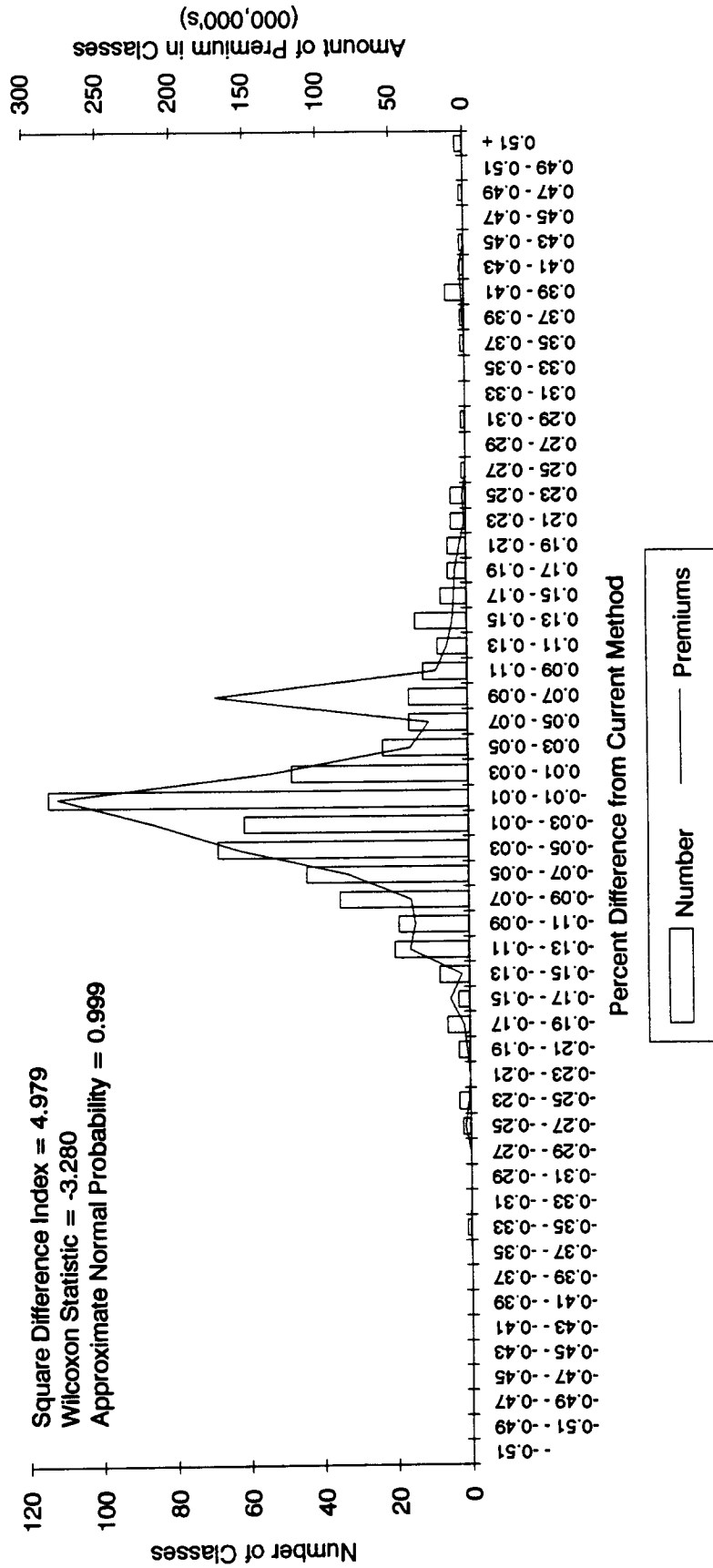


Florida, 1988 Revision
Four Years of Data



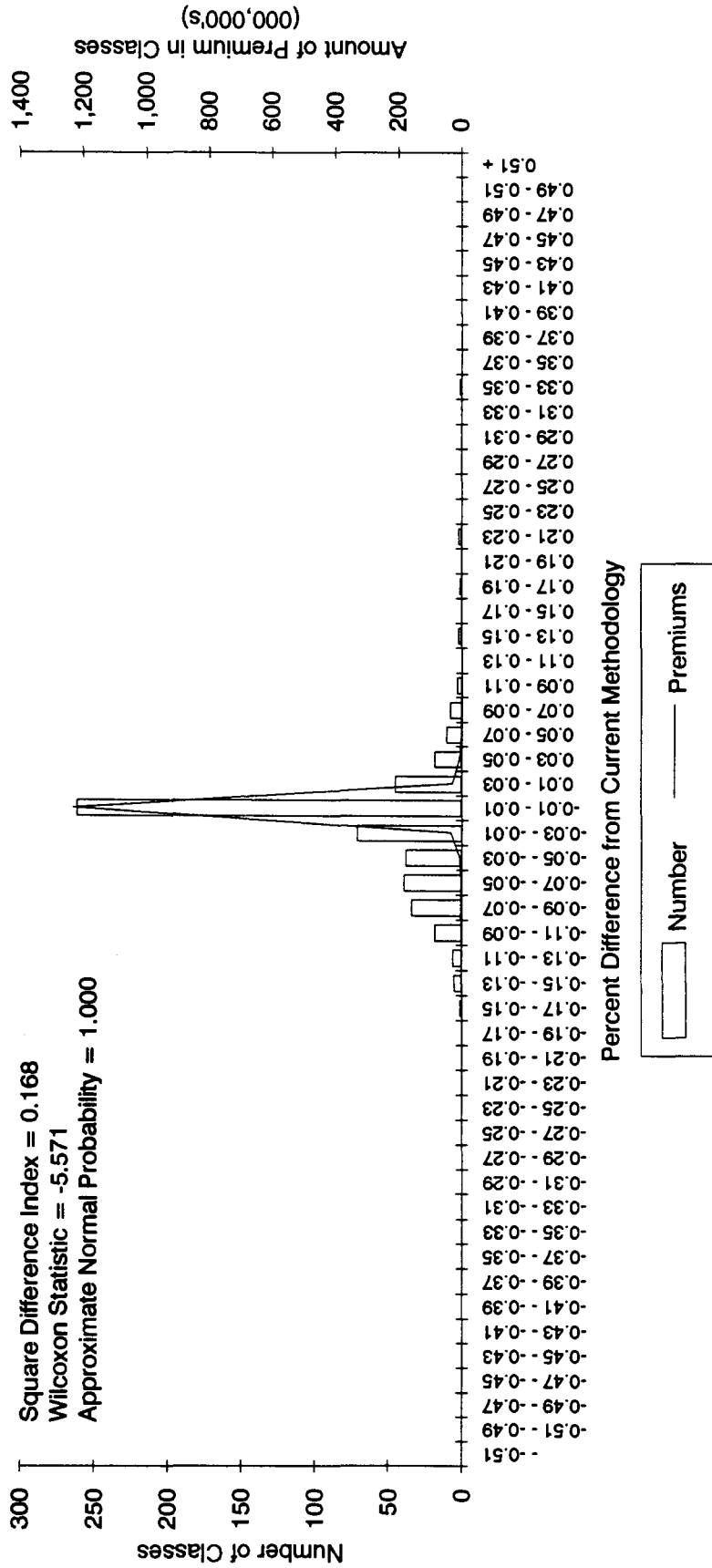
Florida, 1988 Revision
Five Years of Data

Square Difference Index = 4.979
 Wilcoxon Statistic = -3.280
 Approximate Normal Probability = 0.999



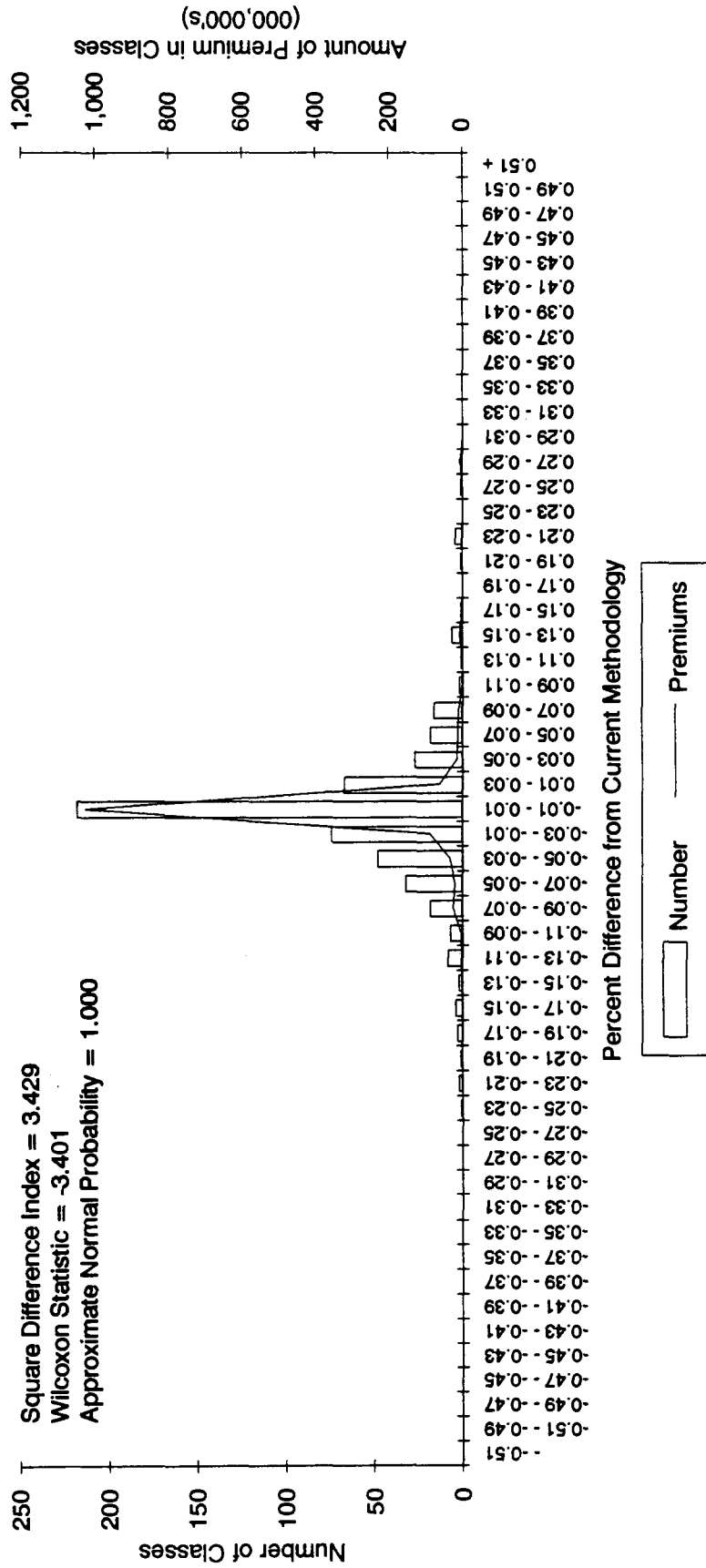
Florida, 1988 Revision
Credibility Using .5 Power

Square Difference Index = 0.168
Wilcoxon Statistic = -5.571
Approximate Normal Probability = 1.000



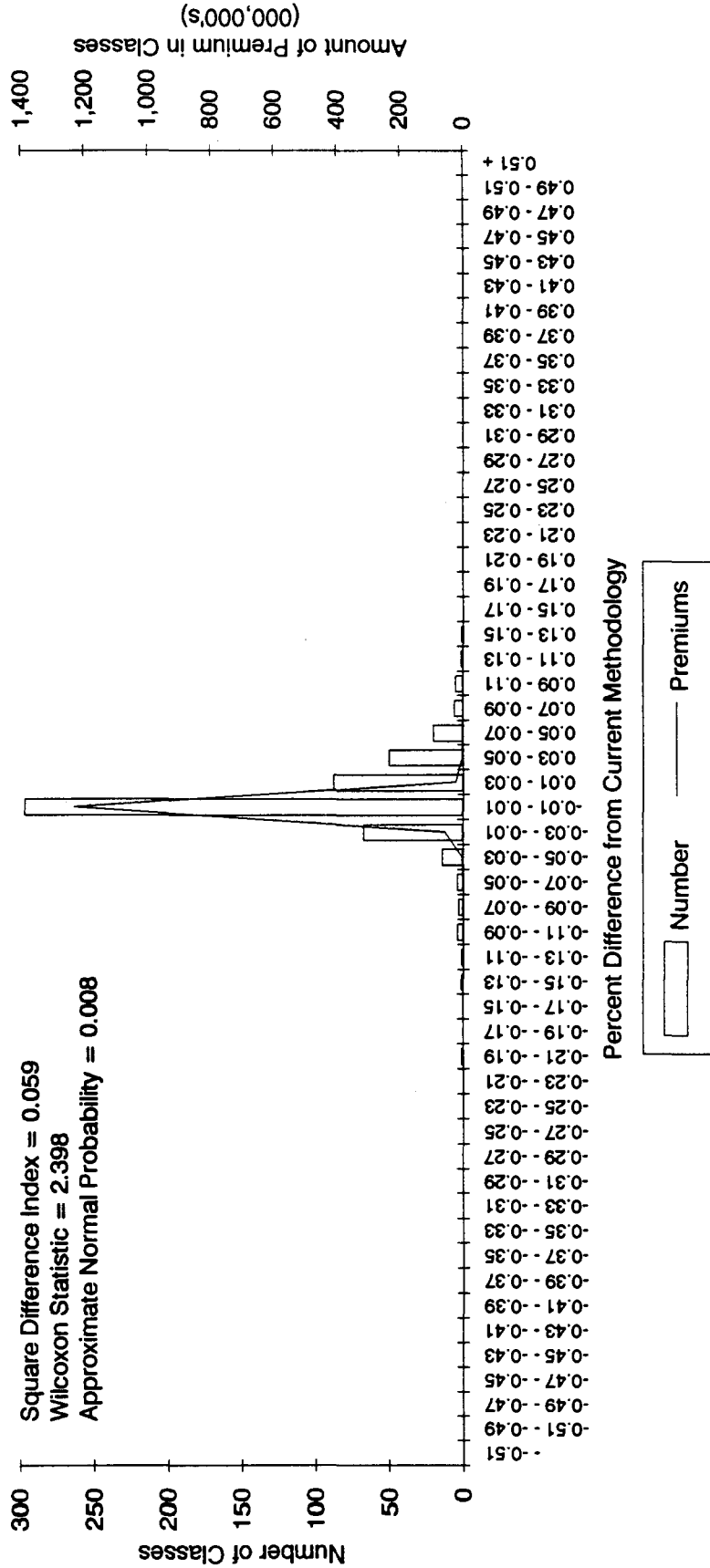
Florida, 1988 Revision
Payroll Based Credibility

Square Difference Index = 3.429
Wilcoxon Statistic = -3.401
Approximate Normal Probability = 1.000

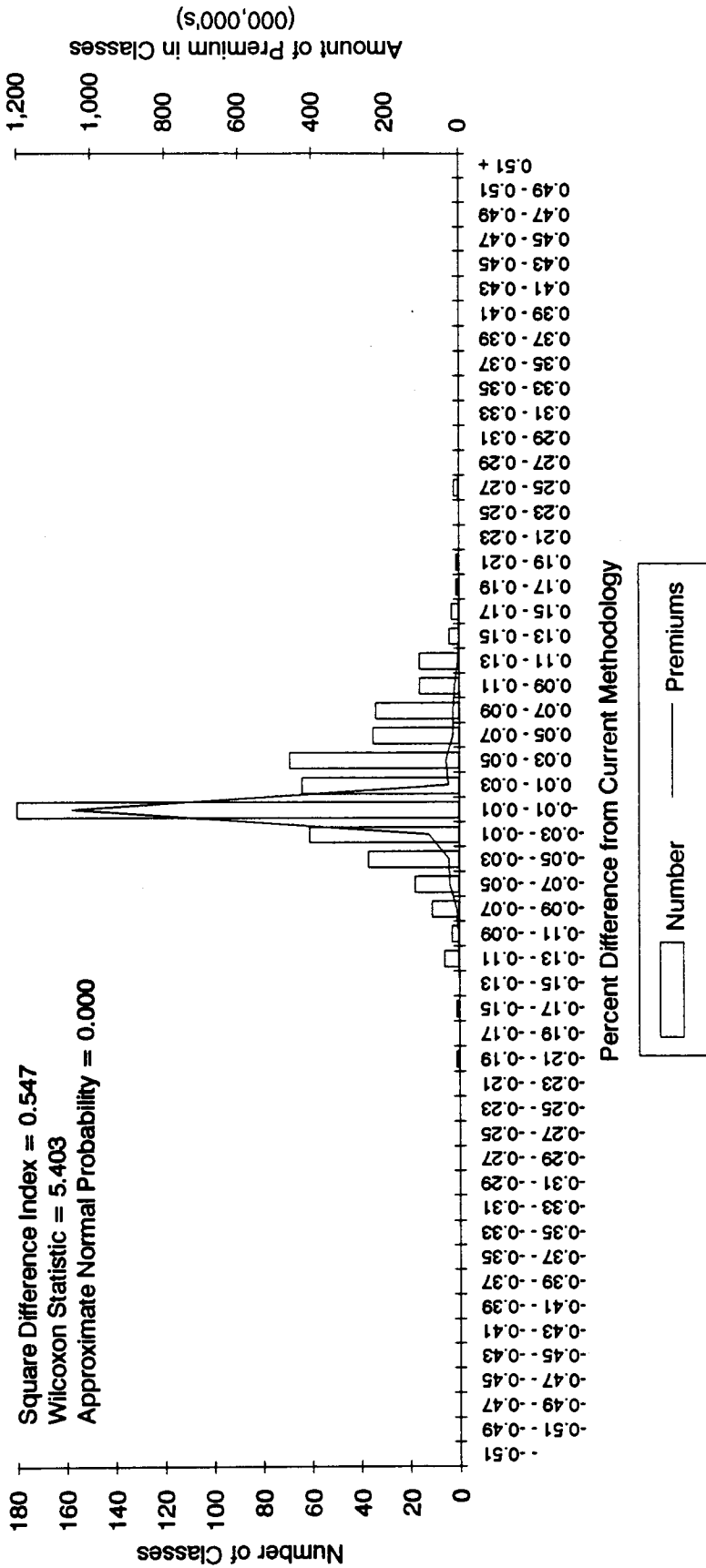


Florida, 1988 Revision
Credibility Using .8 Power

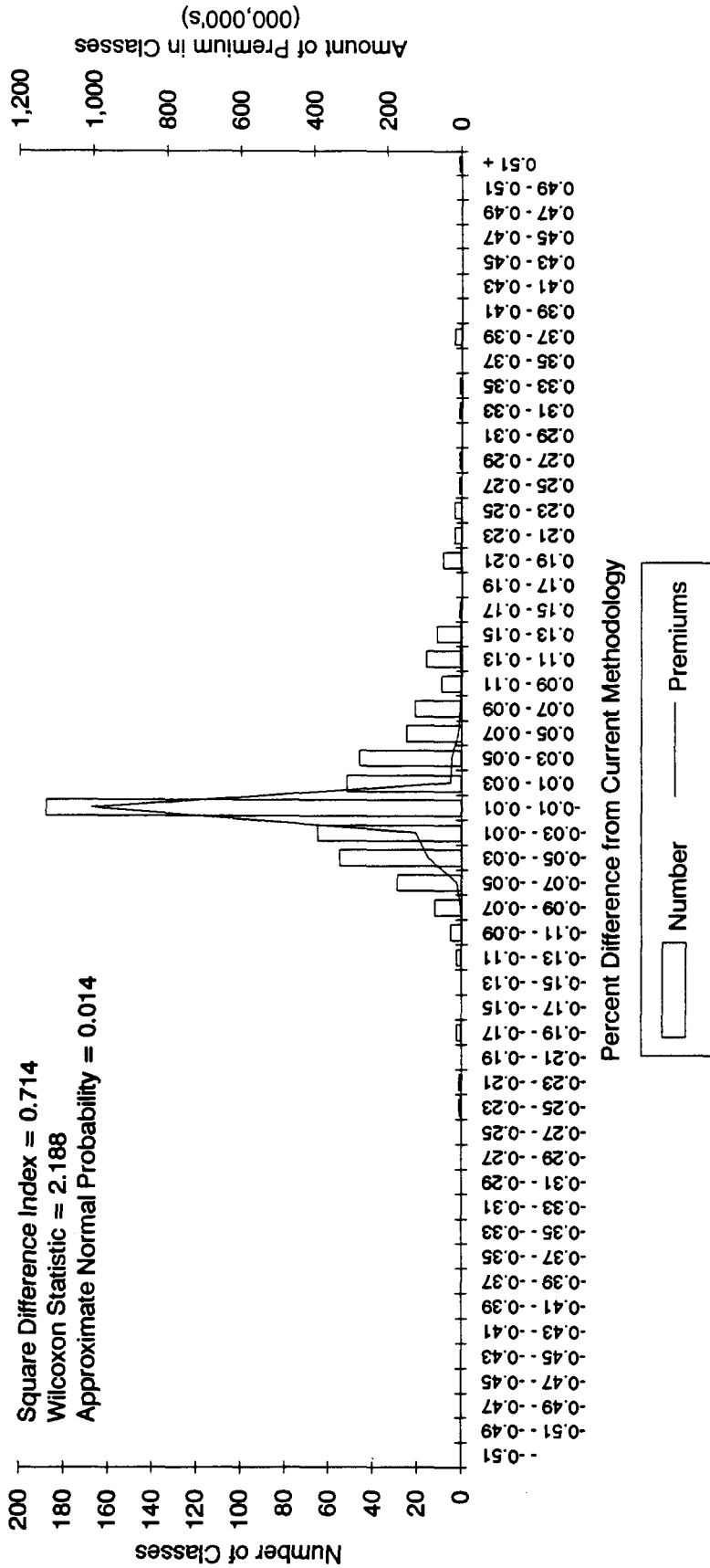
Square Difference Index = 0.059
Wilcoxon Statistic = 2.398
Approximate Normal Probability = 0.008



**Florida, 1988 Revision
Double Full Credibility Standard**

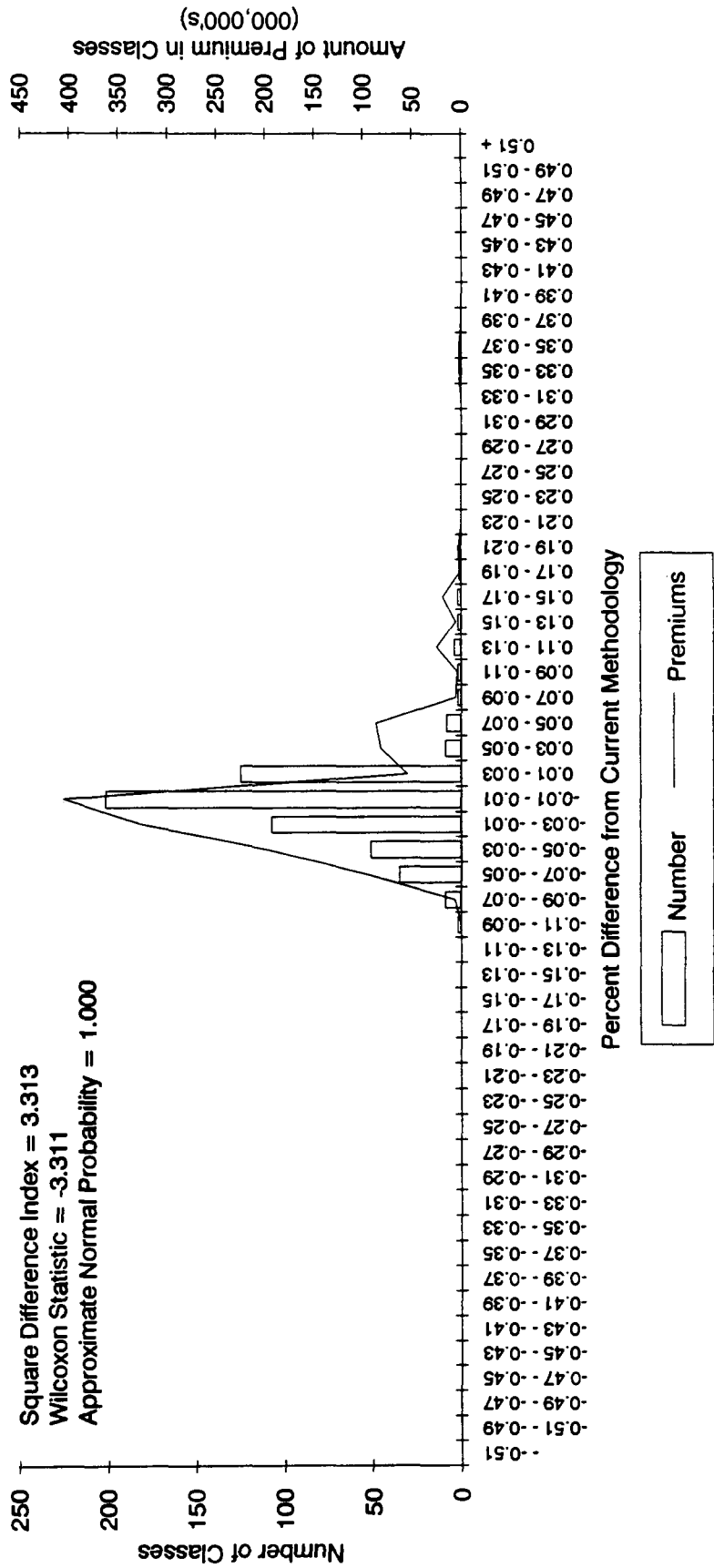


Florida, 1988 Revision
Claim Count Based Credibility



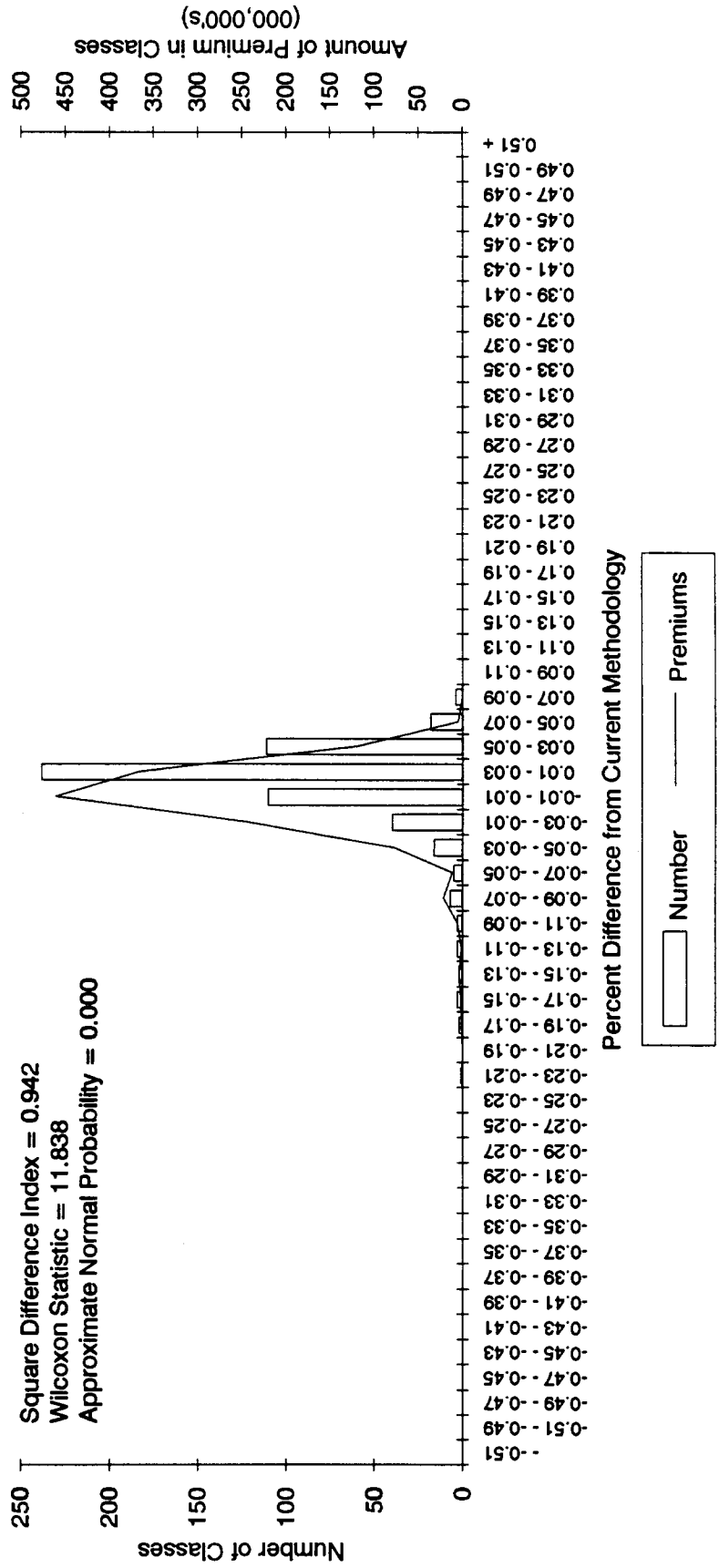
Florida, 1988 Revision
Unlimited Losses

Square Difference Index = 3.313
Wilcoxon Statistic = -3.311
Approximate Normal Probability = 1.000



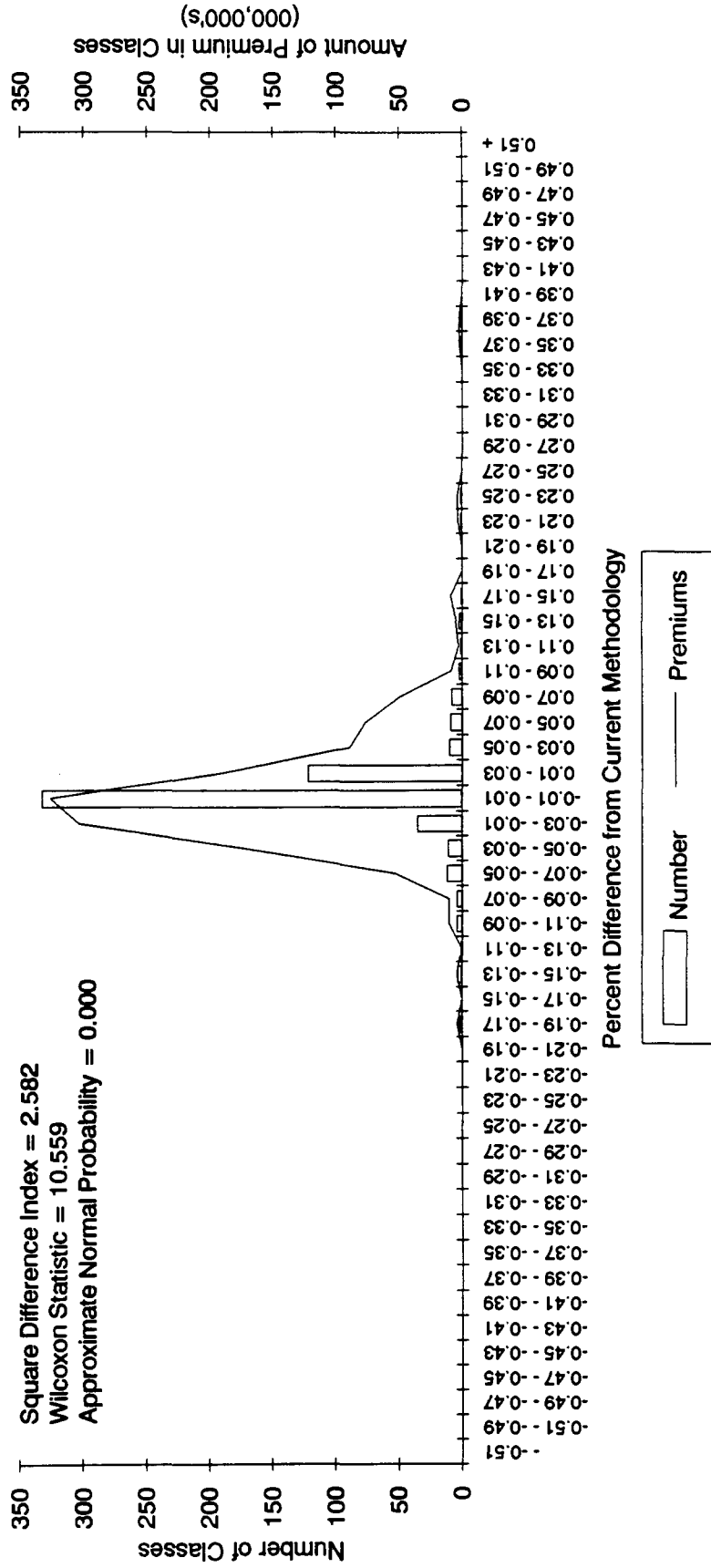
**Florida, 1988 Revision
Half Current Loss Limitation**

Square Difference Index = 0.942
 Wilcoxon Statistic = 11.838
 Approximate Normal Probability = 0.000



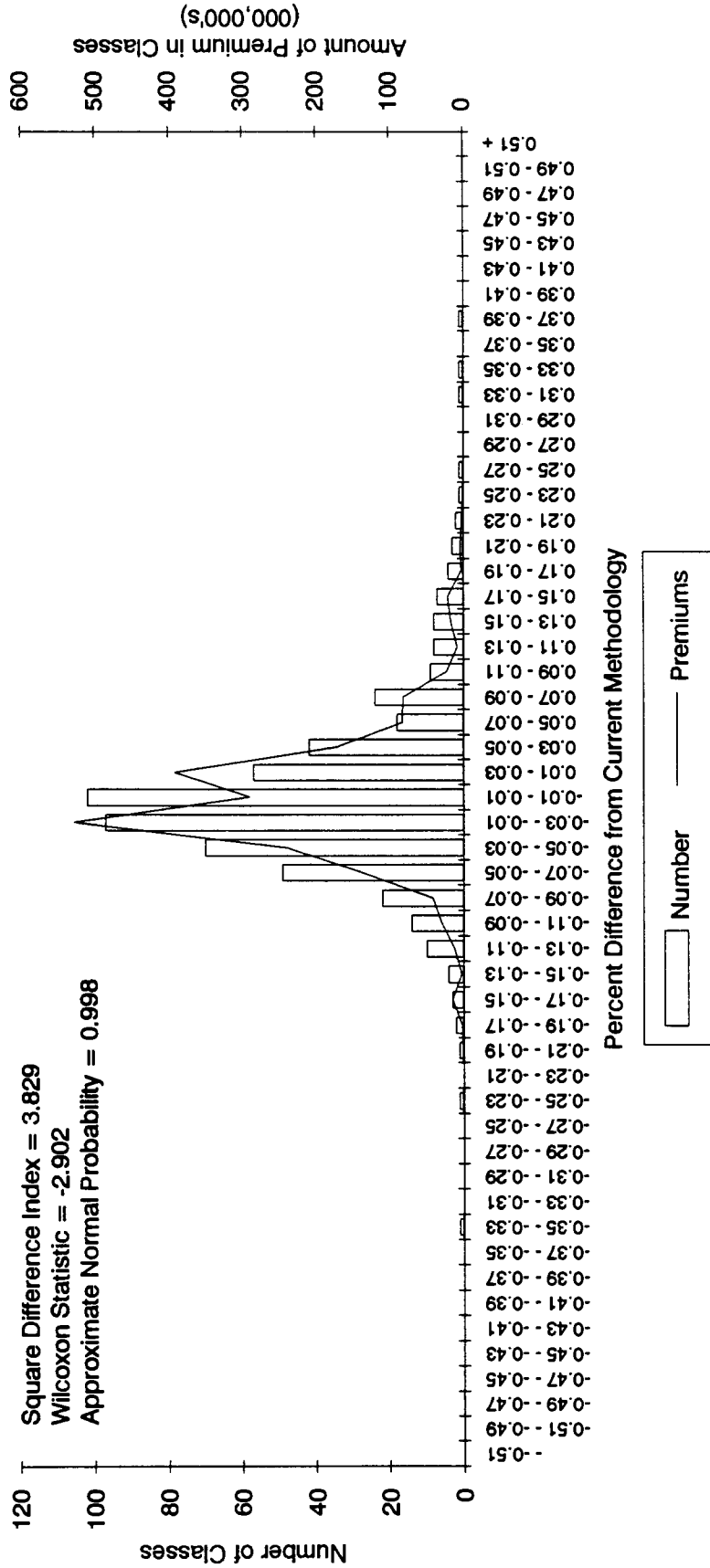
**Florida, 1988 Revision
Sliding Scale Loss Limitation**

Square Difference Index = 2.582
 Wilcoxon Statistic = 10.559
 Approximate Normal Probability = 0.000



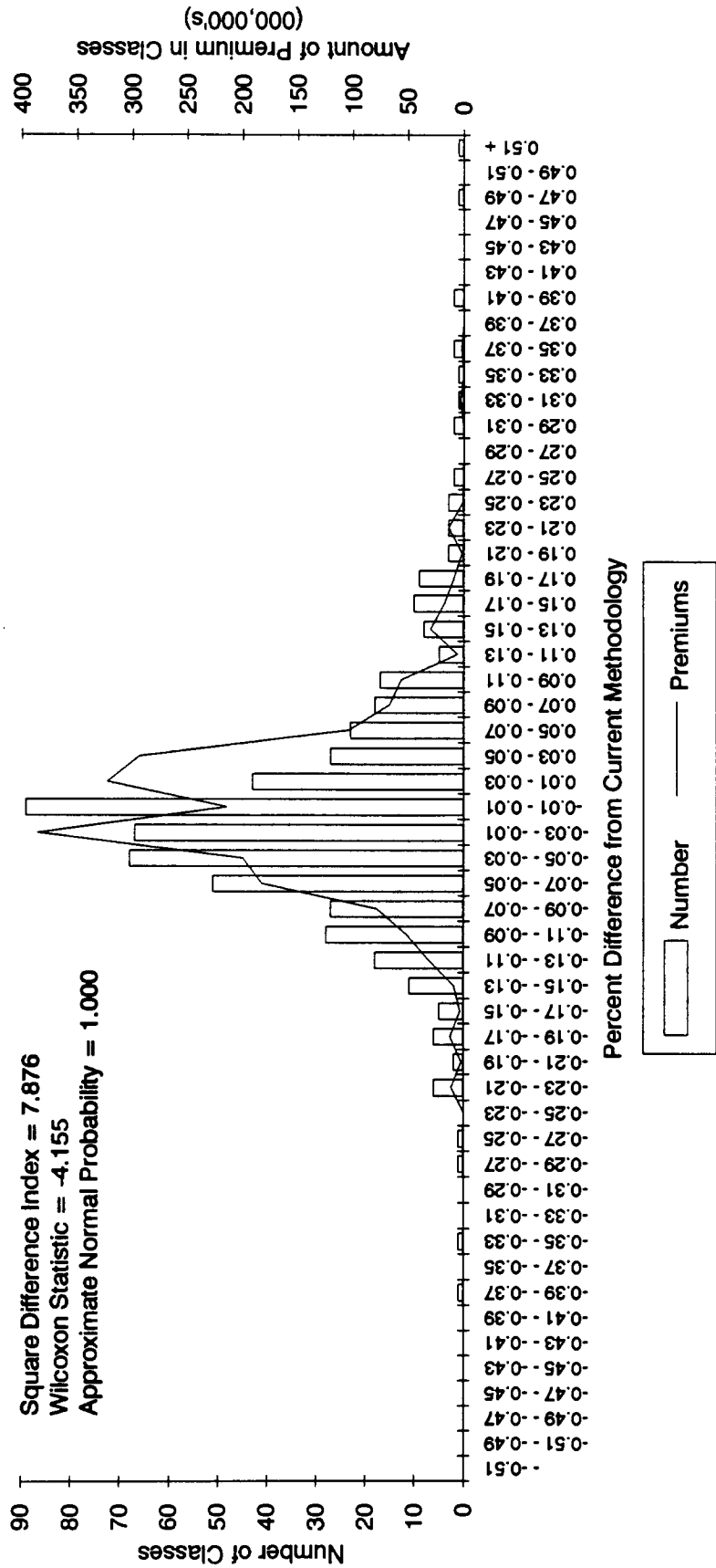
Florida, 1989 Revision
Four Years of Data

Square Difference Index = 3.829
 Wilcoxon Statistic = -2.902
 Approximate Normal Probability = 0.998

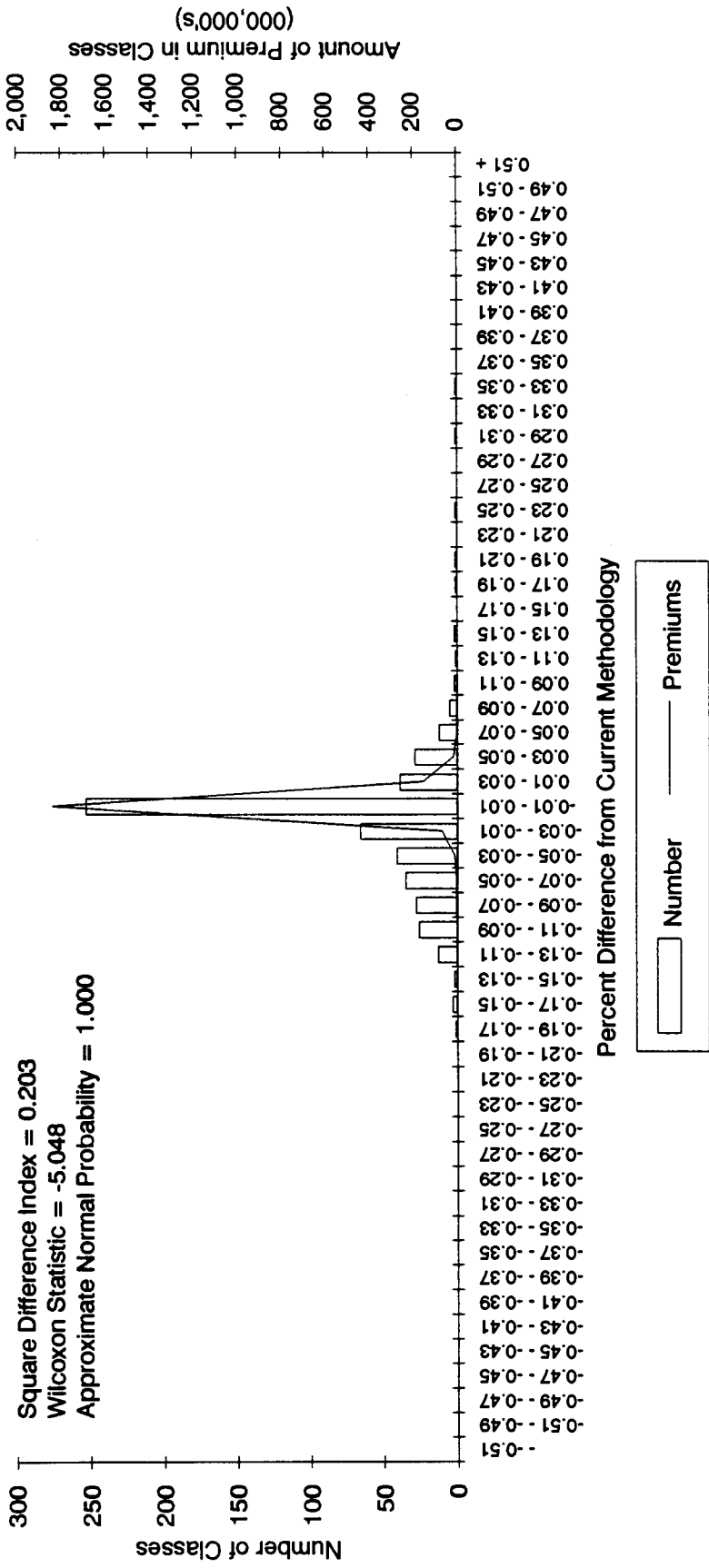


Florida, 1989 Revision
Five Years of Data

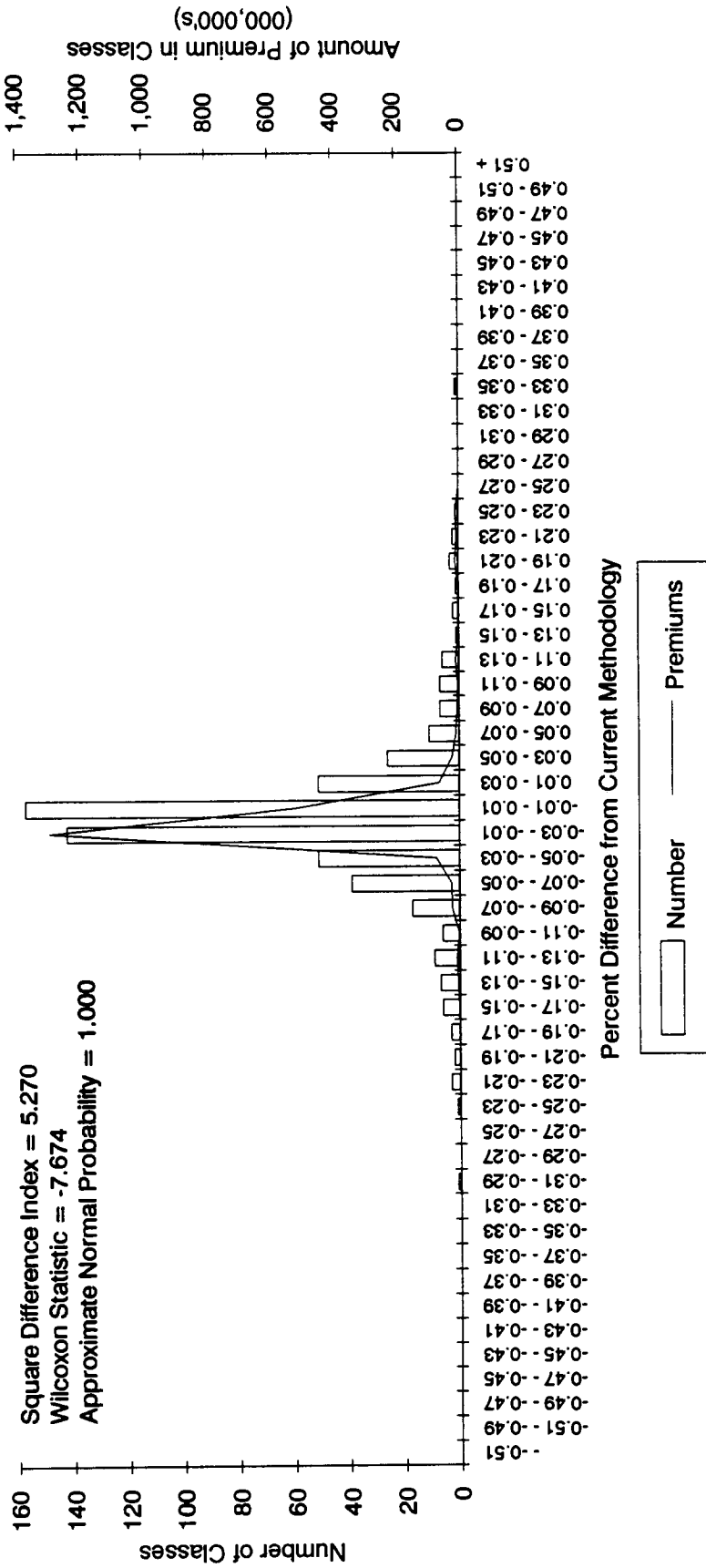
Square Difference Index = 7.876
 Wilcoxon Statistic = -4.155
 Approximate Normal Probability = 1.000



Florida, 1989 Revision
Credibility Using .5 Power

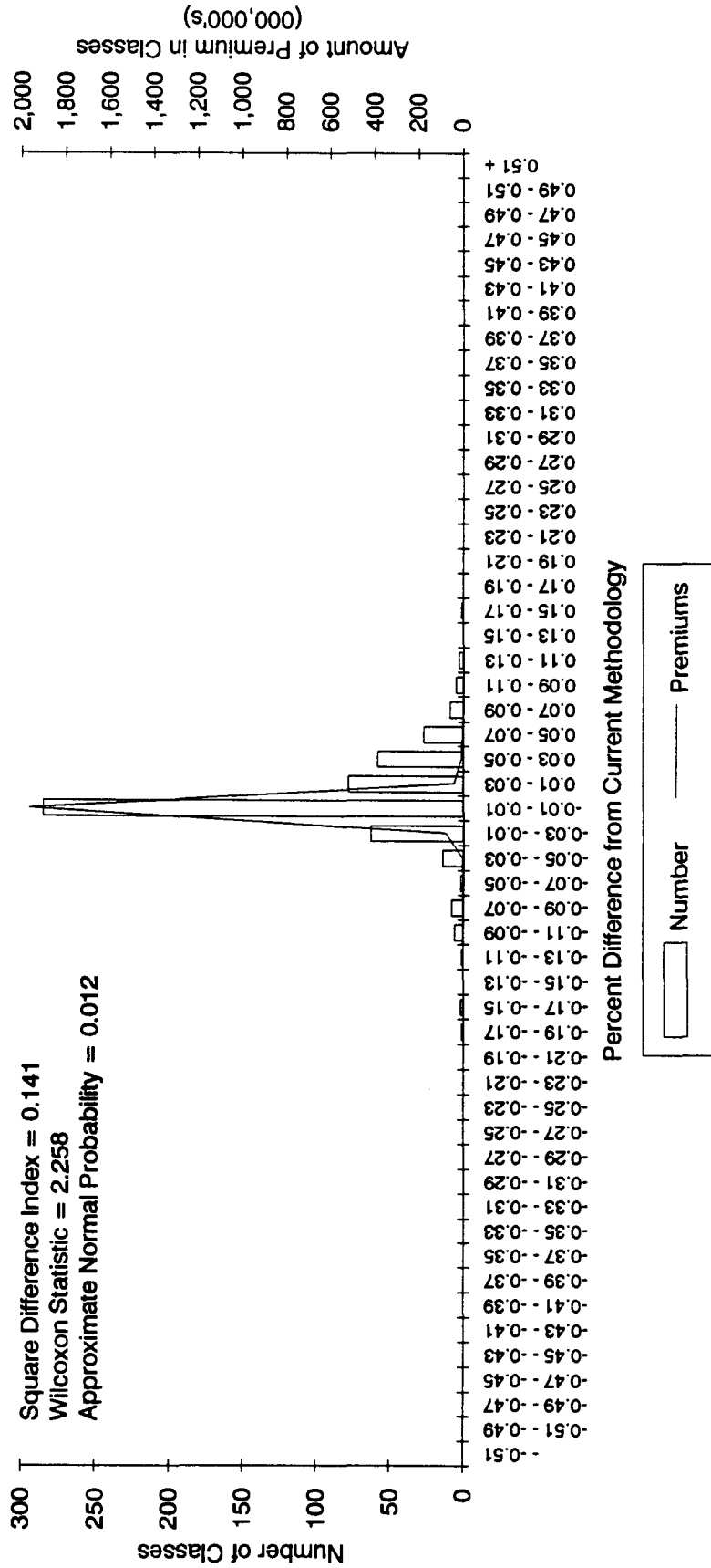


Florida, 1989 Revision
Payroll Based Credibility



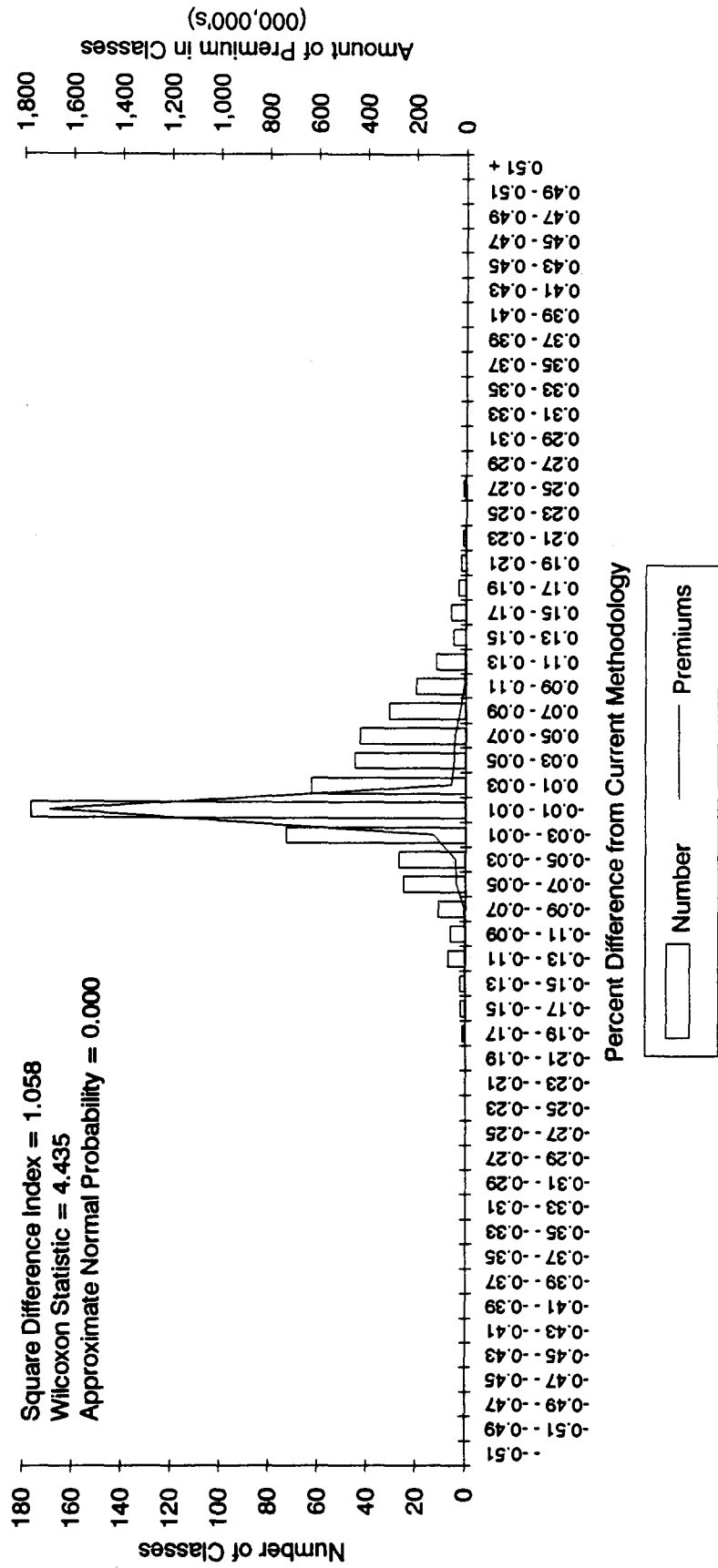
Florida, 1989 Revision
Credibility Using .8 Power

Square Difference Index = 0.141
Wilcoxon Statistic = 2.258
Approximate Normal Probability = 0.012



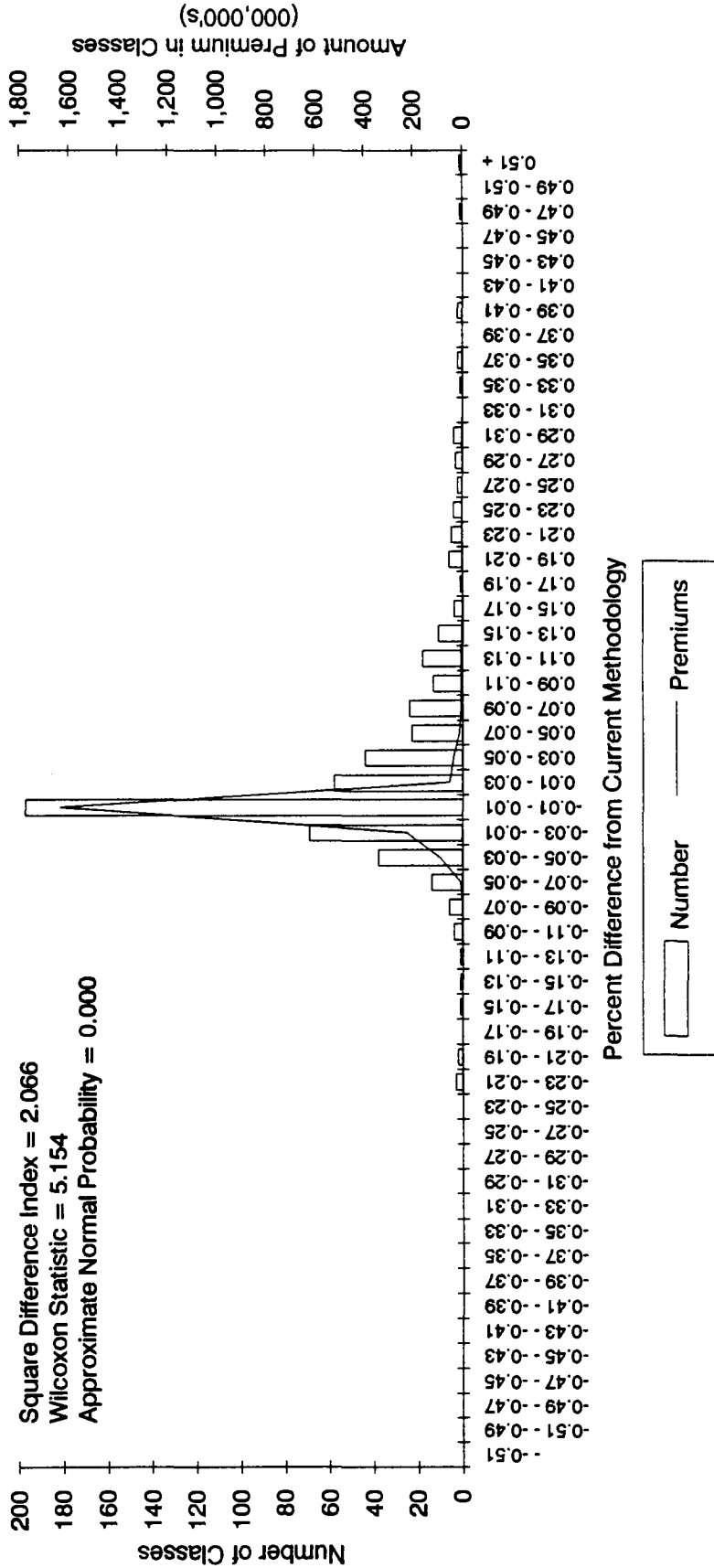
**Florida, 1989 Revision
Double Full Credibility Standard**

Square Difference Index = 1.058
 Wilcoxon Statistic = 4.435
 Approximate Normal Probability = 0.000

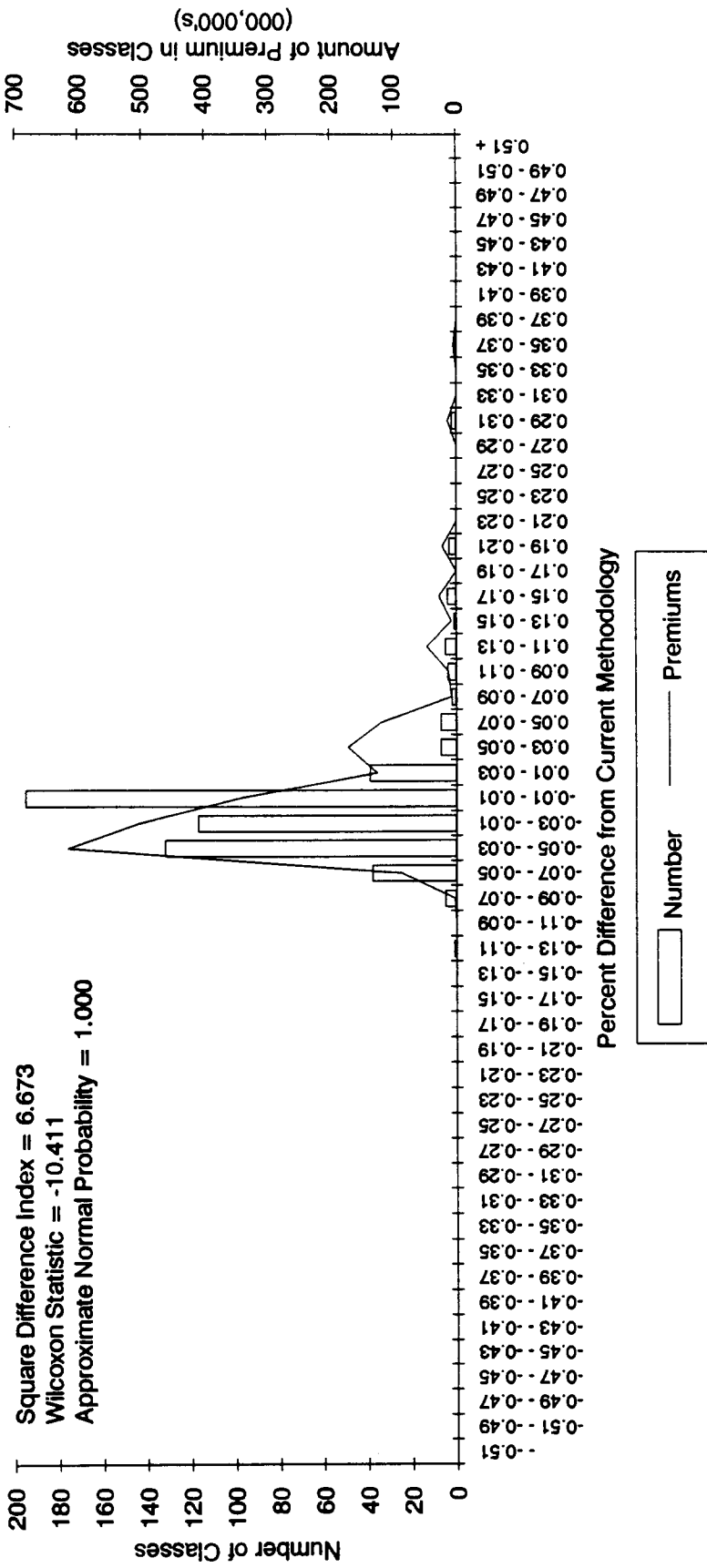


Florida, 1989 Revision
Claim Count Based Credibility

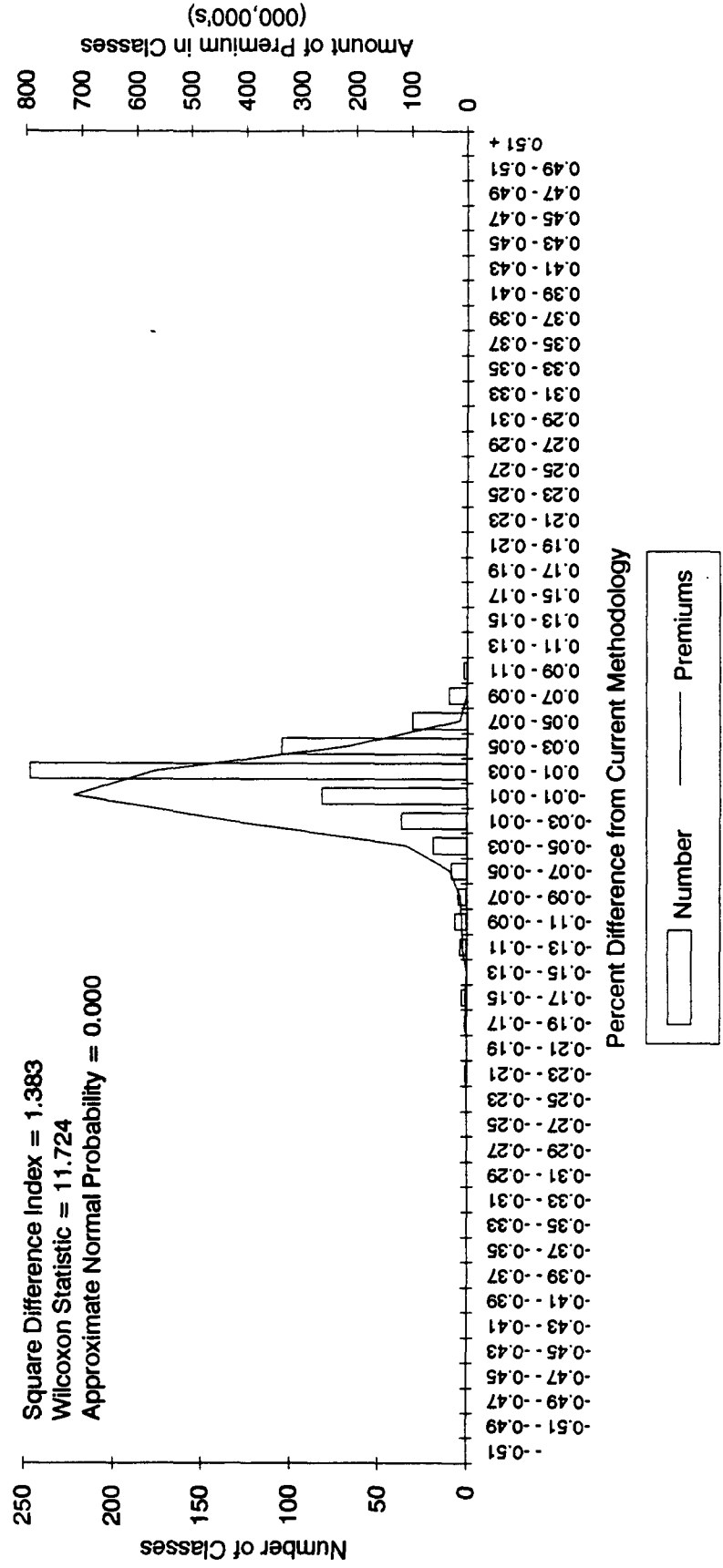
Square Difference Index = 2.066
 Wilcoxon Statistic = 5.154
 Approximate Normal Probability = 0.000



Florida, 1989 Revision
Unlimited Losses

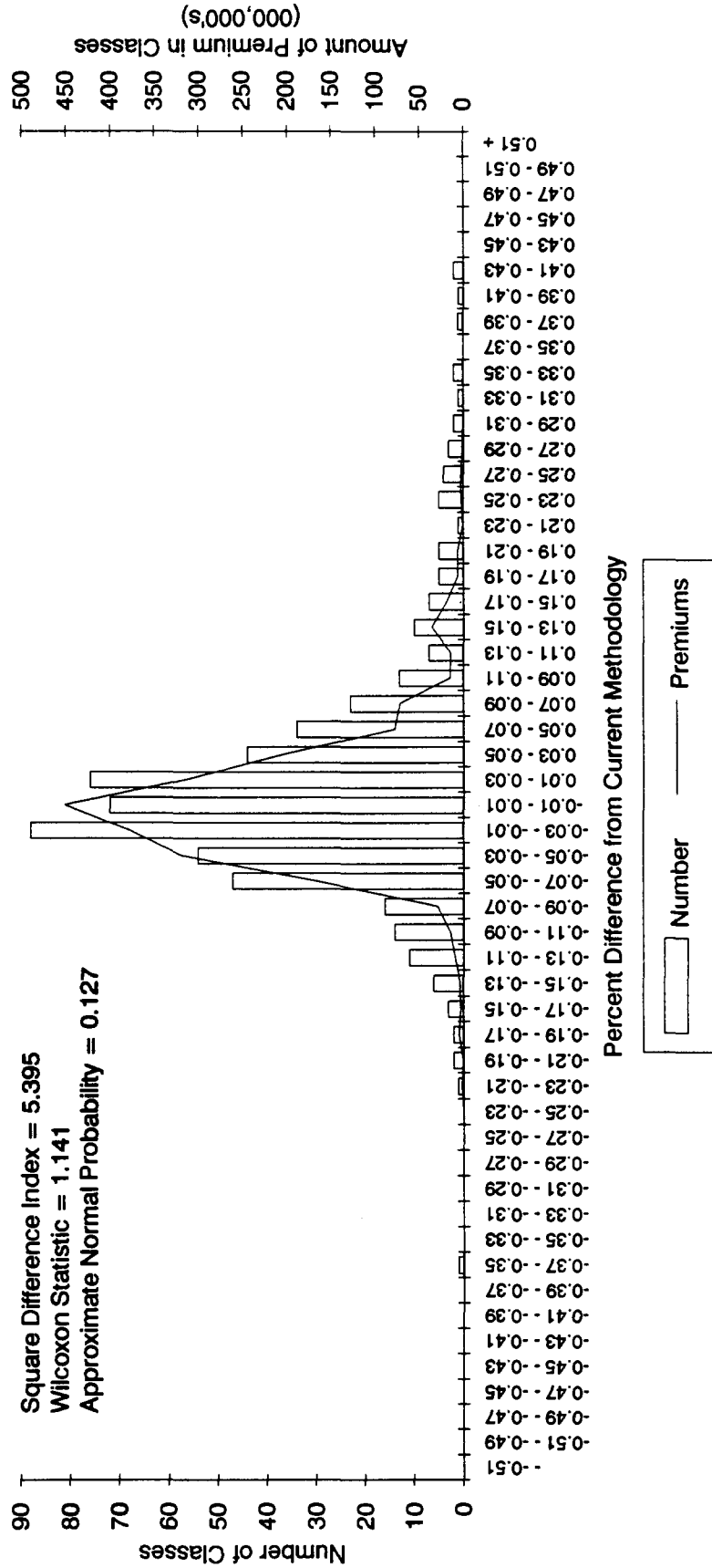


Florida, 1989 Revision
Half Current Loss Limitation

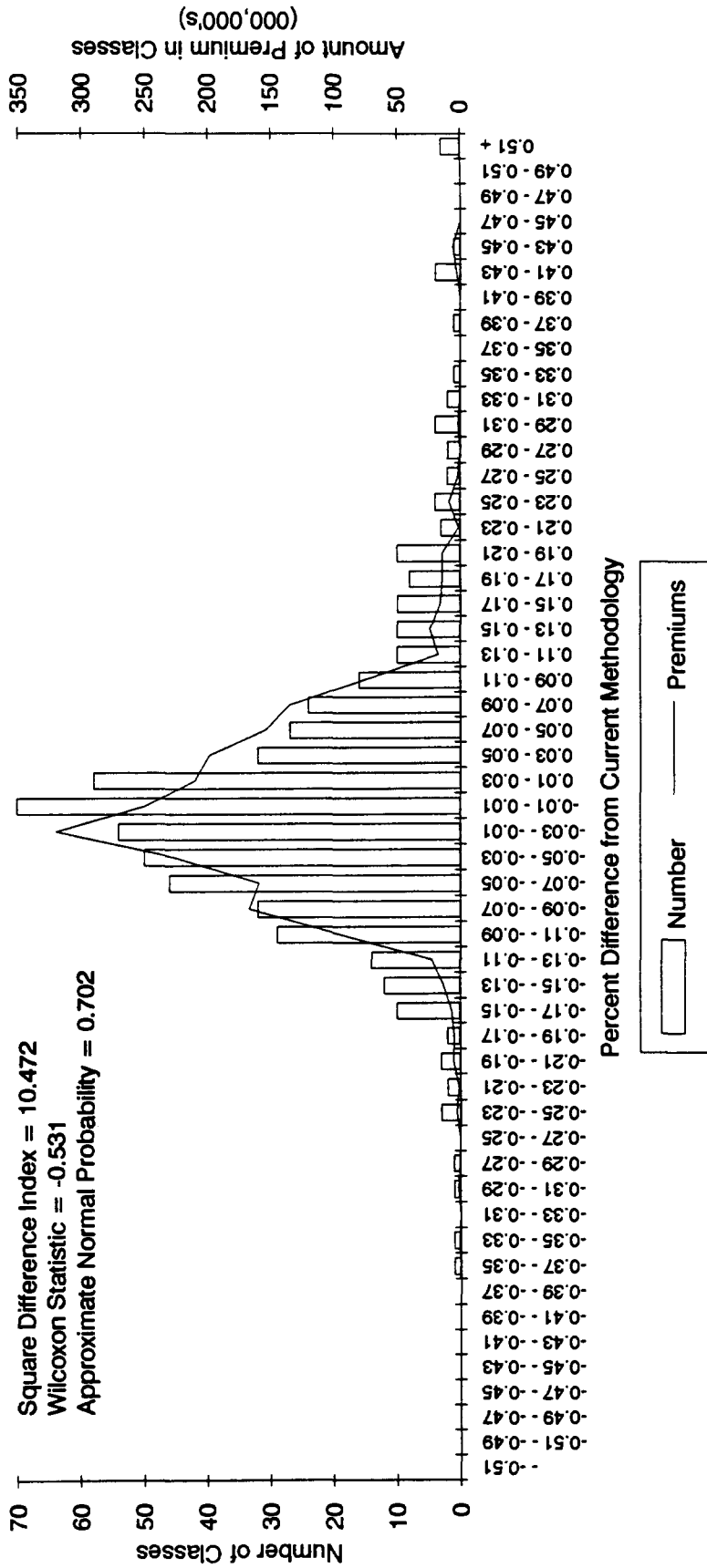


Florida, 1990 Revision
Four Years of Data

Square Difference Index = 5.395
Wilcoxon Statistic = 1.141
Approximate Normal Probability = 0.127

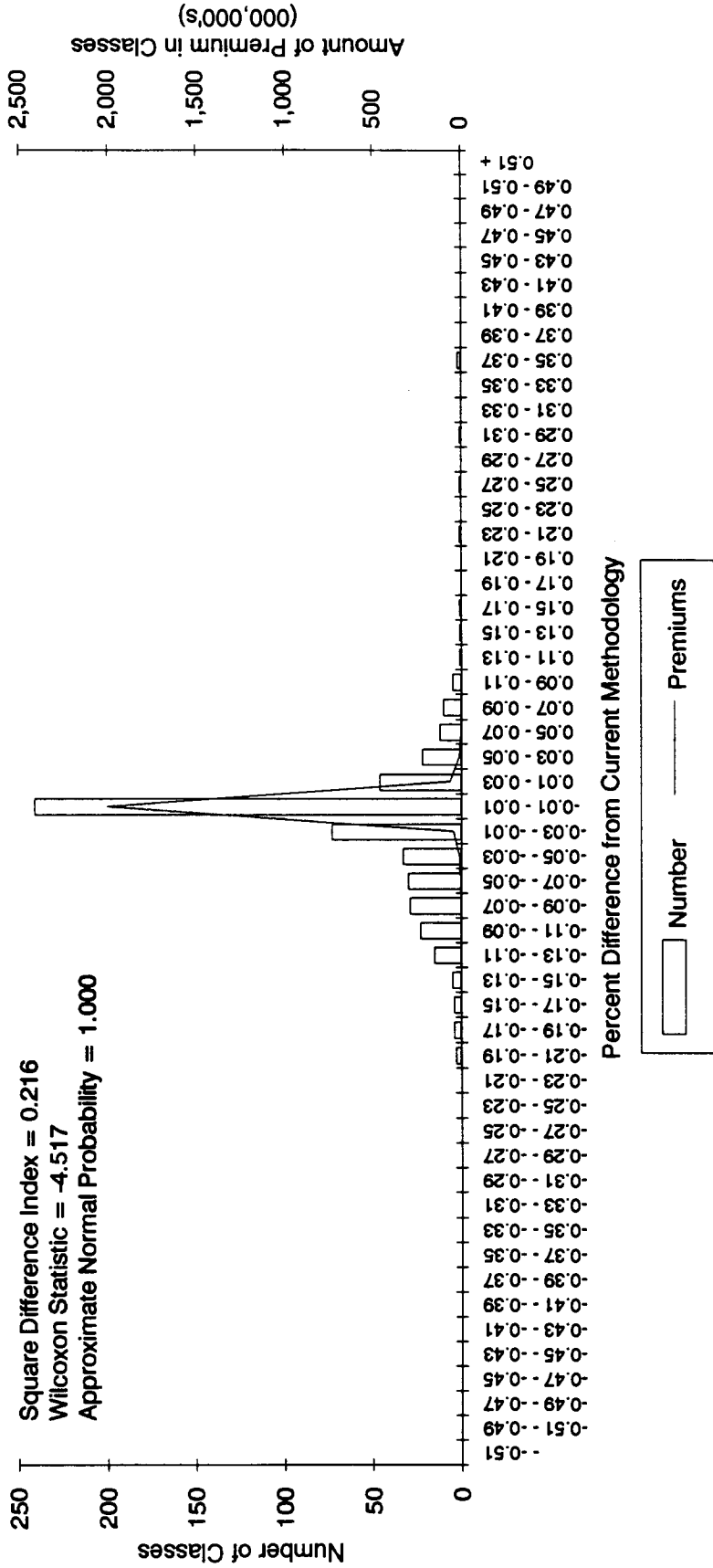


Florida, 1990 Revision
Five Years of Data



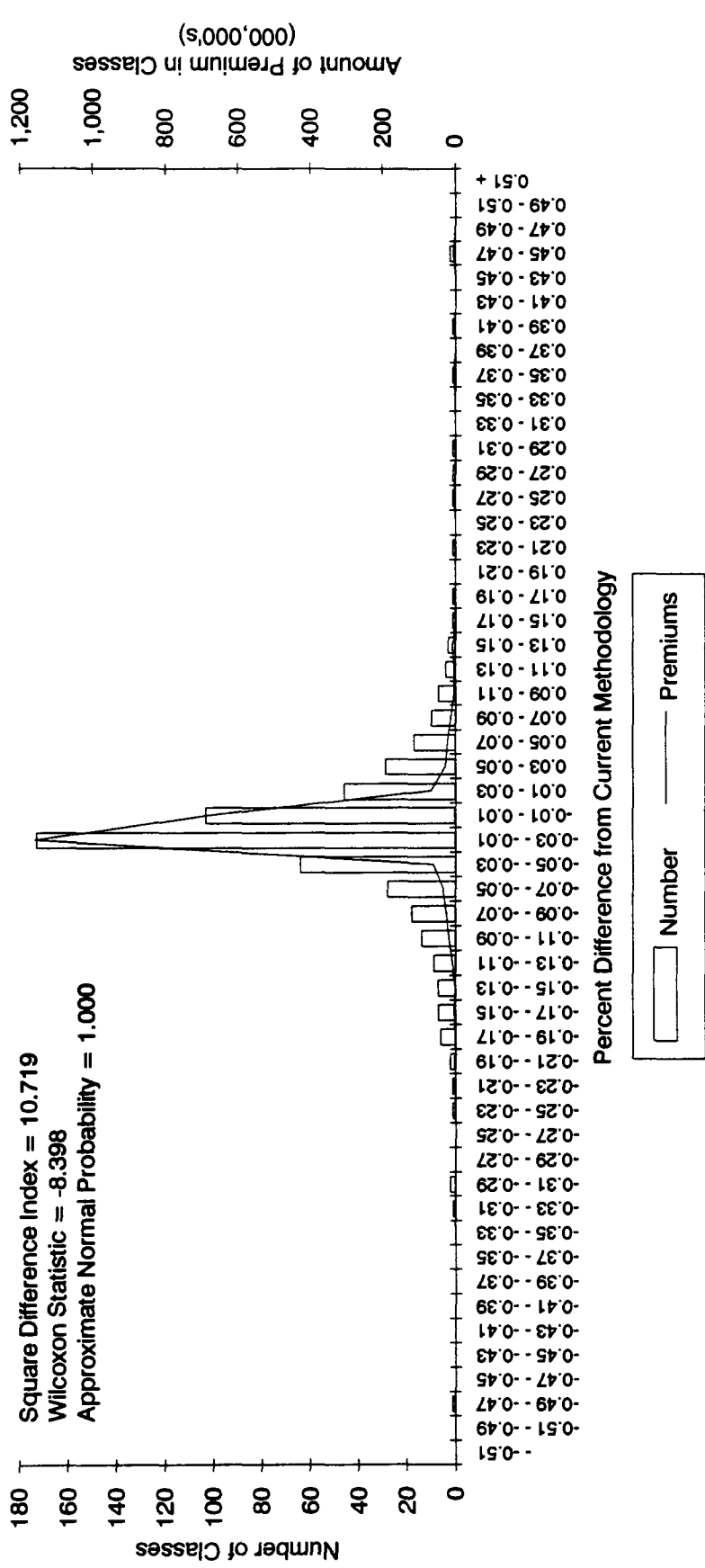
Florida, 1990 Revision
Credibility Using .5 Power

Square Difference Index = 0.216
Wilcoxon Statistic = -4.517
Approximate Normal Probability = 1.000



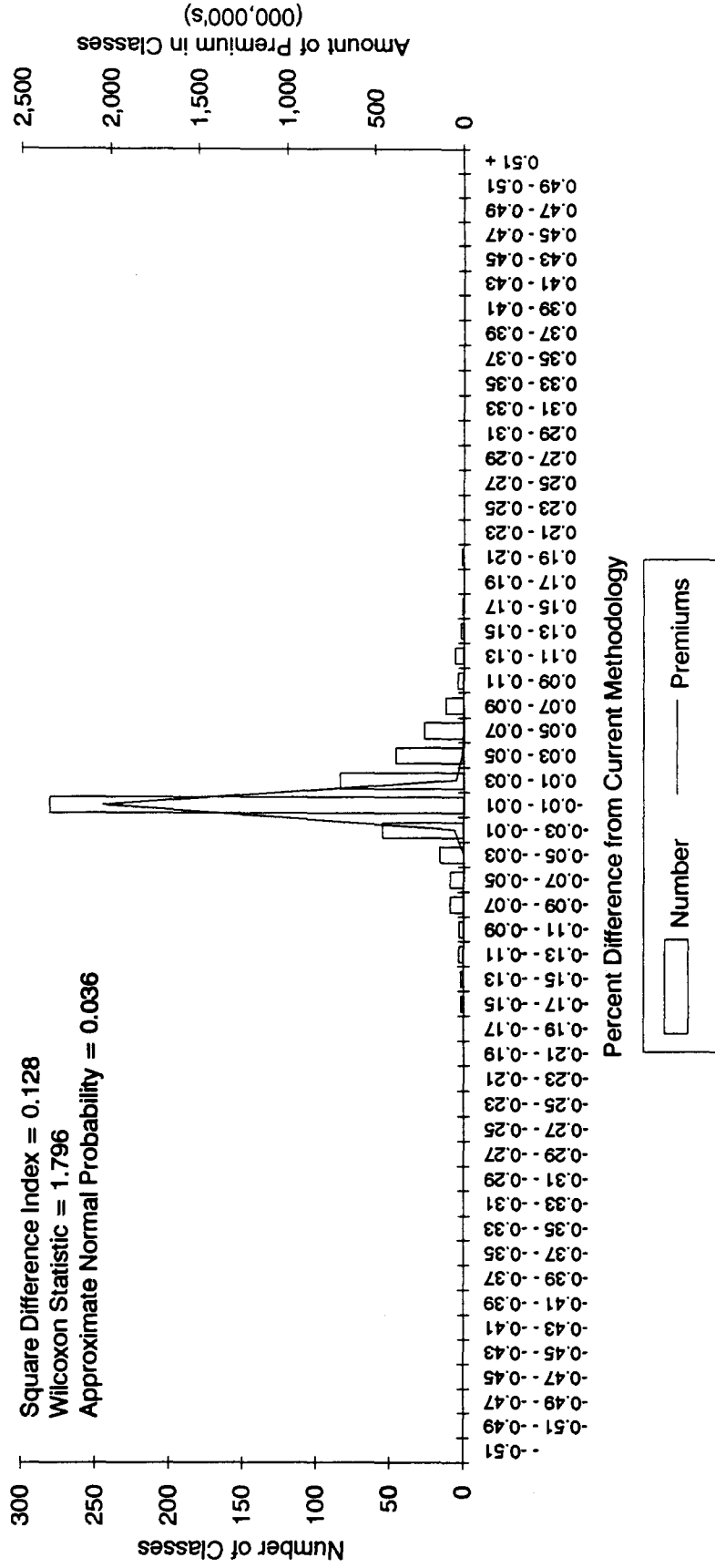
**Florida, 1990 Revision
Payroll Based Credibility**

Square Difference Index = 10.719
 Wilcoxon Statistic = -8.398
 Approximate Normal Probability = 1.000



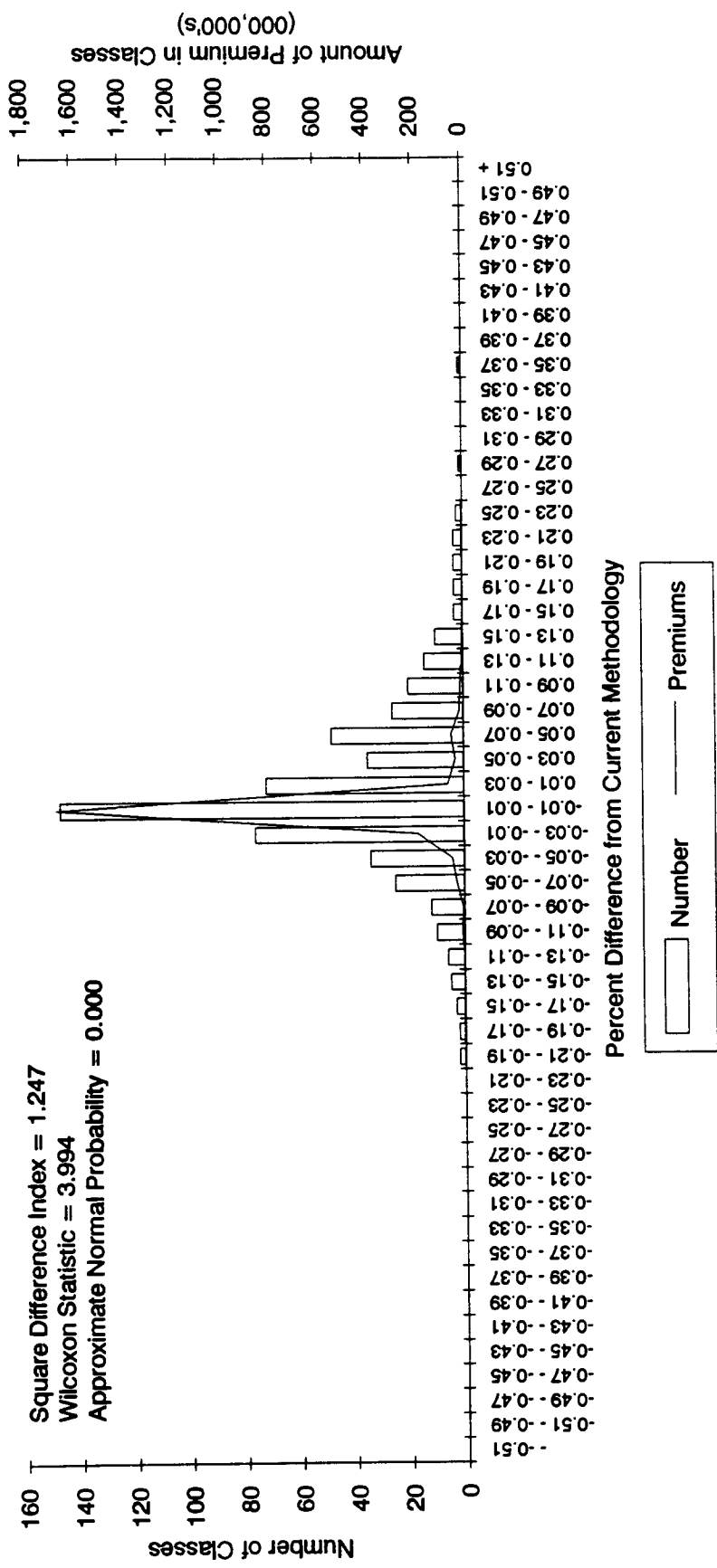
Florida, 1990 Revision
Credibility Using .8 Power

Square Difference Index = 0.128
Wilcoxon Statistic = 1.796
Approximate Normal Probability = 0.036



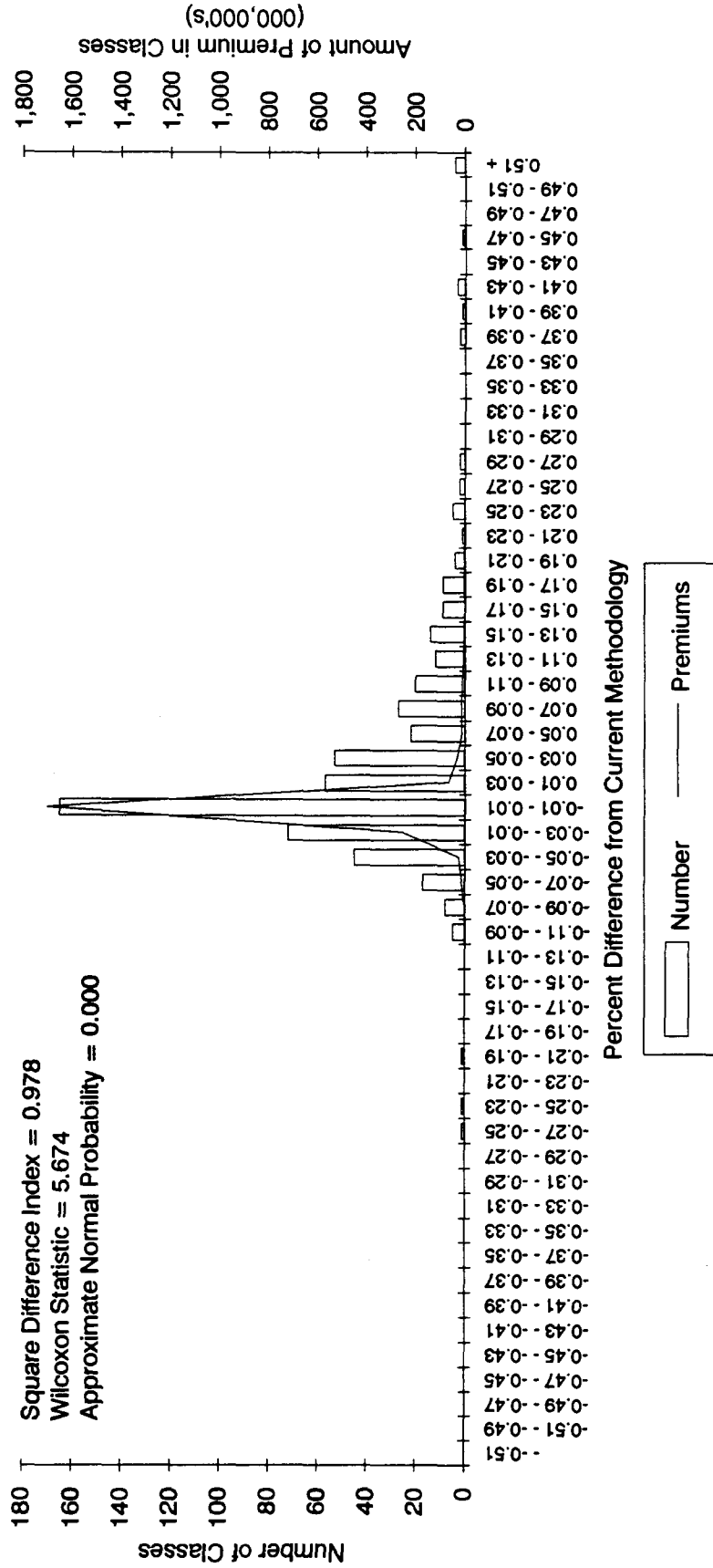
**Florida, 1990 Revision
Double Full Credibility Standard**

Square Difference Index = 1.247
 Wilcoxon Statistic = 3.994
 Approximate Normal Probability = 0.000

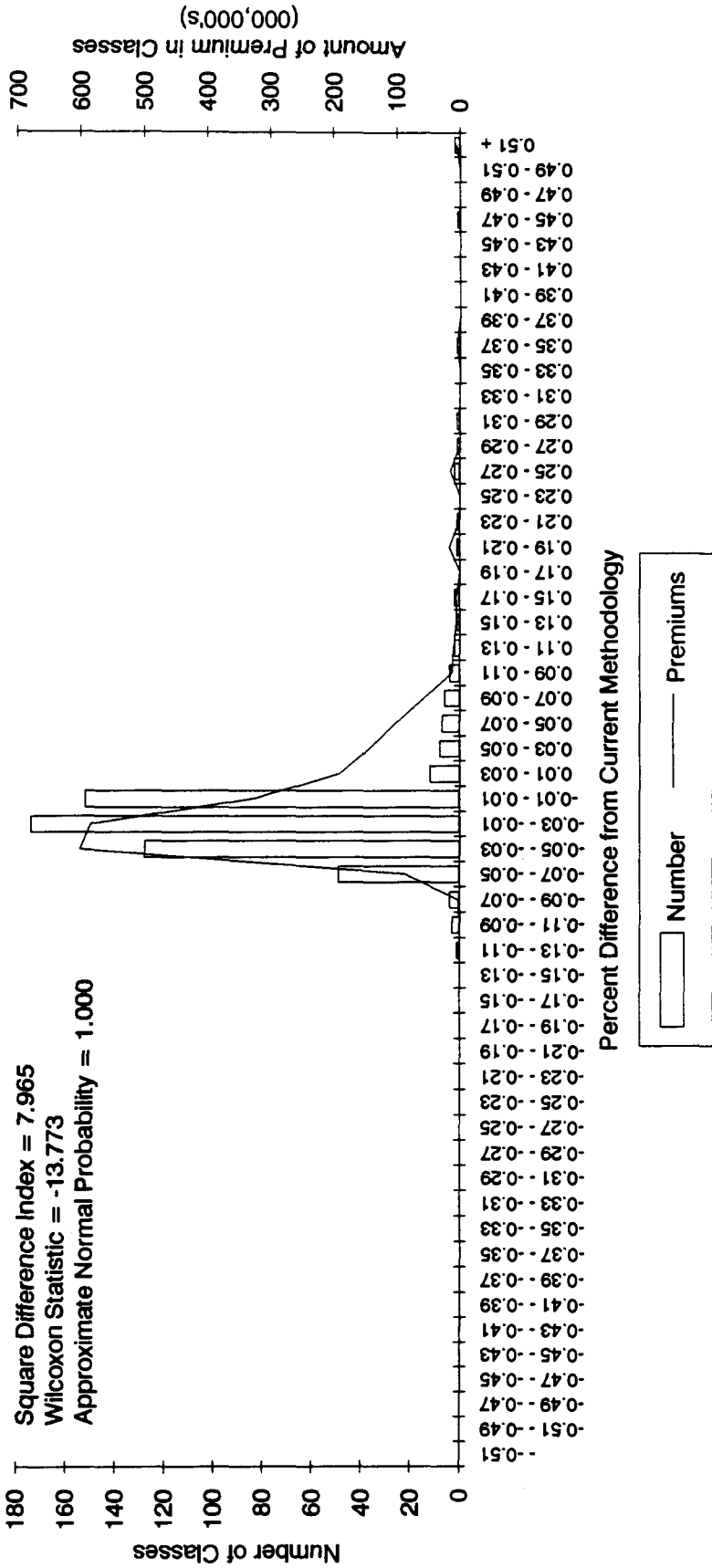


Florida, 1990 Revision
Claim Count Based Credibility

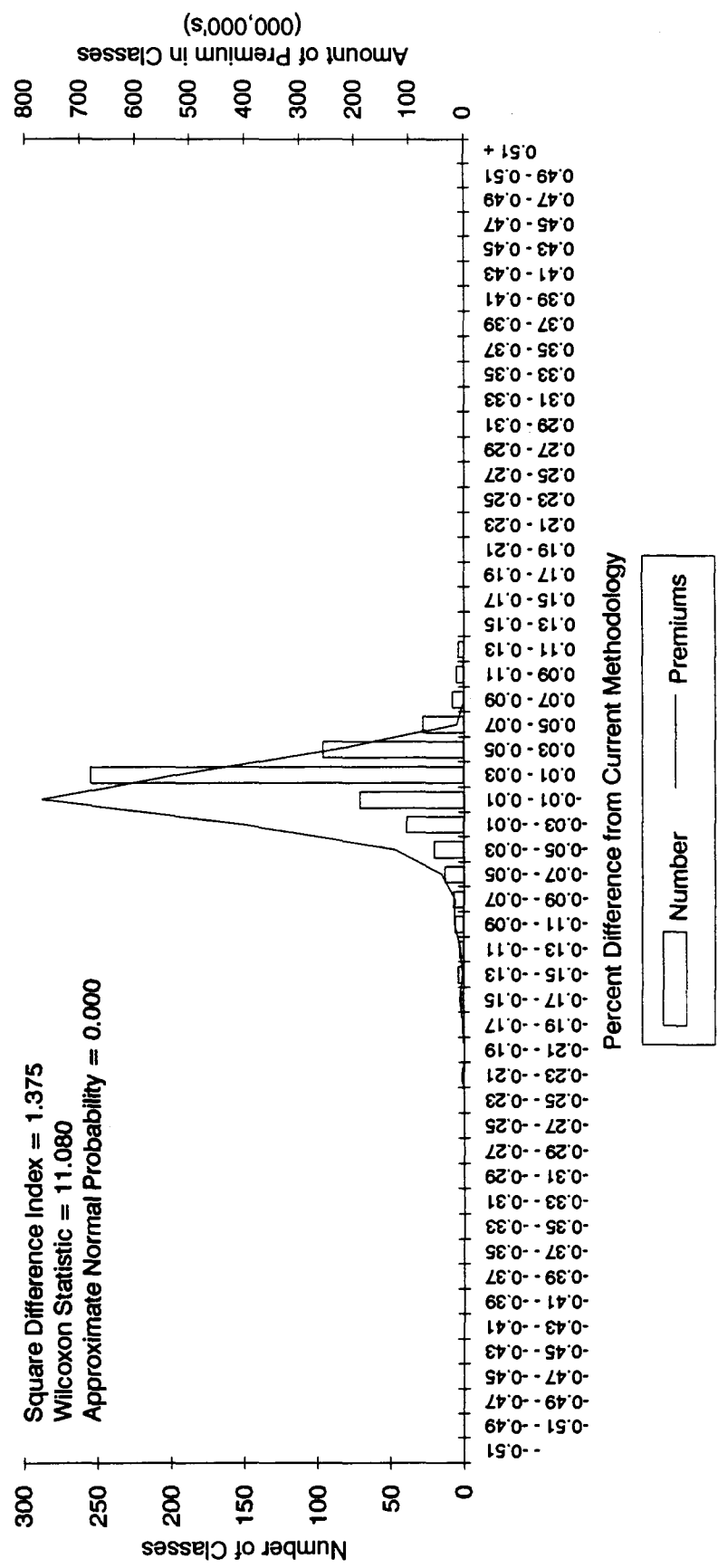
Square Difference Index = 0.978
Wilcoxon Statistic = 5.674
Approximate Normal Probability = 0.000



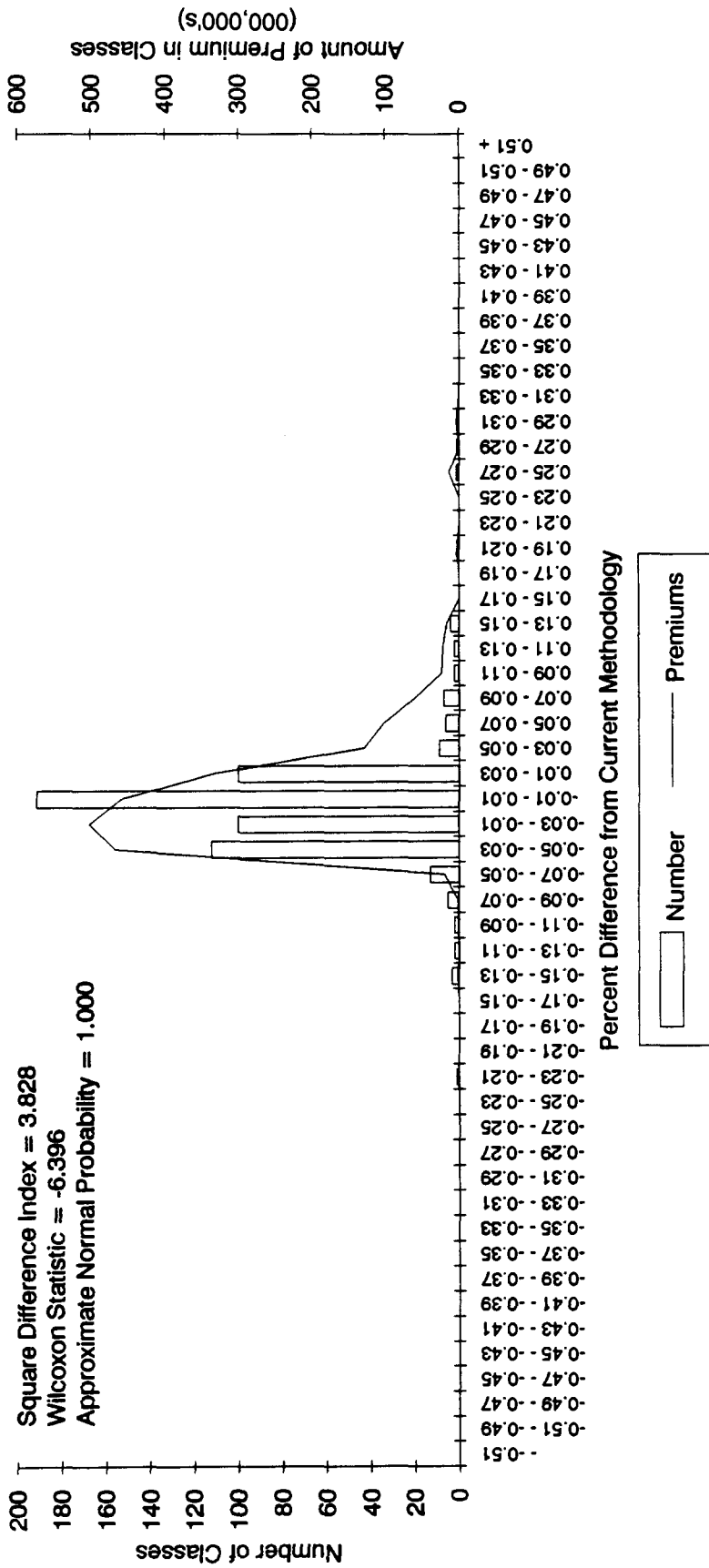
Florida, 1990 Revision
Unlimited Losses



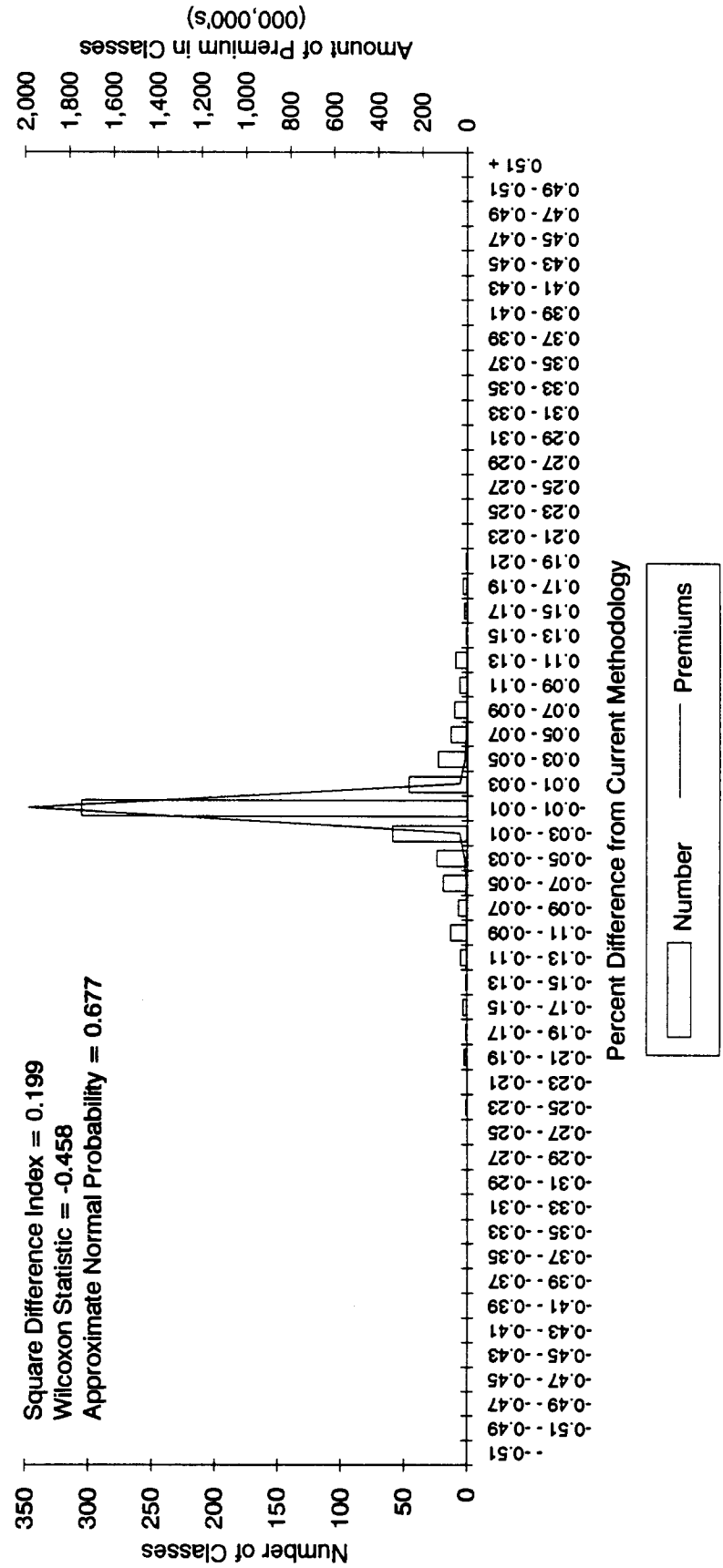
Florida, 1990 Revision
Half Current Loss Limitation



Florida, 1990 Revision
Sliding Scale Loss Limitation

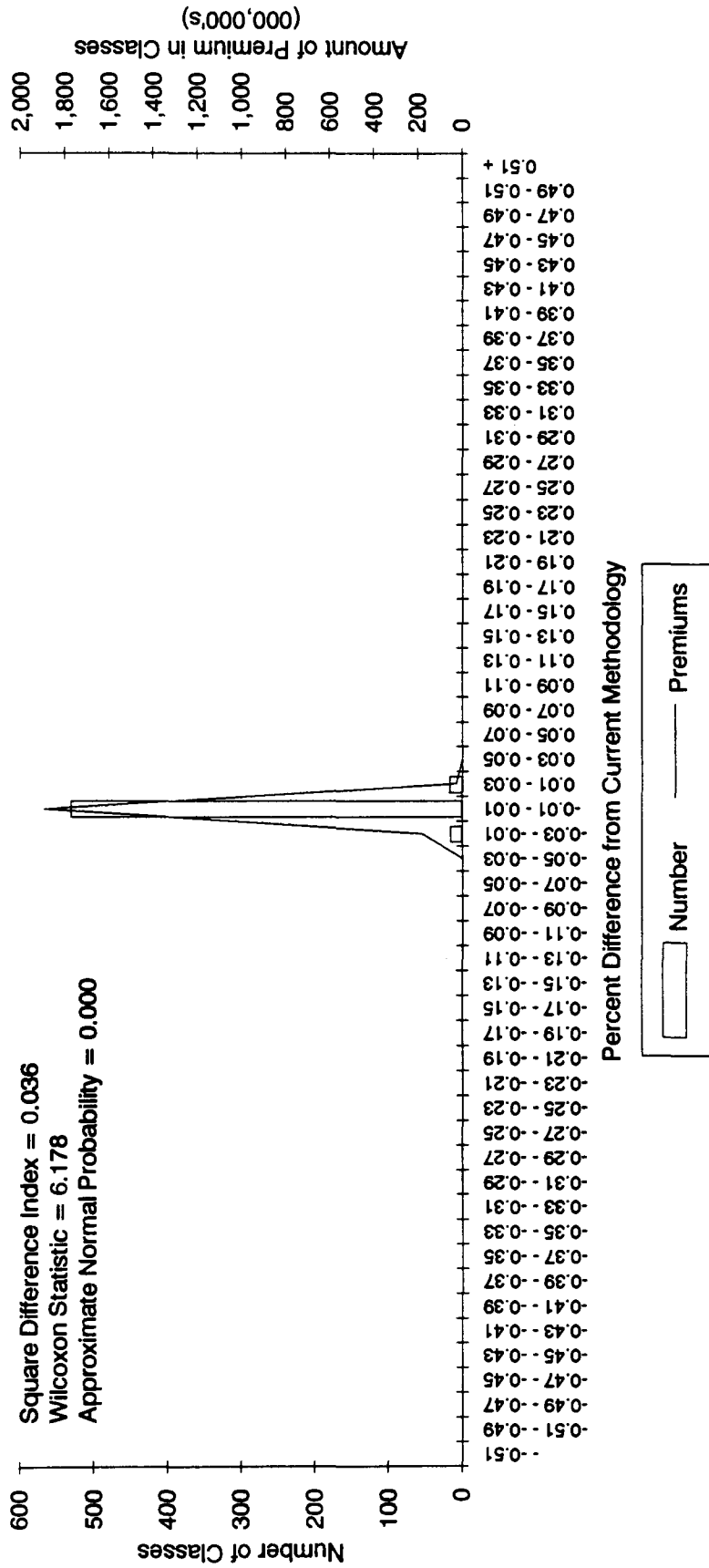


Florida, 1990 Revision
Alternate Regional Pure Premiums



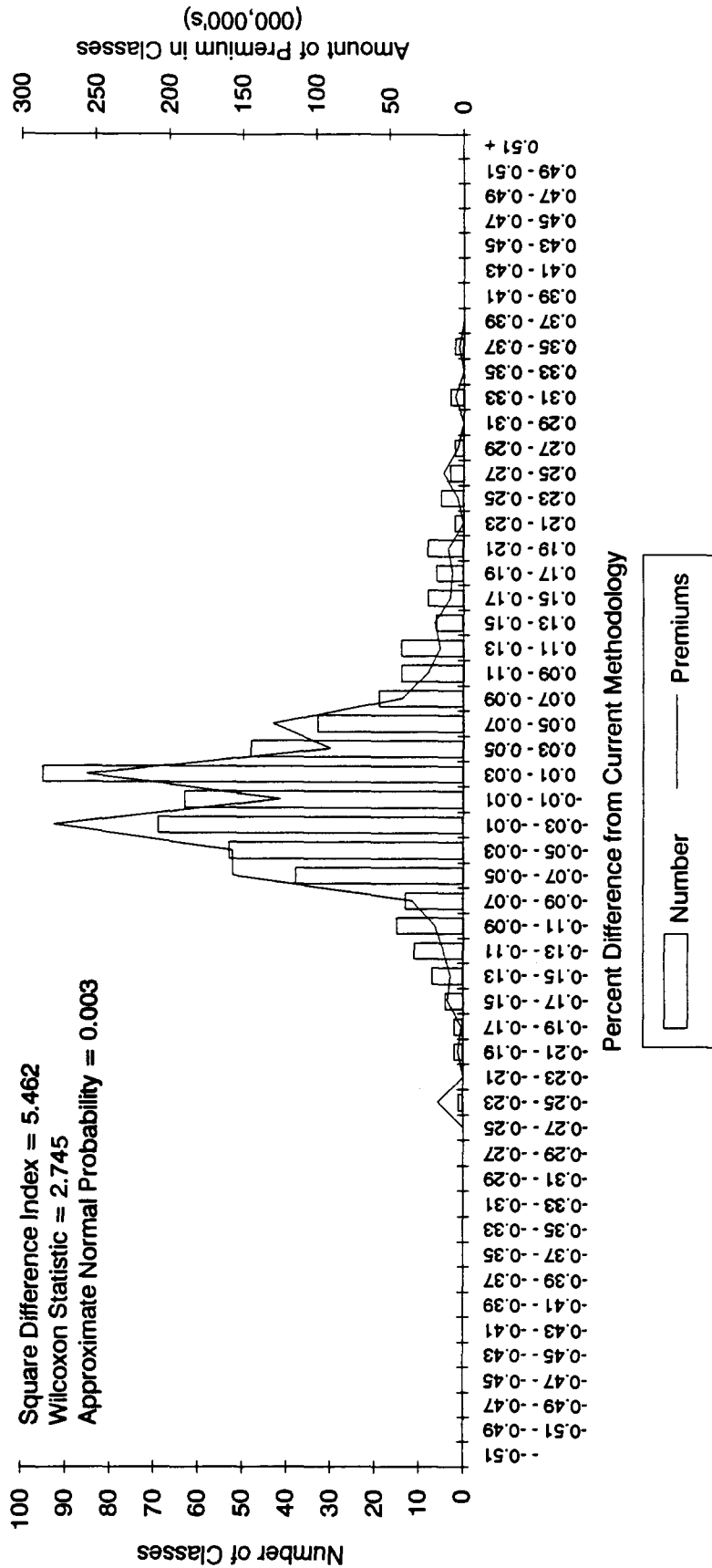
Florida, 1990 Revision
Alternate Trend Application

Square Difference Index = 0.036
Wilcoxon Statistic = 6.178
Approximate Normal Probability = 0.000



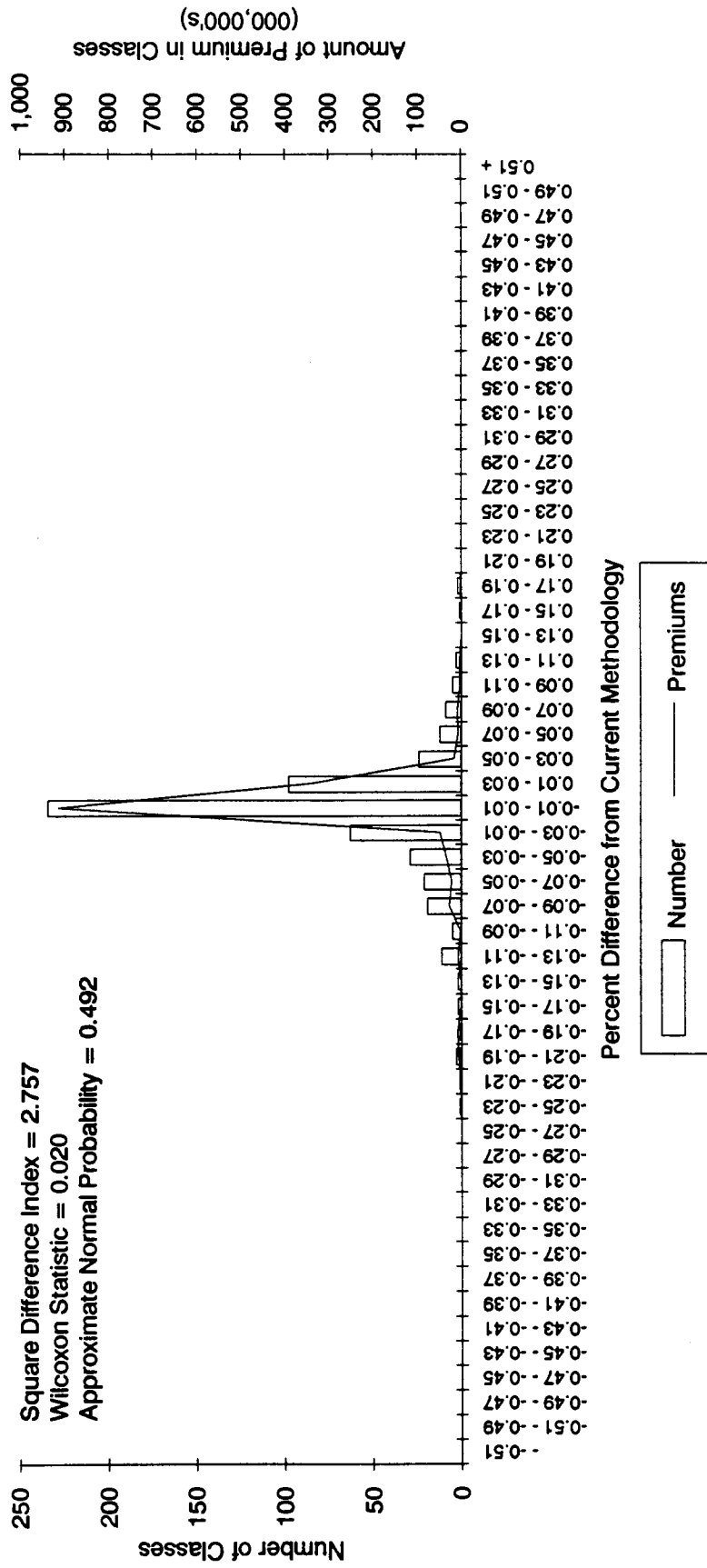
Illinois, 1987 Revision
Five Years of Data

Square Difference Index = 5.462
Wilcoxon Statistic = 2.745
Approximate Normal Probability = 0.003



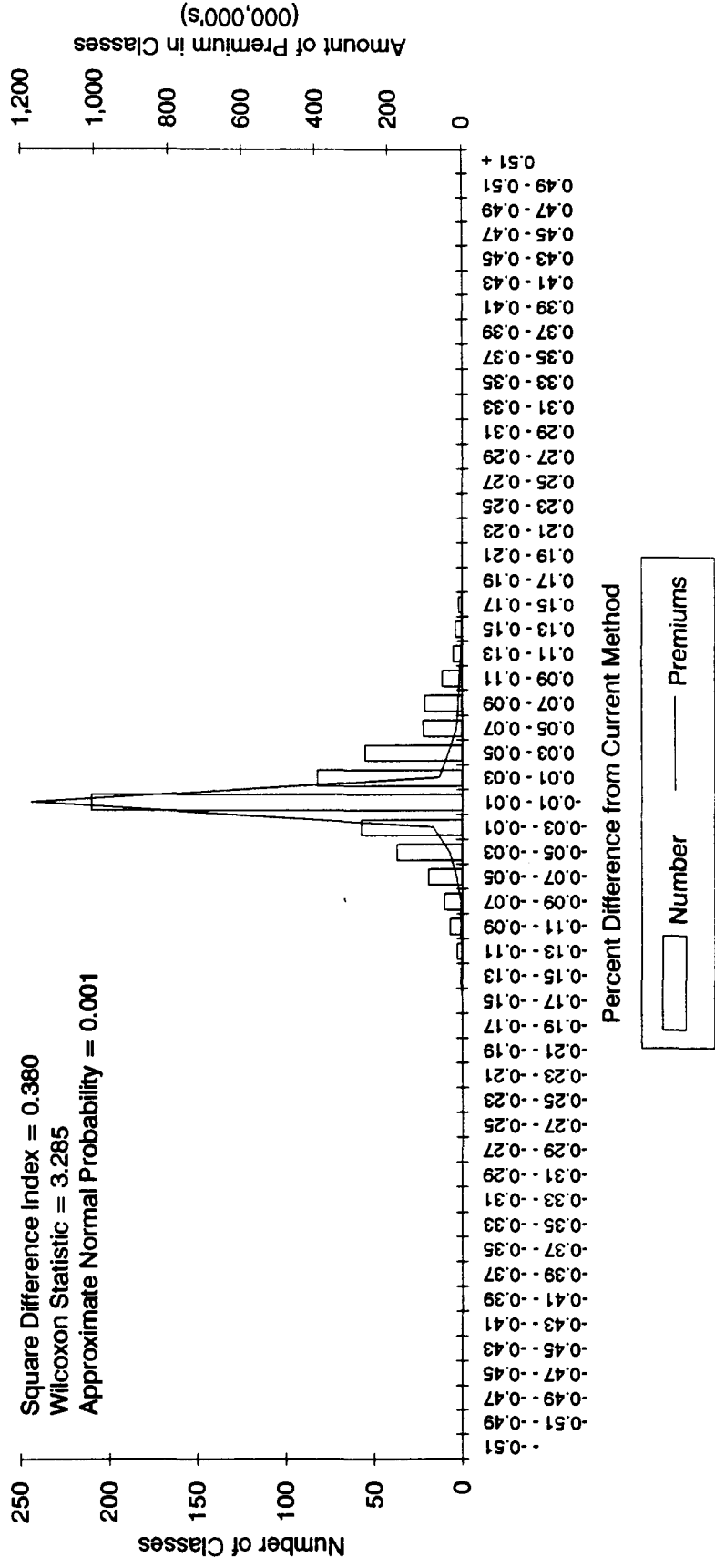
**Illinois, 1987 Revision
Payroll Based Credibility**

Square Difference Index = 2.757
 Wilcoxon Statistic = 0.020
 Approximate Normal Probability = 0.492

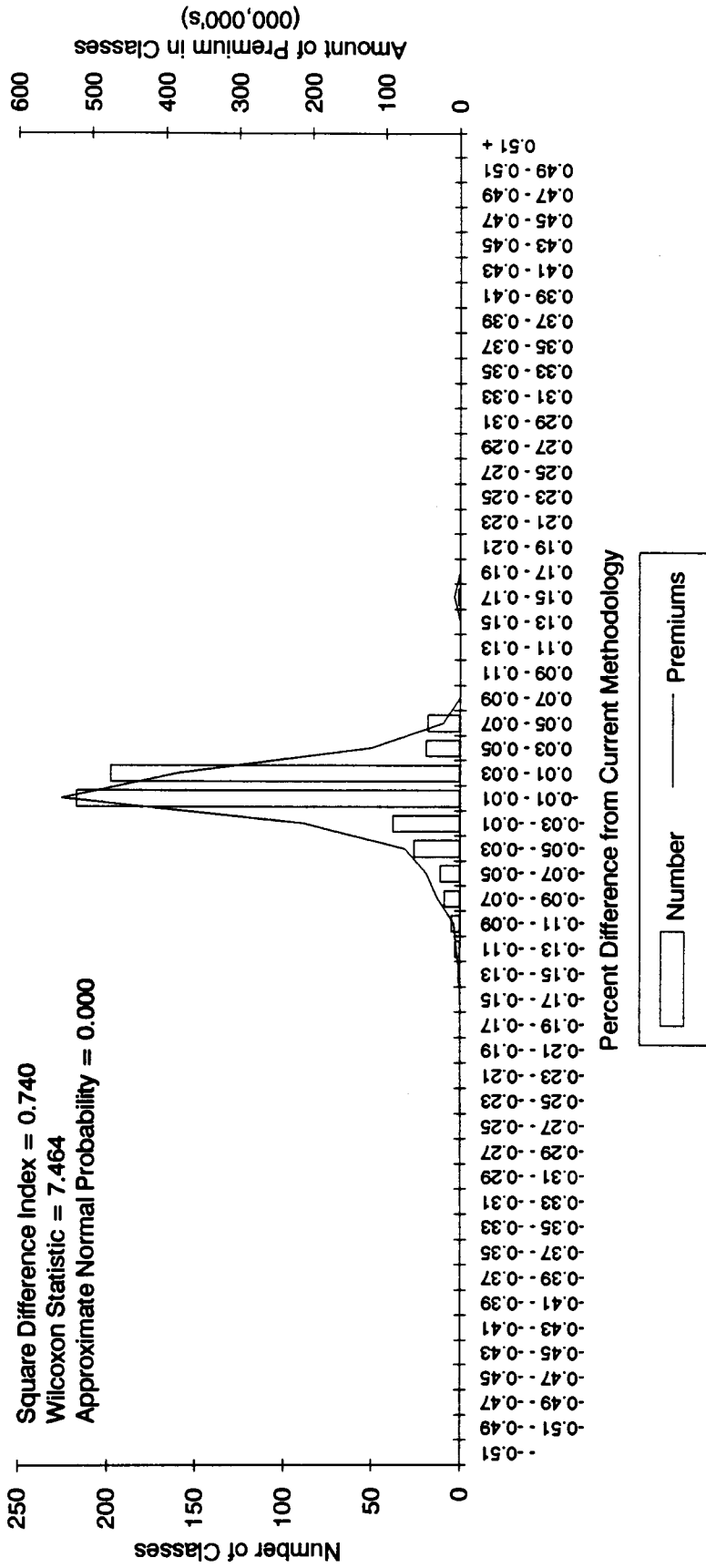


**Illinois, 1987 Revision
Double Full Credibility Standard**

Square Difference Index = 0.380
 Wilcoxon Statistic = 3.285
 Approximate Normal Probability = 0.001

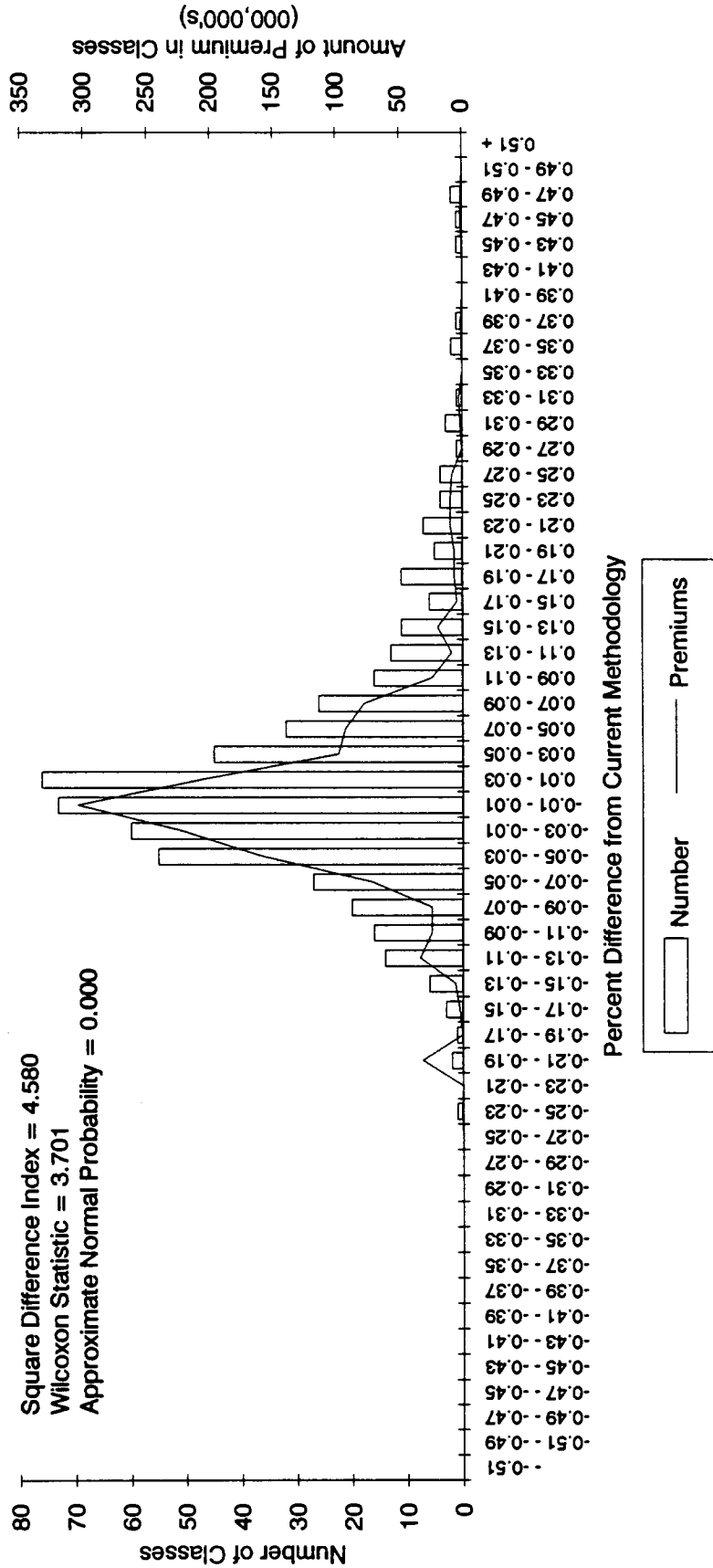


Illinois, 1987 Revision
Half Current Loss Limitation



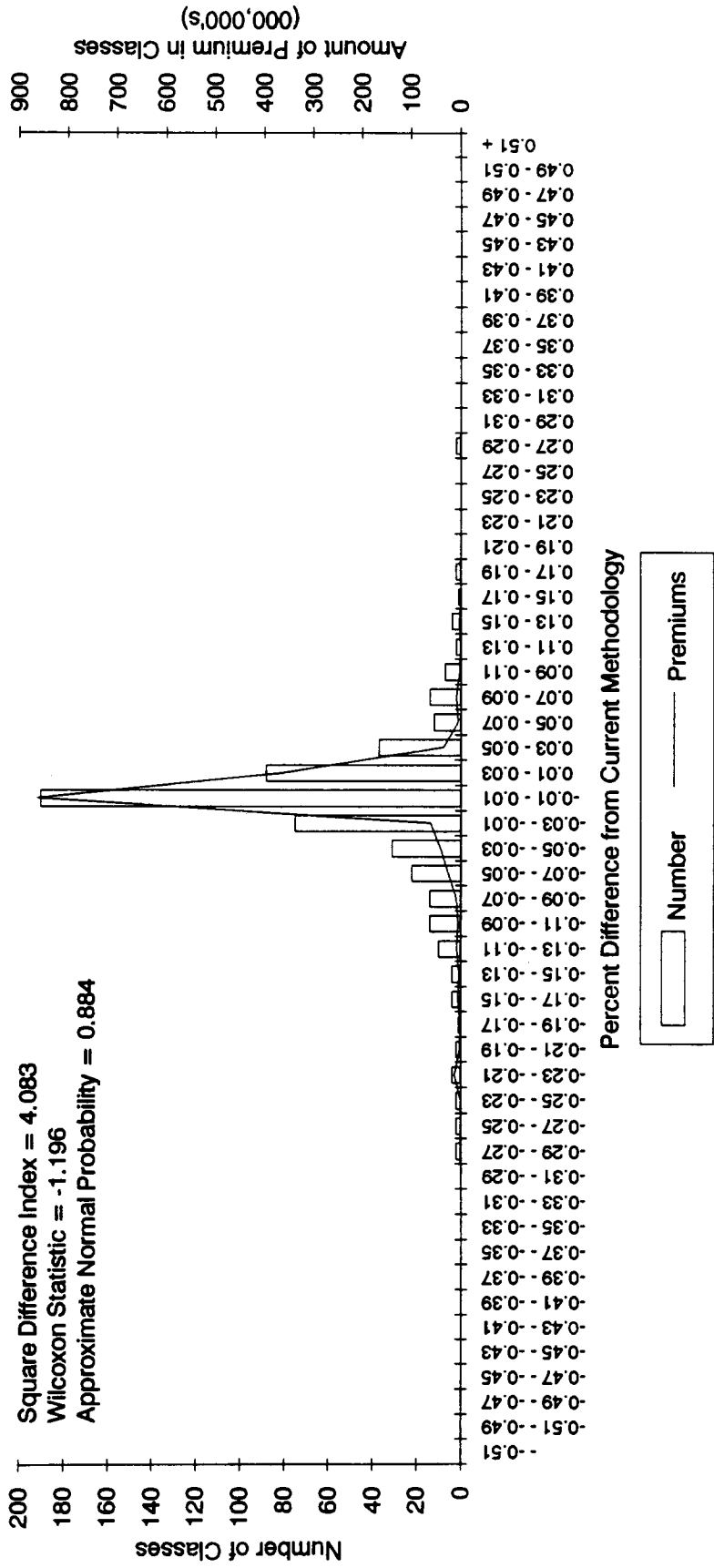
Illinois, 1988 Revision
Five Years of Data

Square Difference Index = 4.580
Wilcoxon Statistic = 3.701
Approximate Normal Probability = 0.000



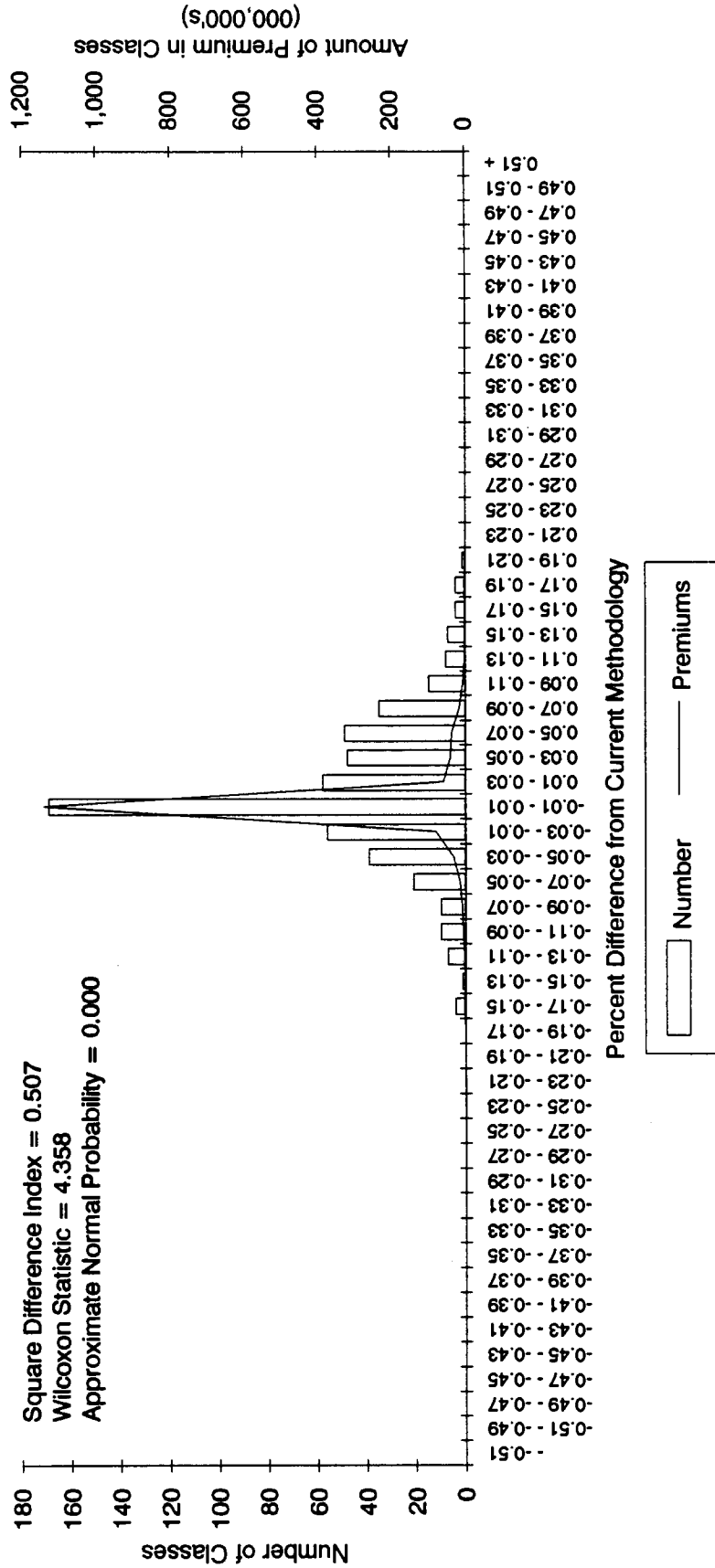
Illinois, 1988 Revision
Payroll Based Credibility

Square Difference Index = 4.083
Wilcoxon Statistic = -1.196
Approximate Normal Probability = 0.884



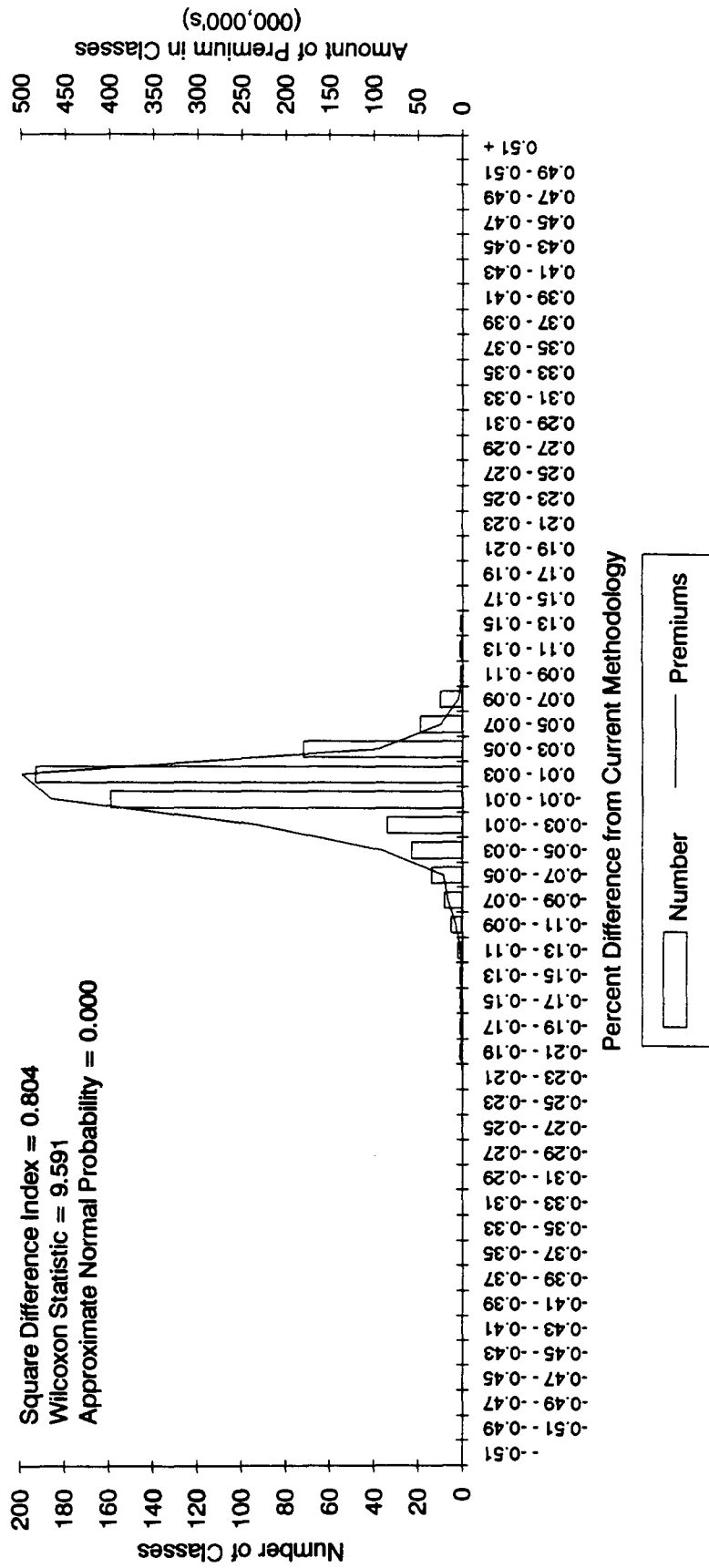
**Illinois, 1988 Revision
Double Full Credibility Standard**

Square Difference Index = 0.507
 Wilcoxon Statistic = 4.358
 Approximate Normal Probability = 0.000



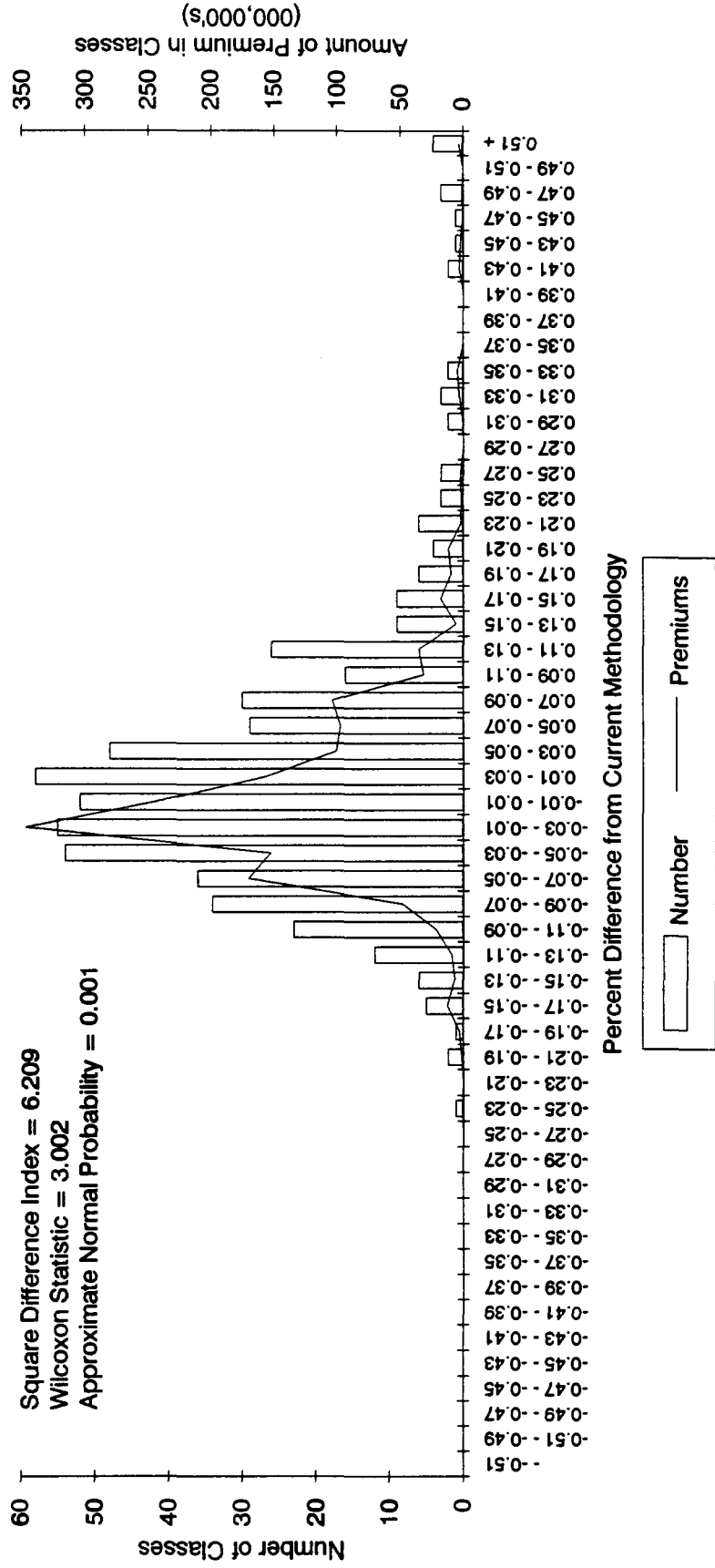
**Illinois, 1988 Revision
Half Current Loss Limitation**

Square Difference Index = 0.804
 Wilcoxon Statistic = 9.591
 Approximate Normal Probability = 0.000

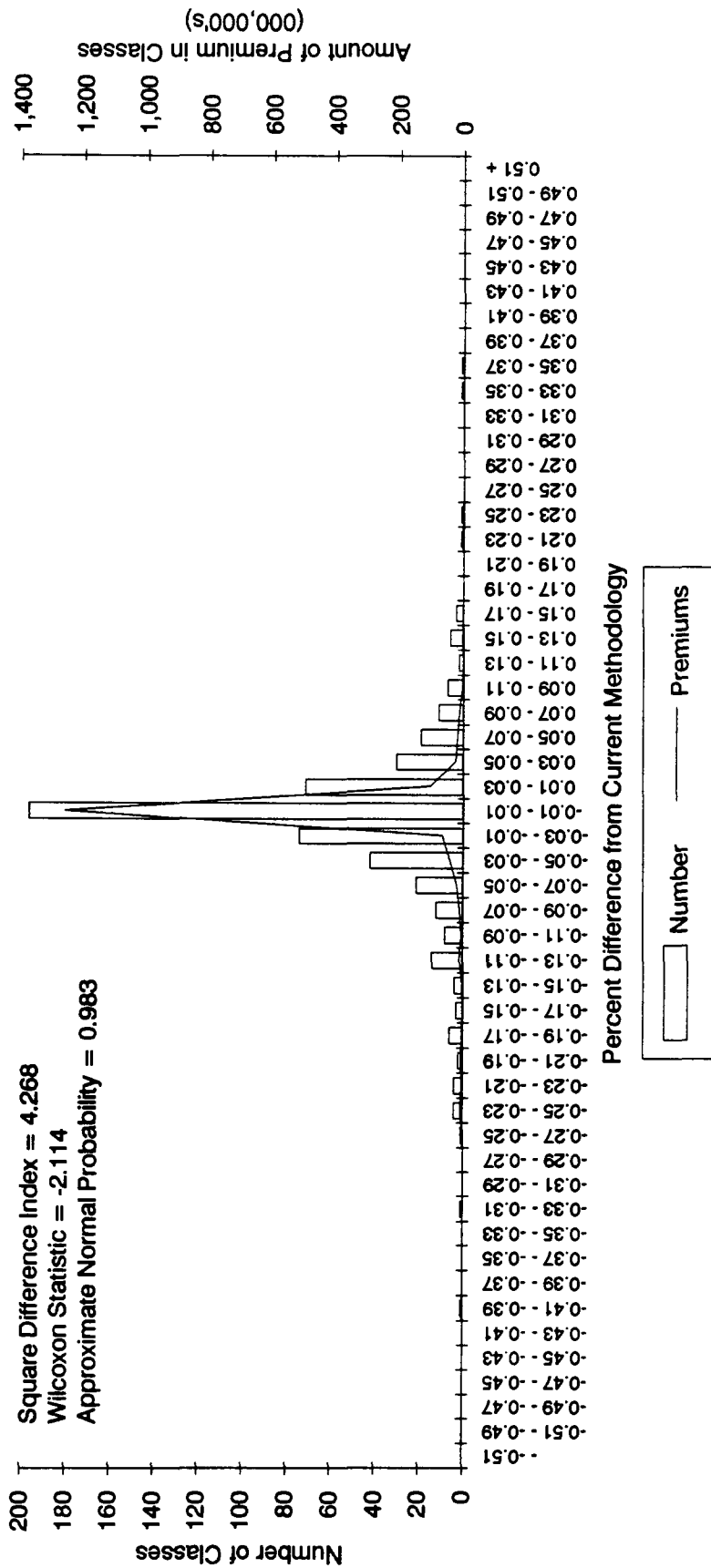


Illinois, 1989 Revision
Five Years of Data

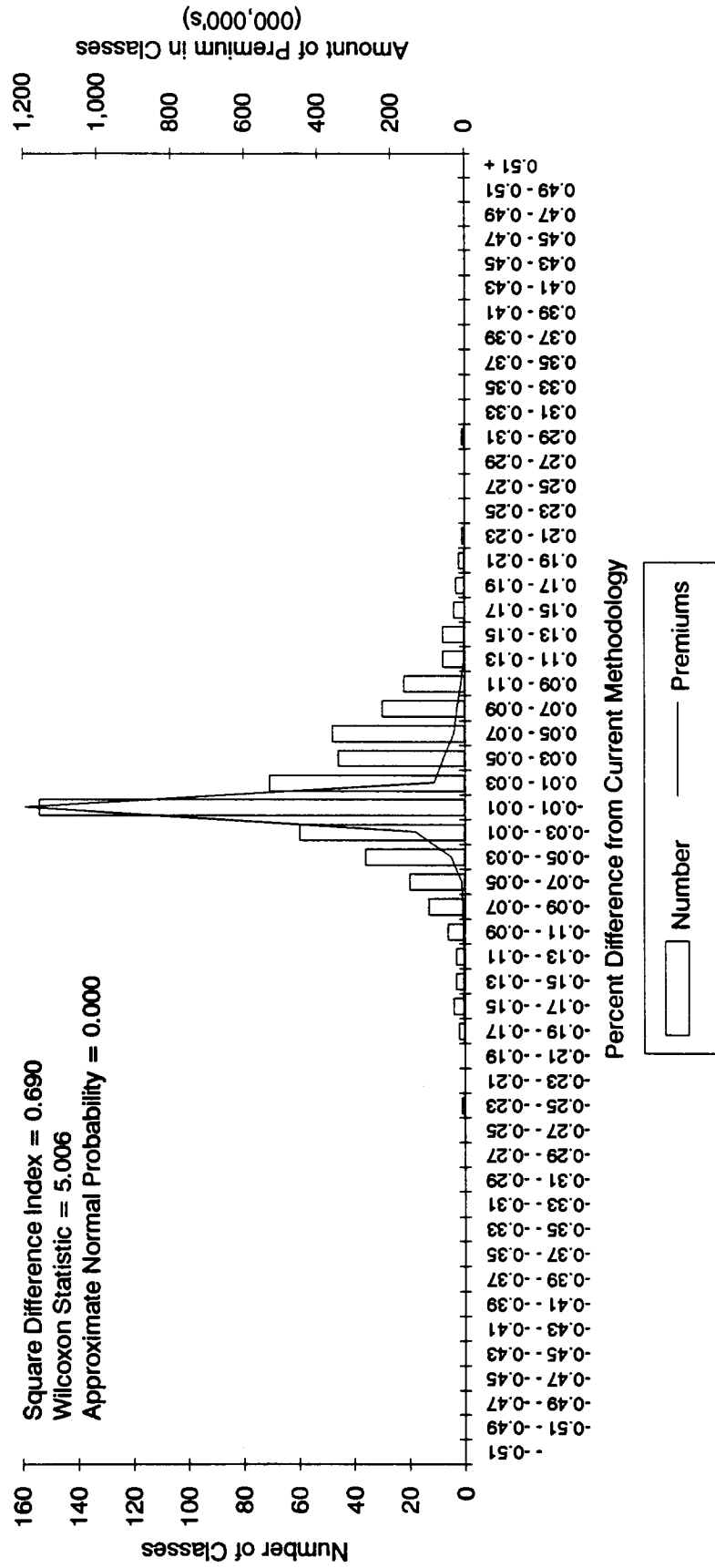
Square Difference Index = 6.209
Wilcoxon Statistic = 3.002
Approximate Normal Probability = 0.001



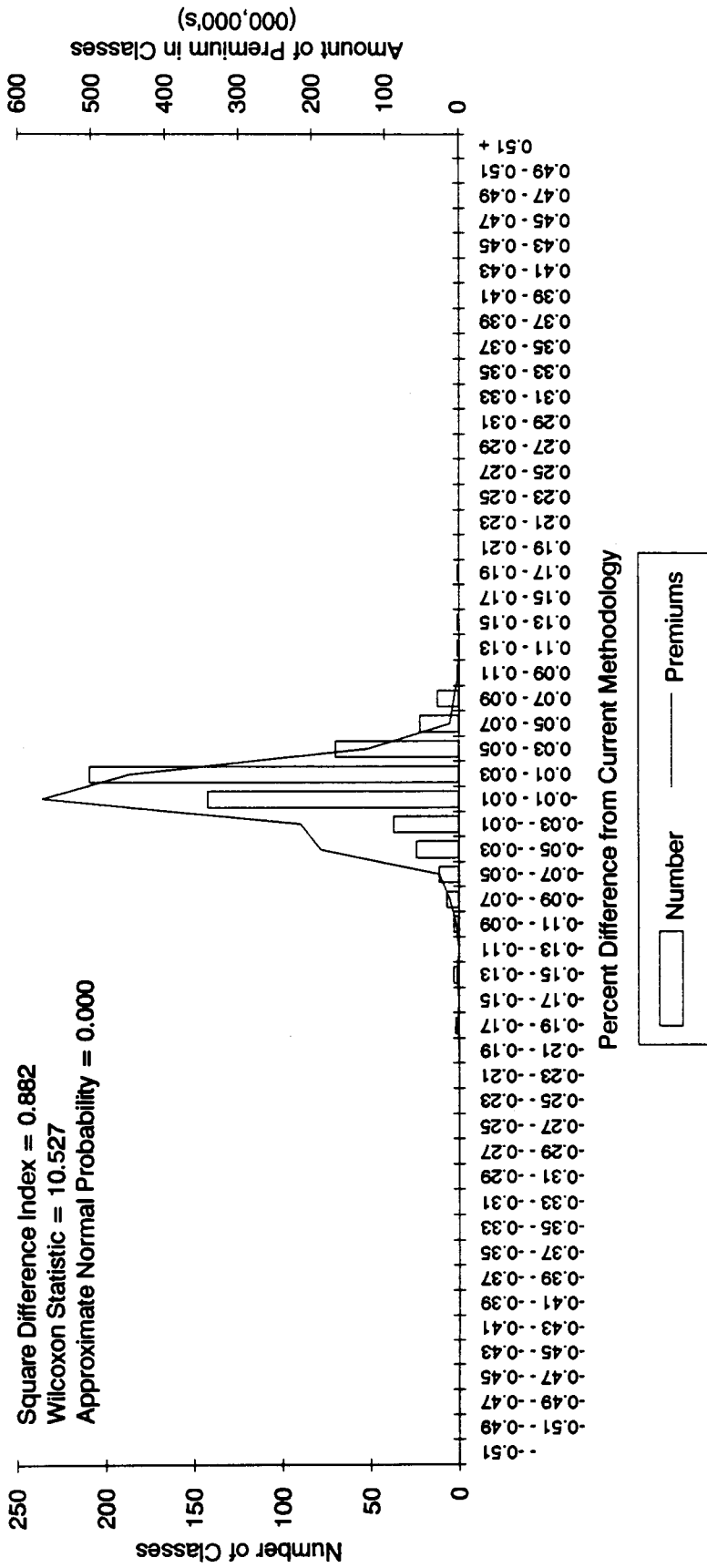
**Illinois, 1989 Revision
Payroll Based Credibility**



**Illinois, 1989 Revision
Double Full Credibility Standard**

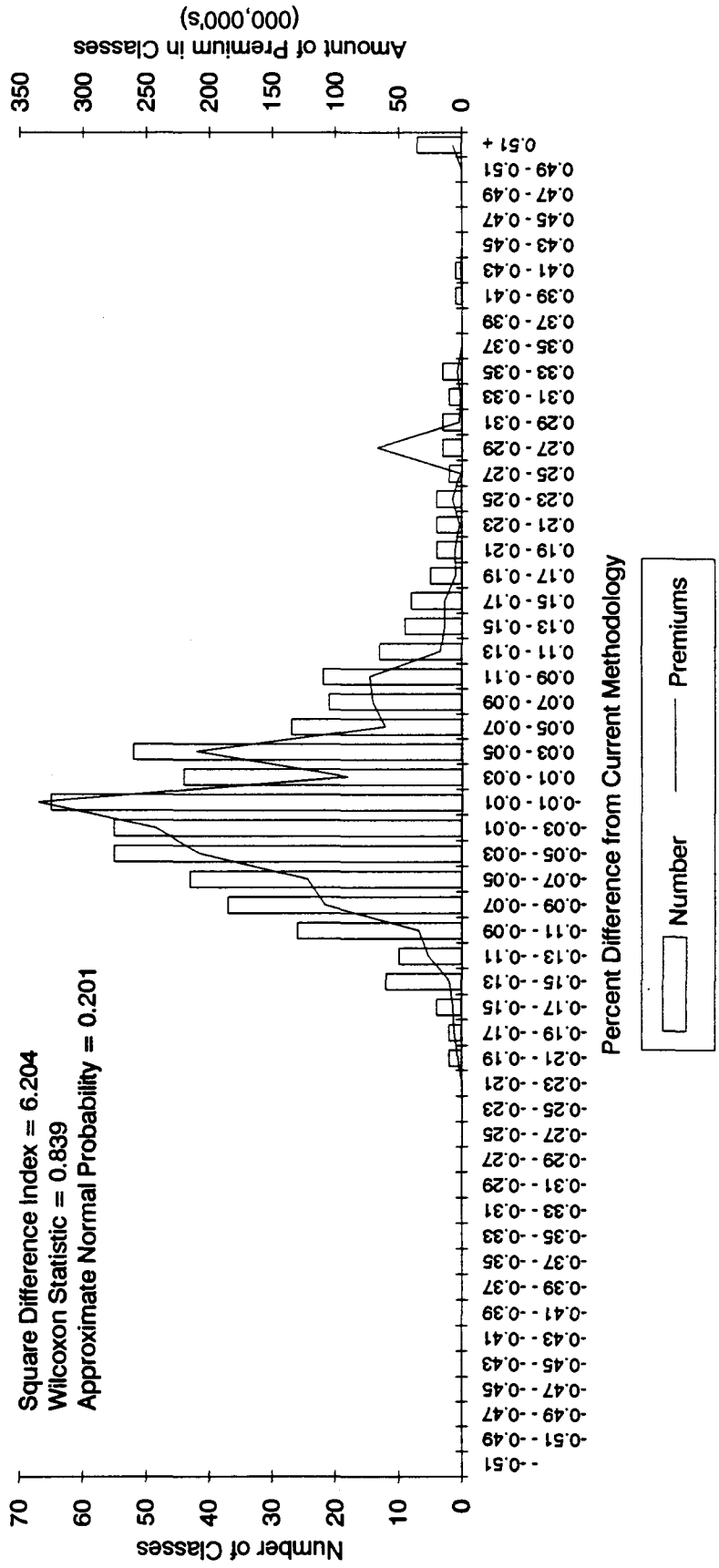


Illinois, 1989 Revision
Half Current Loss Limitation



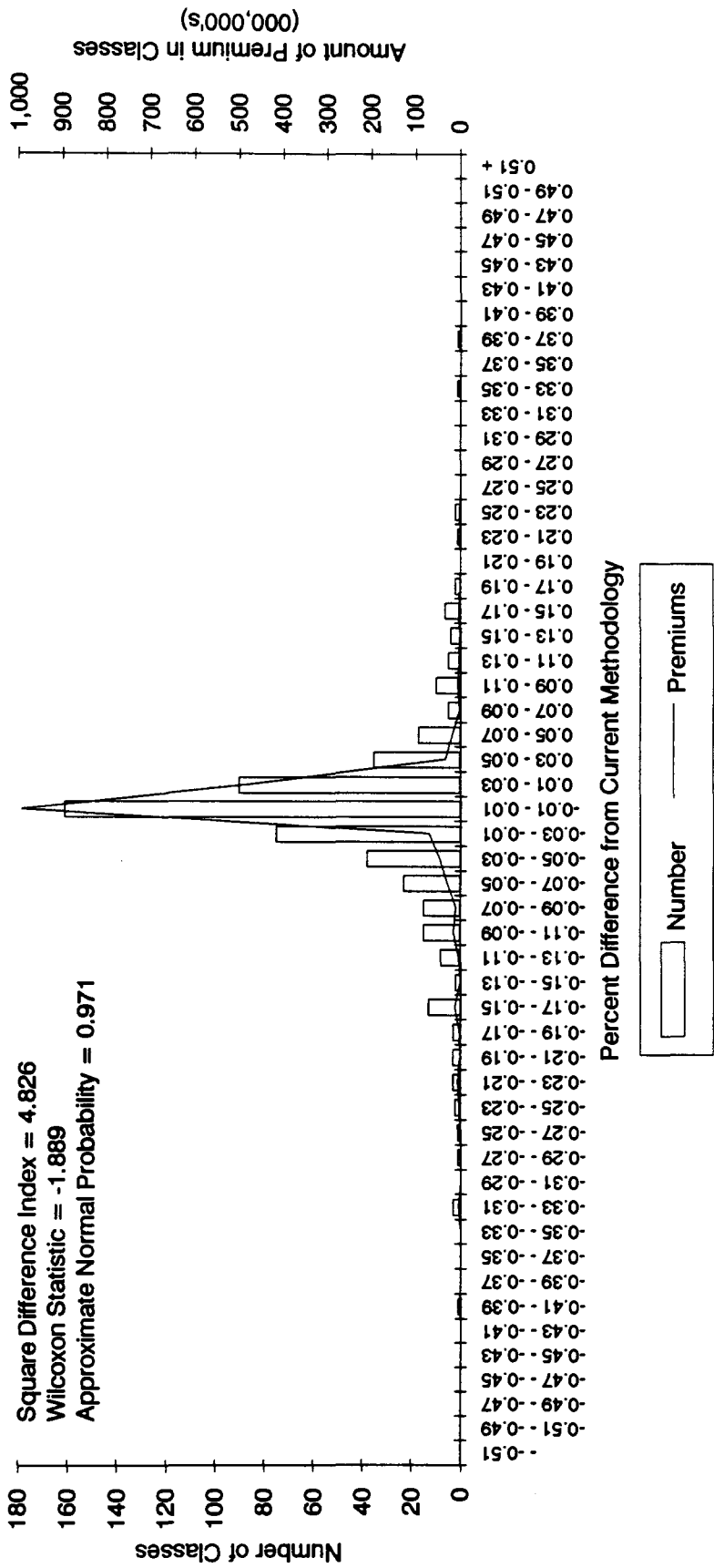
Illinois, 1990 Revision
Five Years of Data

Square Difference Index = 6.204
 Wilcoxon Statistic = 0.839
 Approximate Normal Probability = 0.201

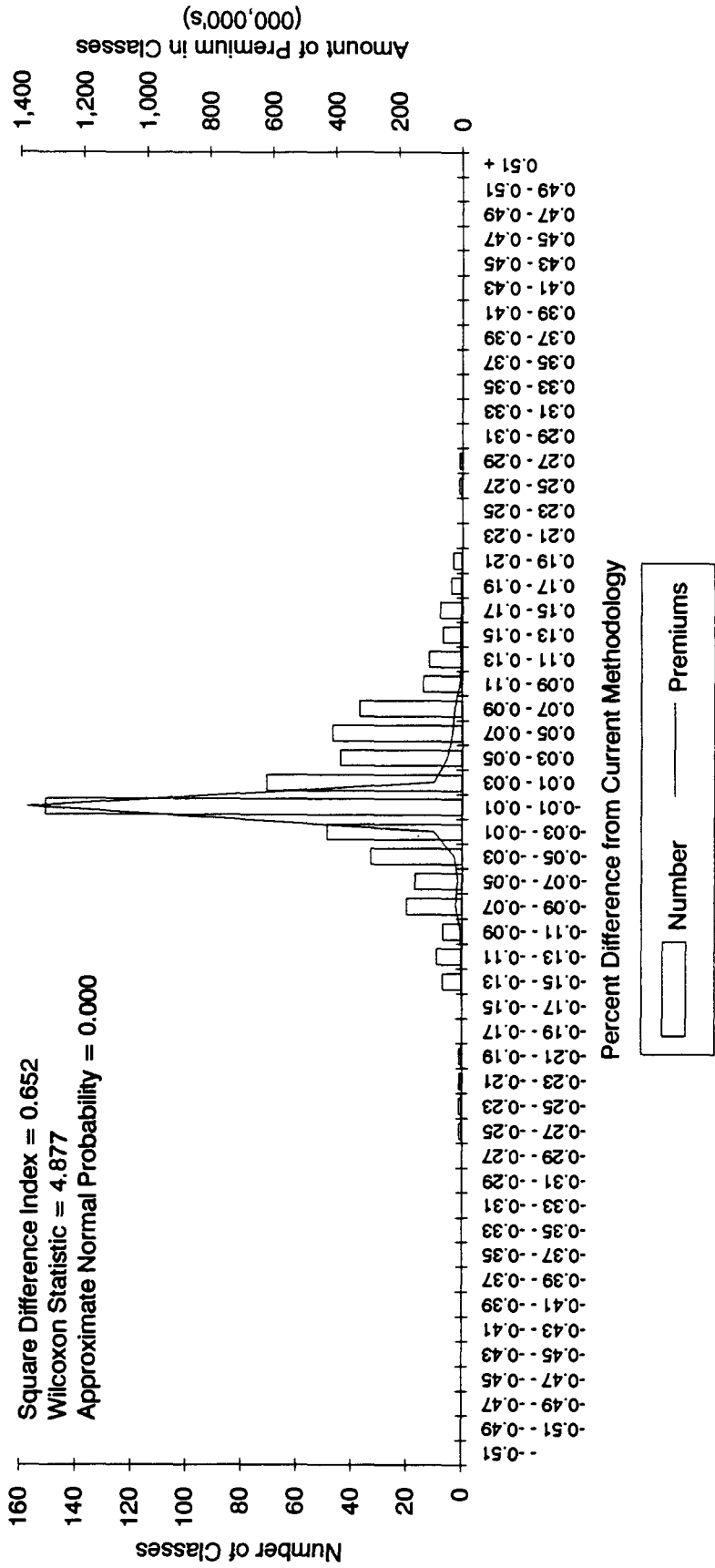


**Illinois, 1990 Revision
Payroll Based Credibility**

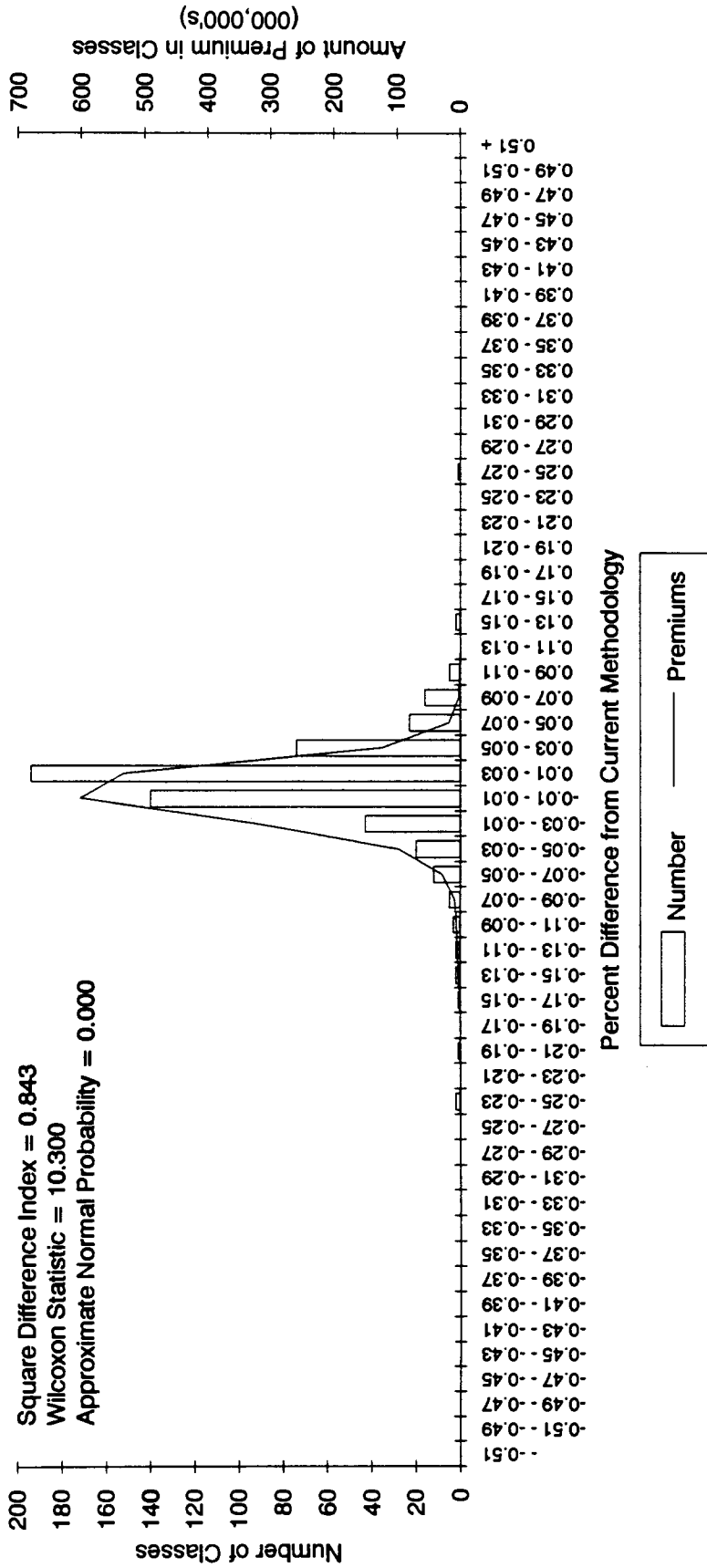
Square Difference Index = 4.826
 Wilcoxon Statistic = -1.889
 Approximate Normal Probability = 0.971



**Illinois, 1990 Revision
Double Full Credibility Standard**

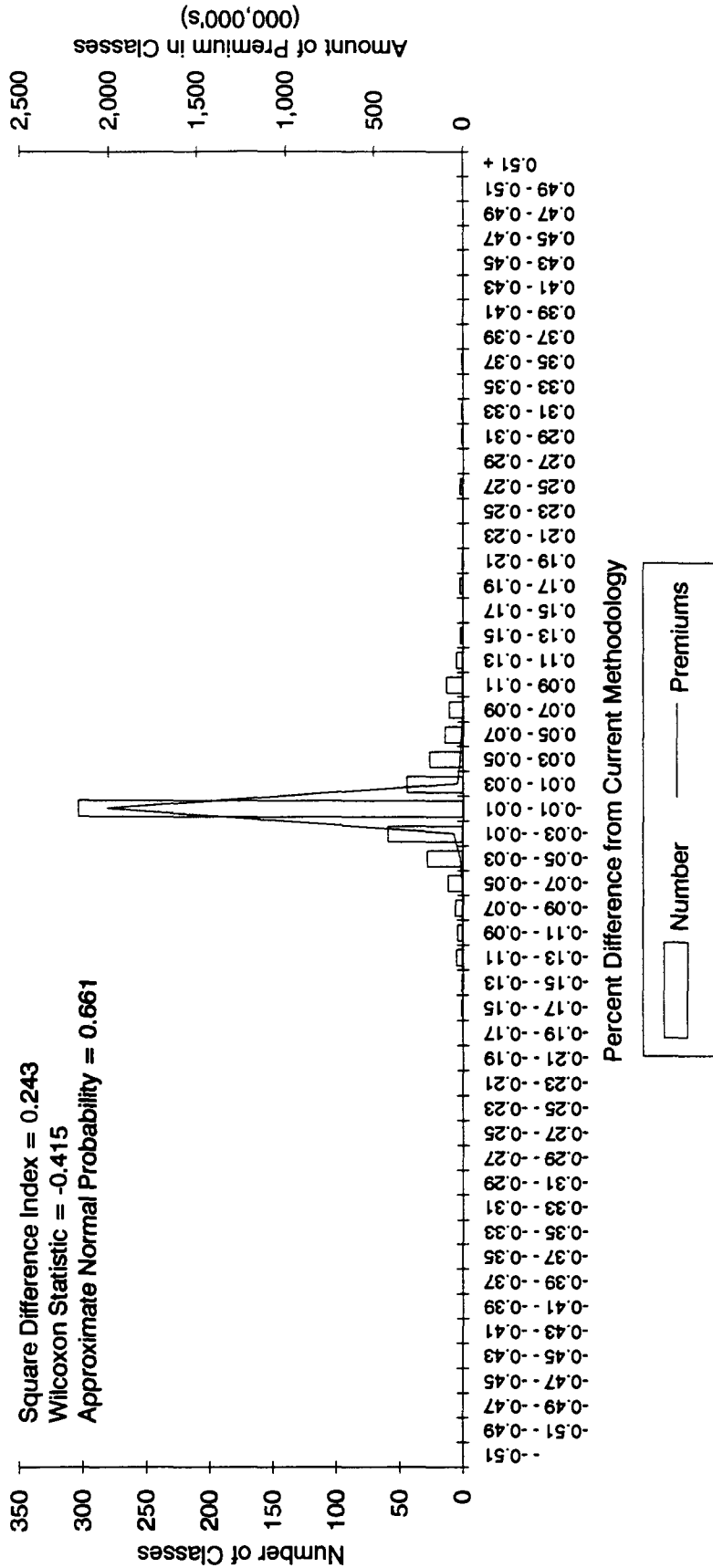


Illinois, 1990 Revision
Half Current Loss Limitation



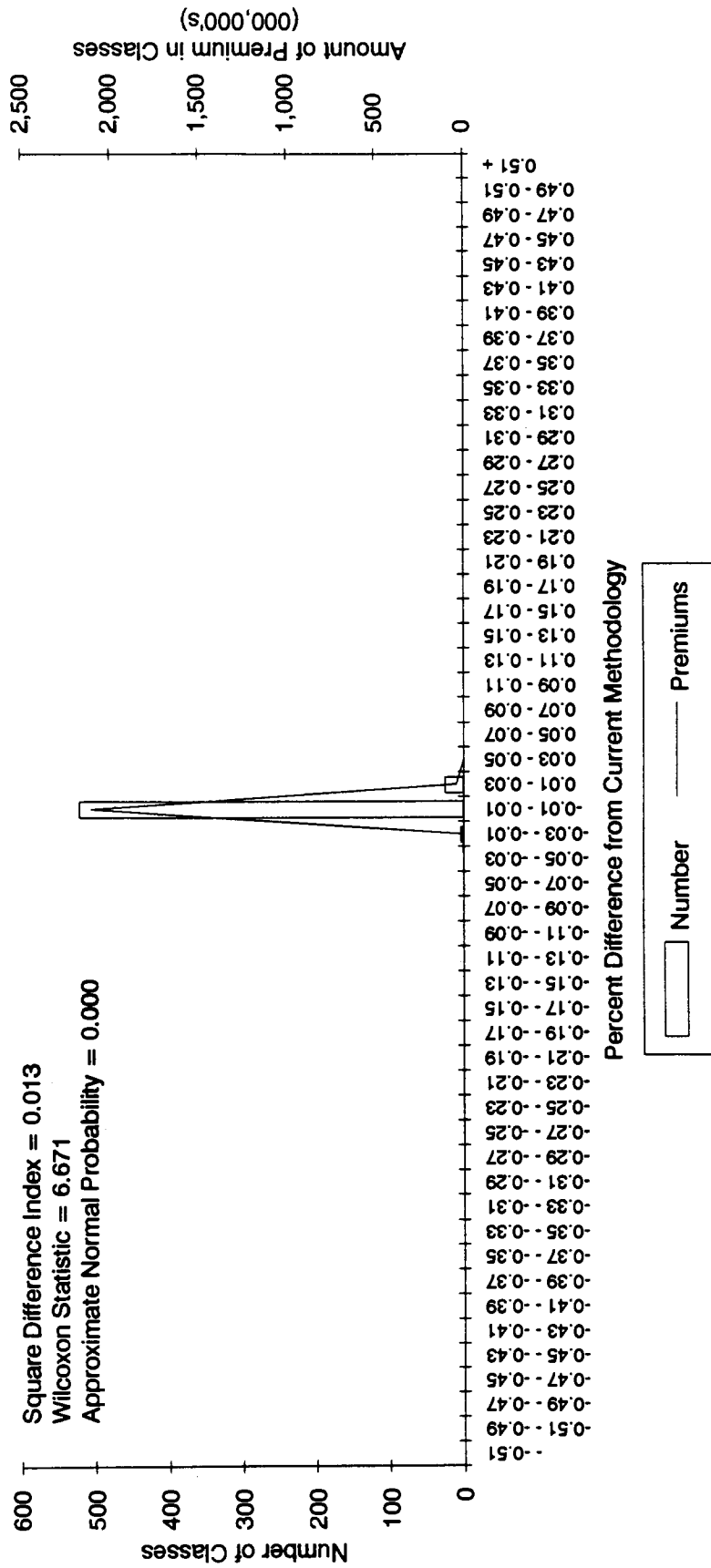
**Illinois, 1990 Revision
Alternate Regional Pure Premiums**

Square Difference Index = 0.243
 Wilcoxon Statistic = -0.415
 Approximate Normal Probability = 0.661



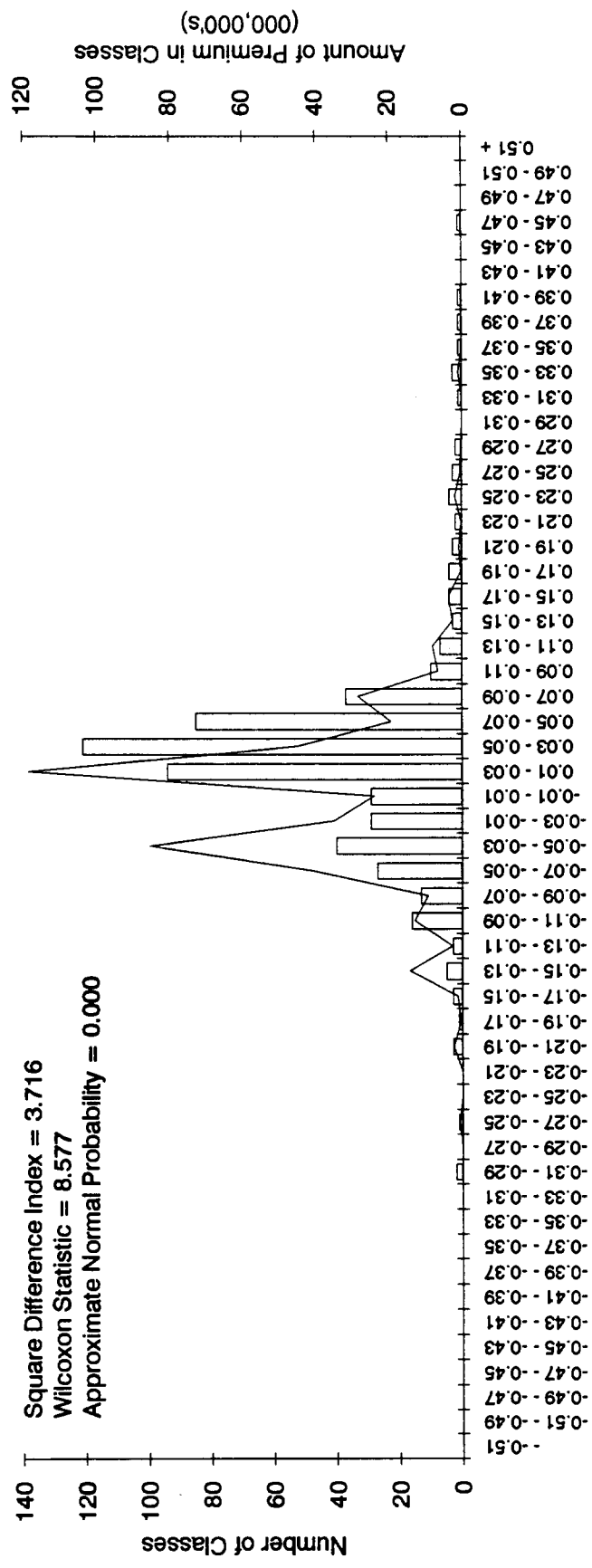
**Illinois, 1990 Revision
Alternate Trend Application**

Square Difference Index = 0.013
 Wilcoxon Statistic = 6.671
 Approximate Normal Probability = 0.000



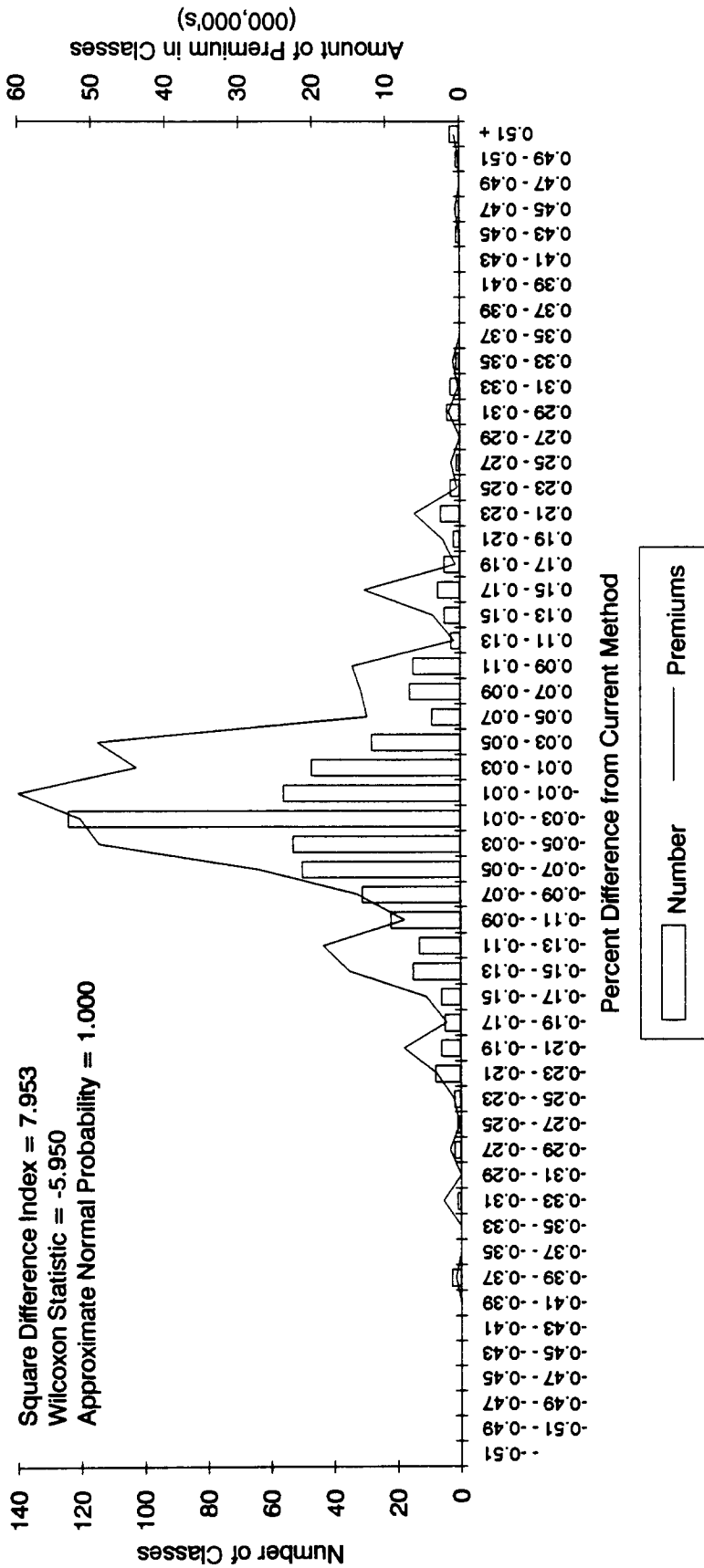
Louisiana, 1988 Revision
Five Years of Data

Square Difference Index = 3.716
Wilcoxon Statistic = 8.577
Approximate Normal Probability = 0.000

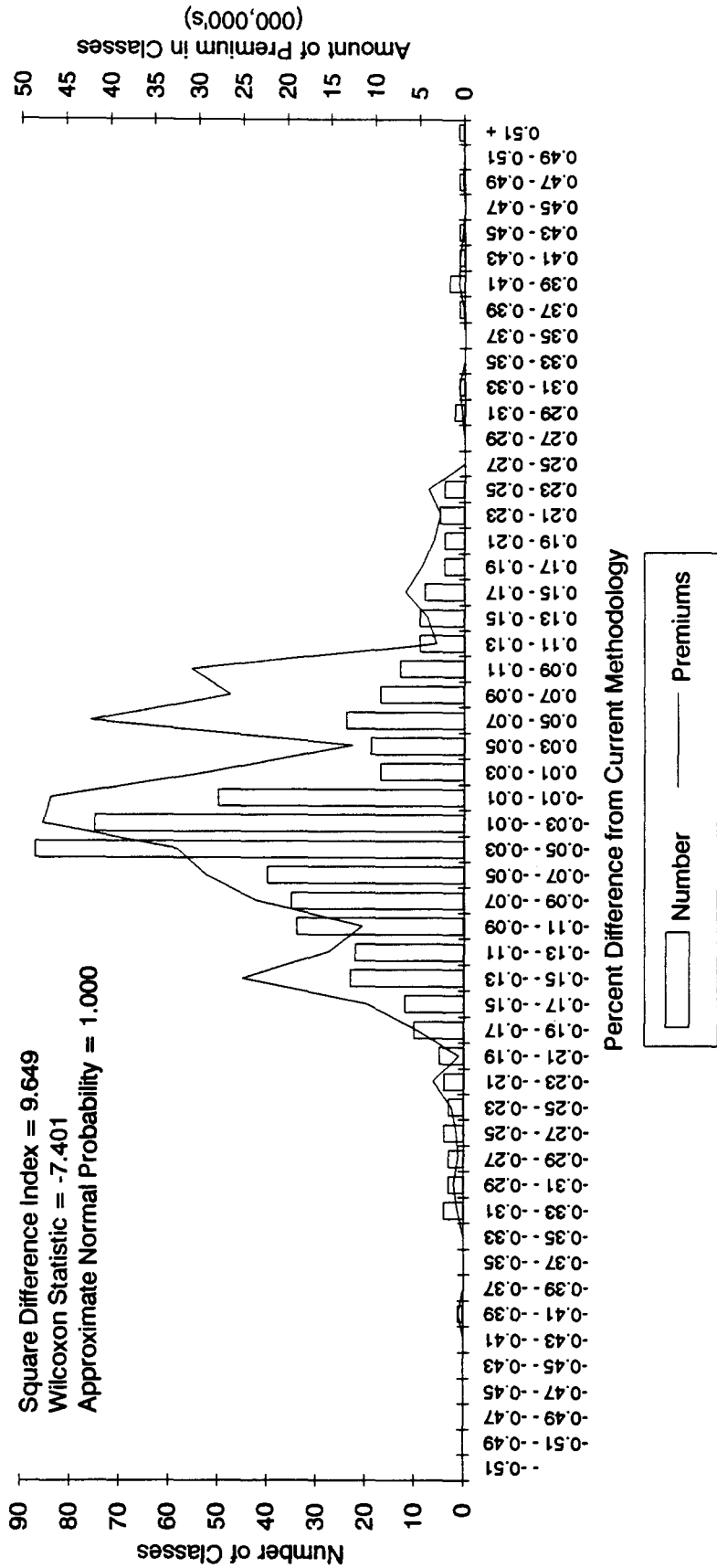


Number — Premiums

Louisiana, 1989 Revision
Five Years of Data

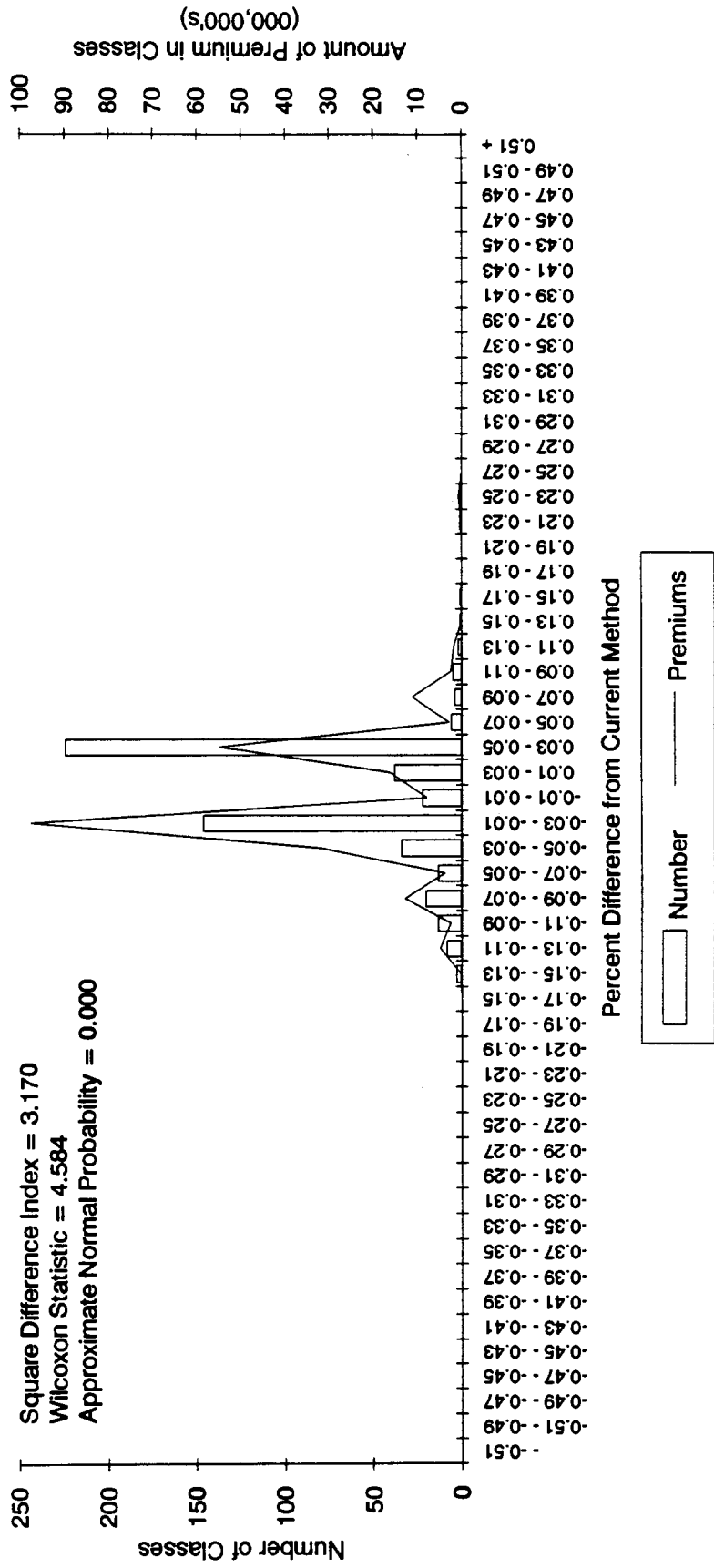


Louisiana, 1990 Revision
Five Years of Data



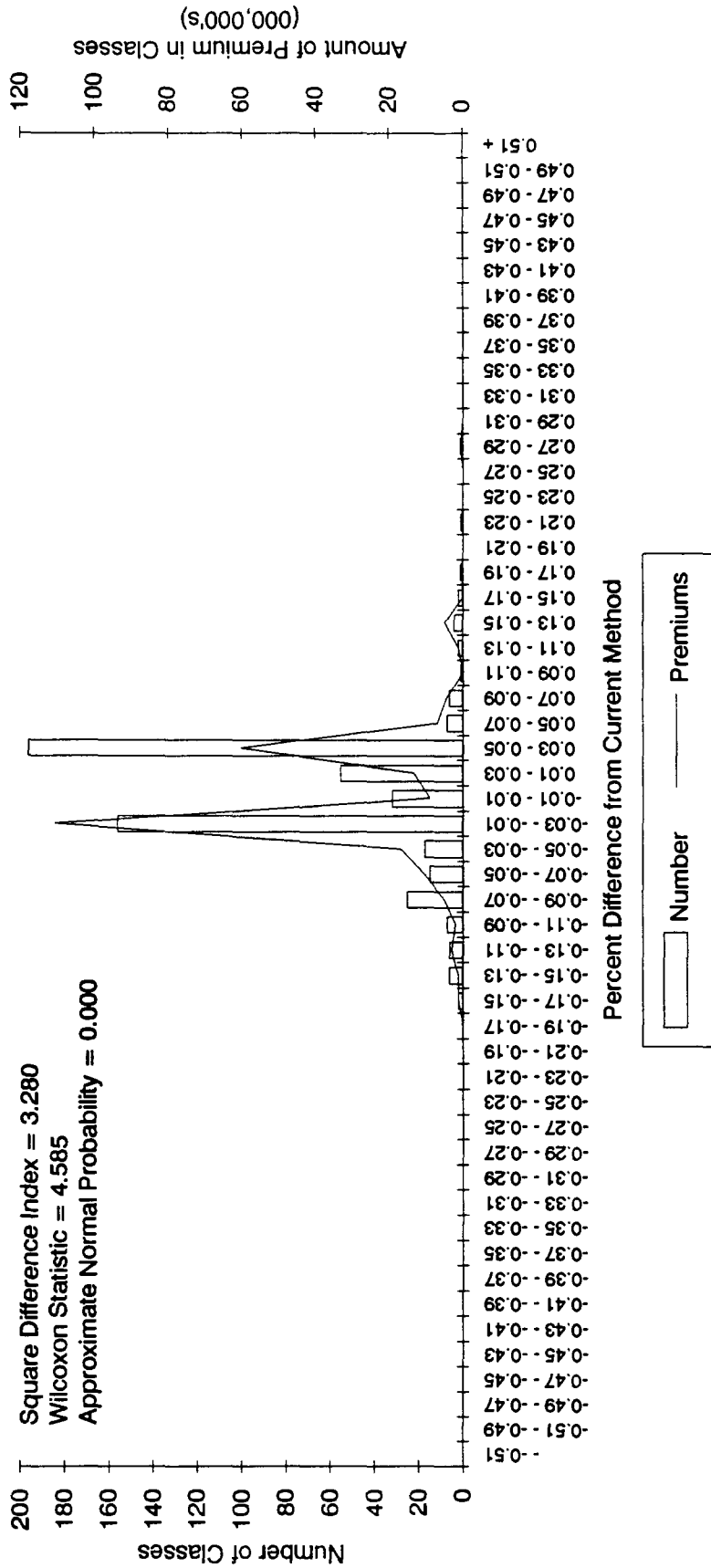
Maine, 1987 Revision
Four Years of Data

Square Difference Index = 3.170
Wilcoxon Statistic = 4.584
Approximate Normal Probability = 0.000



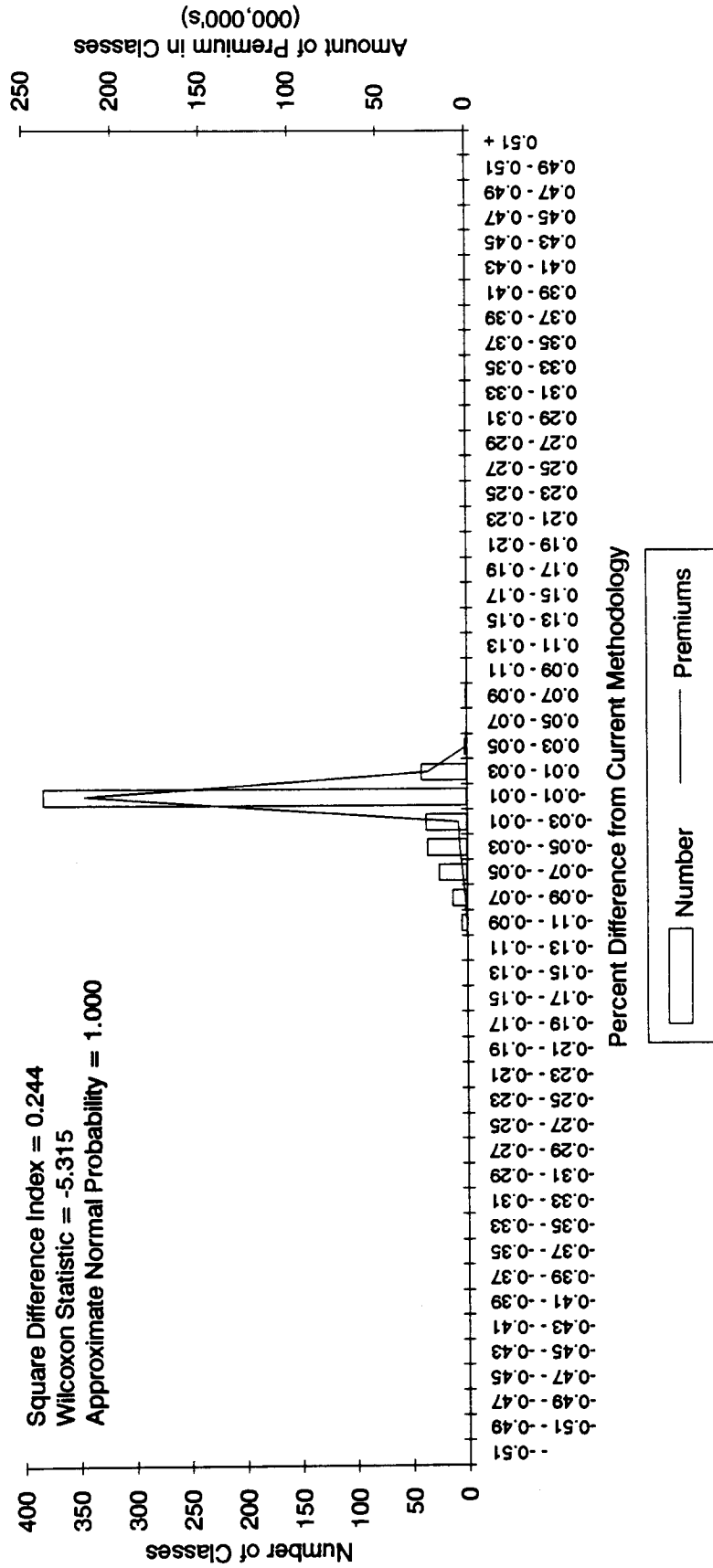
Maine, 1987 Revision
Five Years of Data

Square Difference Index = 3.280
Wilcoxon Statistic = 4.585
Approximate Normal Probability = 0.000



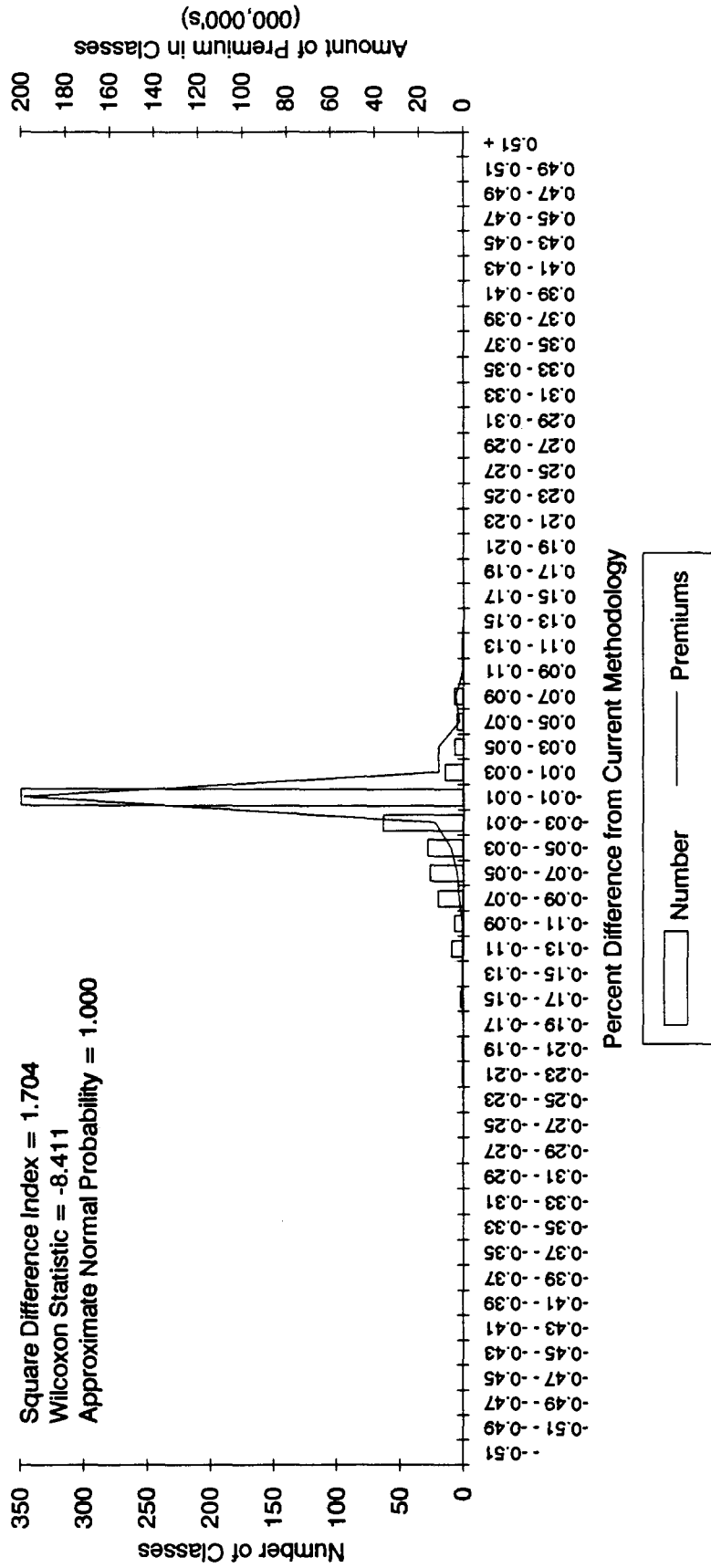
Maine, 1987 Revision
Credibility Using .5 Power

Square Difference Index = 0.244
Wilcoxon Statistic = -5.315
Approximate Normal Probability = 1.000

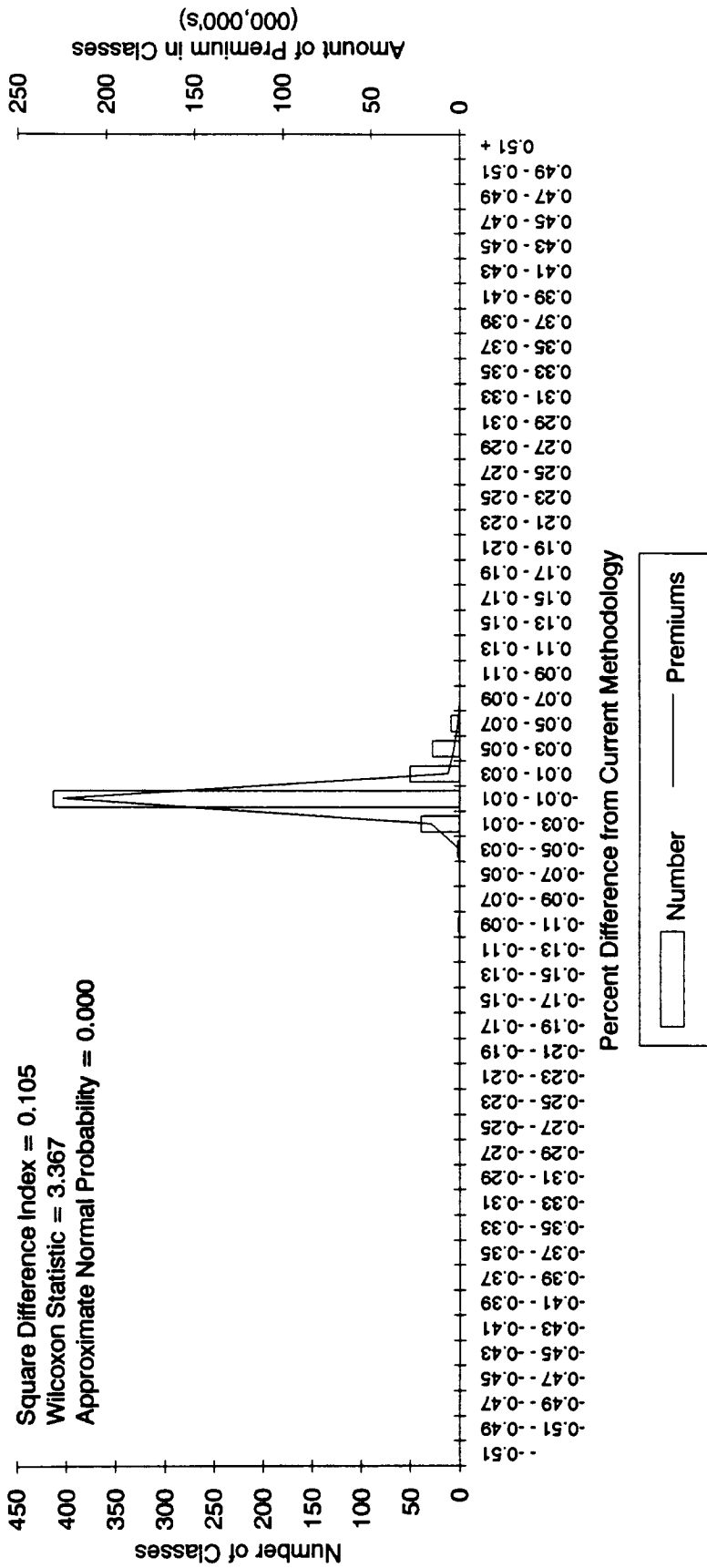


Maine, 1987 Revision
Payroll Based Credibility

Square Difference Index = 1.704
Wilcoxon Statistic = -8.411
Approximate Normal Probability = 1.000

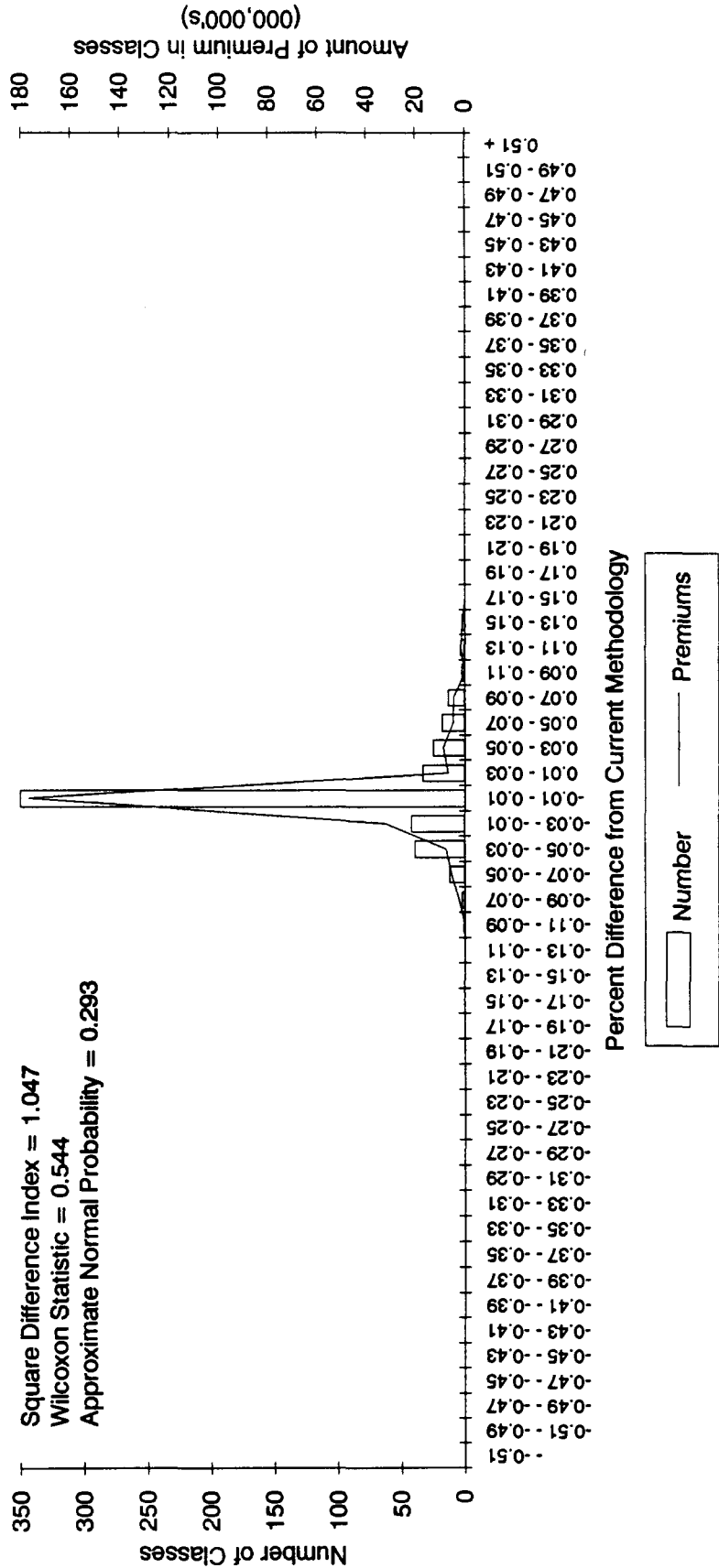


Maine, 1987 Revision
Credibility Using .8 Power

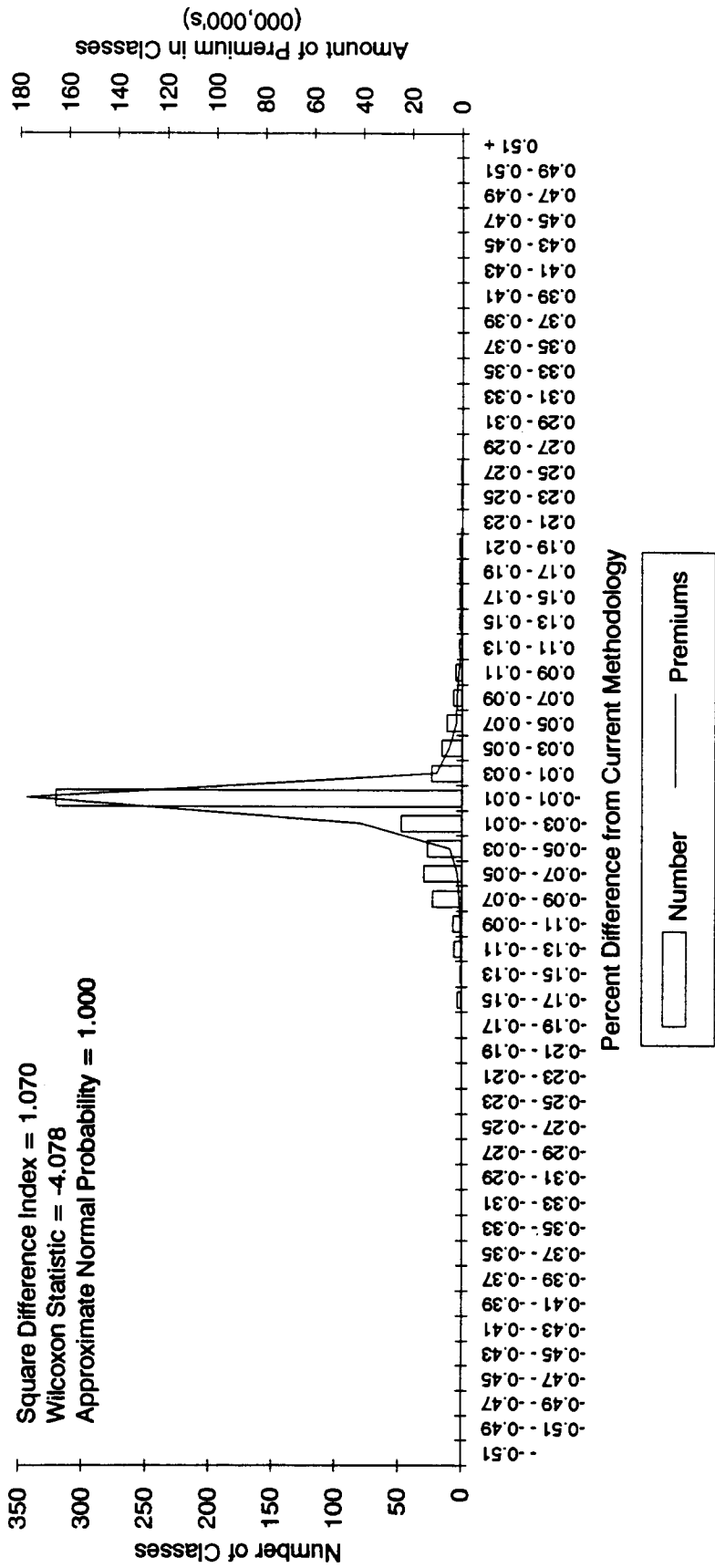


Maine, 1987 Revision
 Double Full Credibility Standard

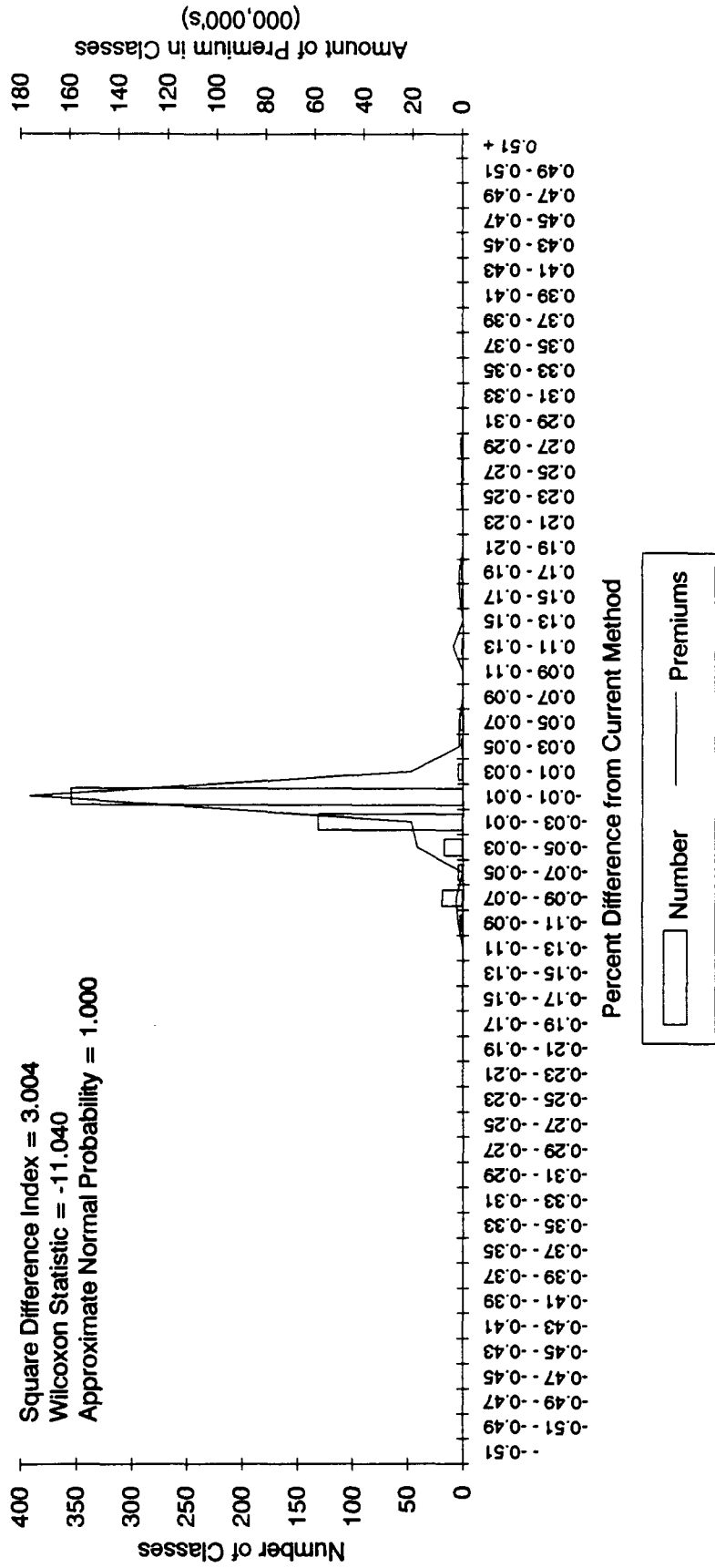
Square Difference Index = 1.047
 Wilcoxon Statistic = 0.544
 Approximate Normal Probability = 0.293



**Maine, 1987 Revision
Claim Count Based Credibility**

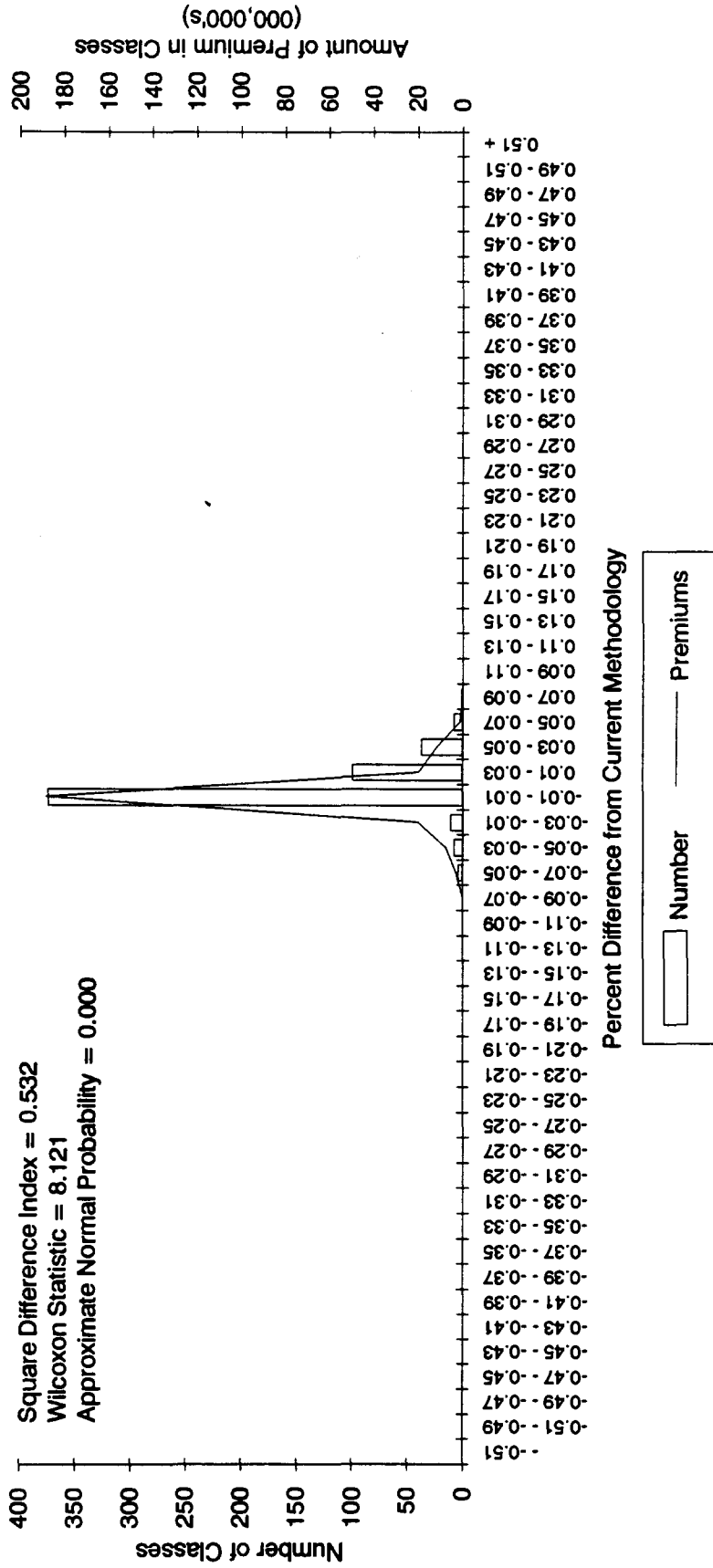


Maine, 1987 Revision
Unlimited Losses

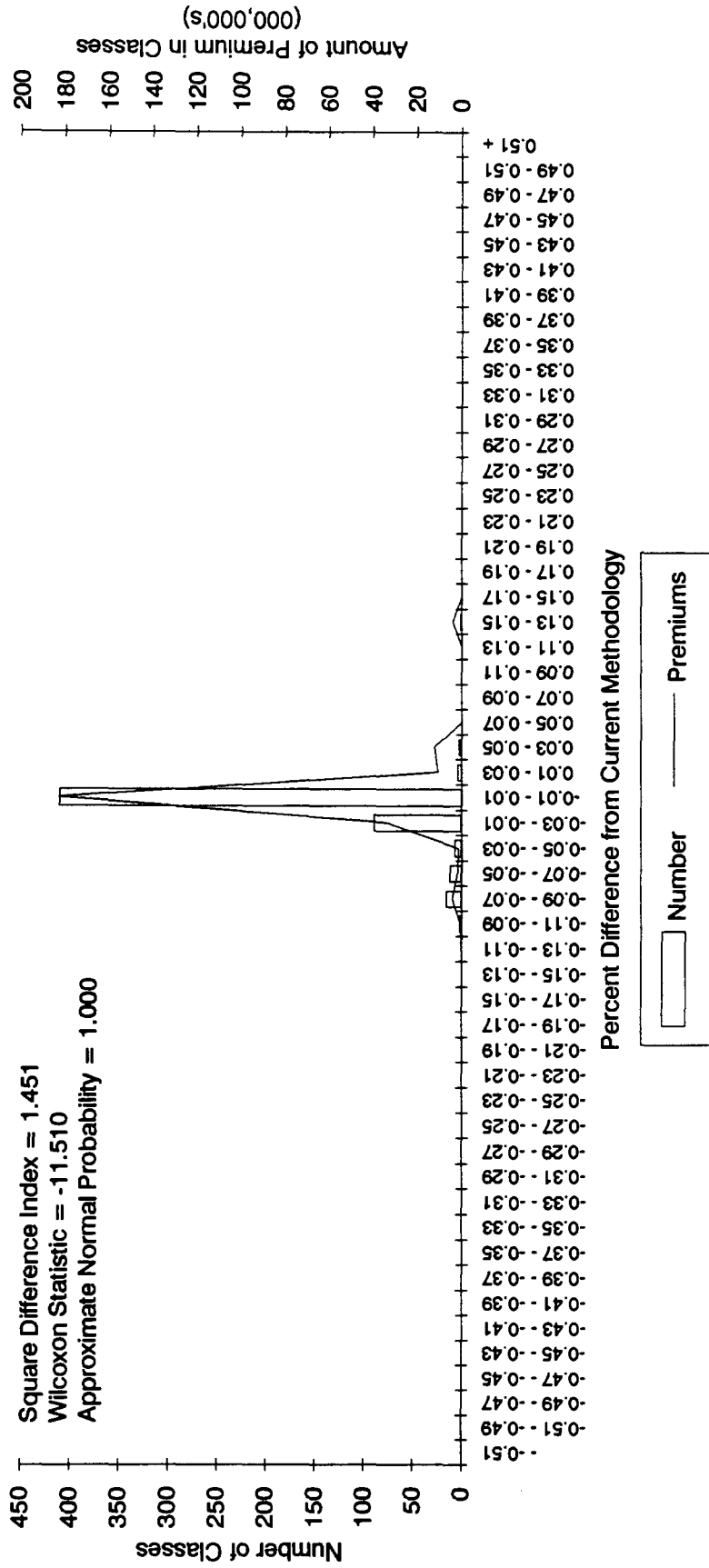


Maine, 1987 Revision
Half Current Loss Limitation

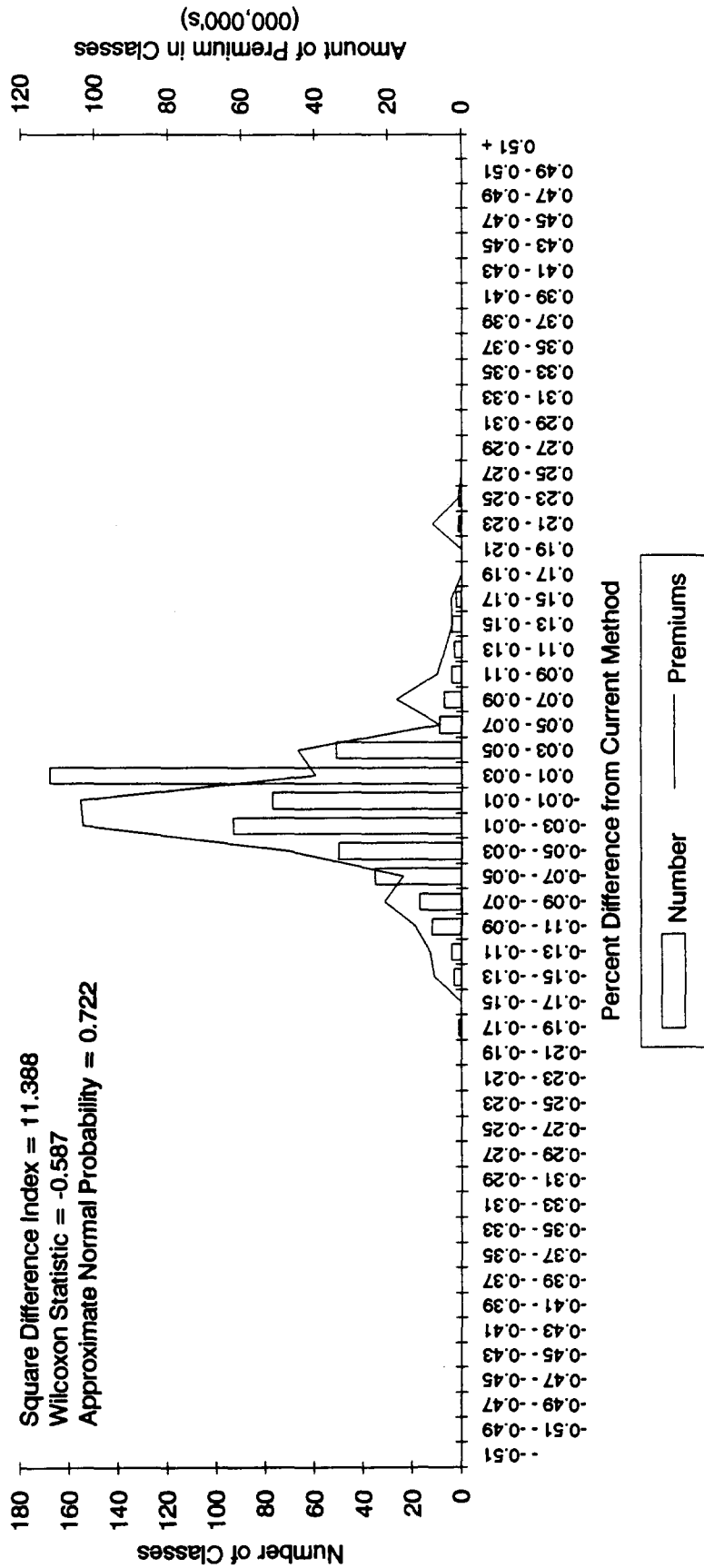
Square Difference Index = 0.532
Wilcoxon Statistic = 8.121
Approximate Normal Probability = 0.000



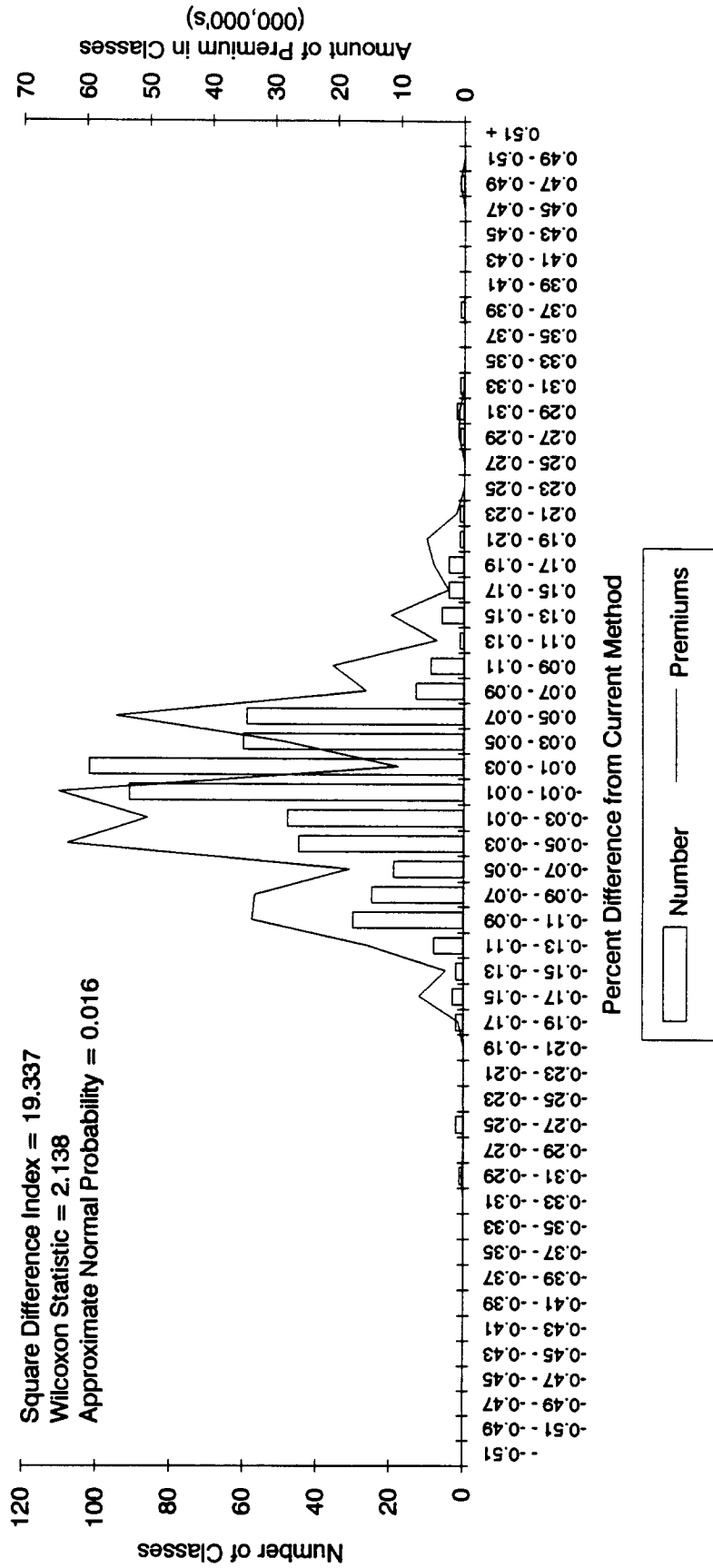
Maine, 1987 Revision
Sliding Scale Loss Limitation



Maine, 1988 Revision
Four Years of Data

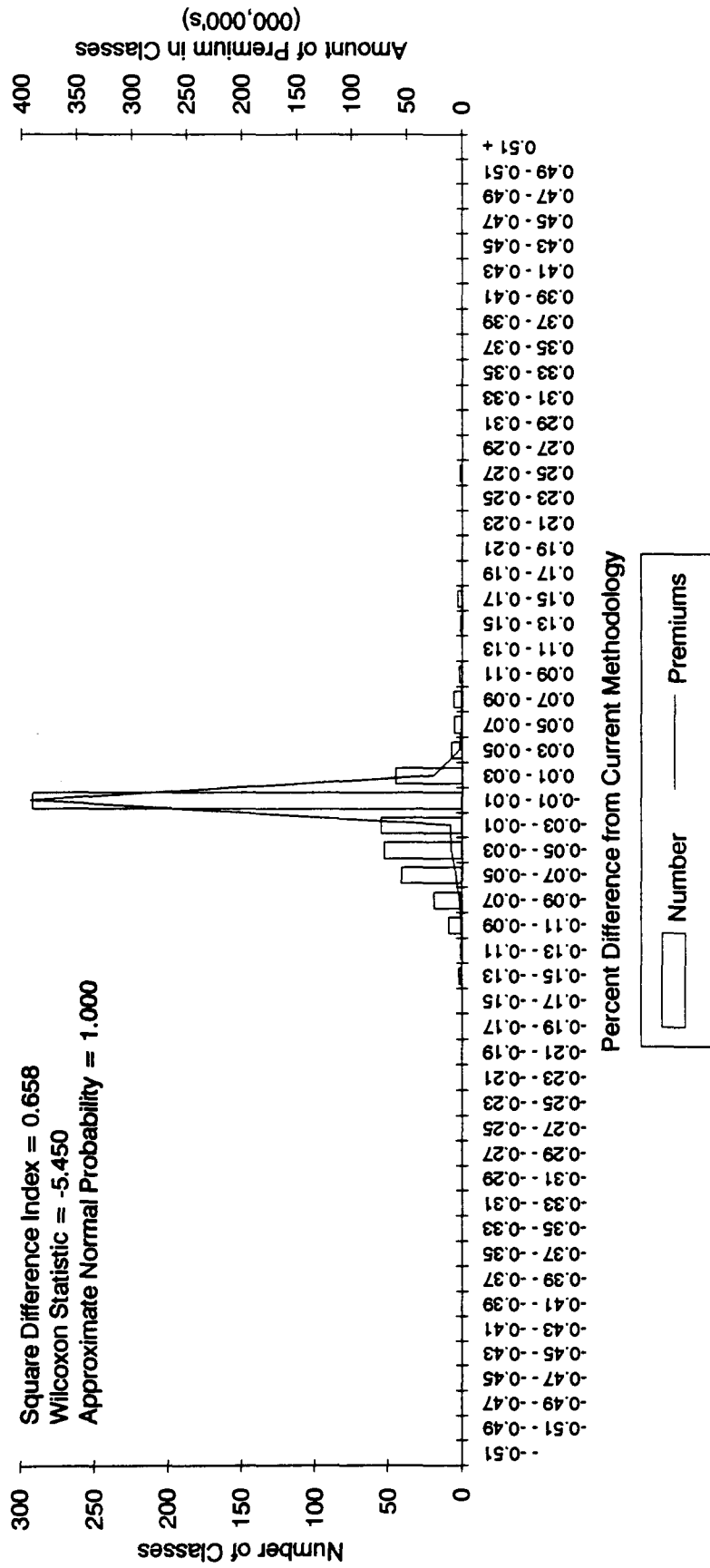


Maine, 1988 Revision
Five Years of Data

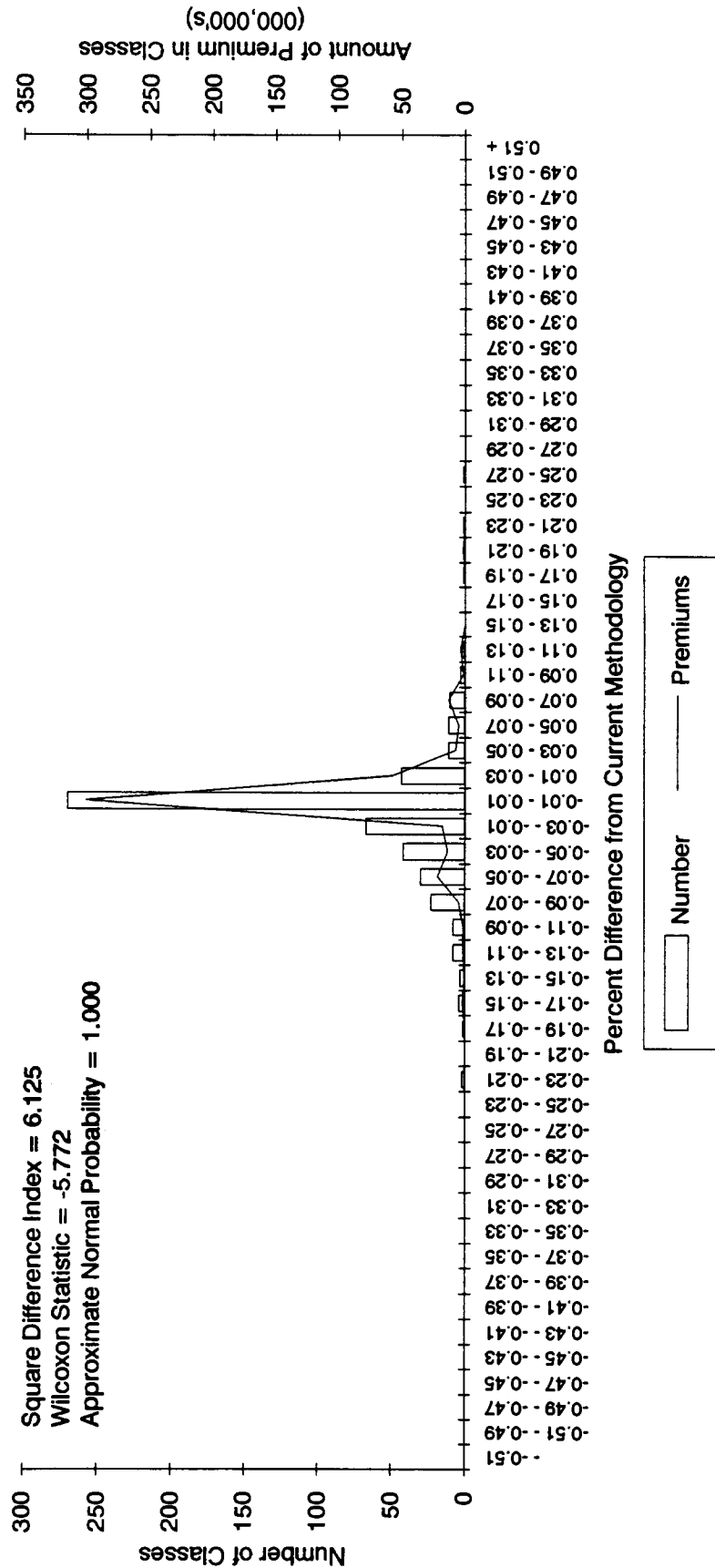


Maine, 1988 Revision
Credibility Using .5 Power

Square Difference Index = 0.658
 Wilcoxon Statistic = -5.450
 Approximate Normal Probability = 1.000

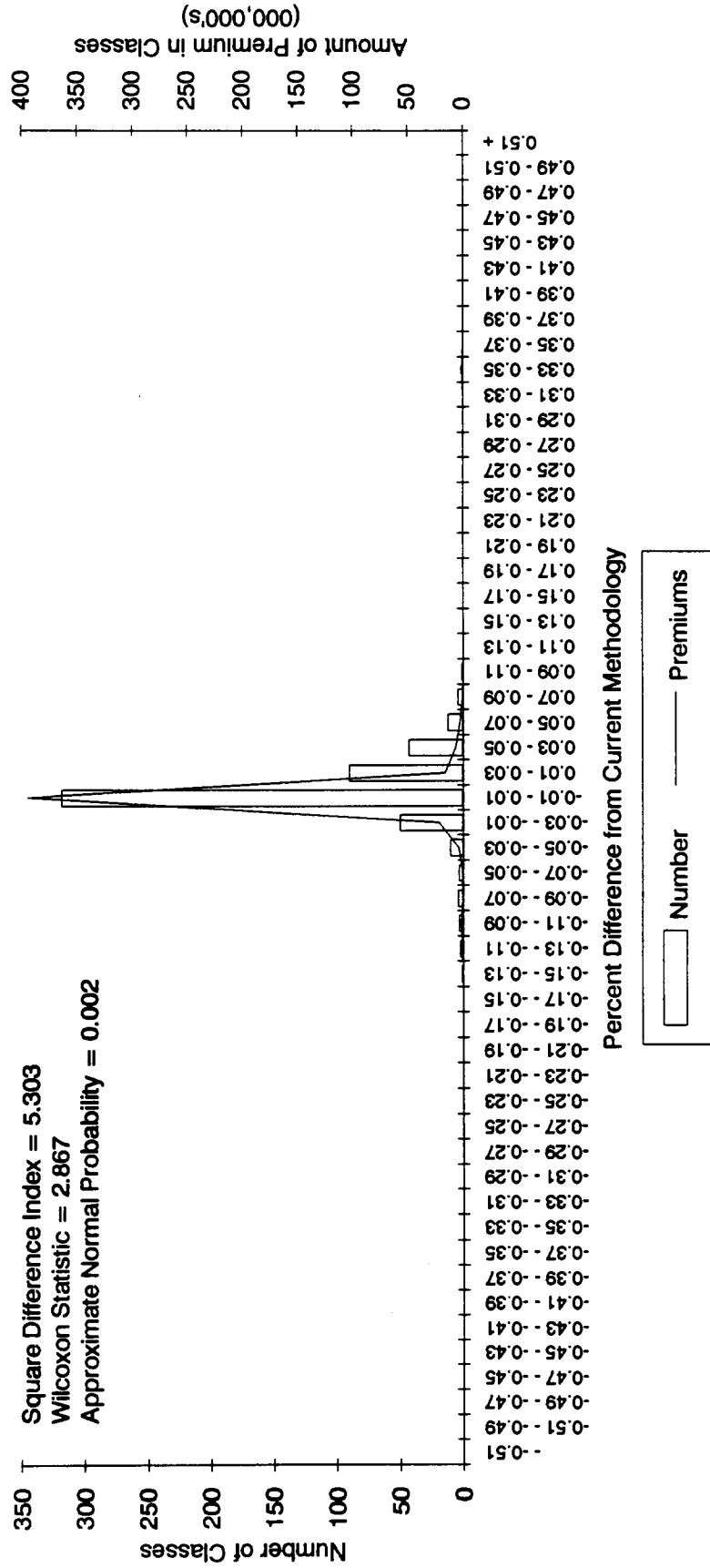


**Maine, 1988 Revision
Payroll Based Credibility**



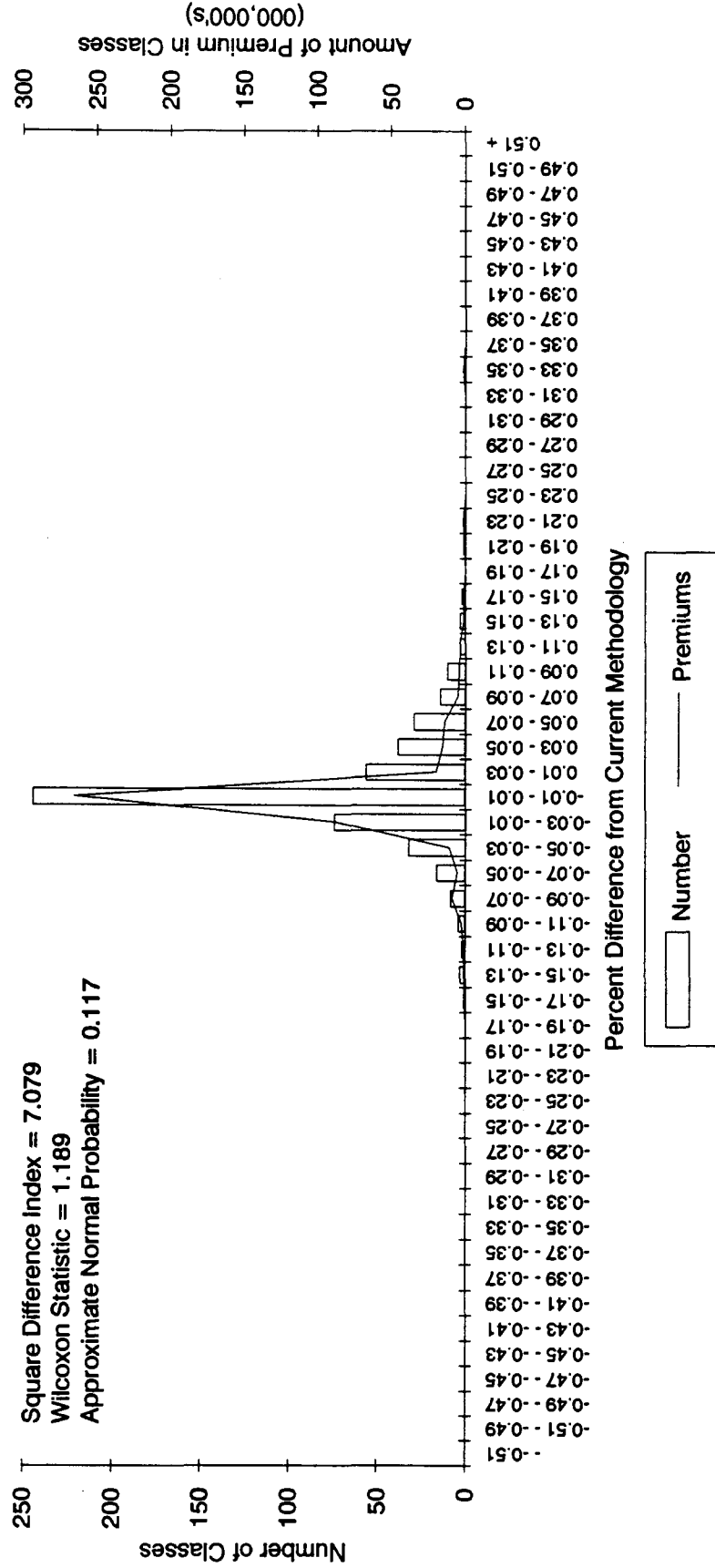
Maine, 1988 Revision
Credibility Using .8 Power

Square Difference Index = 5.303
Wilcoxon Statistic = 2.867
Approximate Normal Probability = 0.002



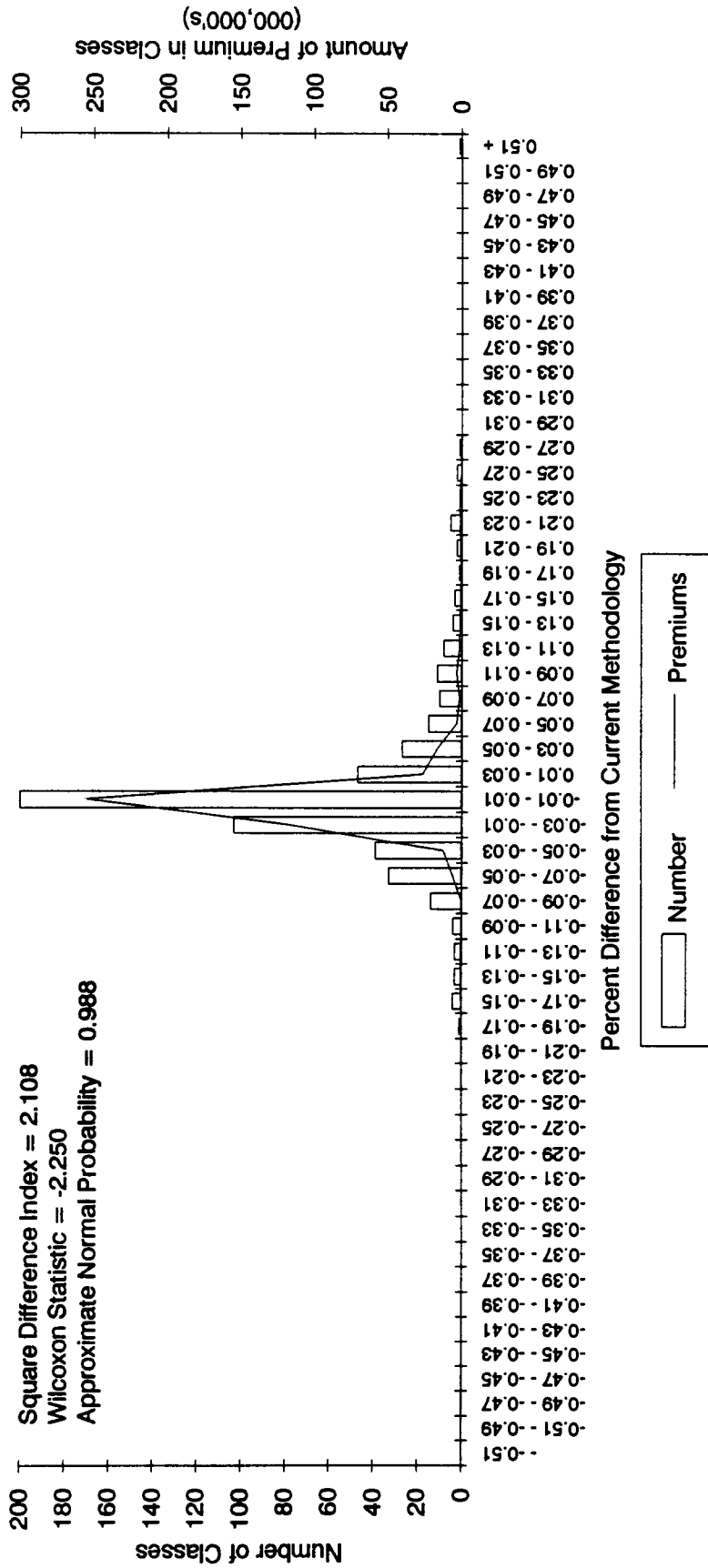
**Maine, 1988 Revision
Double Full Credibility Standard**

Square Difference Index = 7.079
 Wilcoxon Statistic = 1.189
 Approximate Normal Probability = 0.117

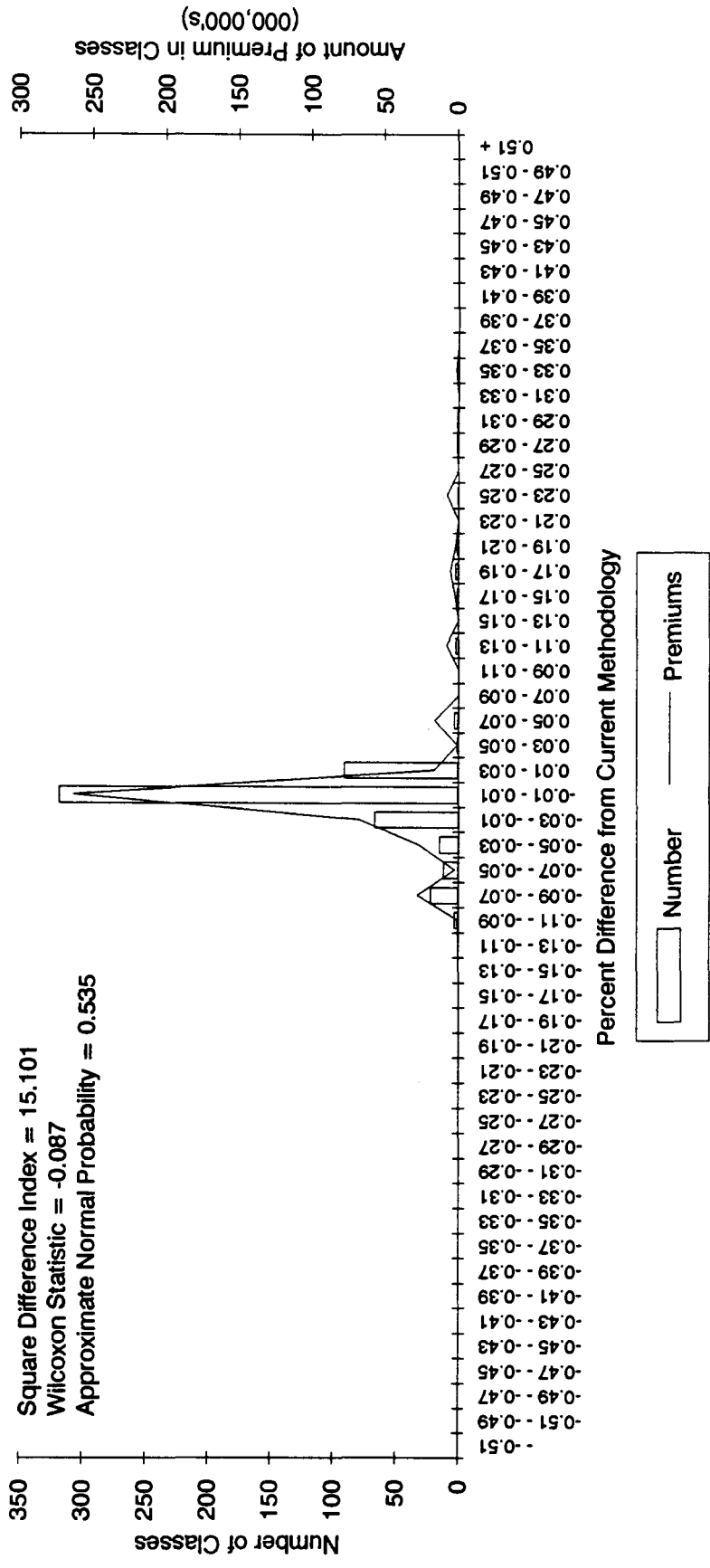


Maine, 1988 Revision
Claim Count Based Credibility

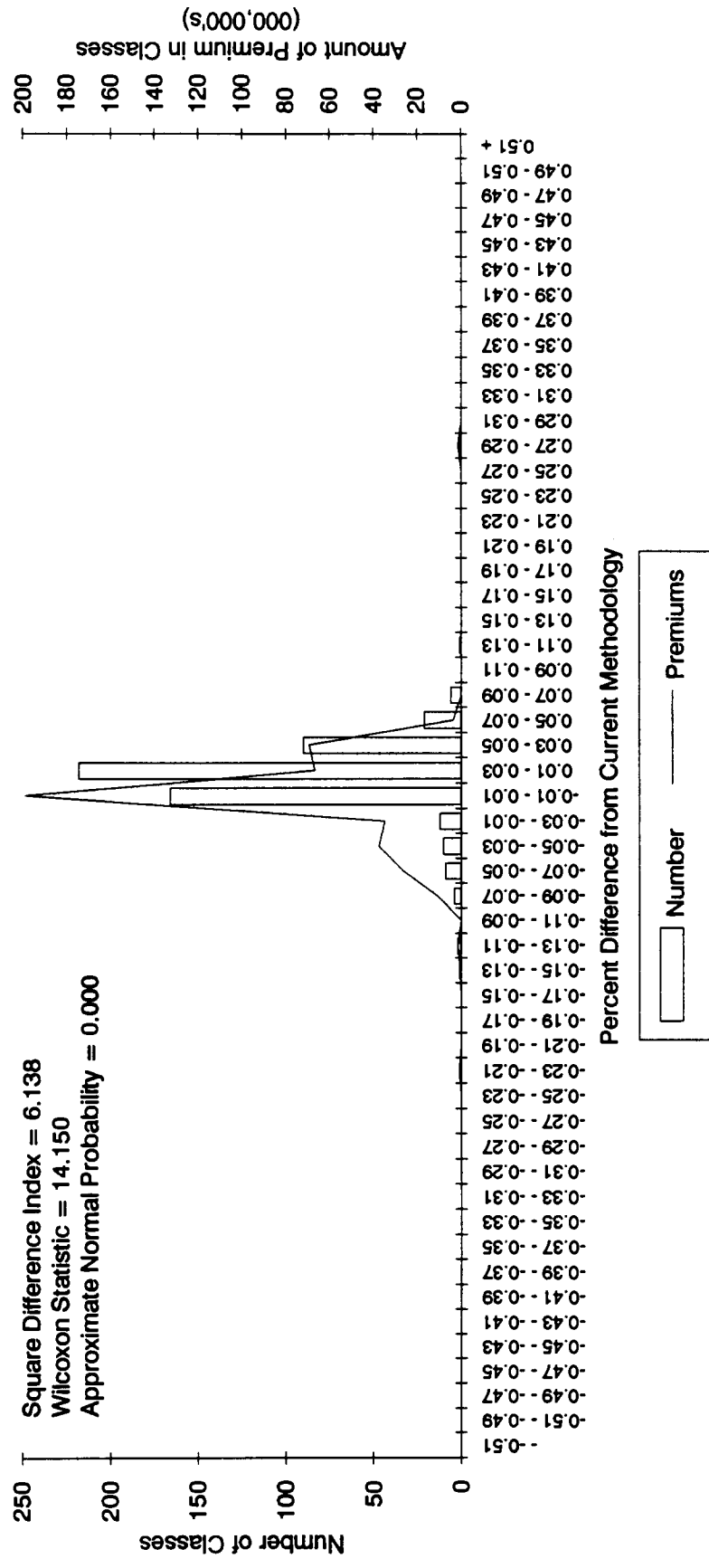
Square Difference Index = 2.108
Wilcoxon Statistic = -2.250
Approximate Normal Probability = 0.988



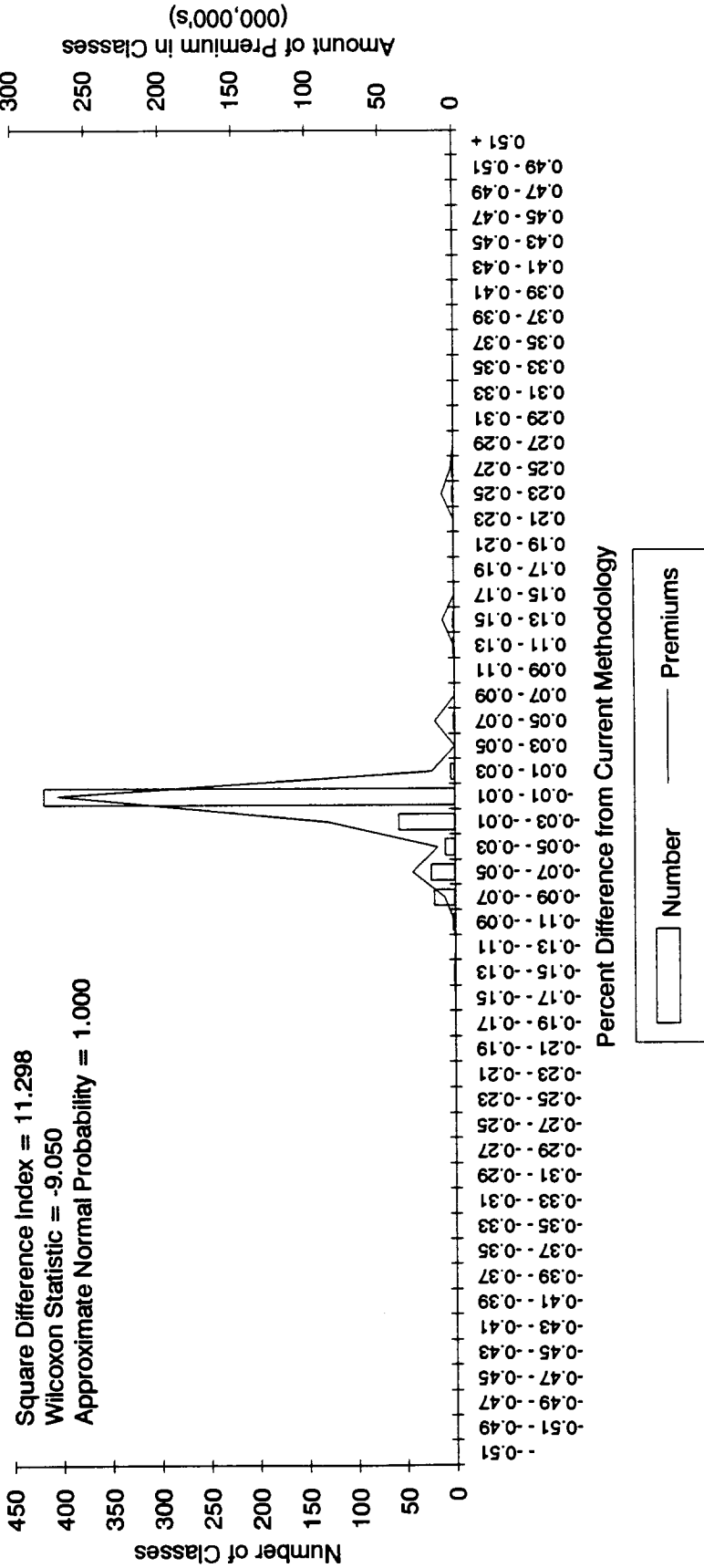
Maine, 1988 Revision
Unlimited Losses



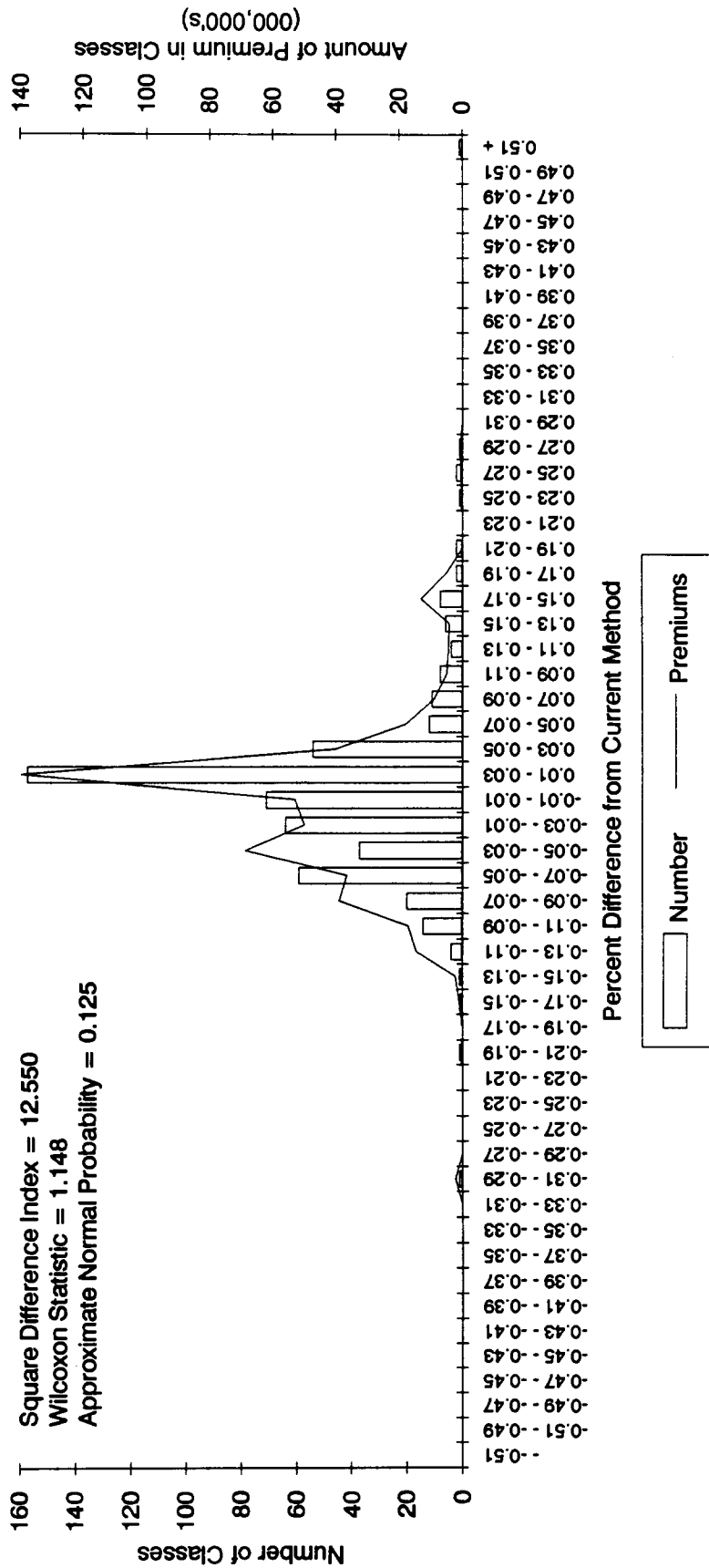
Maine, 1988 Revision
Half Current Loss Limitation



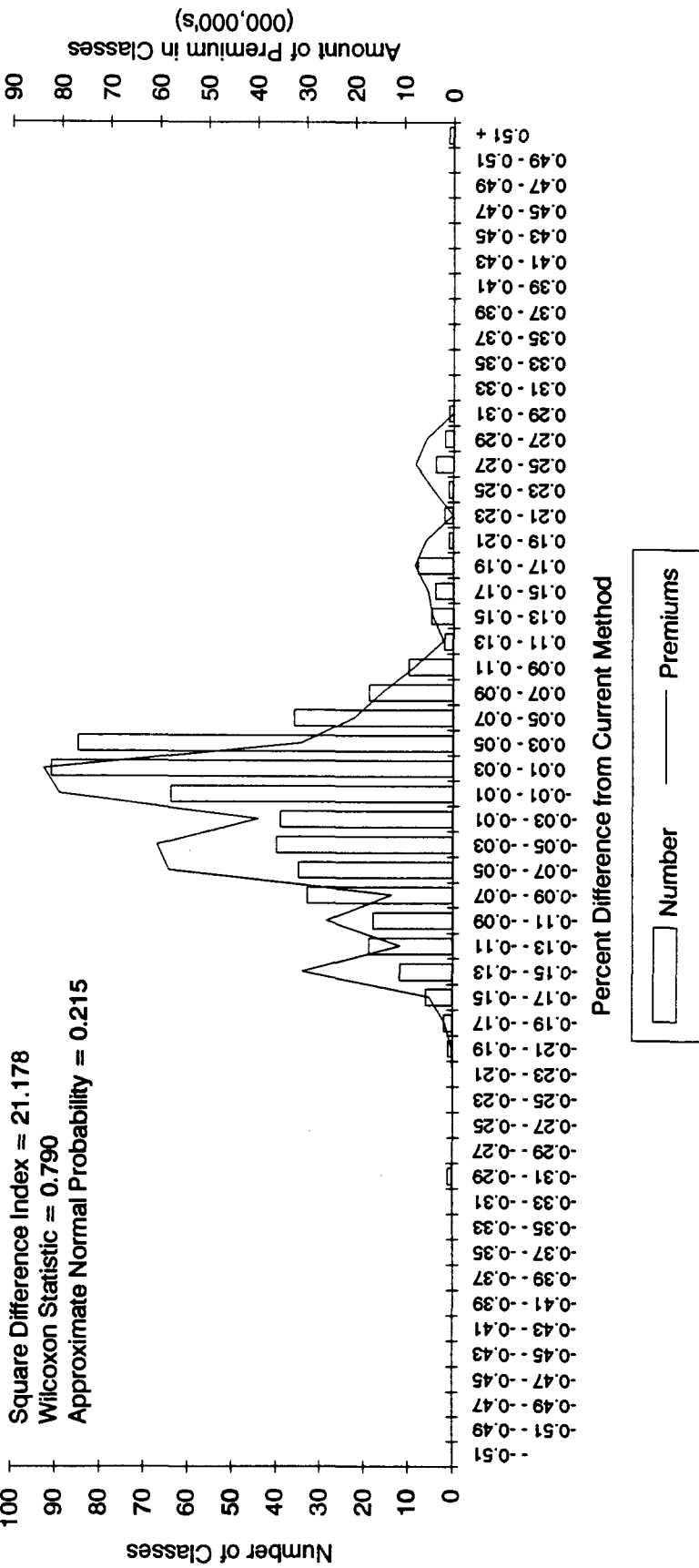
**Maine, 1988 Revision
Sliding Scale Loss Limitation**



Maine, 1989 Revision
Four Years of Data

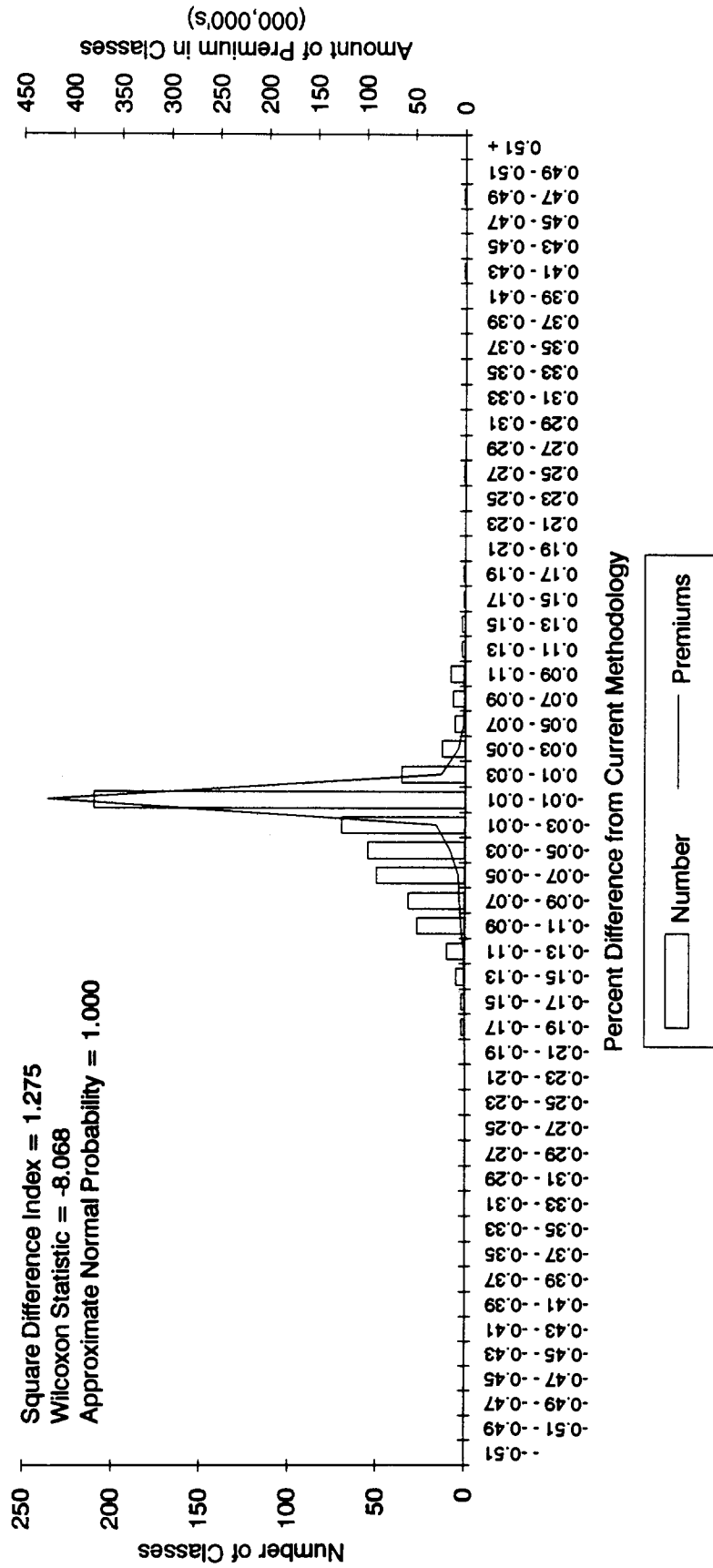


Maine, 1989 Revision
Five Years of Data

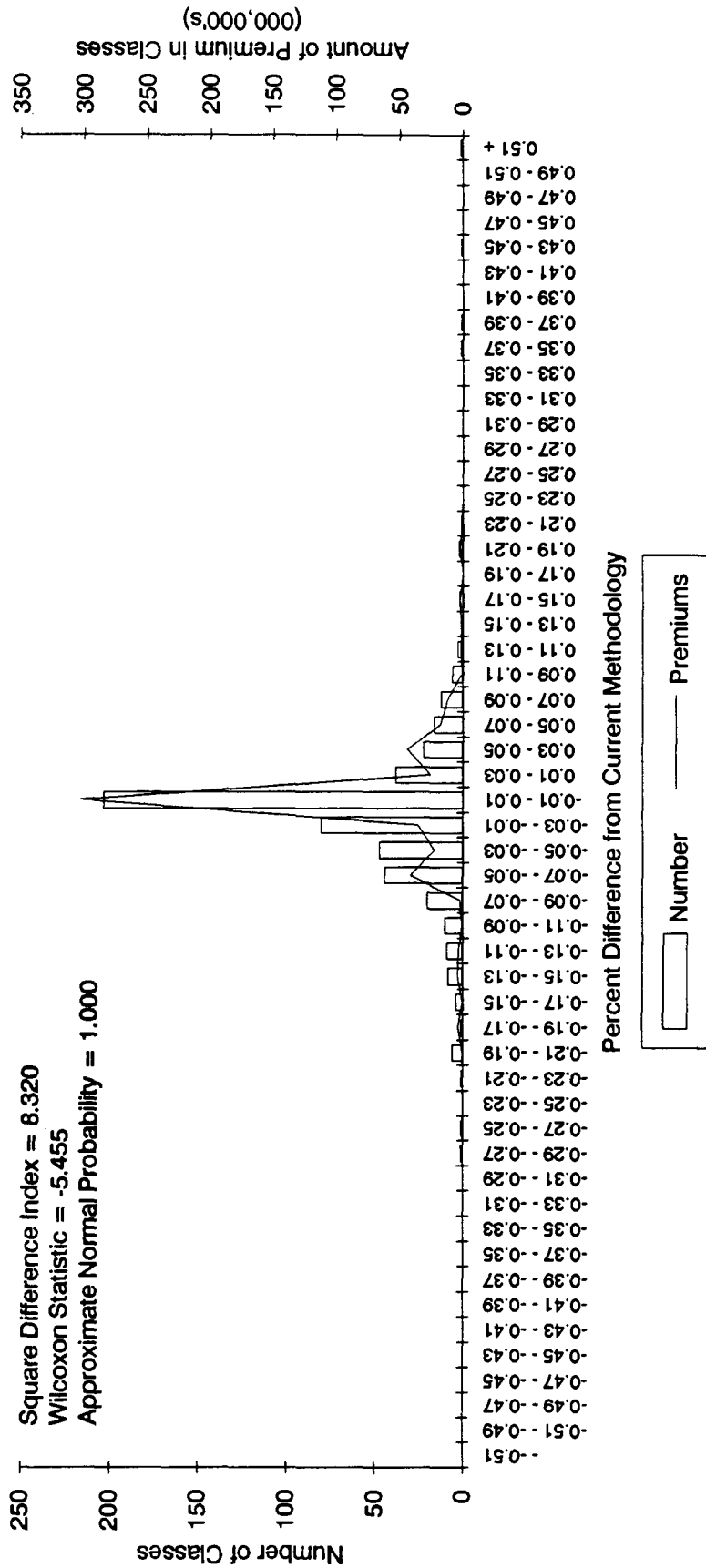


Maine, 1989 Revision
Credibility Using .5 Power

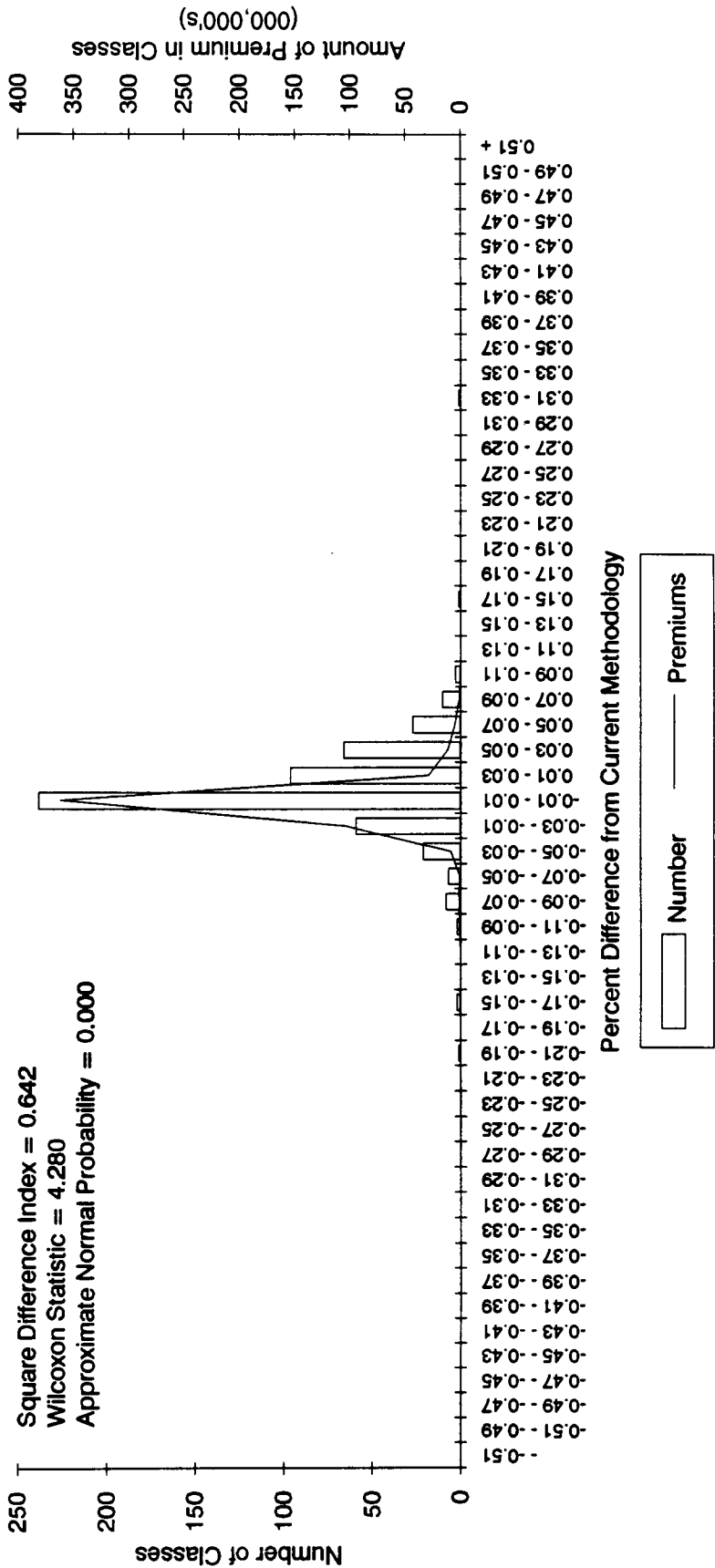
Square Difference Index = 1.275
 Wilcoxon Statistic = -8.068
 Approximate Normal Probability = 1.000



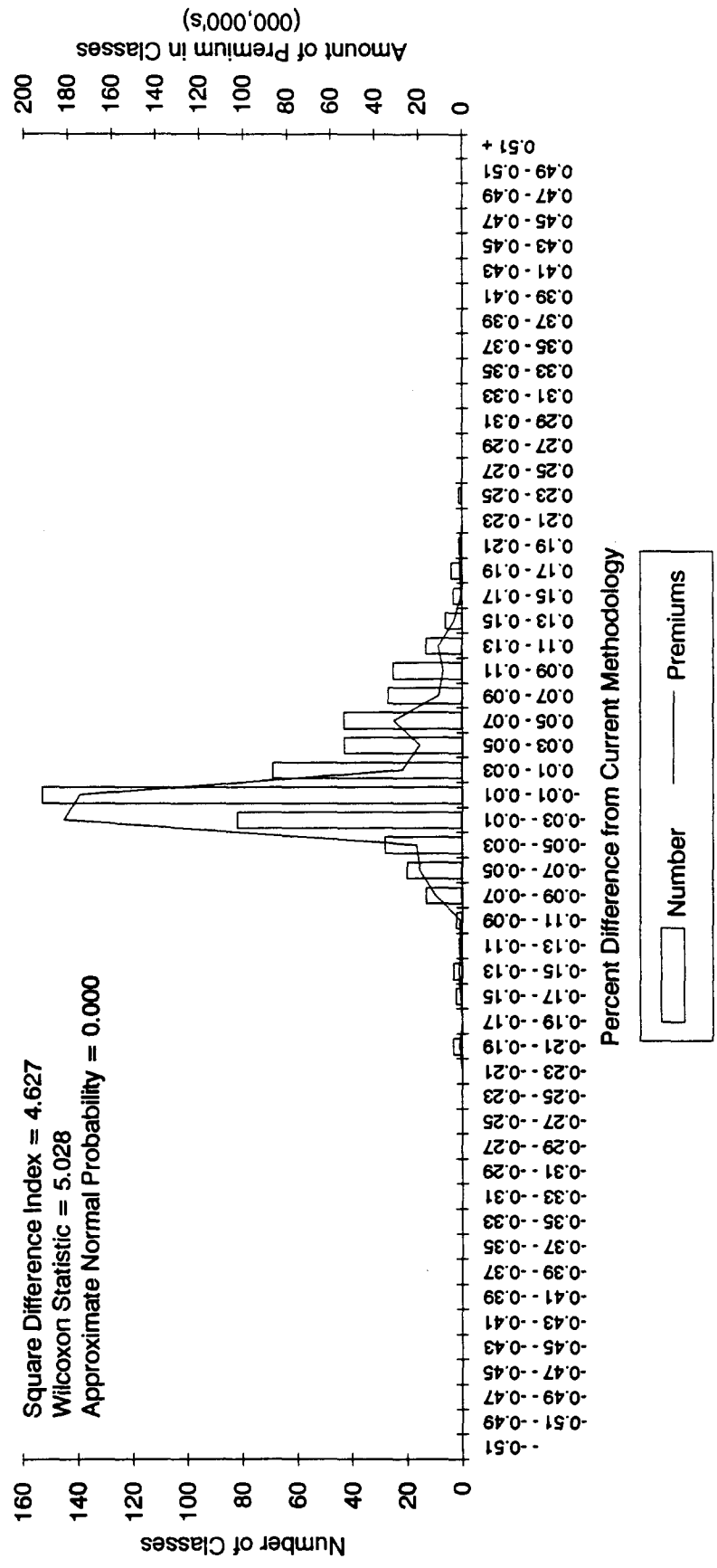
Maine, 1989 Revision
Payroll Based Credibility



Maine, 1989 Revision
Credibility Using .8 Power

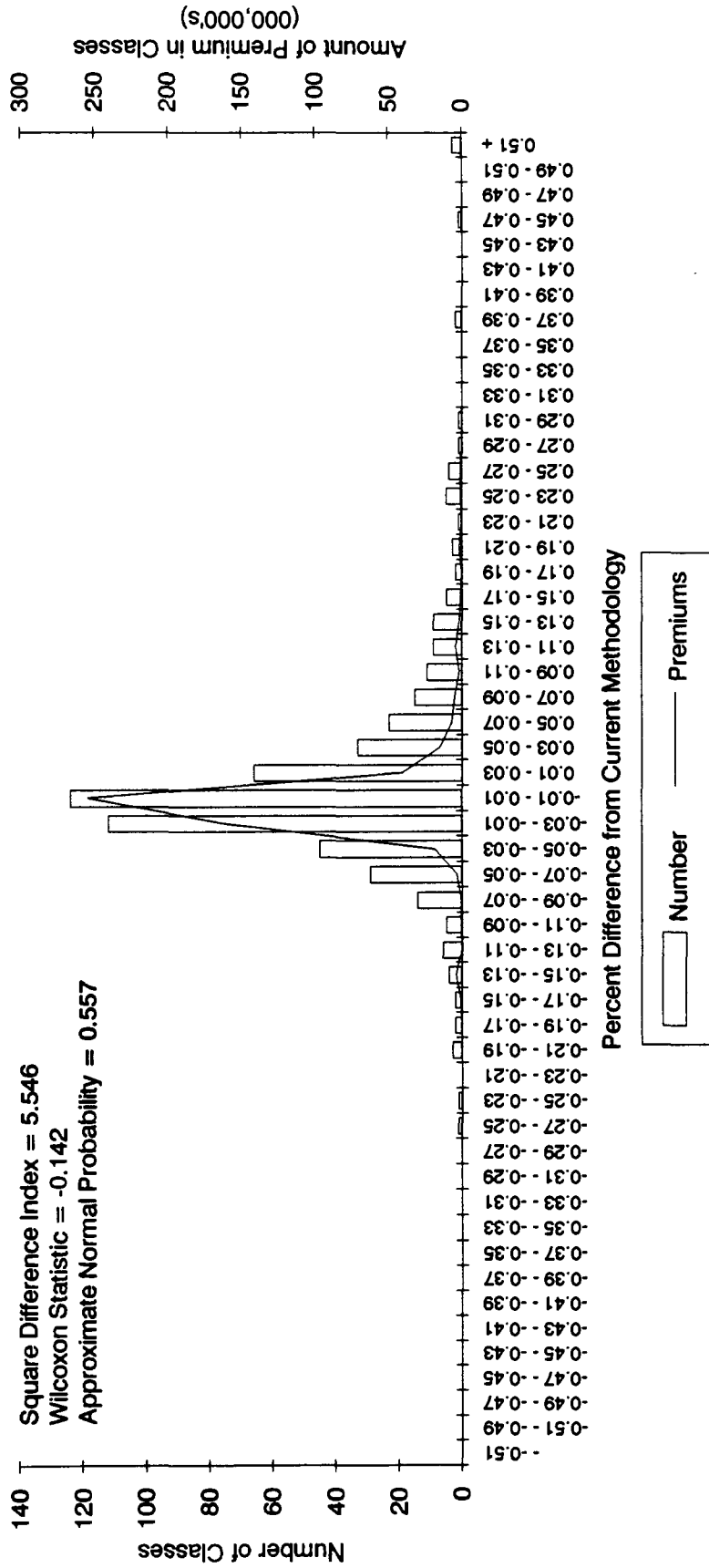


**Maine, 1989 Revision
Double Full Credibility Standard**

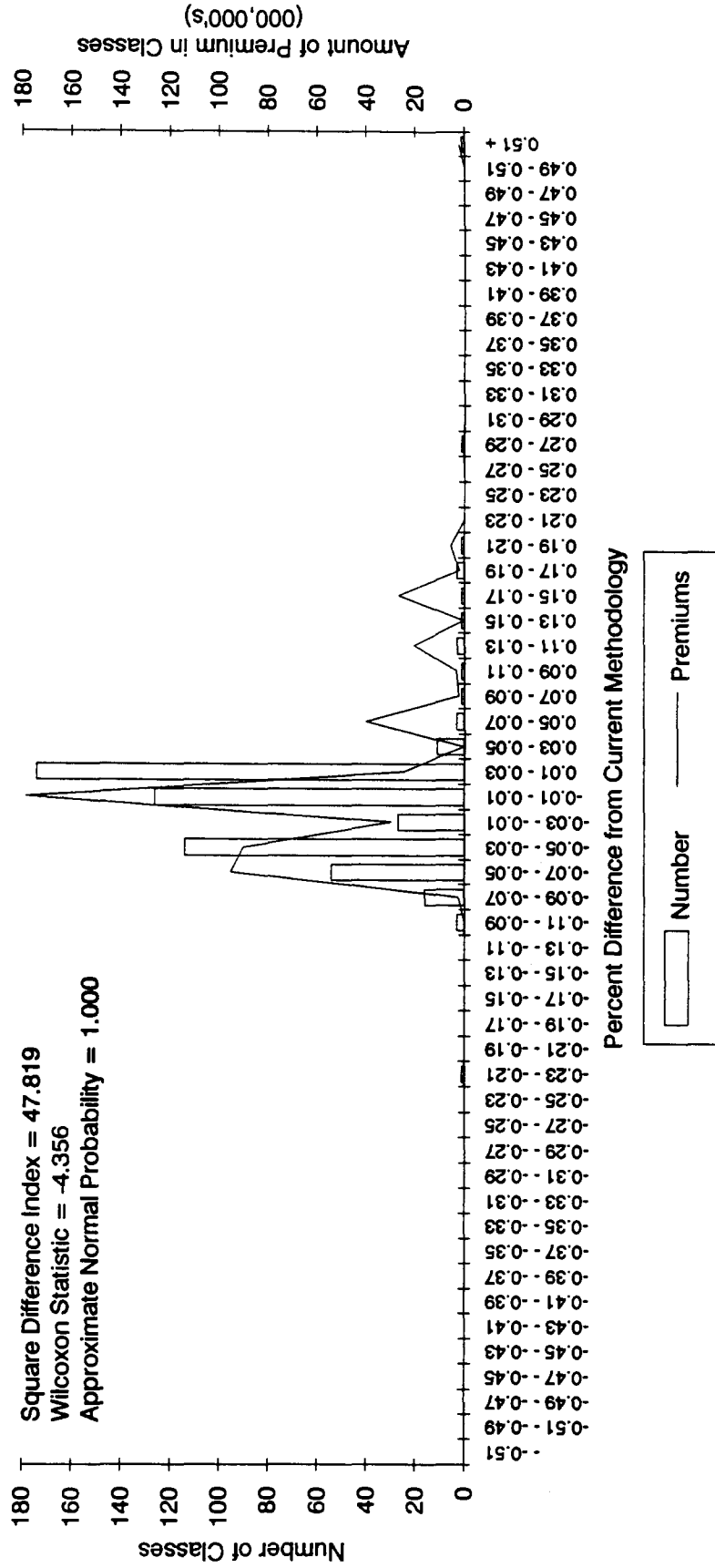


Maine, 1989 Revision
Claim Count Based Credibility

Square Difference Index = 5.546
Wilcoxon Statistic = -0.142
Approximate Normal Probability = 0.557

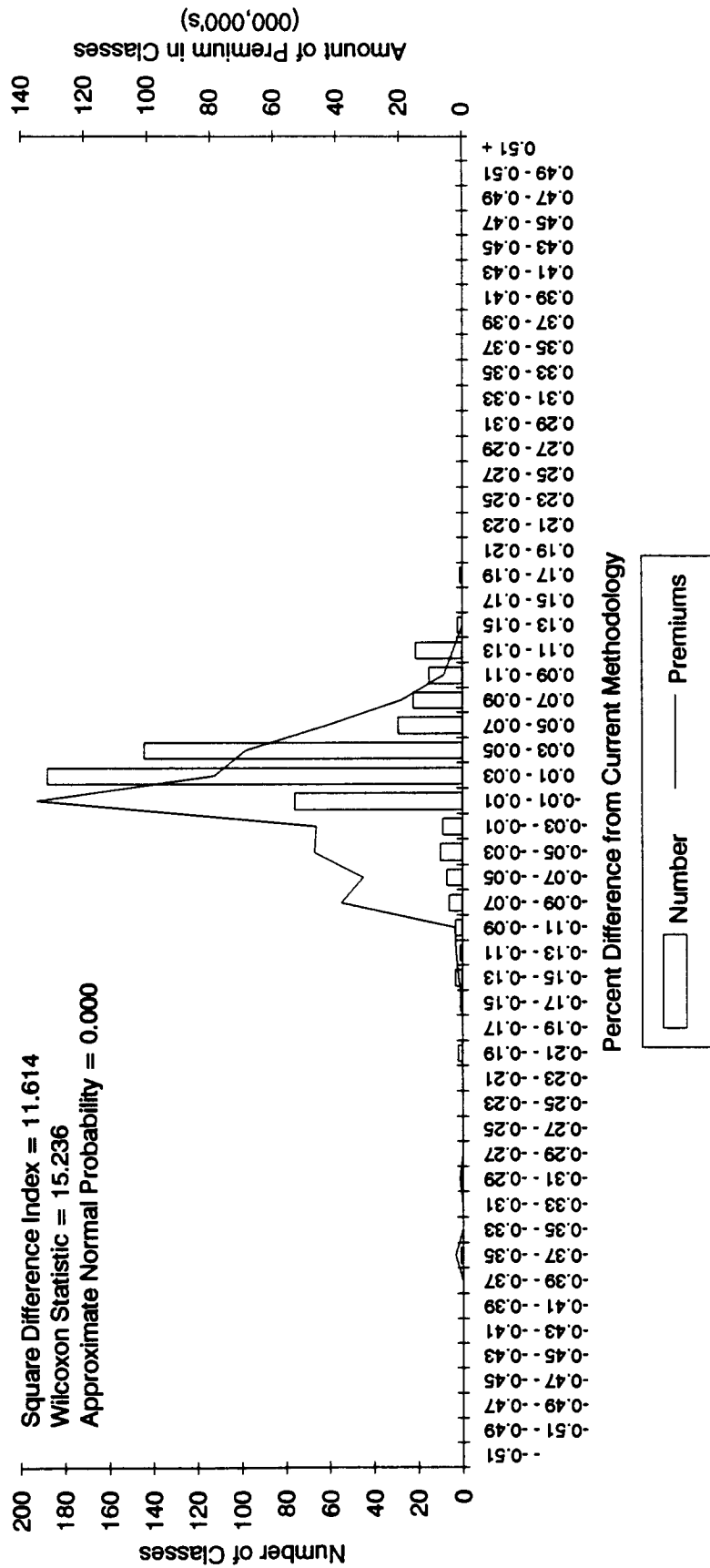


Maine, 1989 Revision
Unlimited Losses

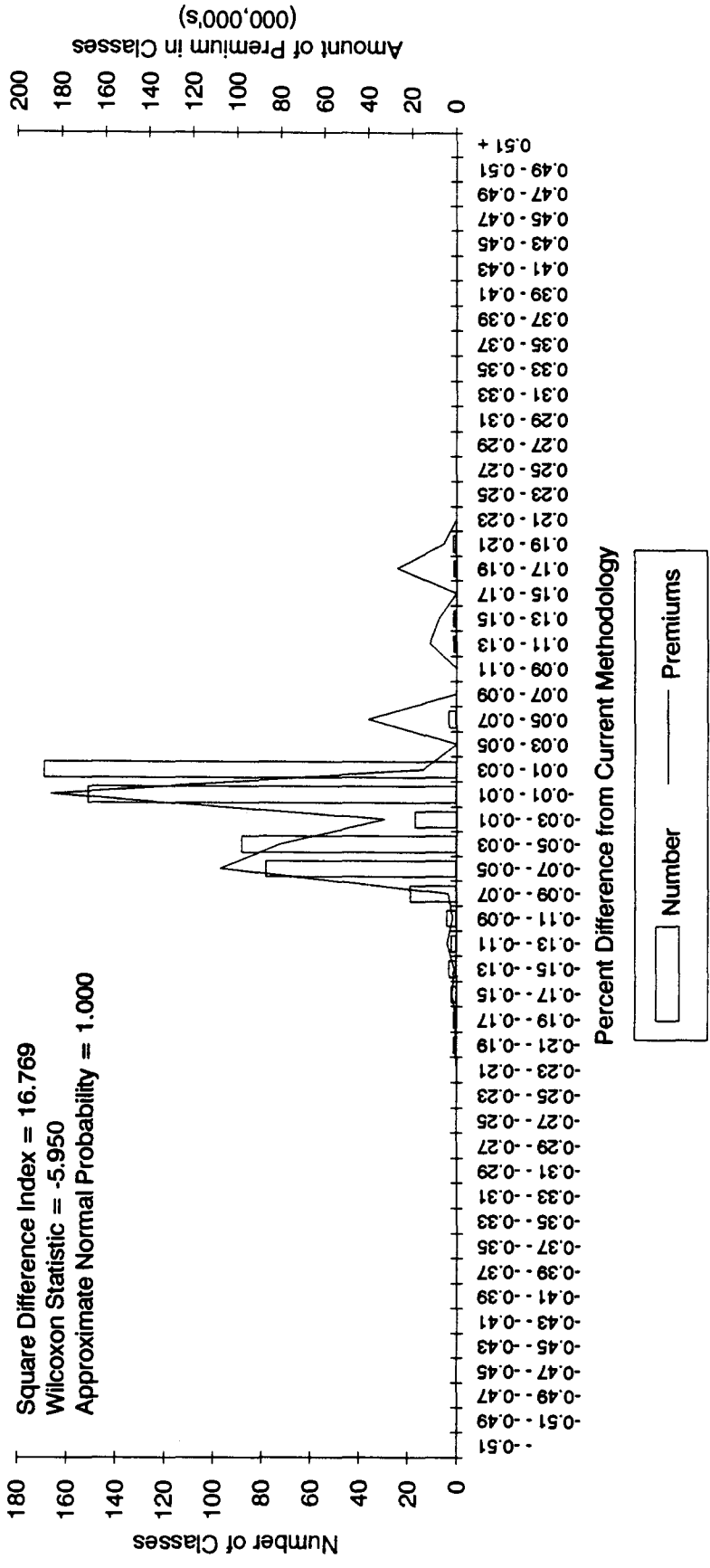


**Maine, 1989 Revision
Half Current Loss Limitation**

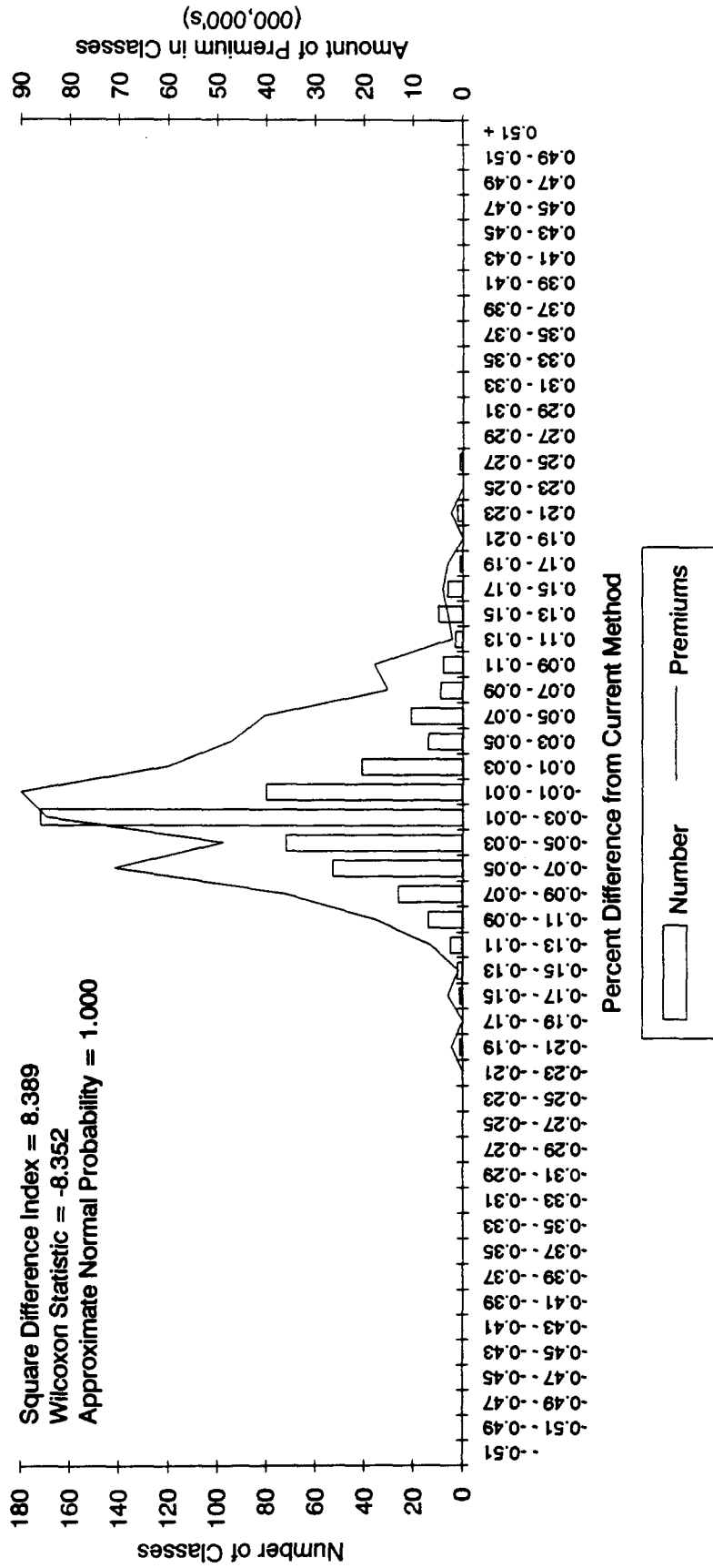
Square Difference Index = 11.614
 Wilcoxon Statistic = 15.236
 Approximate Normal Probability = 0.000



**Maine, 1989 Revision
Sliding Scale Loss Limitation**

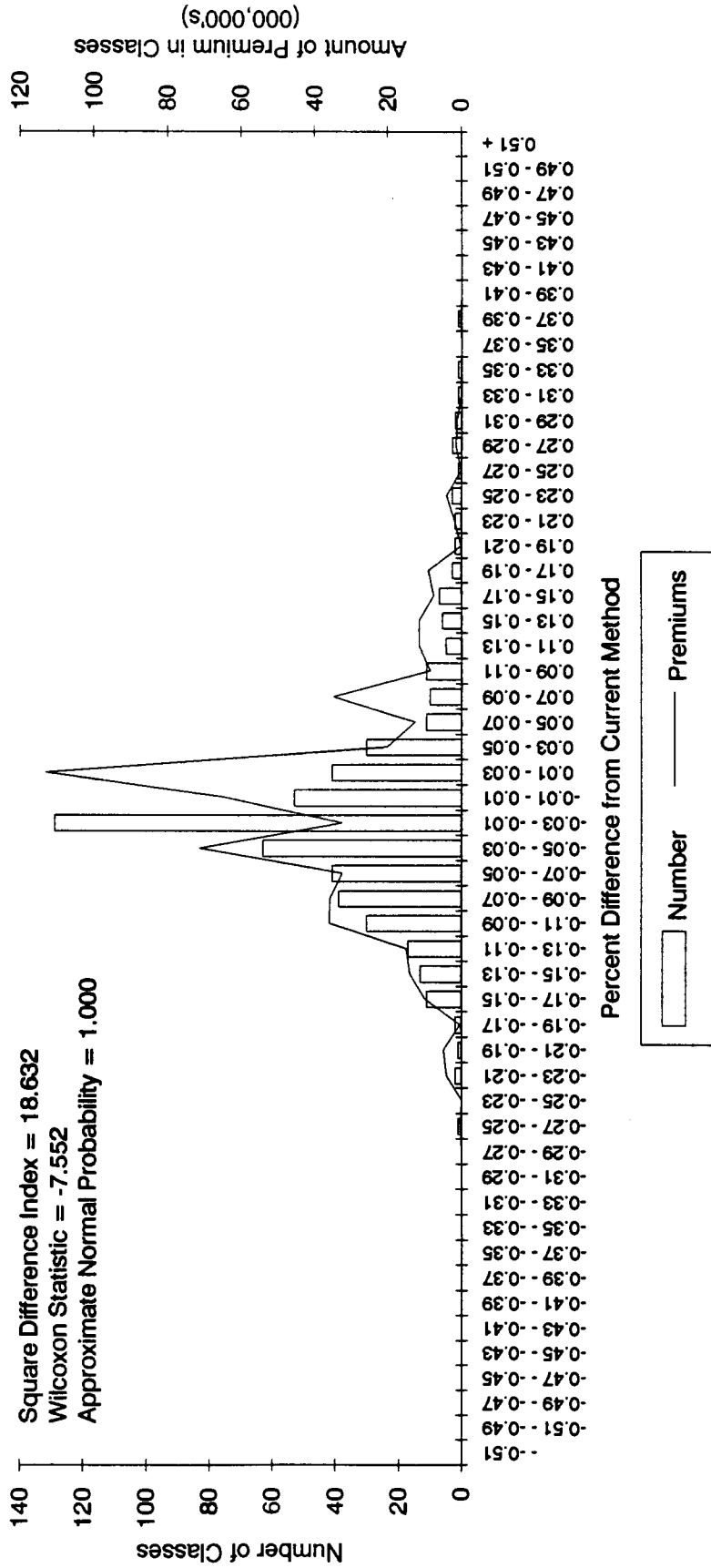


Maine, 1990 Revision
Four Years of Data

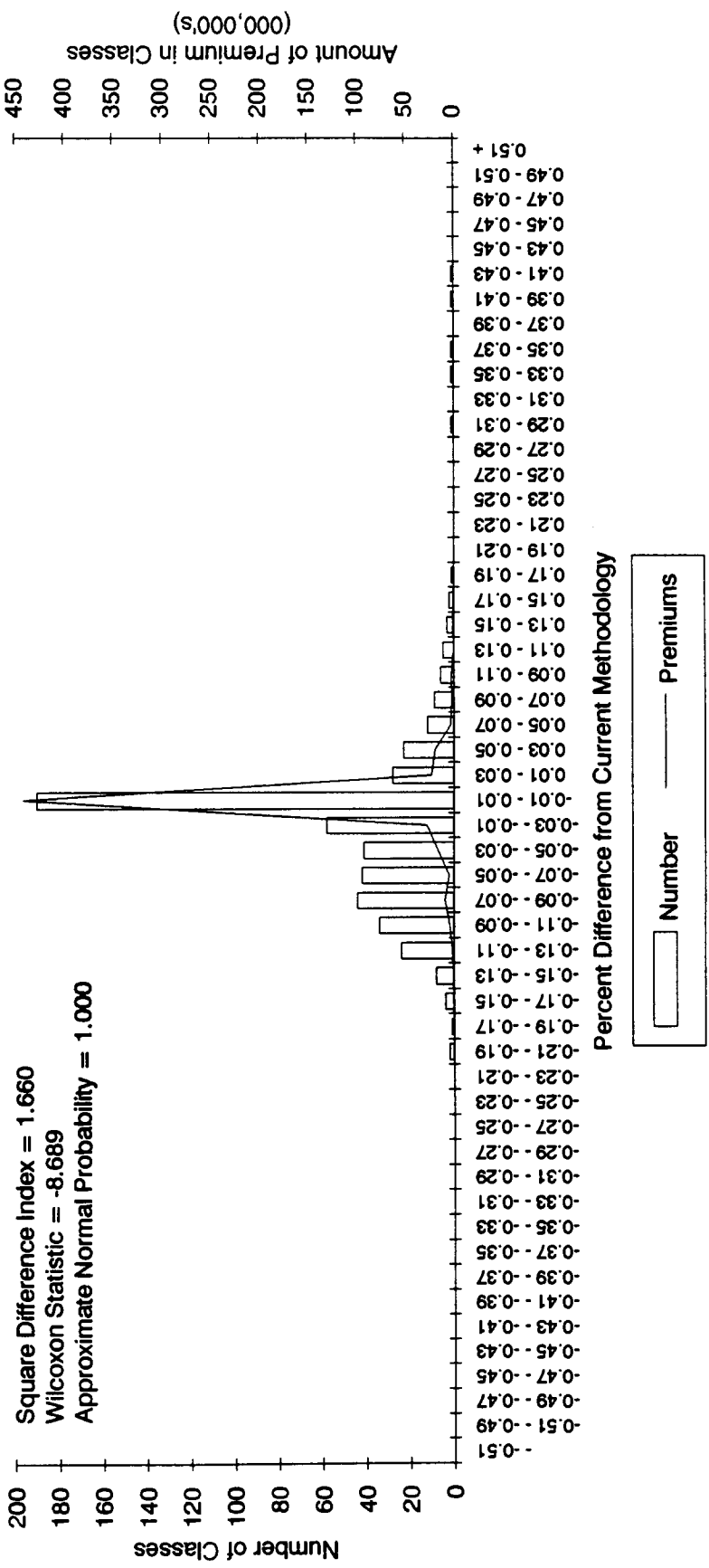


Maine, 1990 Revision
Five Years of Data

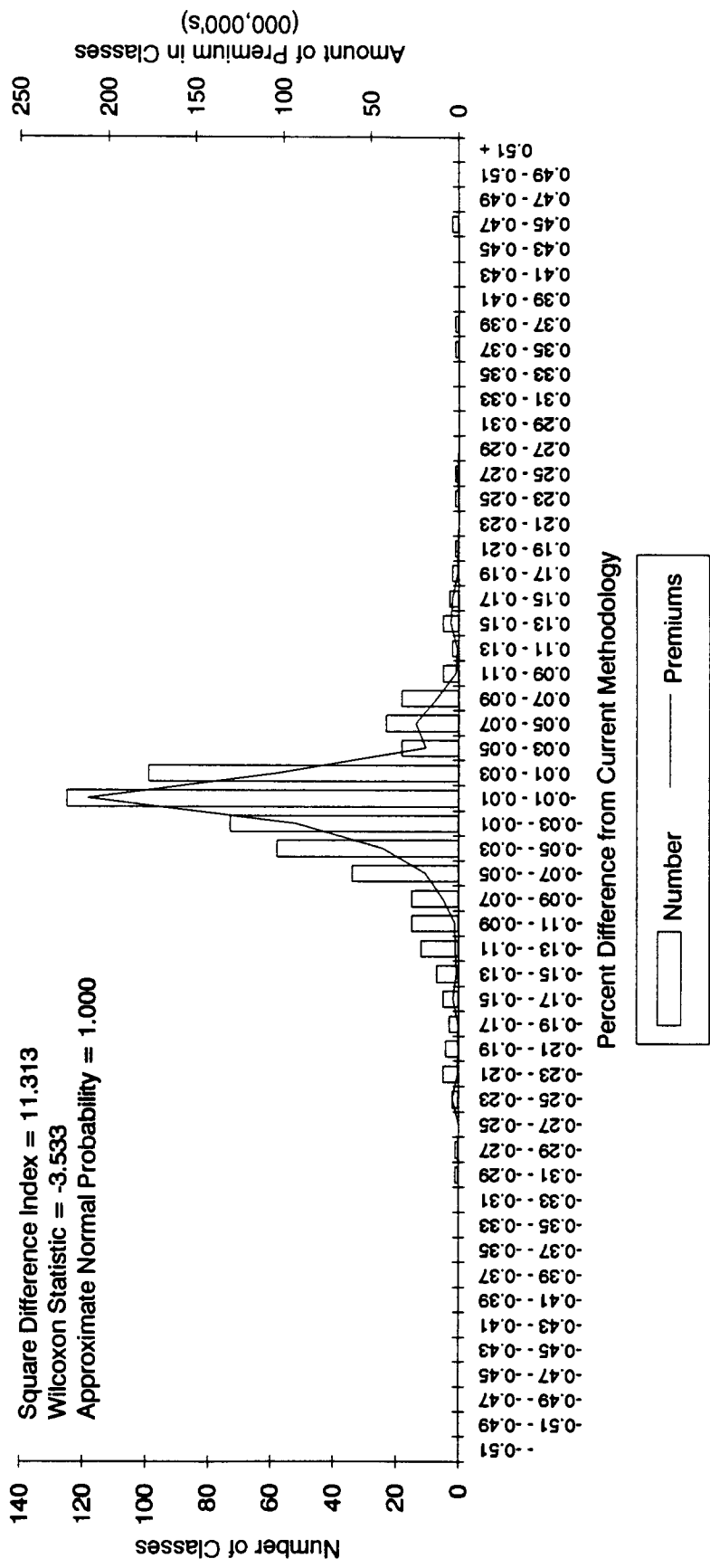
Square Difference Index = 18.632
 Wilcoxon Statistic = -7.552
 Approximate Normal Probability = 1.000



Maine, 1990 Revision
Credibility Using .5 Power

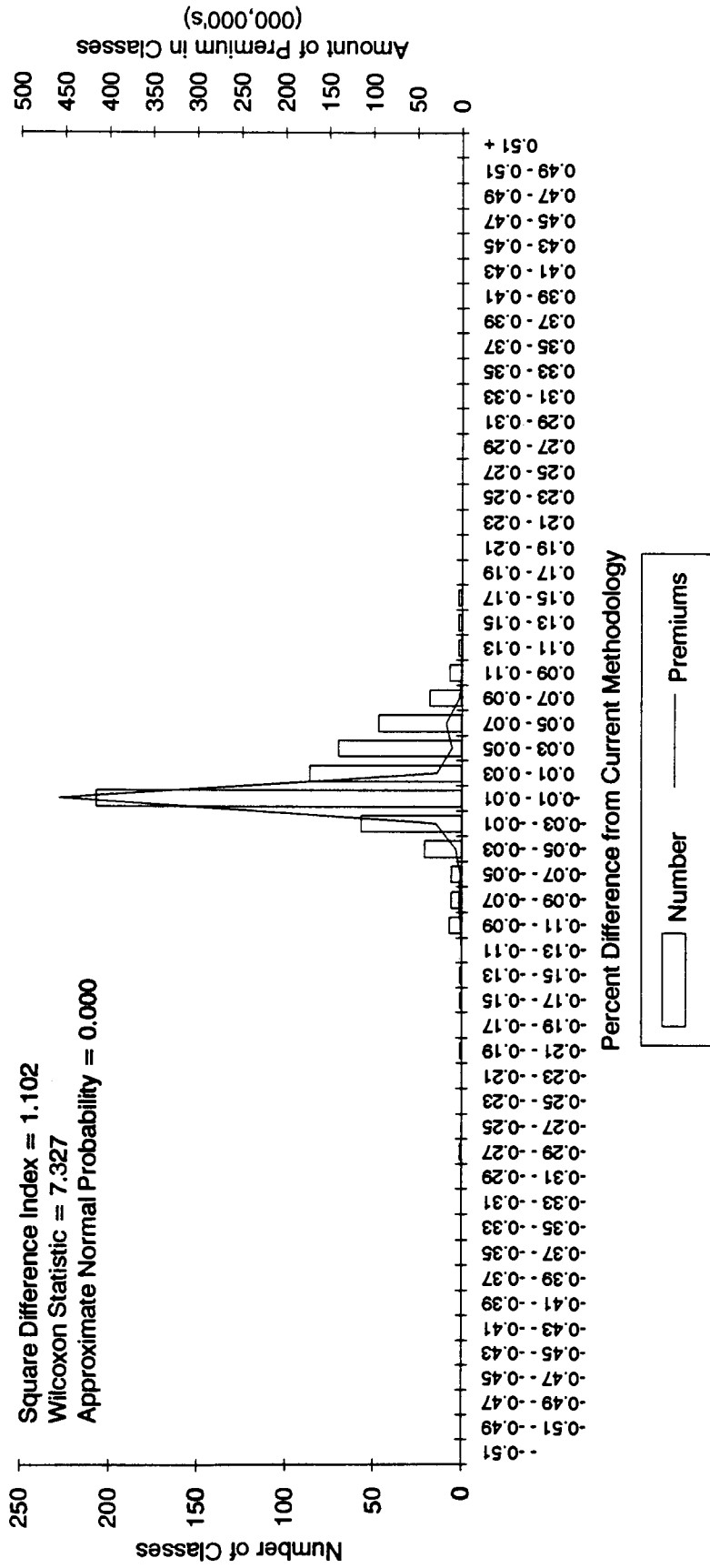


**Maine, 1990 Revision
Payroll Based Credibility**

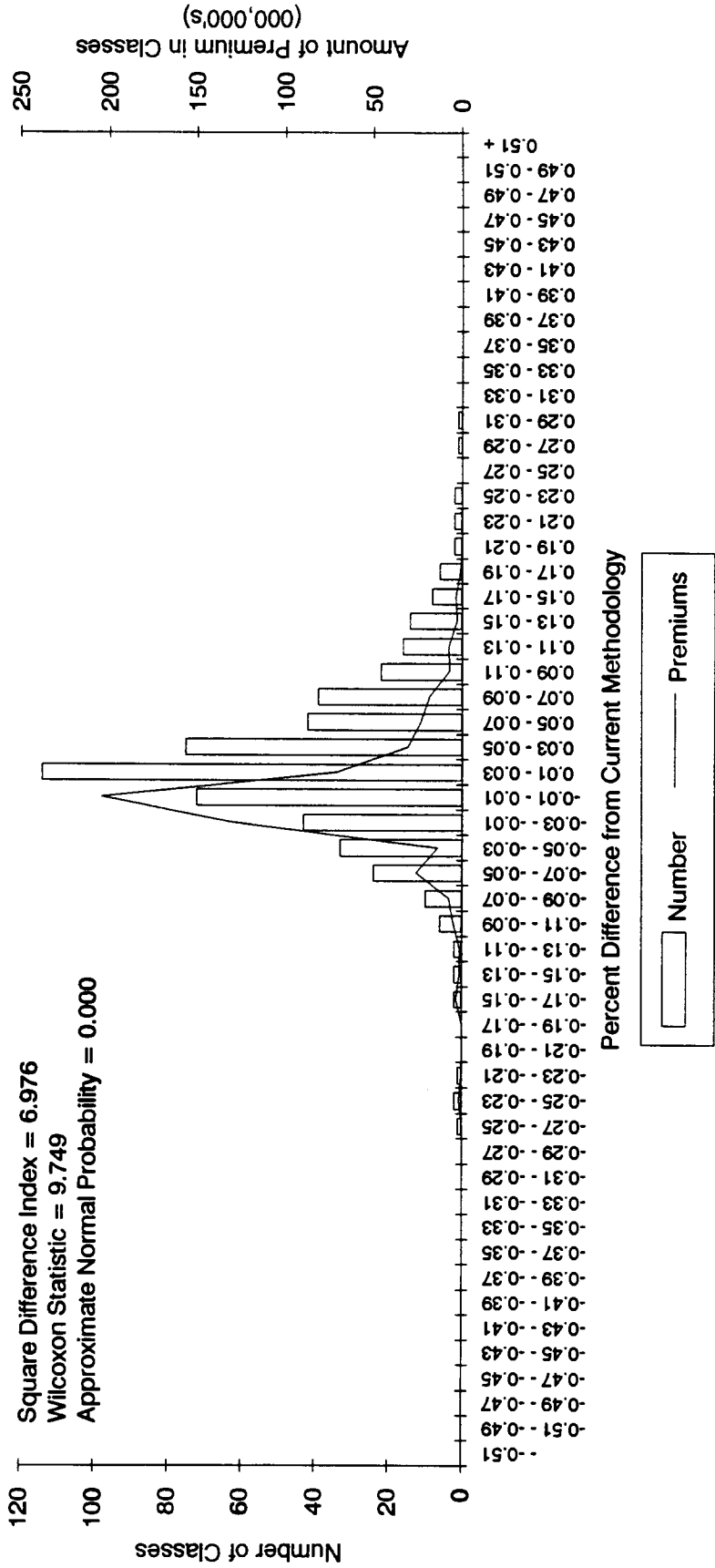


Maine, 1990 Revision
Credibility Using .8 Power

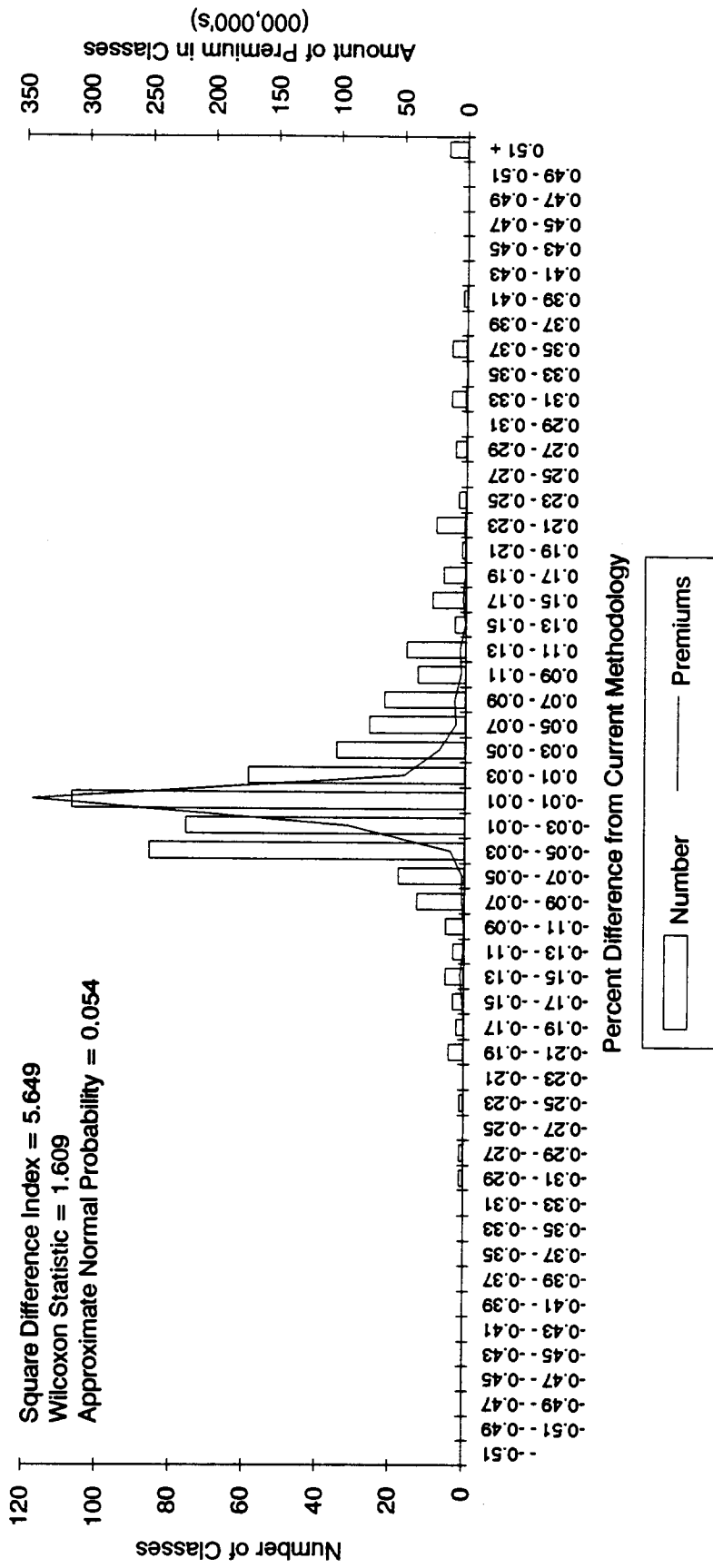
Square Difference Index = 1.102
Wilcoxon Statistic = 7.327
Approximate Normal Probability = 0.000



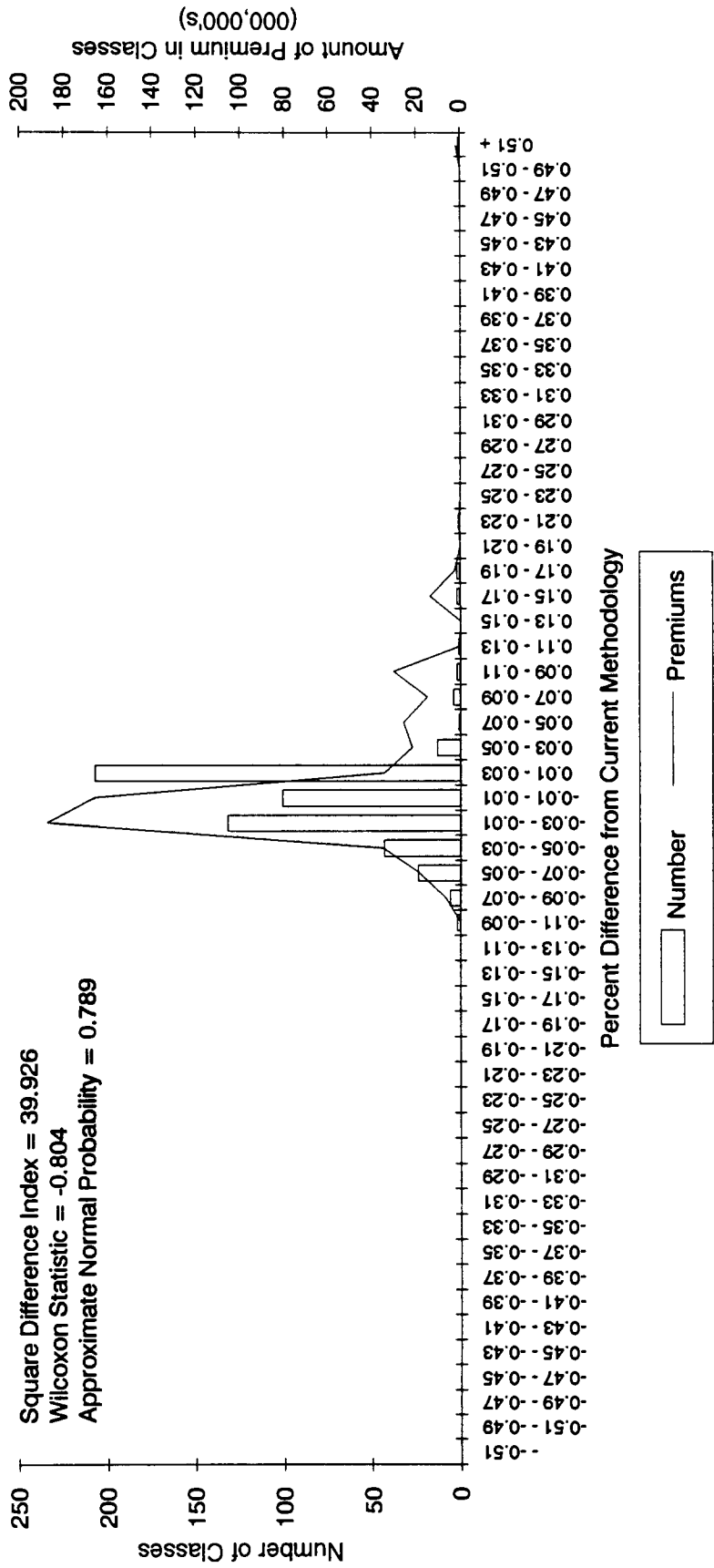
**Maine, 1990 Revision
Double Full Credibility Standard**



**Maine, 1990 Revision
Claim Count Based Credibility**

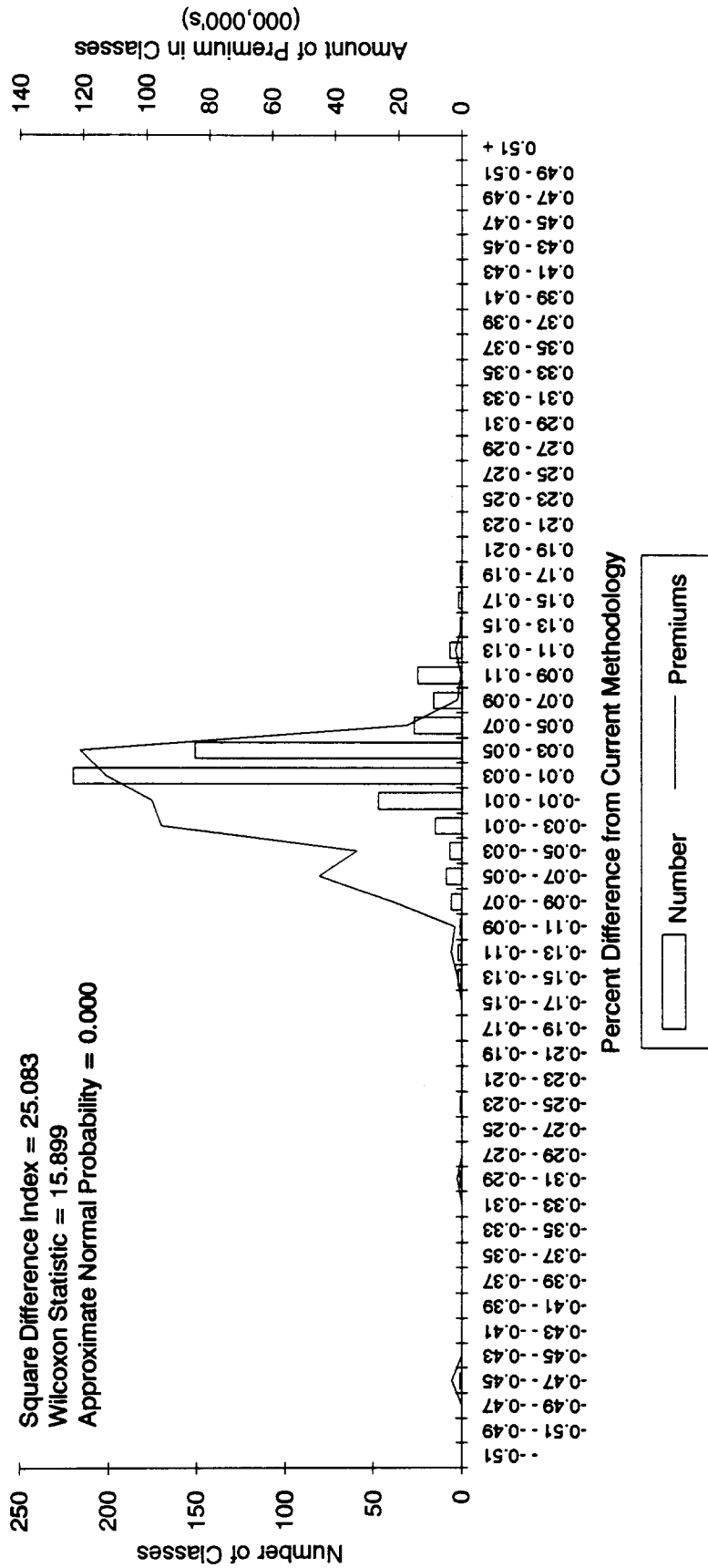


Maine, 1990 Revision
Unlimited Losses



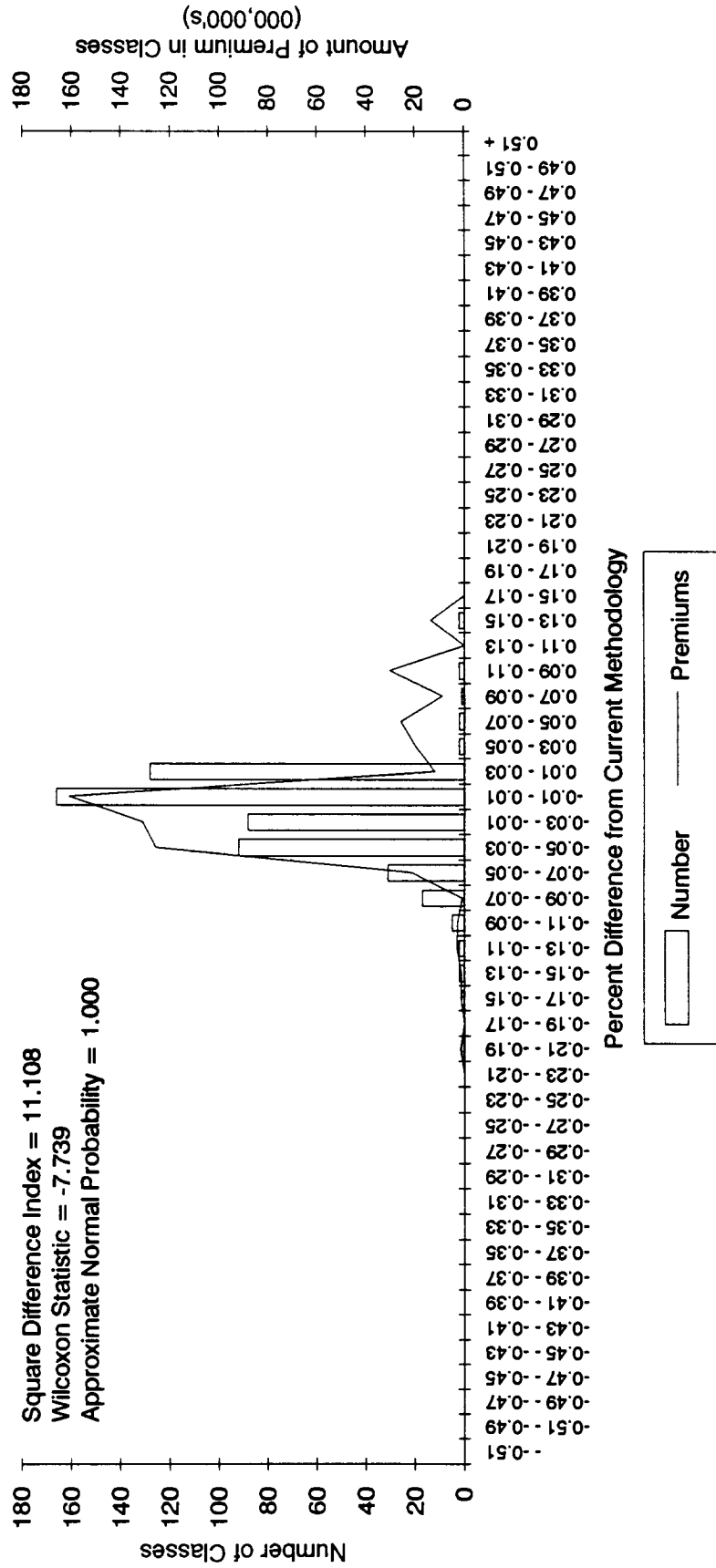
Maine, 1990 Revision
Half Current Loss Limitation

Square Difference Index = 25.083
 Wilcoxon Statistic = 15.899
 Approximate Normal Probability = 0.000



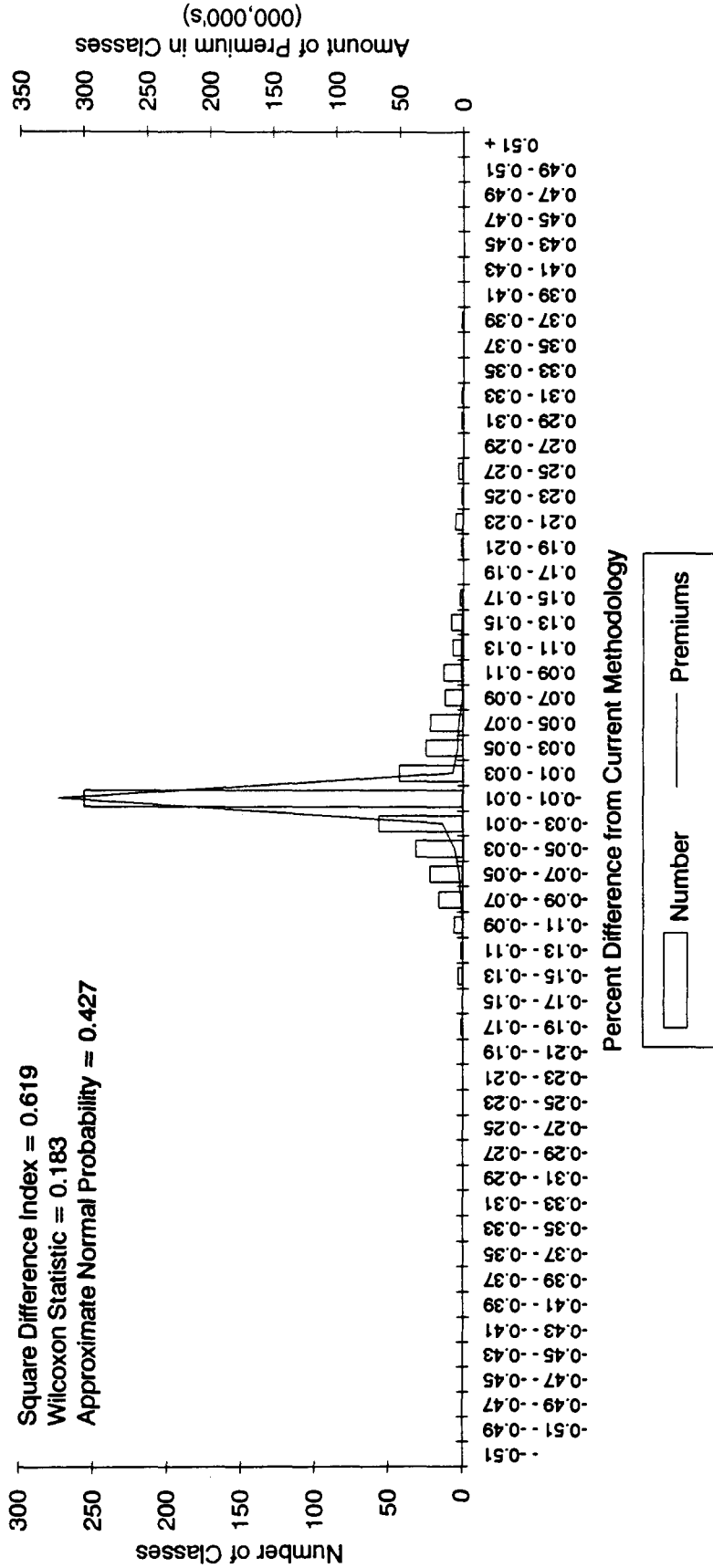
Maine, 1990 Revision
Sliding Scale Loss Limitation

Square Difference Index = 11.108
Wilcoxon Statistic = -7.739
Approximate Normal Probability = 1.000



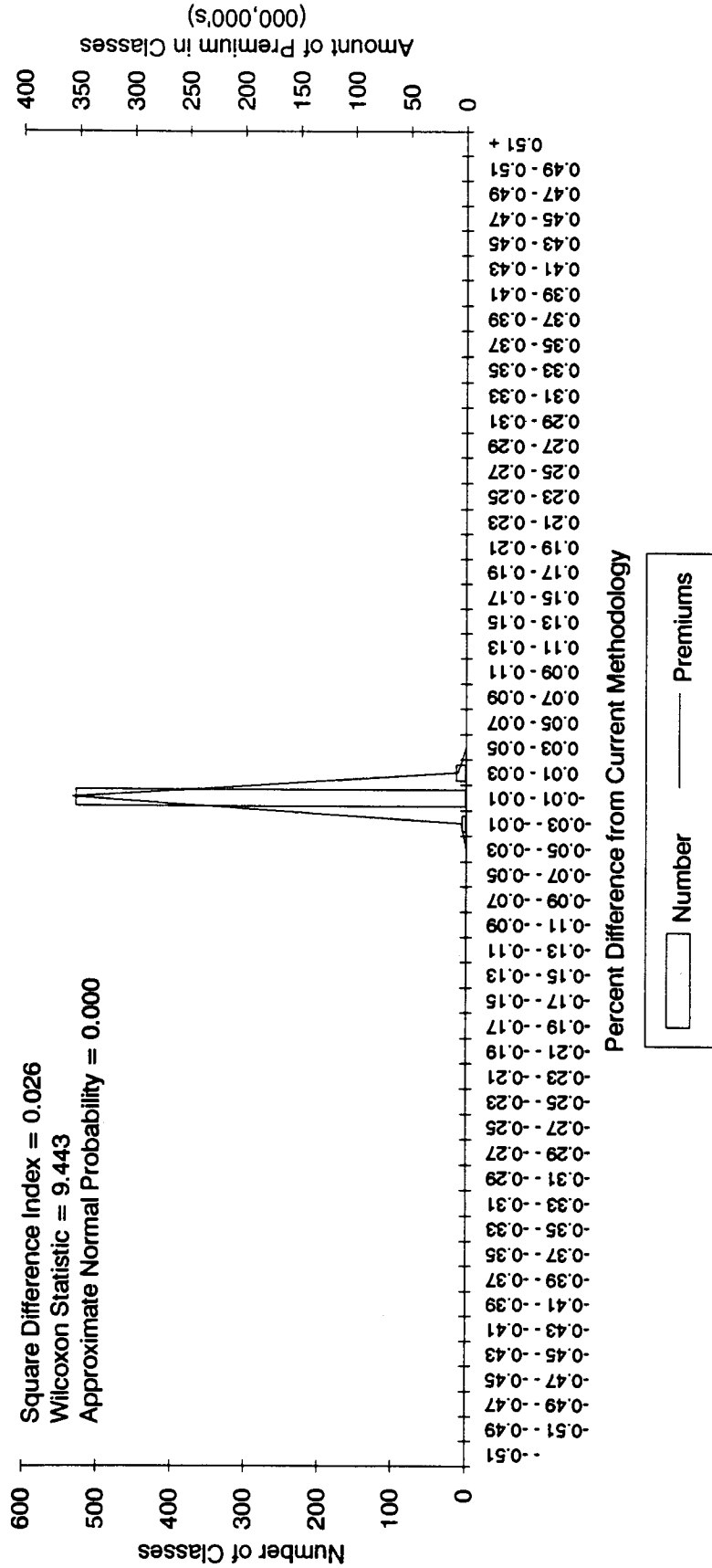
**Maine, 1990 Revision
Alternate Regional Pure Premiums**

Square Difference Index = 0.619
 Wilcoxon Statistic = 0.183
 Approximate Normal Probability = 0.427

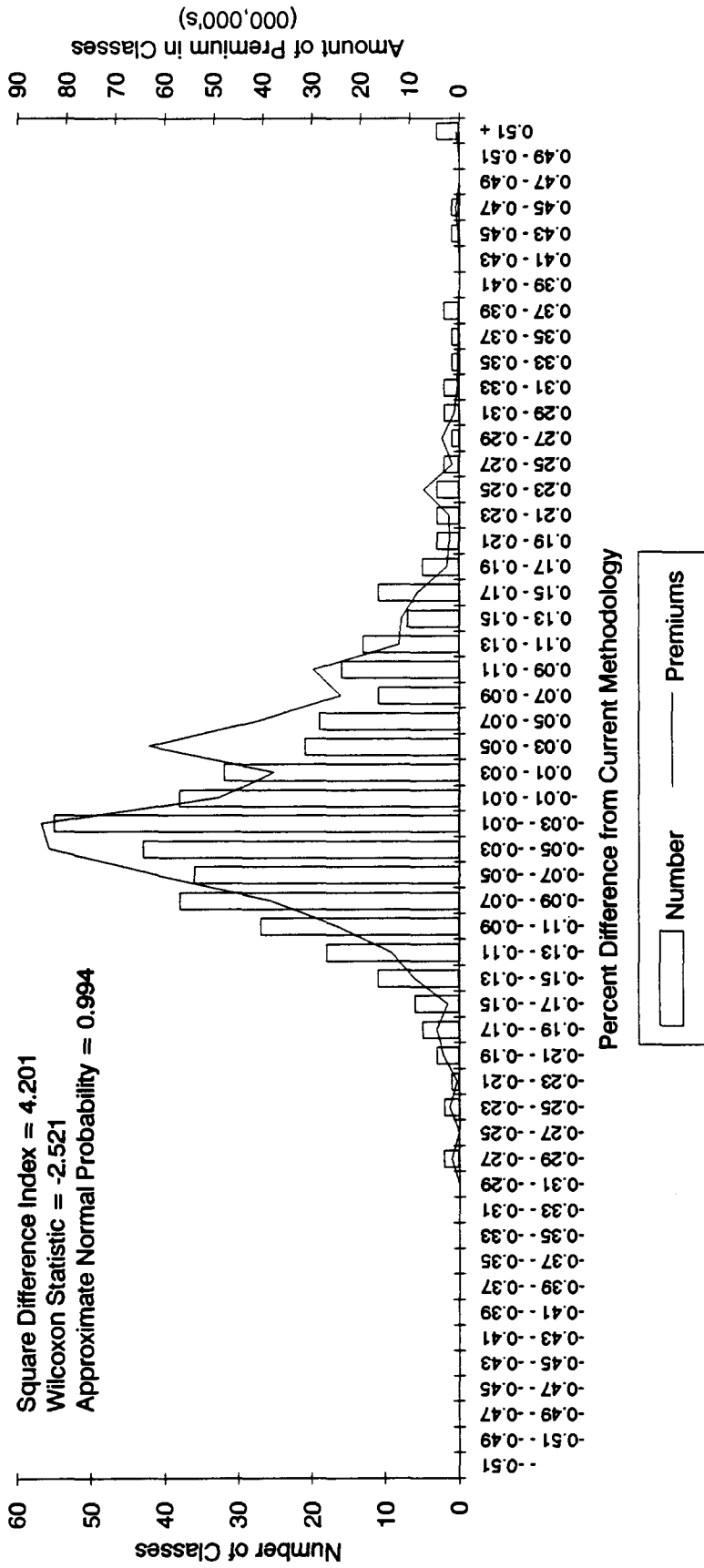


Maine, 1990 Revision
Alternate Trend Application

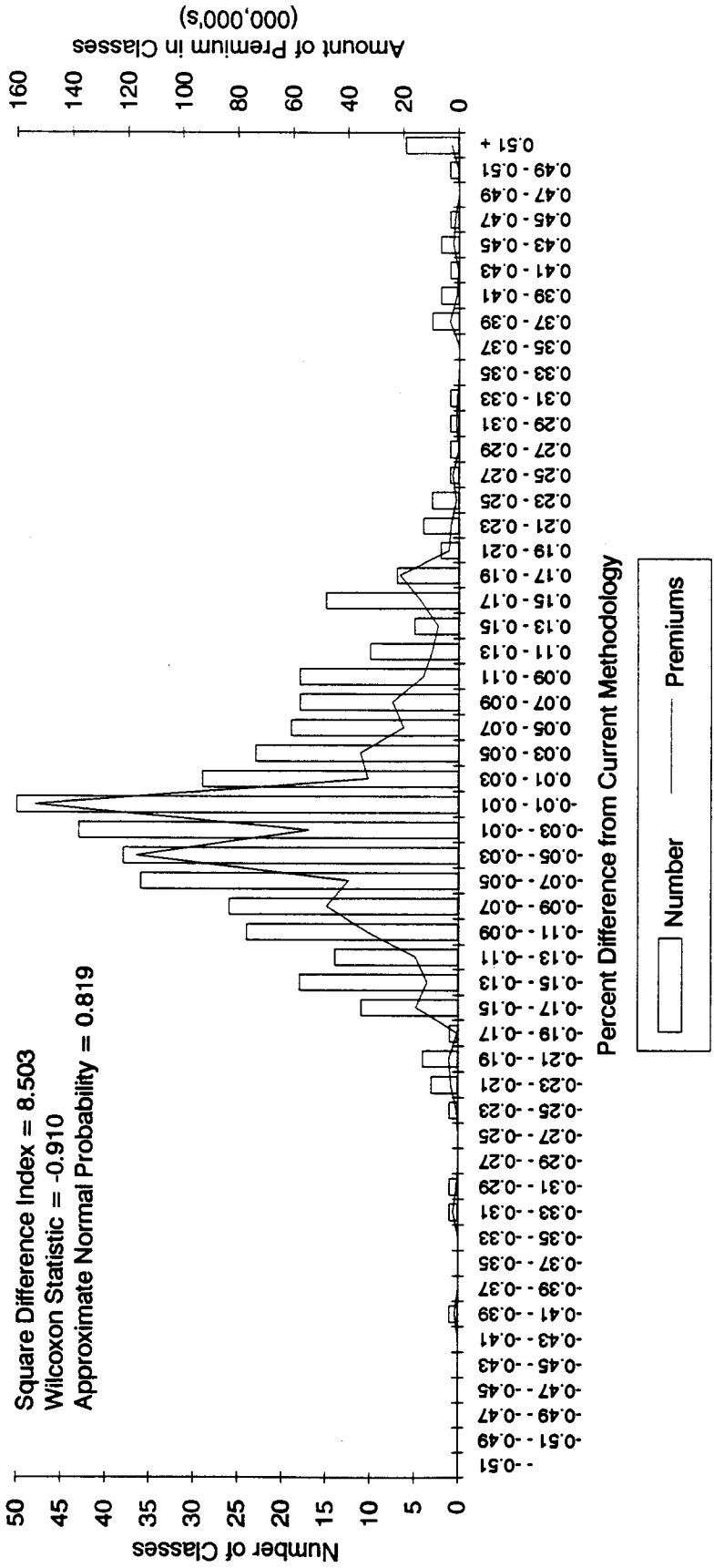
Square Difference Index = 0.026
Wicoxon Statistic = 9.443
Approximate Normal Probability = 0.000



Michigan, 1988 Revision
Five Years of Data

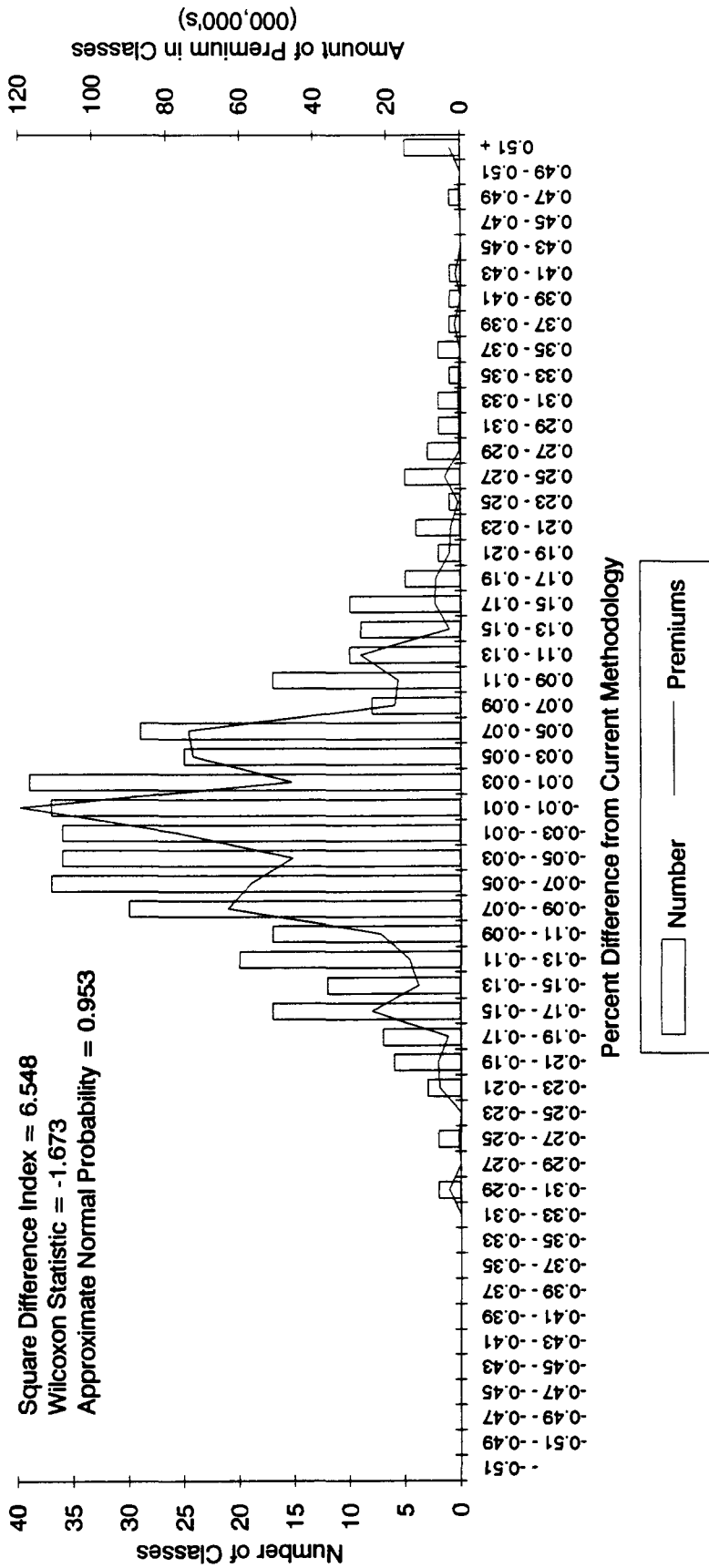


Michigan, 1989 Revision
Five Years of Data

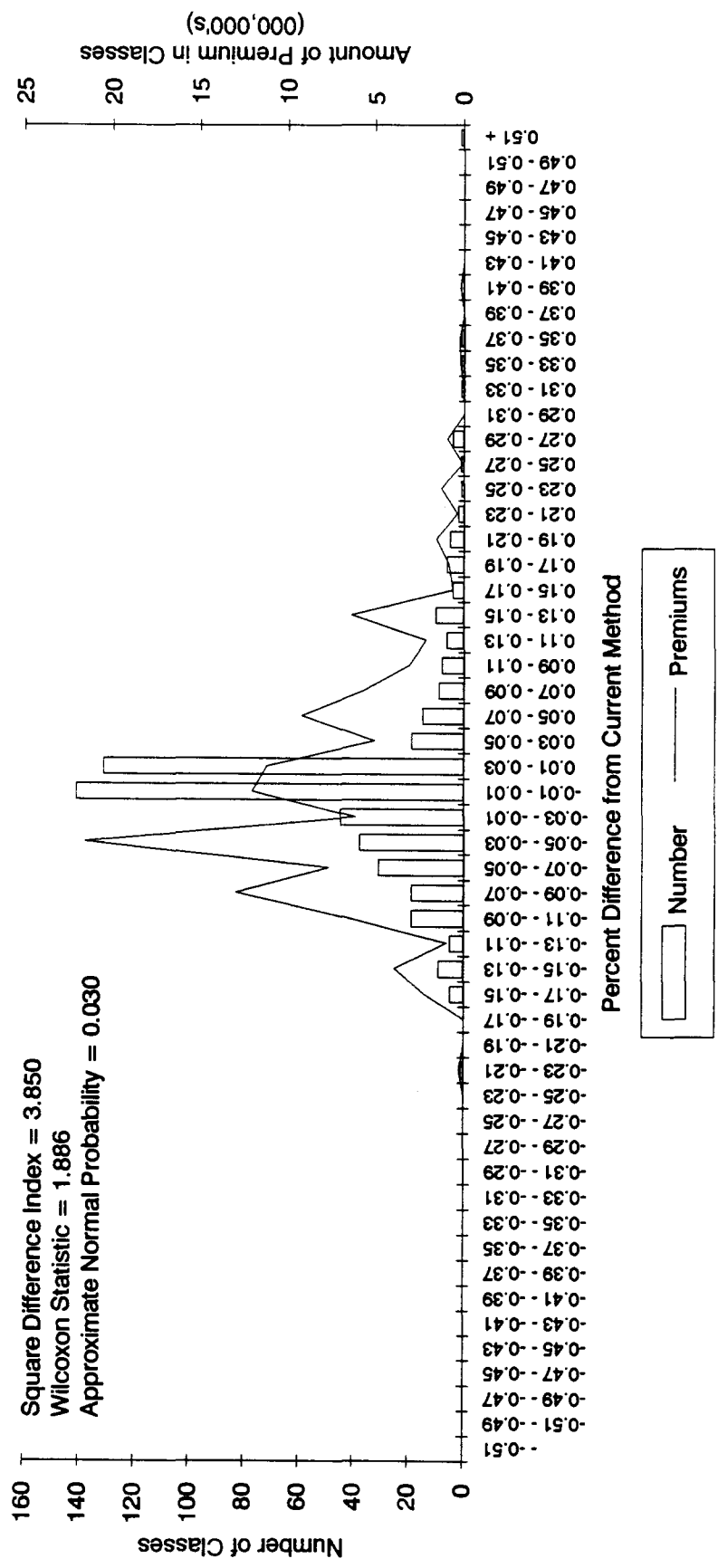


Michigan, 1990 Revision
Five Years of Data

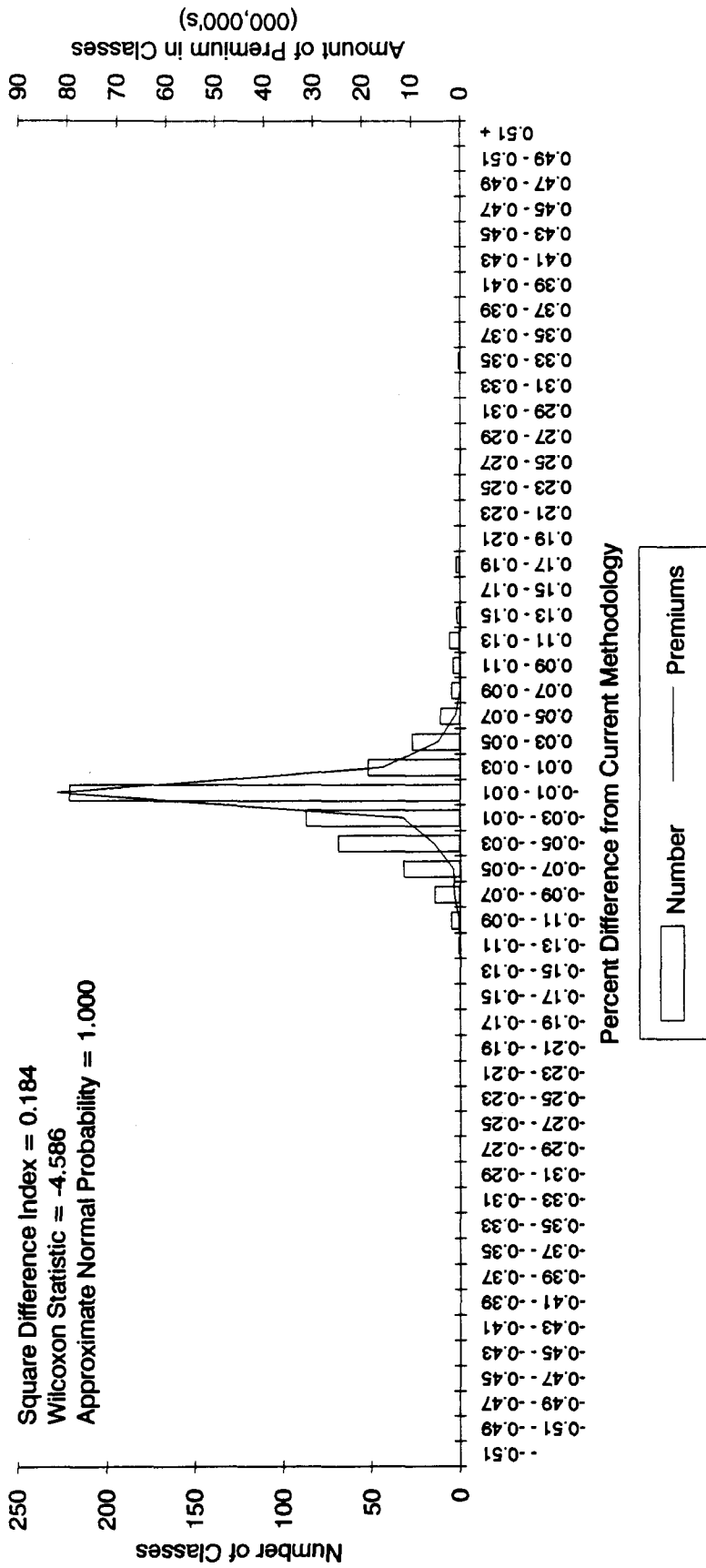
Square Difference Index = 6.548
Wilcoxon Statistic = -1.673
Approximate Normal Probability = 0.953



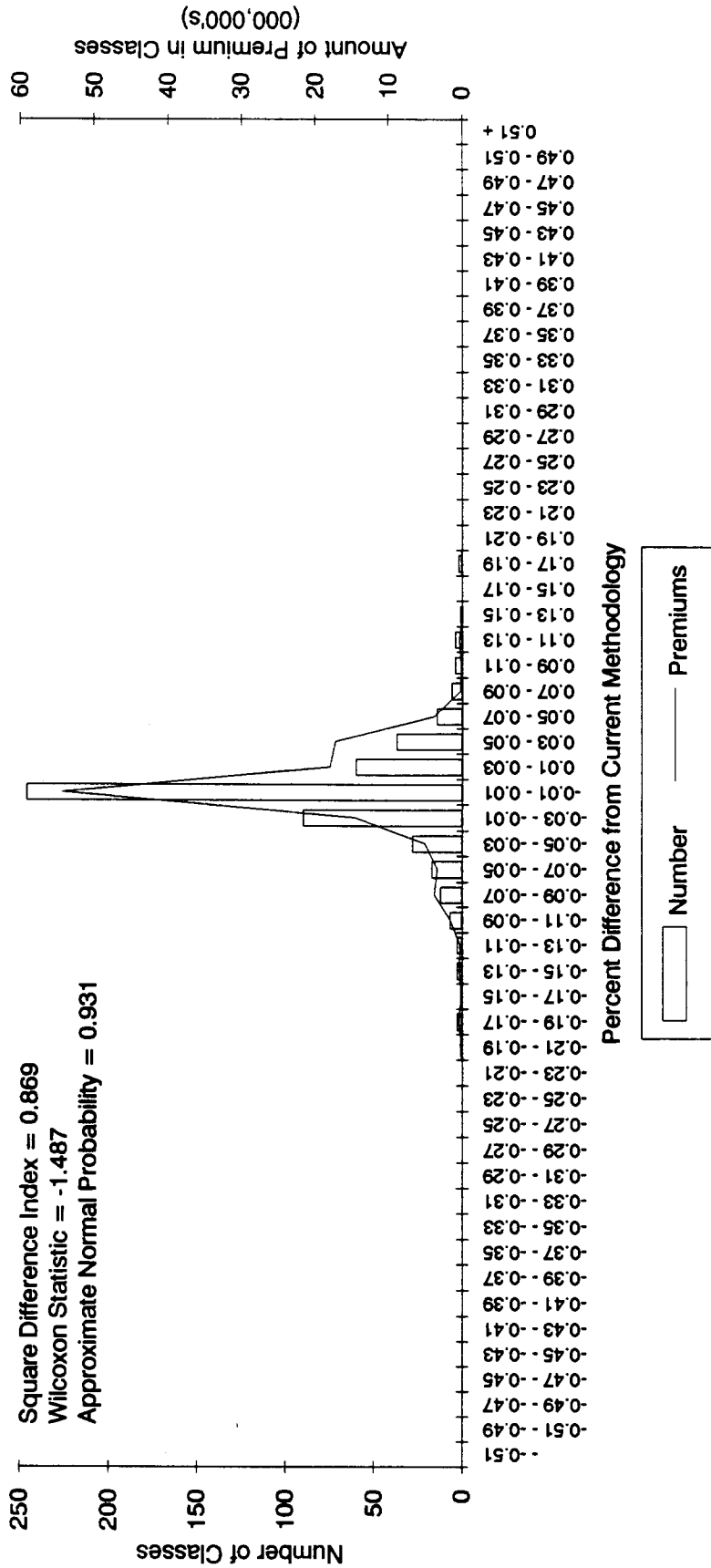
Nebraska, 1987 Revision
Five Years of Data



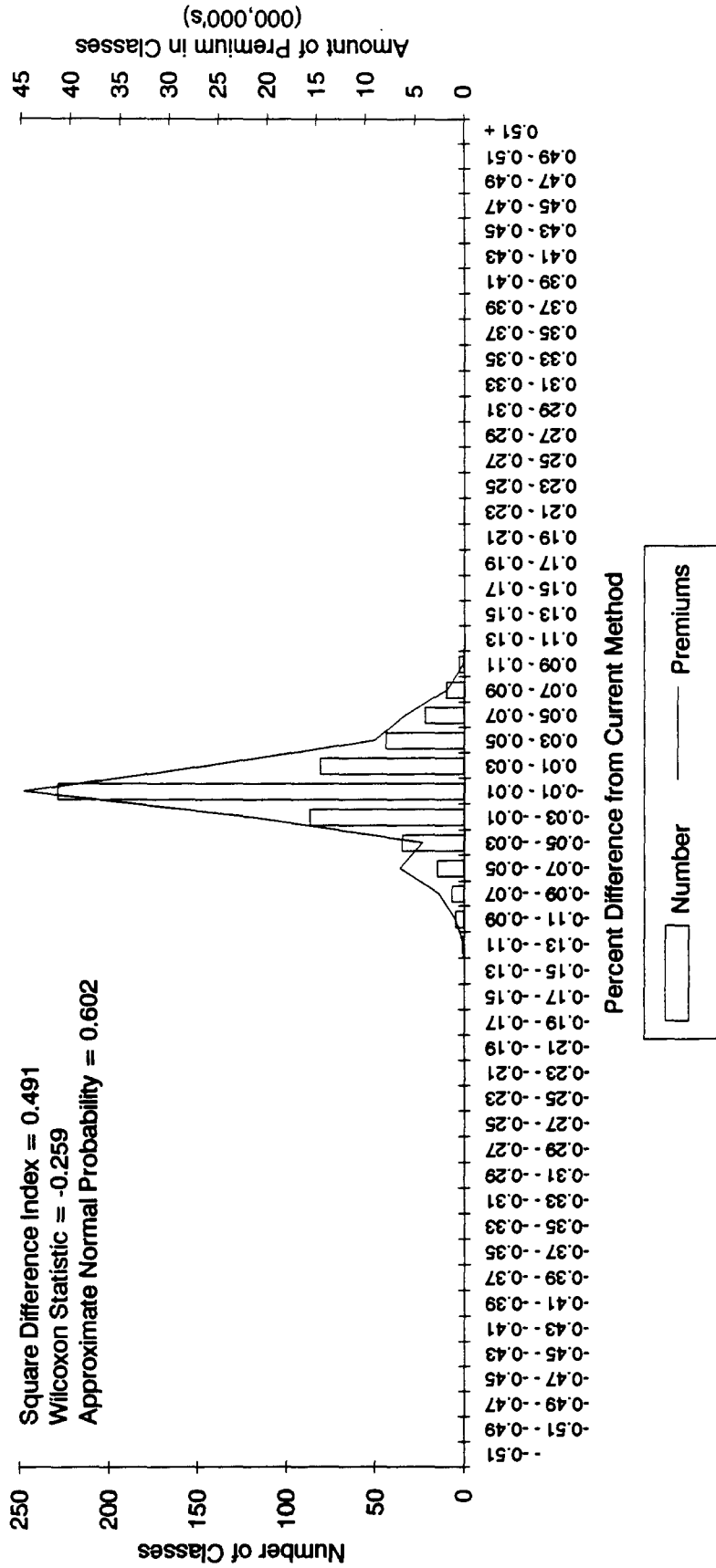
Nebraska, 1987 Revision
Credibility Using .5 Power



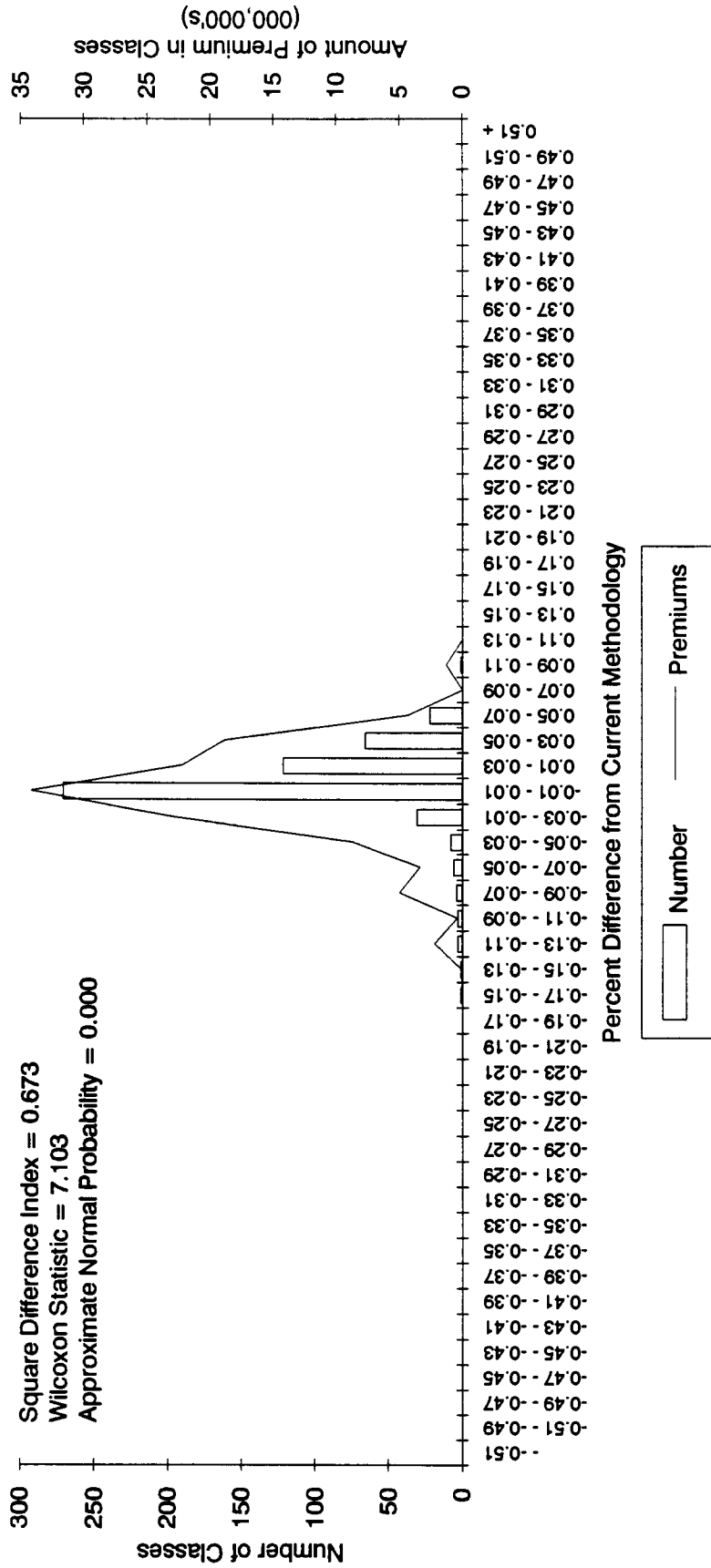
Nebraska, 1987 Revision
Payroll Based Credibility



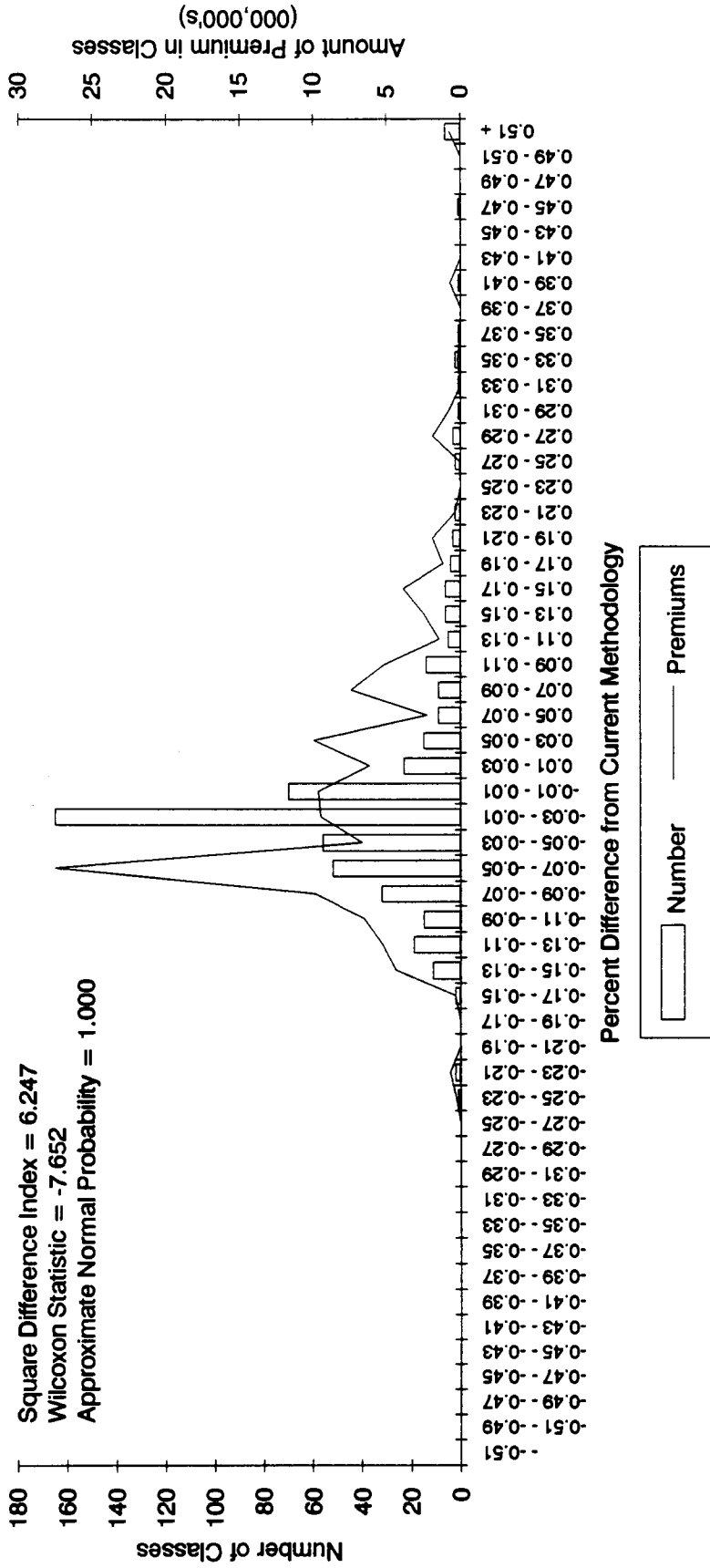
Nebraska, 1987 Revision
 Double Full Credibility Standard



Nebraska, 1987 Revision
Half Current Loss Limitation

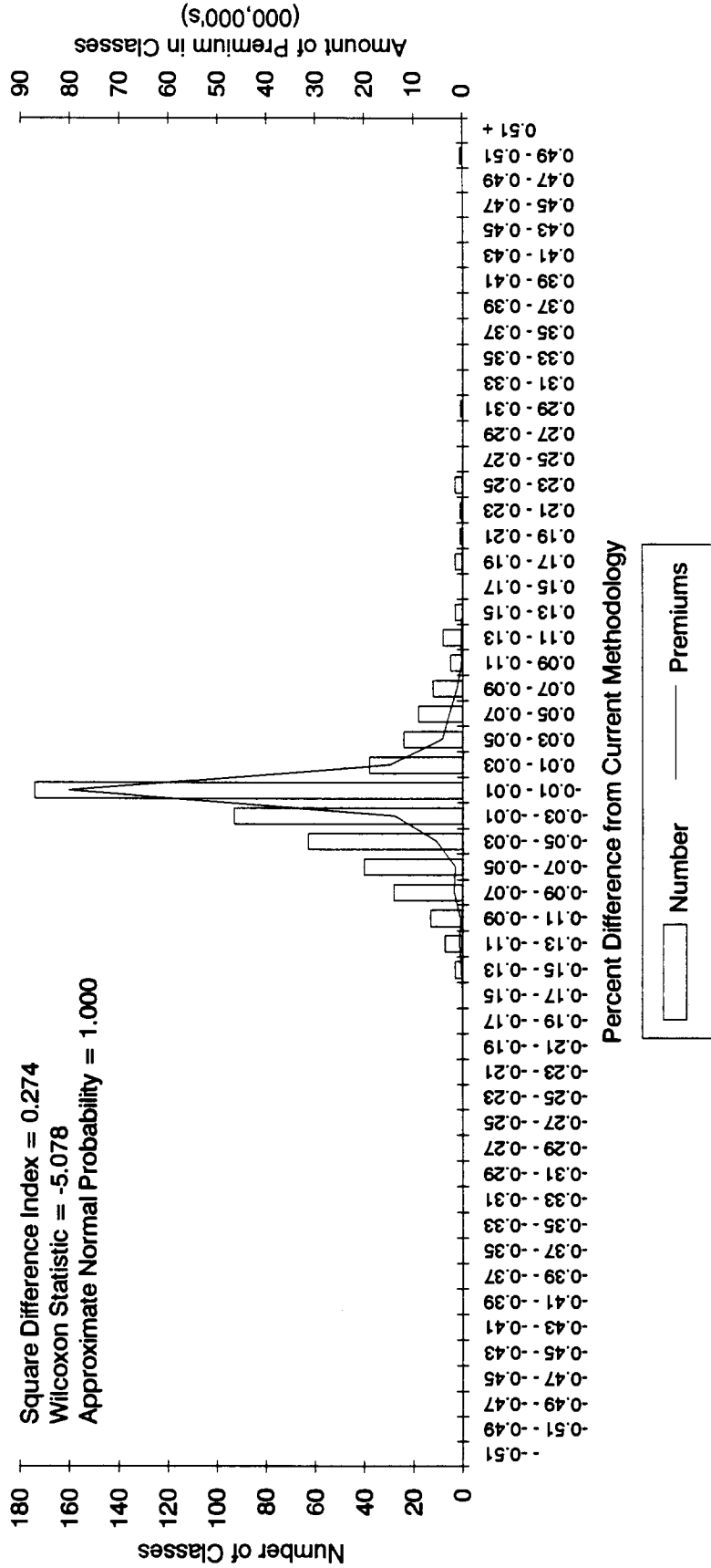


Nebraska, 1988 Revision
Five Years of Data

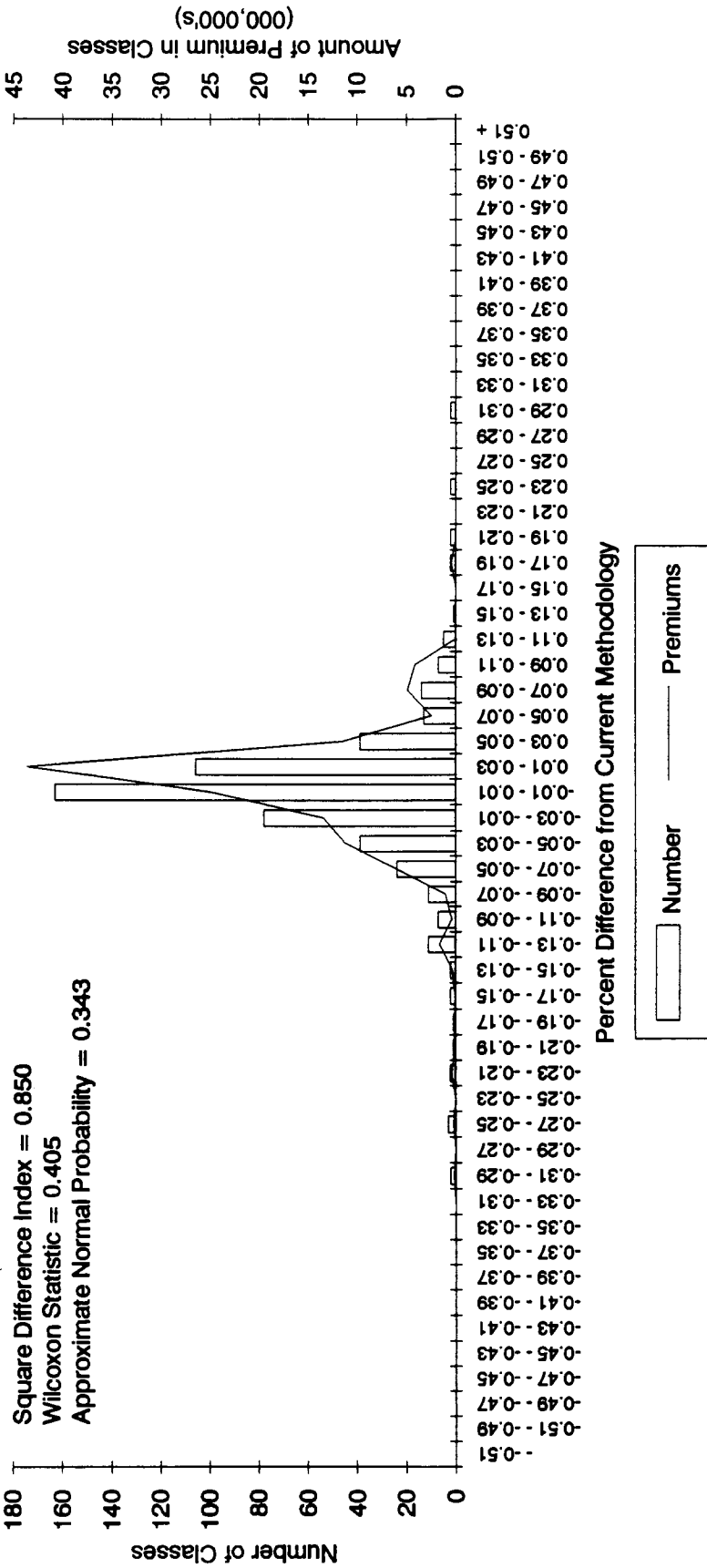


Nebraska, 1988 Revision
Credibility Using .5 Power

Square Difference Index = 0.274
Wilcoxon Statistic = -5.078
Approximate Normal Probability = 1.000

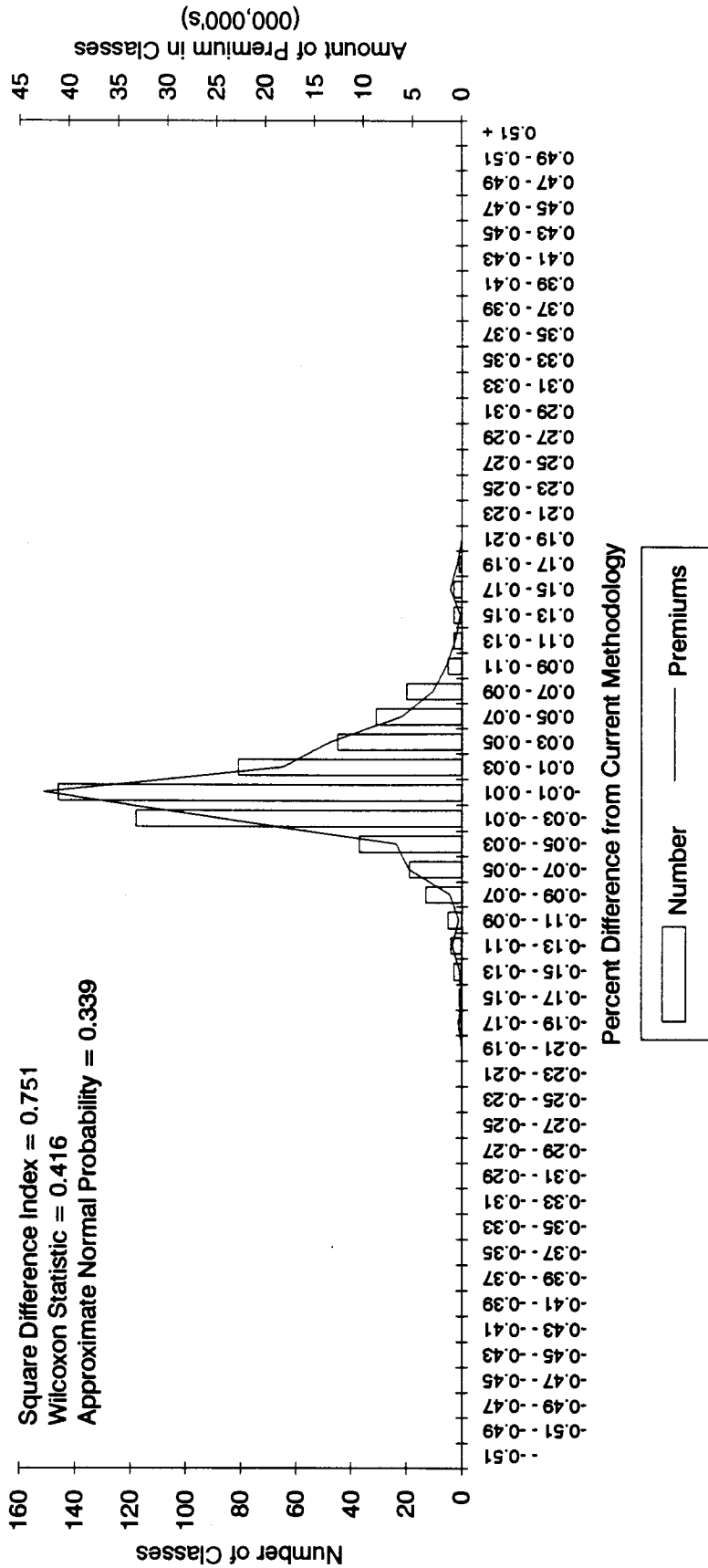


Nebraska, 1988 Revision
Payroll Based Credibility

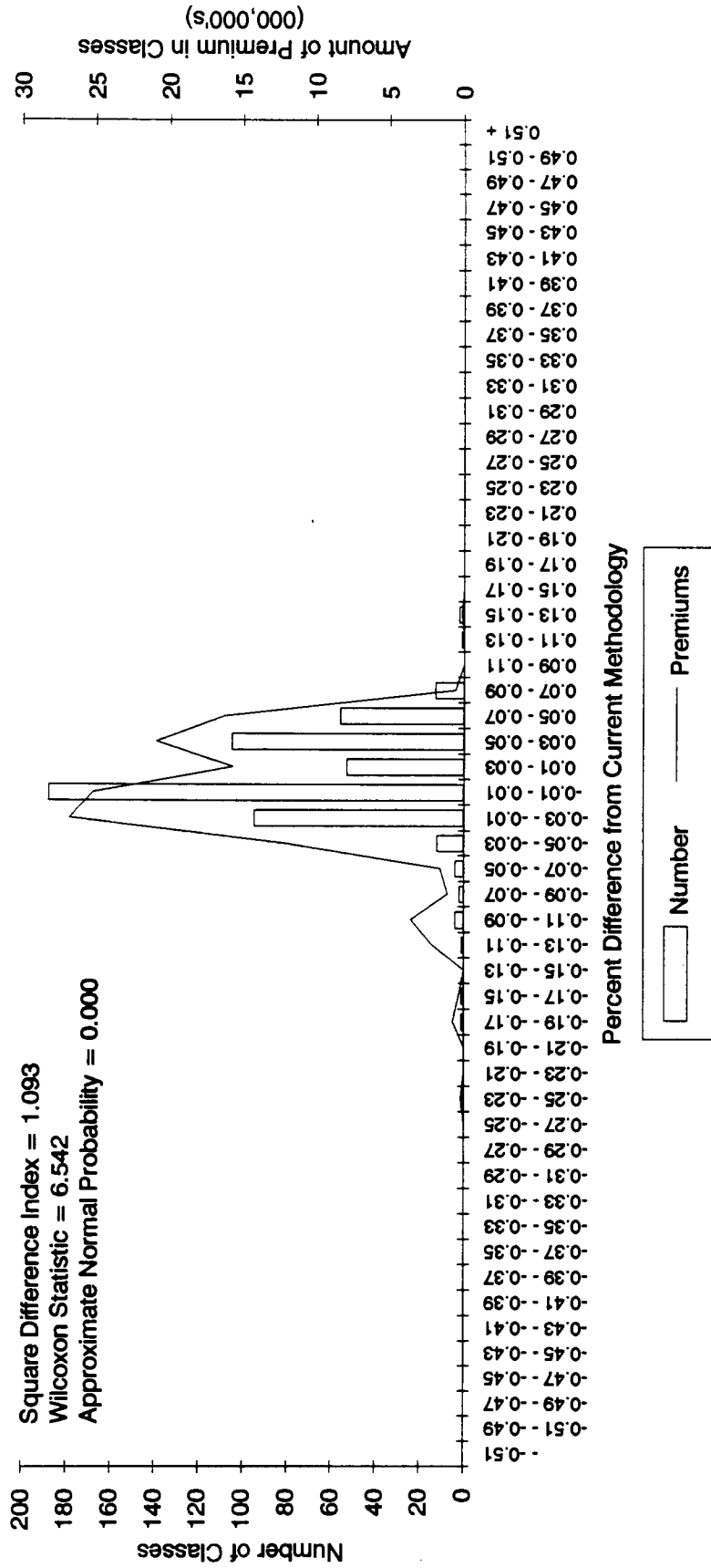


Nebraska, 1988 Revision
 Double Full Credibility Standard

Square Difference Index = 0.751
 Wilcoxon Statistic = 0.416
 Approximate Normal Probability = 0.339

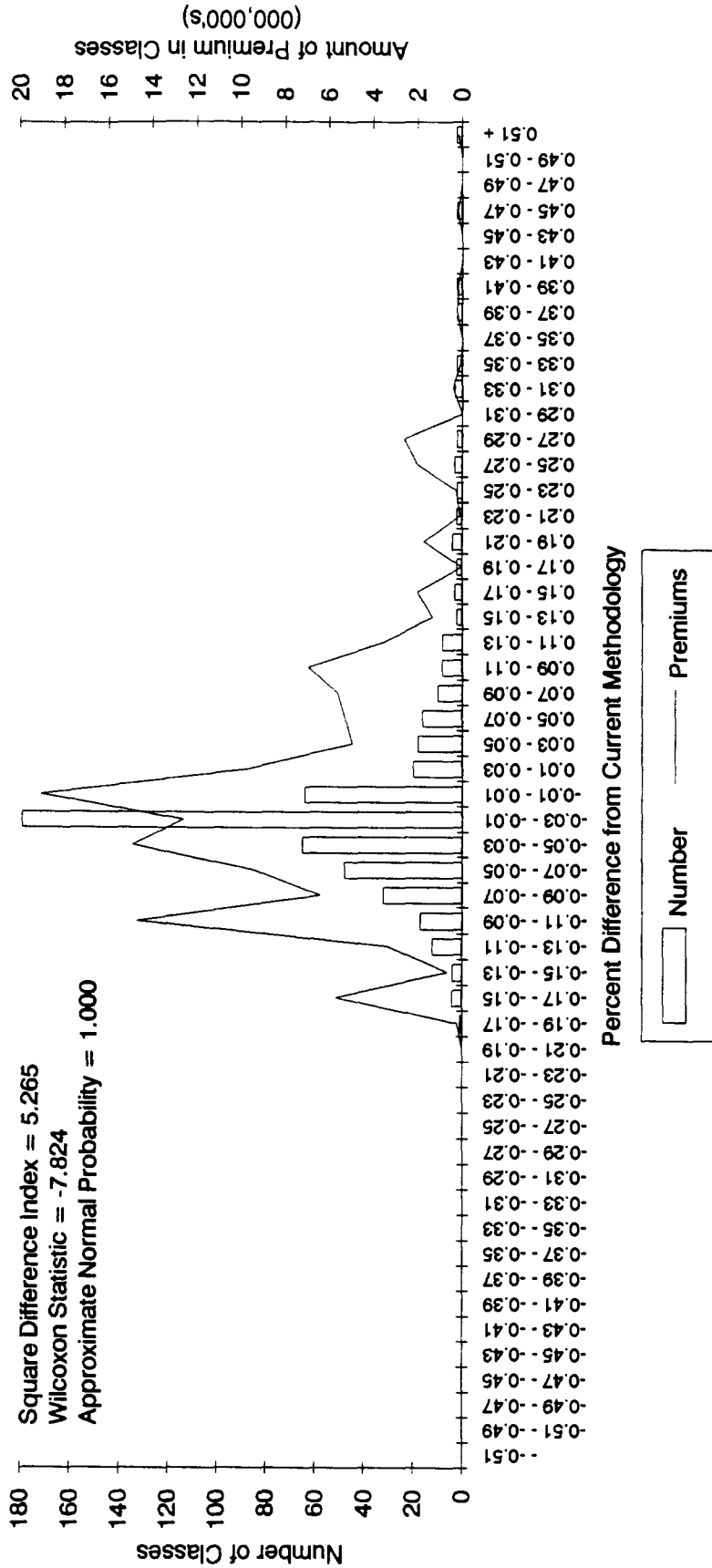


Nebraska, 1988 Revision
Half Current Loss Limitation

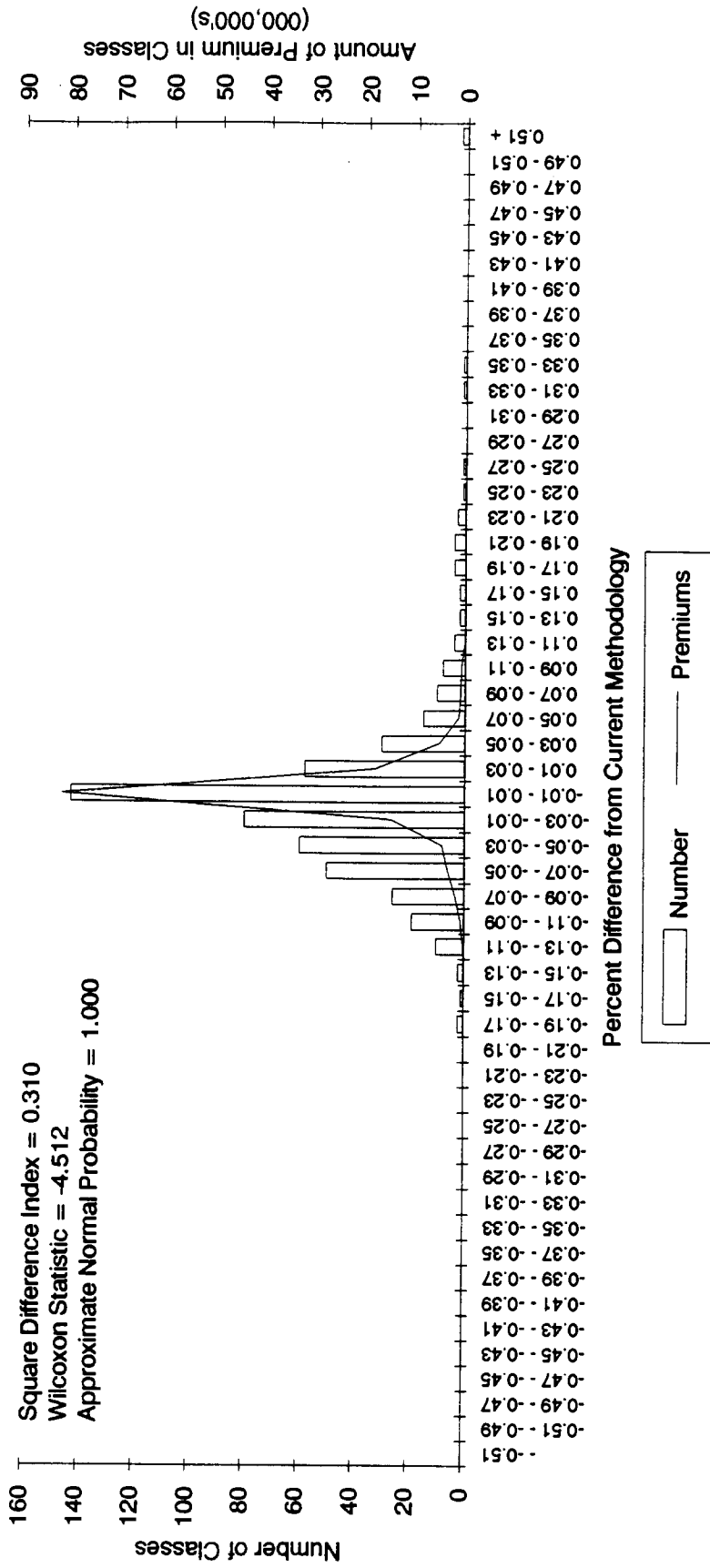


Nebraska, 1989 Revision
Five Years of Data

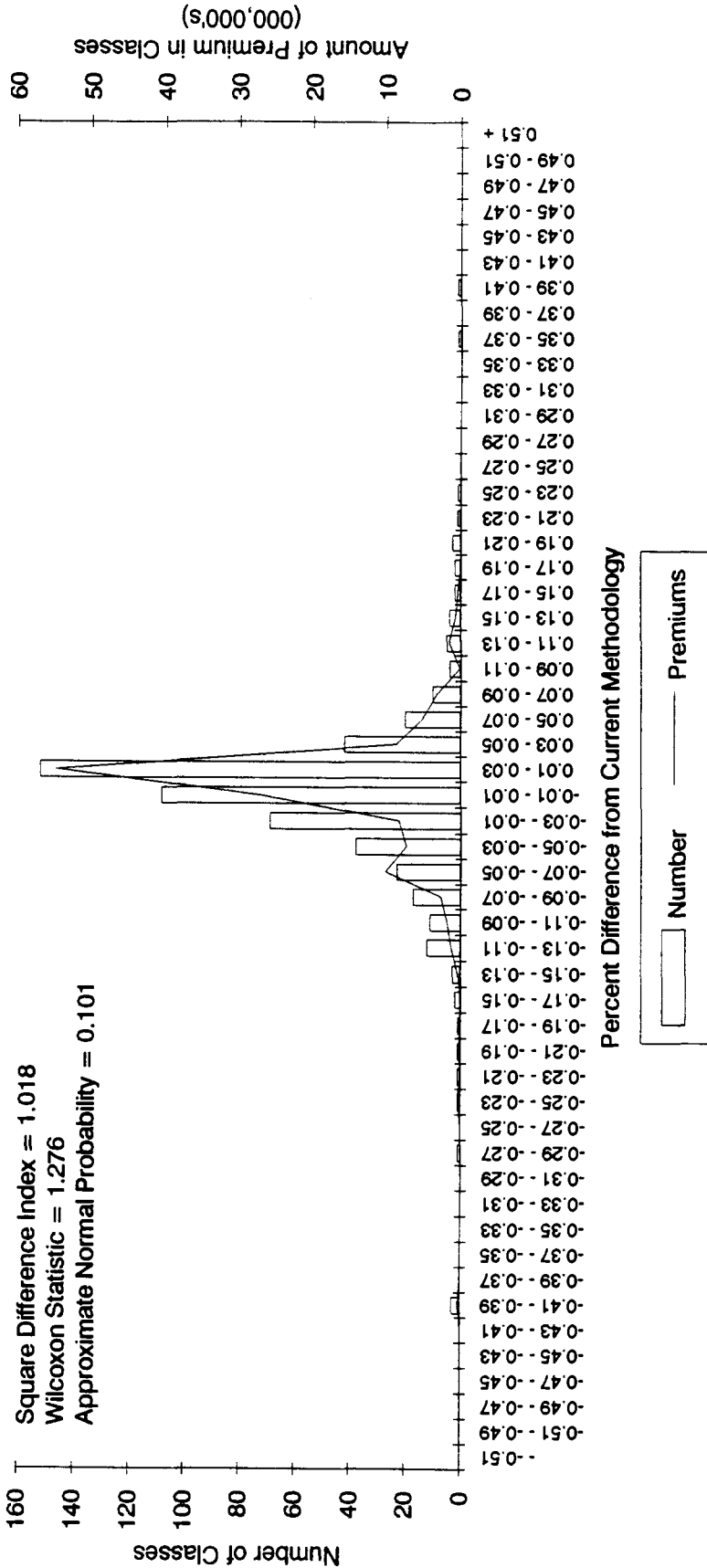
Square Difference Index = 5.265
Wilcoxon Statistic = -7.824
Approximate Normal Probability = 1.000



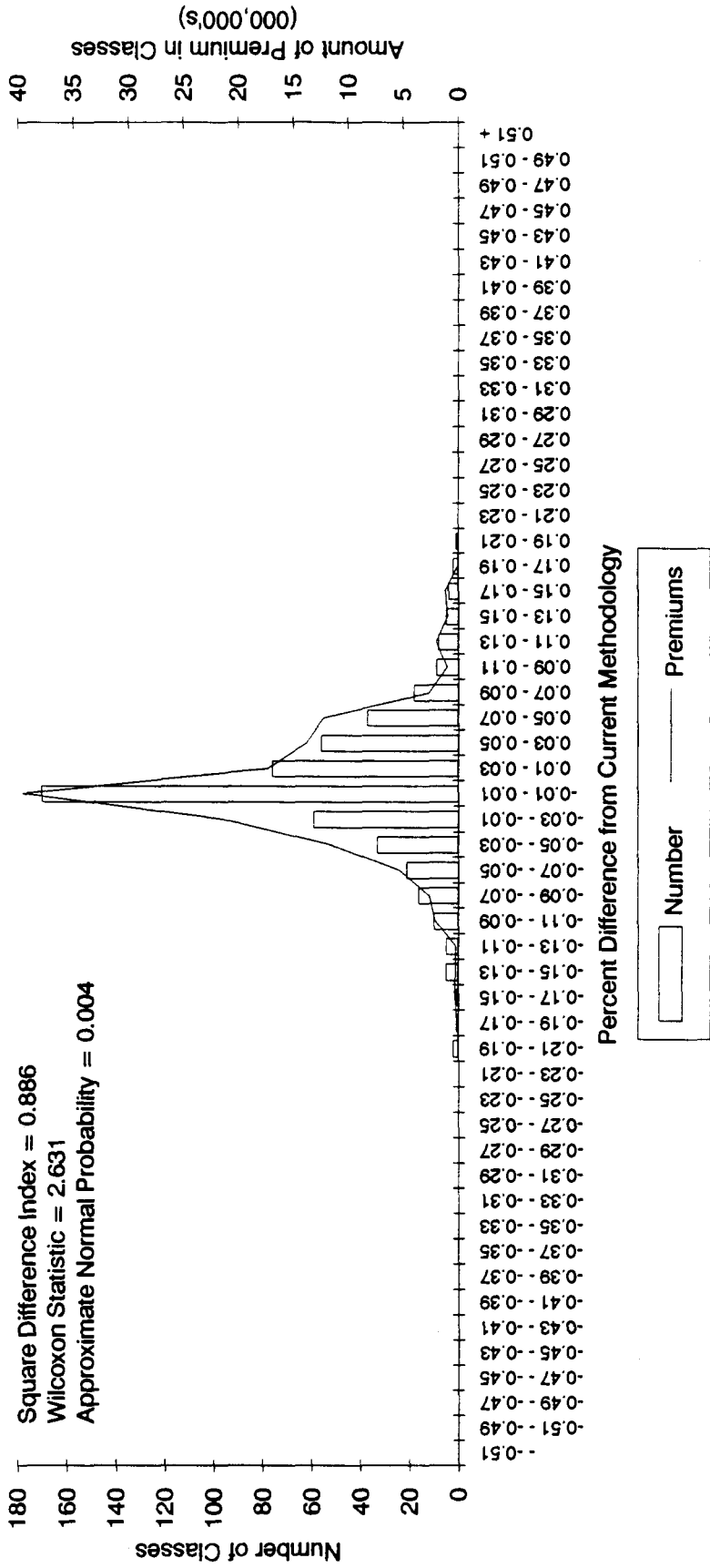
Nebraska, 1989 Revision
Credibility Using .5 Power



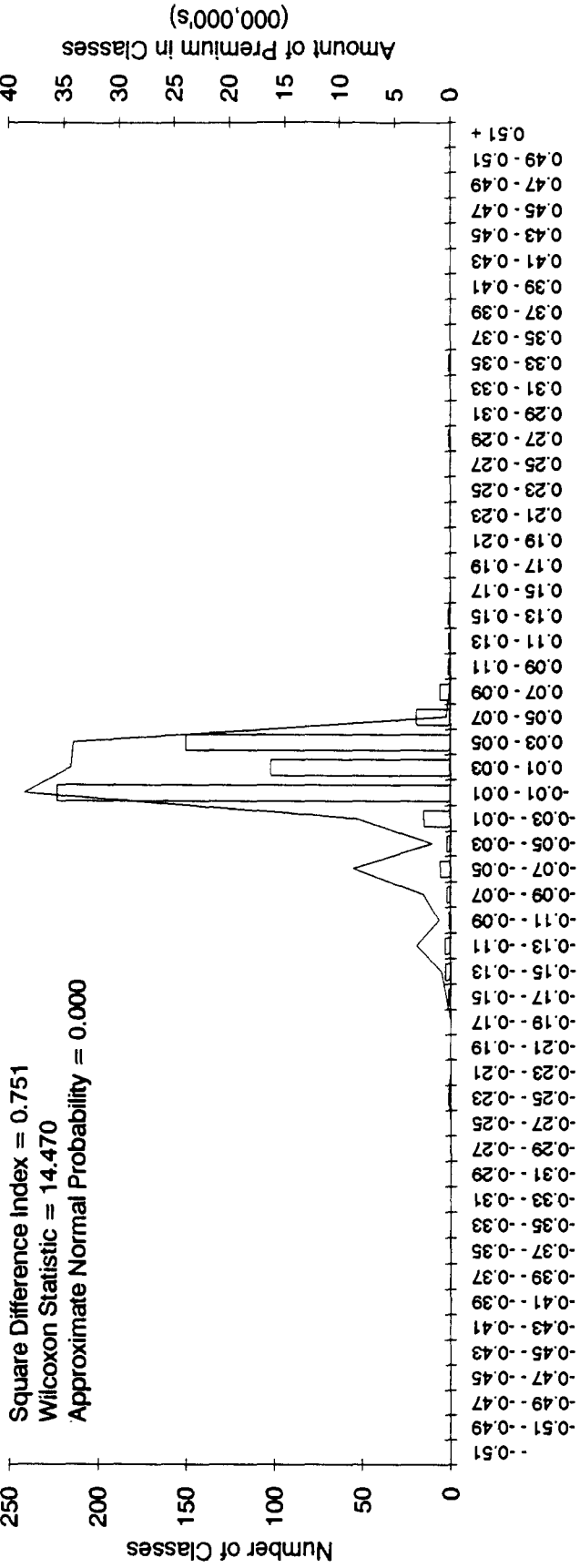
Nebraska, 1989 Revision
Payroll Based Credibility



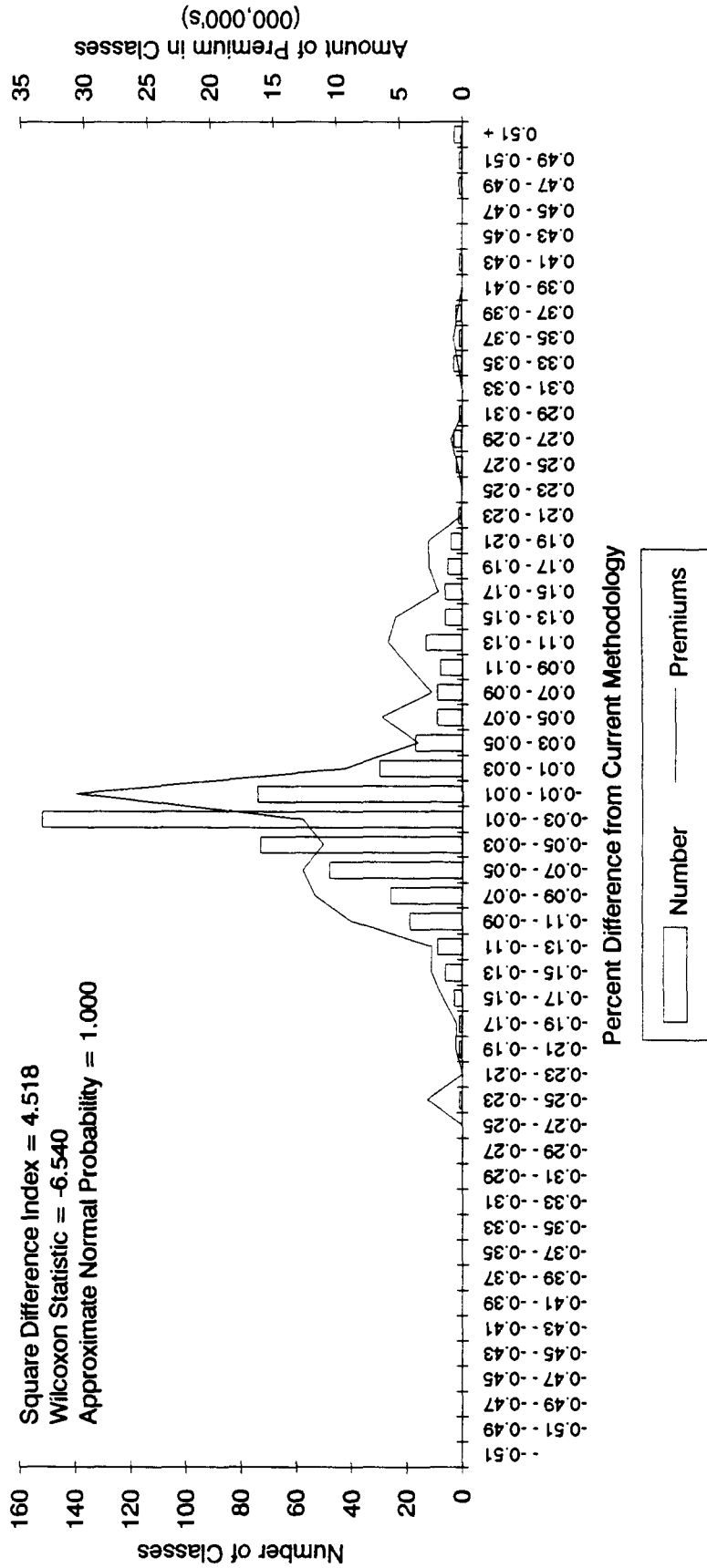
Nebraska, 1989 Revision
 Double Full Credibility Standard



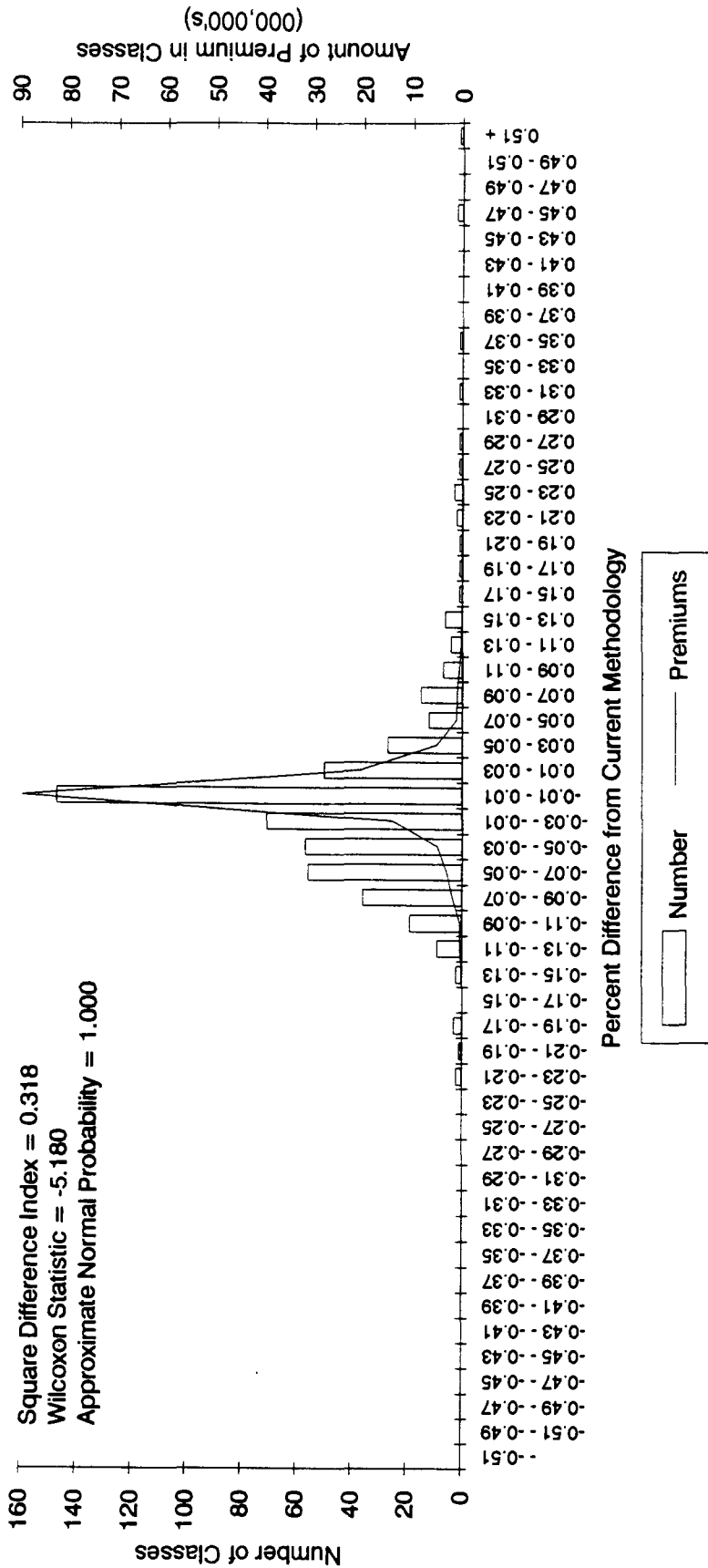
Nebraska, 1989 Revision
Half Current Loss Limitation



Nebraska, 1990 Revision
Five Years of Data

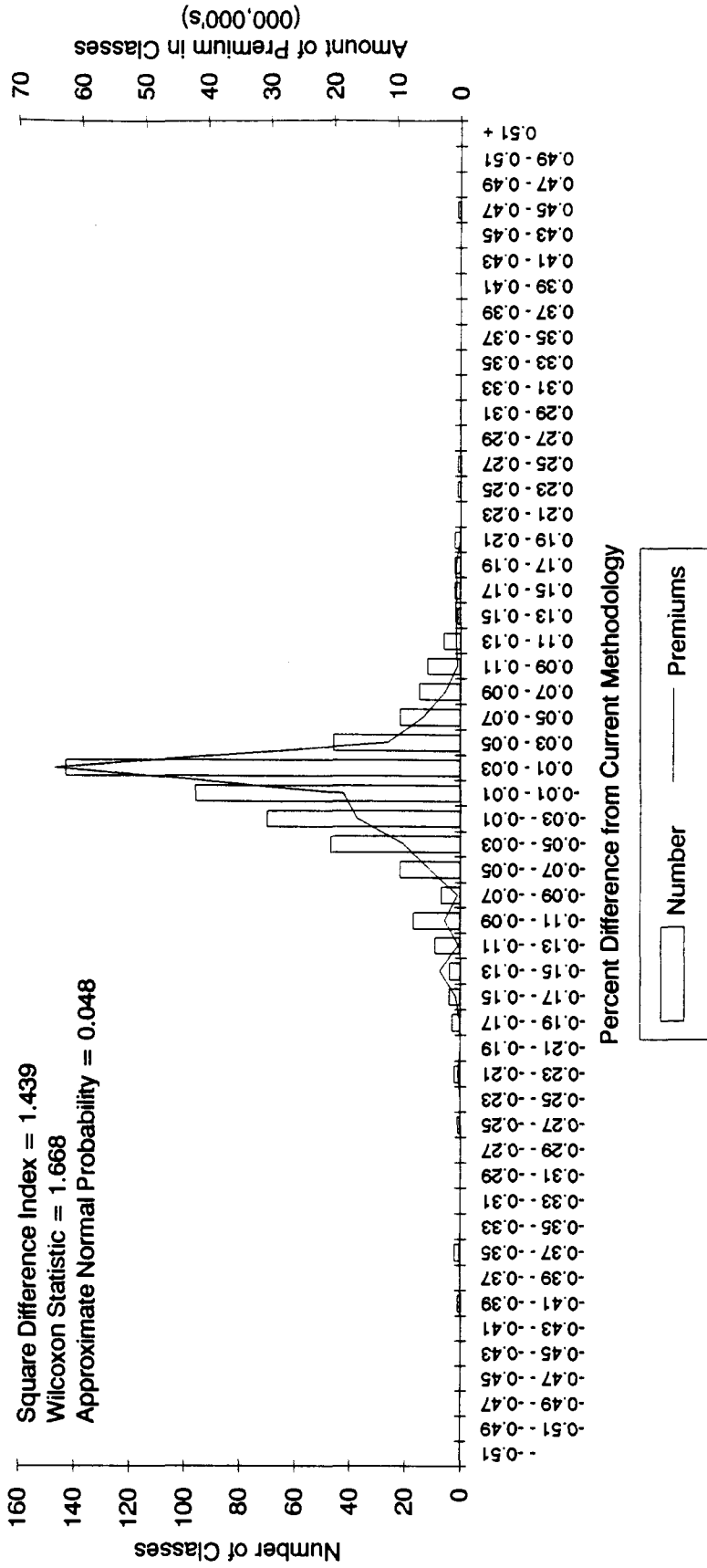


Nebraska, 1990 Revision
Credibility Using .5 Power



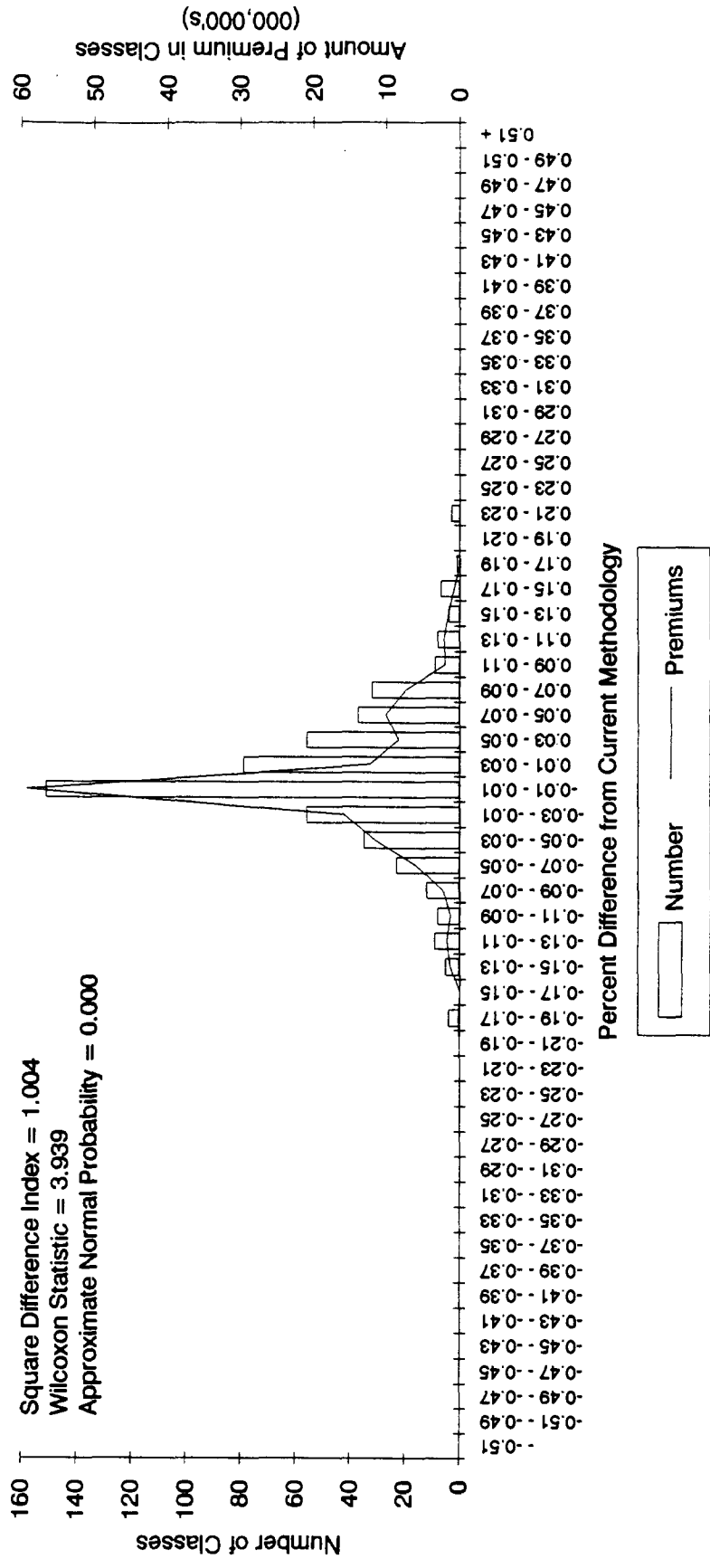
Nebraska, 1990 Revision
Payroll Based Credibility

Square Difference Index = 1.439
 Wilcoxon Statistic = 1.668
 Approximate Normal Probability = 0.048

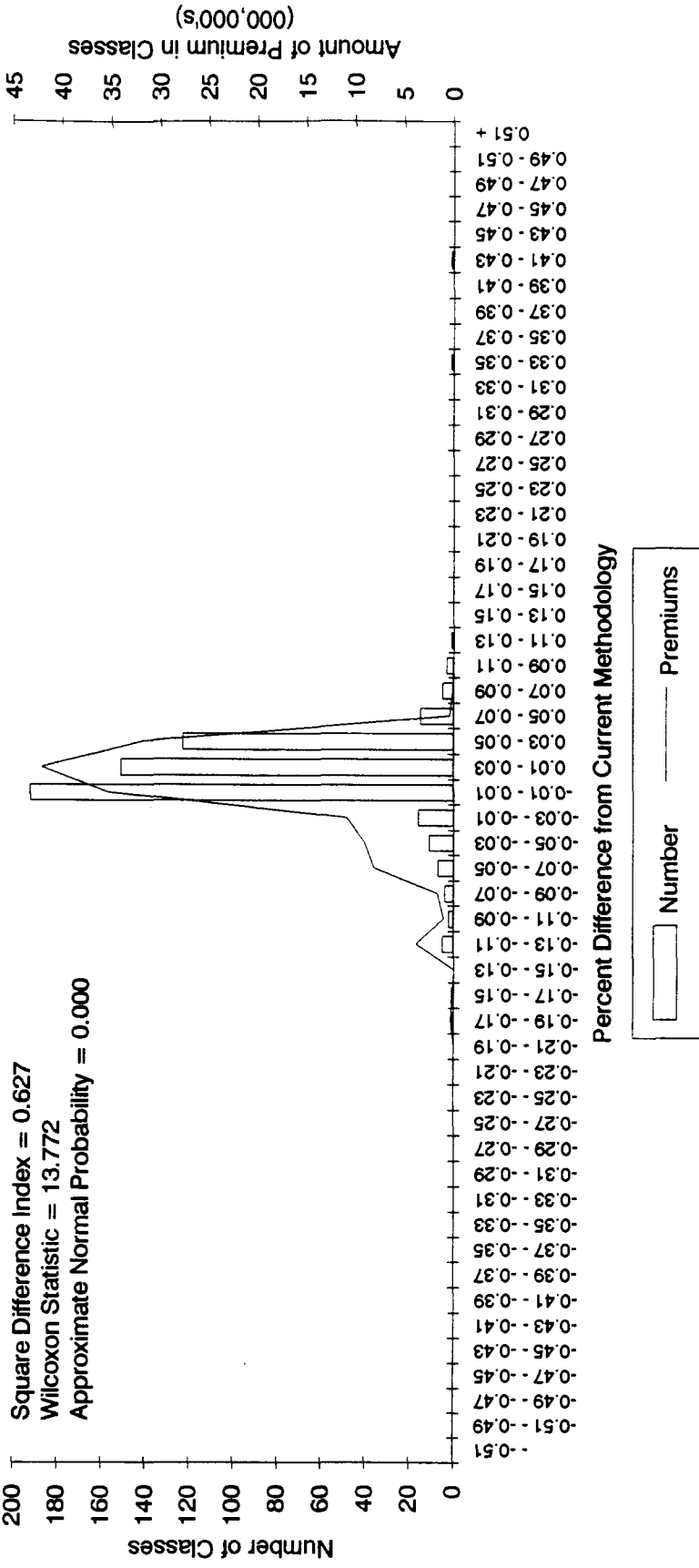


Nebraska, 1990 Revision
Double Full Credibility Standard

Square Difference Index = 1.004
Wilcoxon Statistic = 3.939
Approximate Normal Probability = 0.000

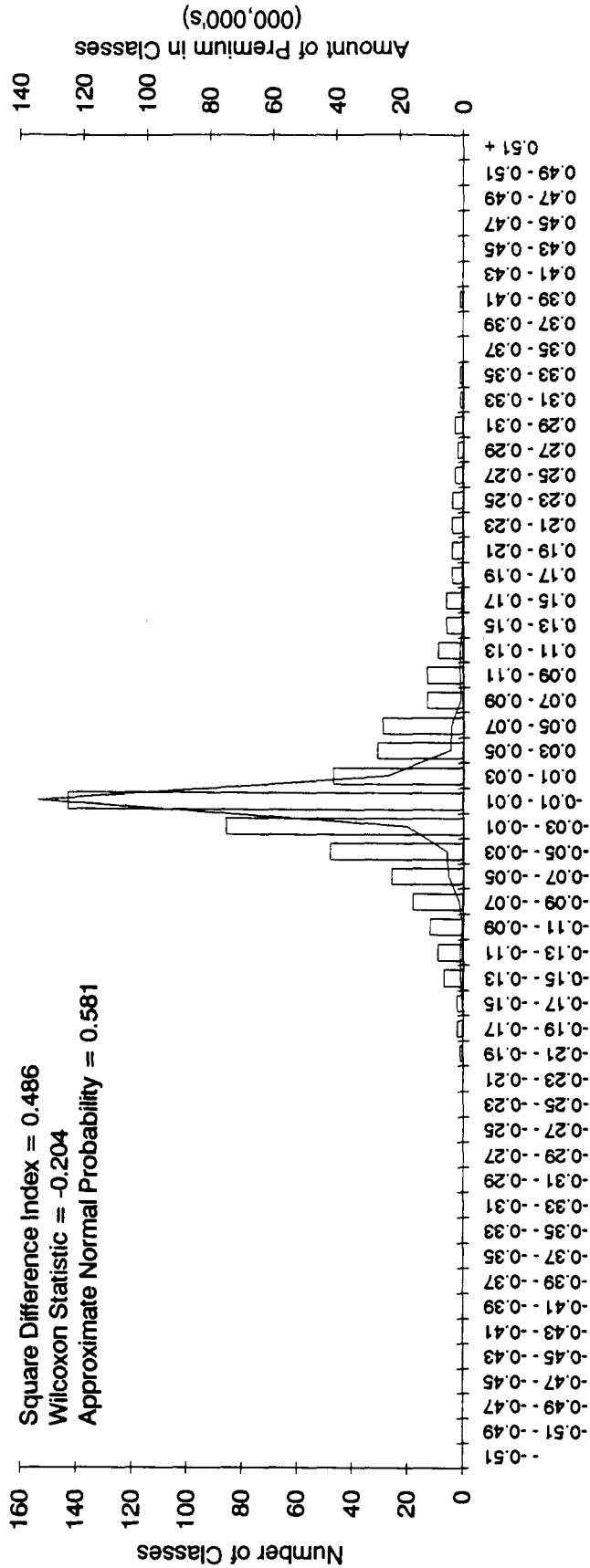


Nebraska, 1990 Revision
Half Current Loss Limitation



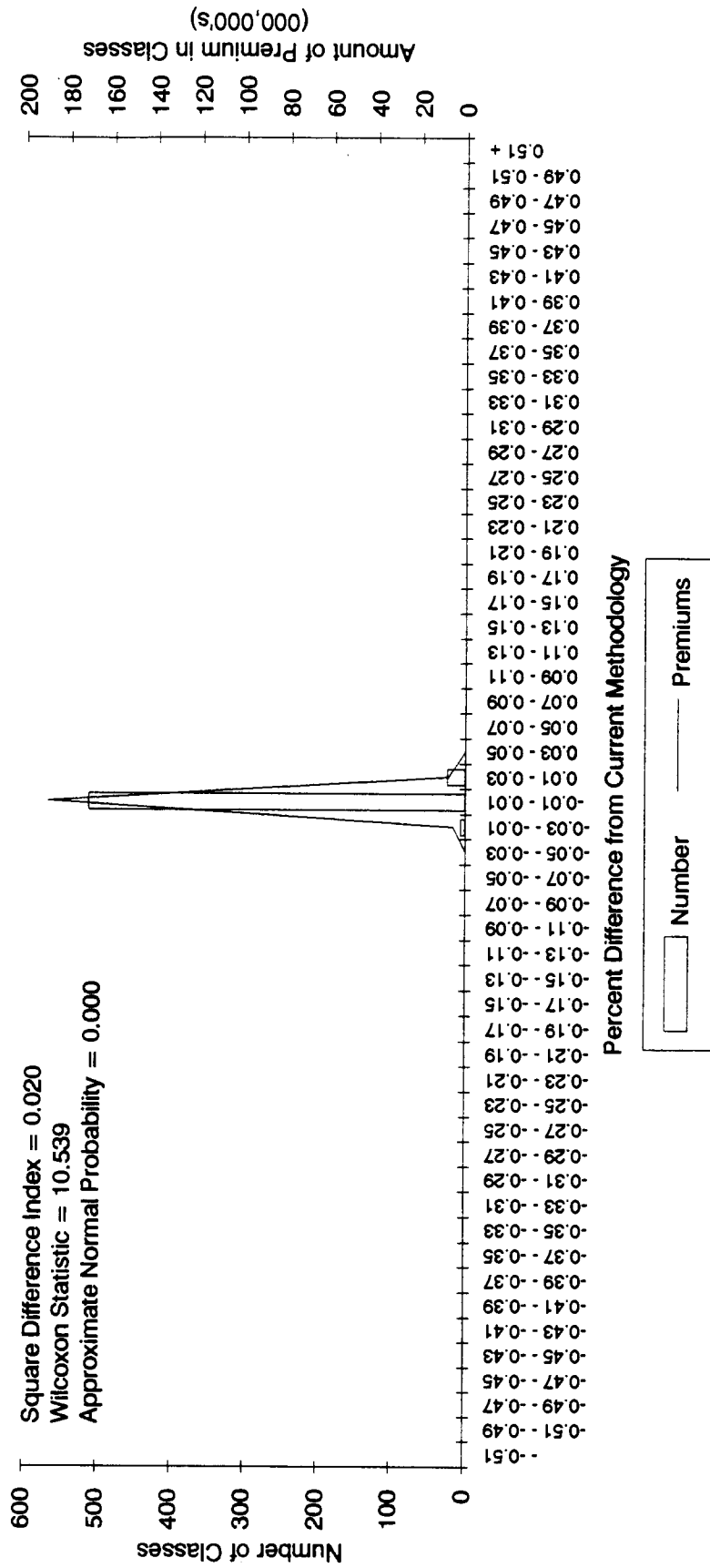
Nebraska, 1990 Revision
 Alternate Regional Pure Premiums

Square Difference Index = 0.486
 Wilcoxon Statistic = -0.204
 Approximate Normal Probability = 0.581

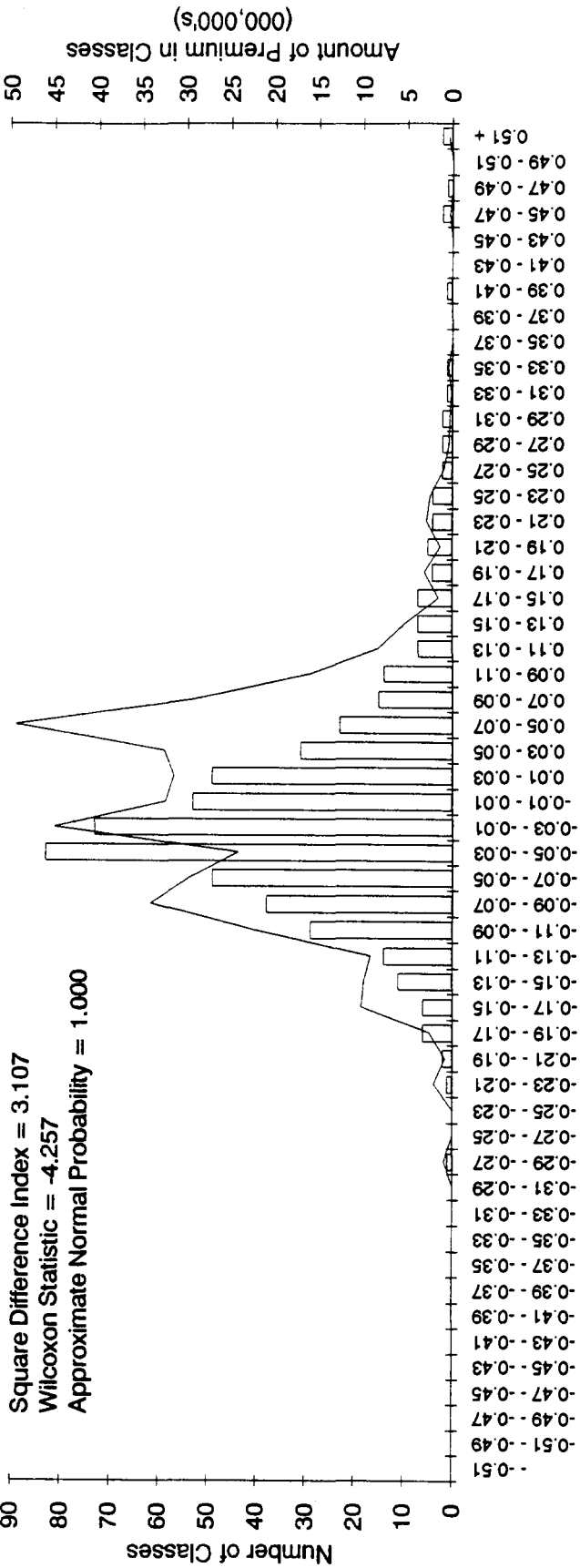


Nebraska, 1990 Revision
Alternate Trend Application

Square Difference Index = 0.020
Wilcoxon Statistic = 10.539
Approximate Normal Probability = 0.000

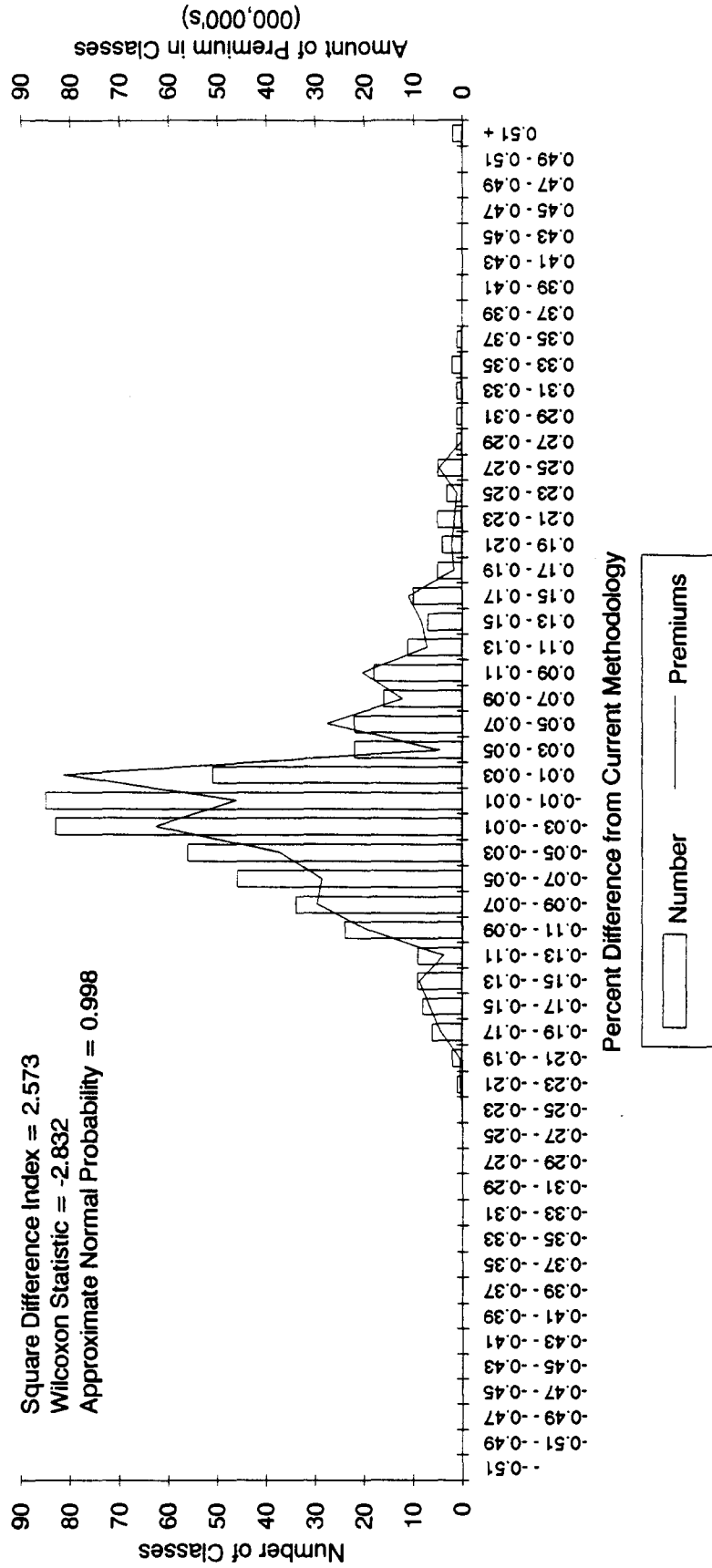


North Carolina, 1988 Revision
Five Years of Data

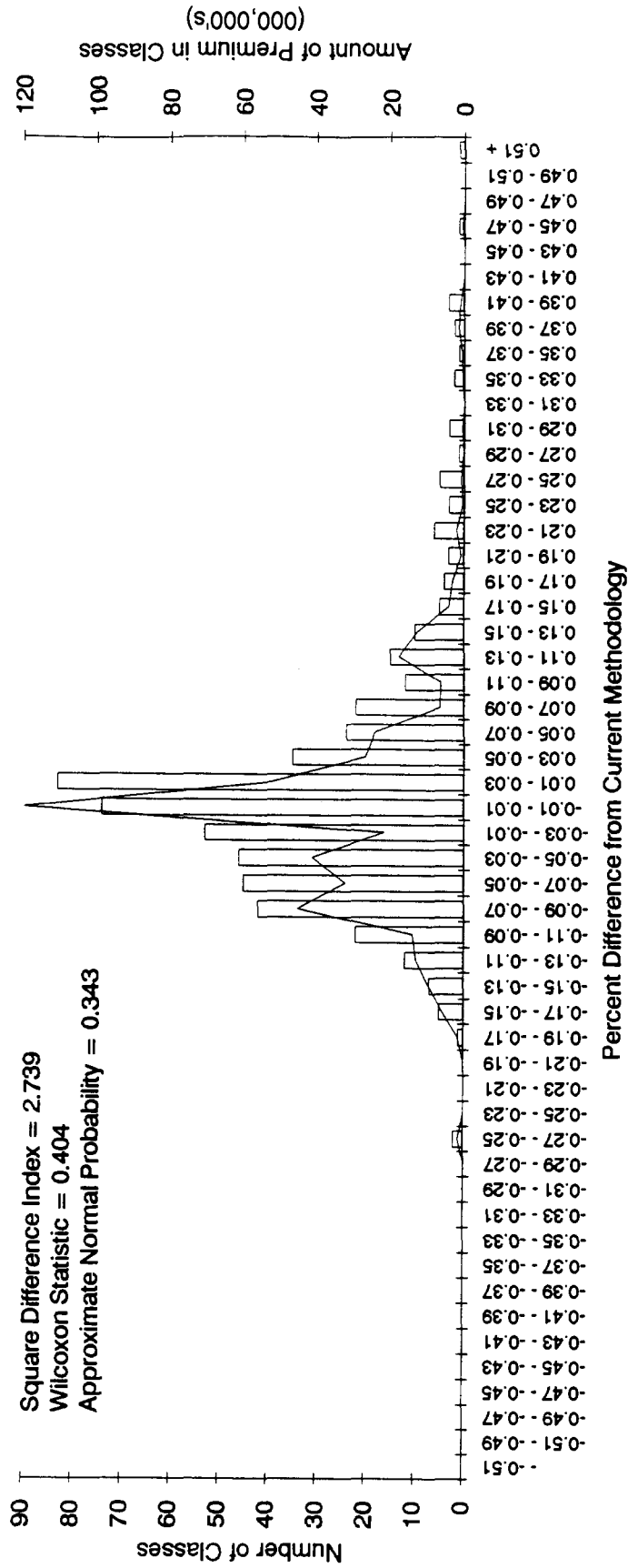


North Carolina, 1989 Revision
Five Years of Data

Square Difference Index = 2.573
 Wilcoxon Statistic = -2.832
 Approximate Normal Probability = 0.998

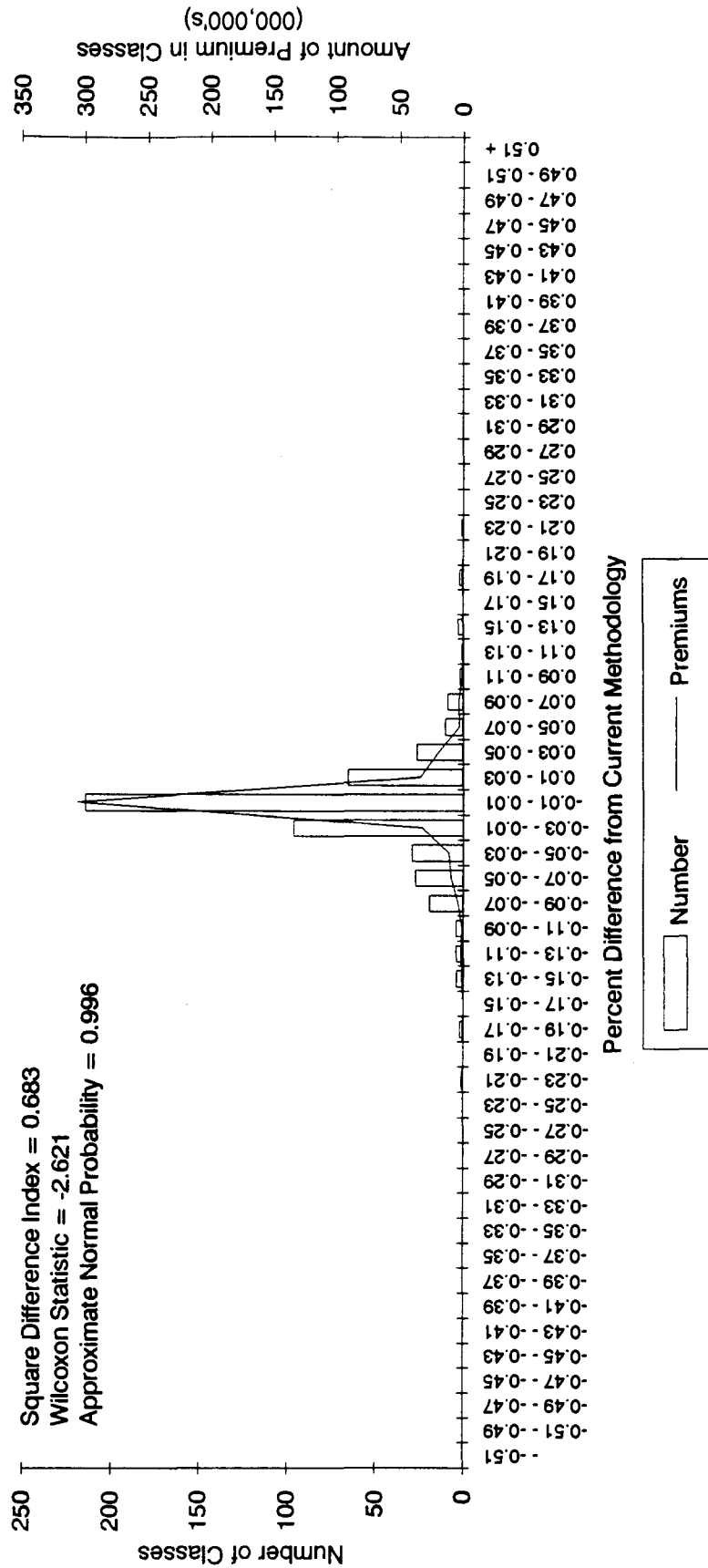


North Carolina, 1990 Revision
Five Years of Data

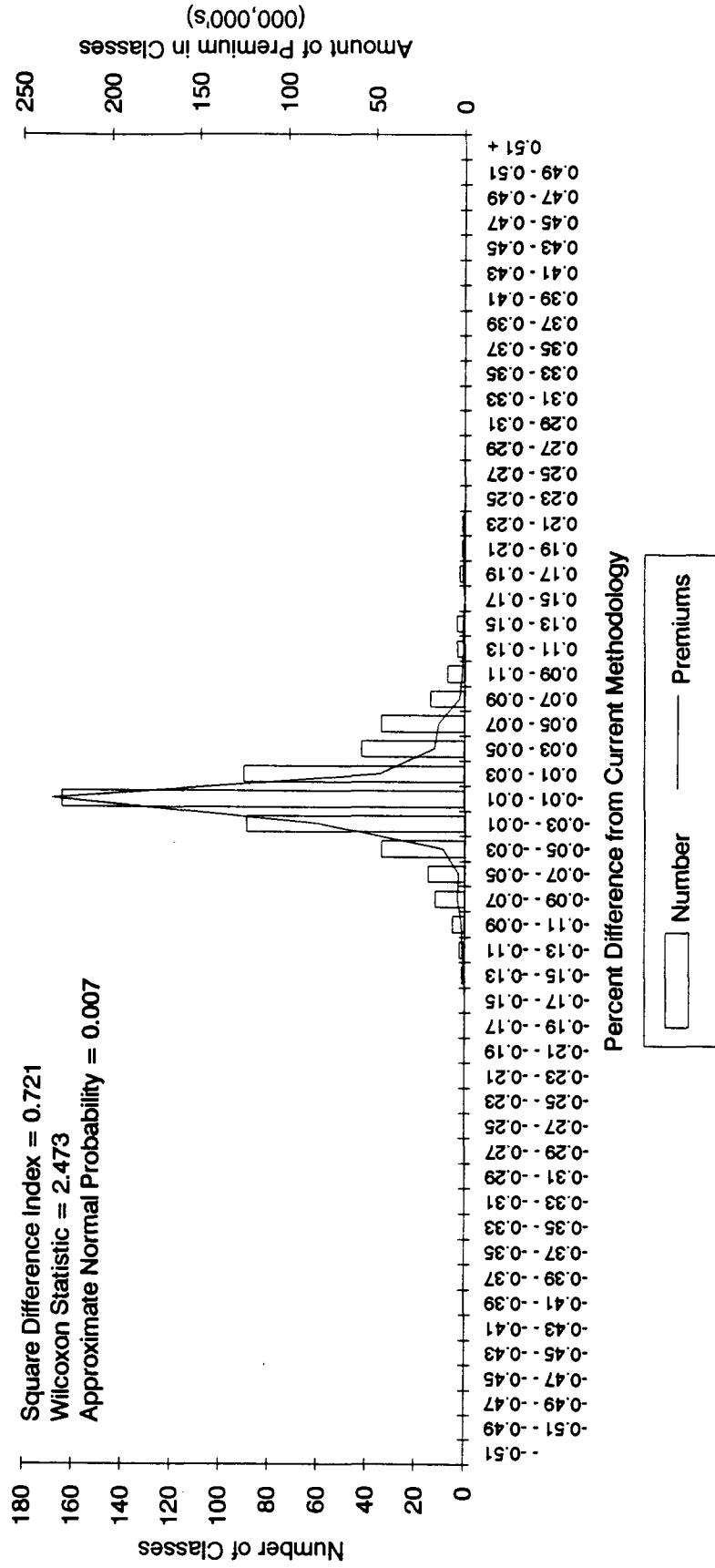


Oregon, 1987 Revision
Payroll Based Credibility

Square Difference Index = 0.683
Wilcoxon Statistic = -2.621
Approximate Normal Probability = 0.996

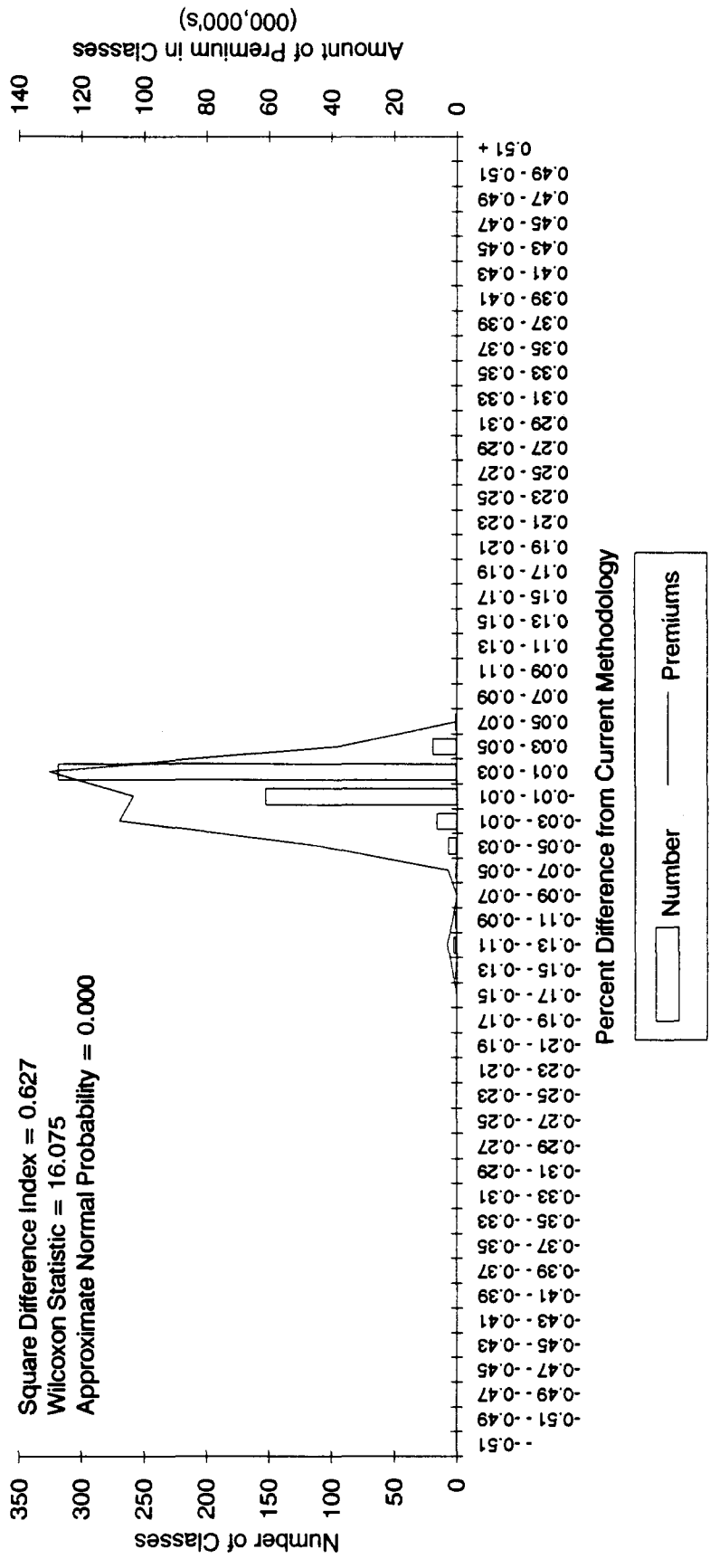


**Oregon, 1987 Revision
Double Full Credibility Standard**



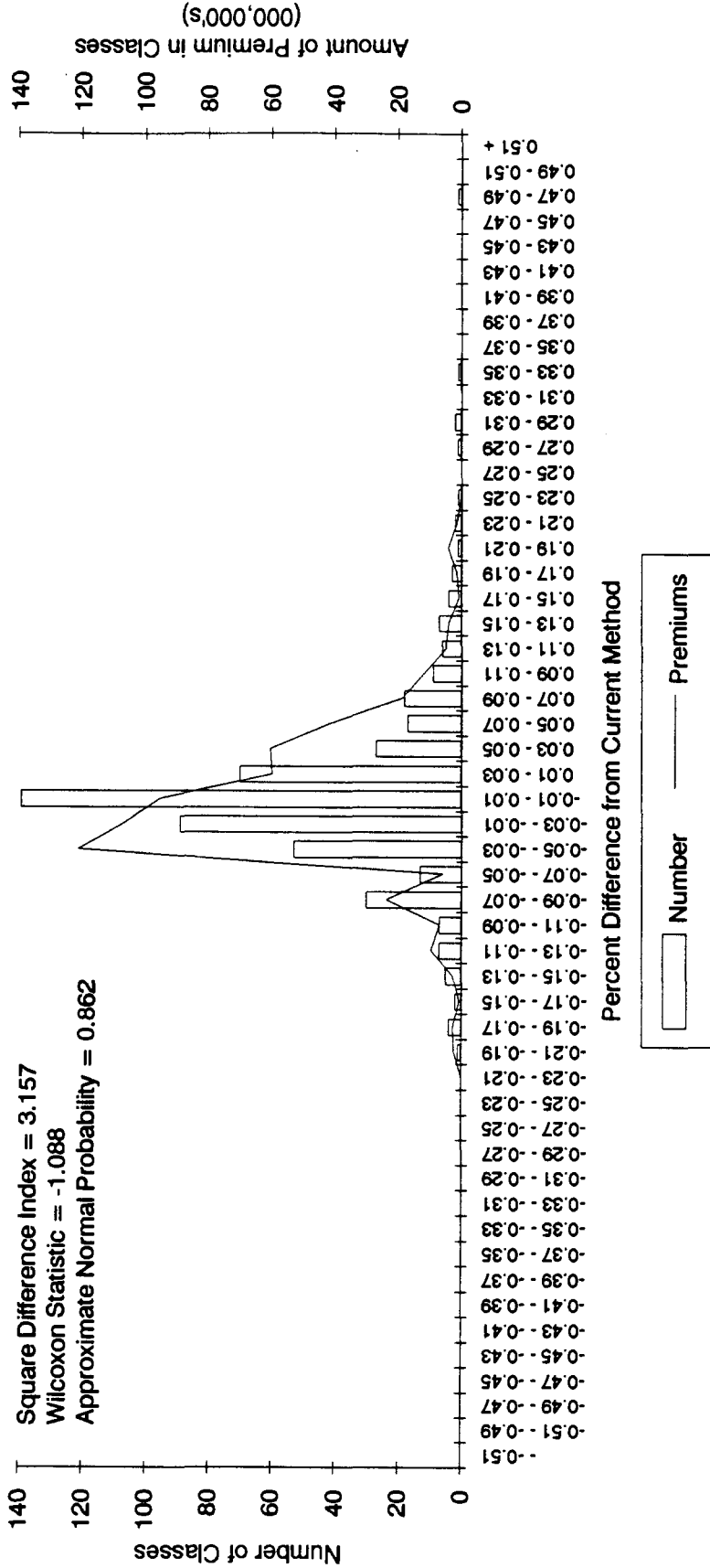
**Oregon, 1987 Revision
Half Current Loss Limitation**

Square Difference Index = 0.627
 Wilcoxon Statistic = 16.075
 Approximate Normal Probability = 0.000

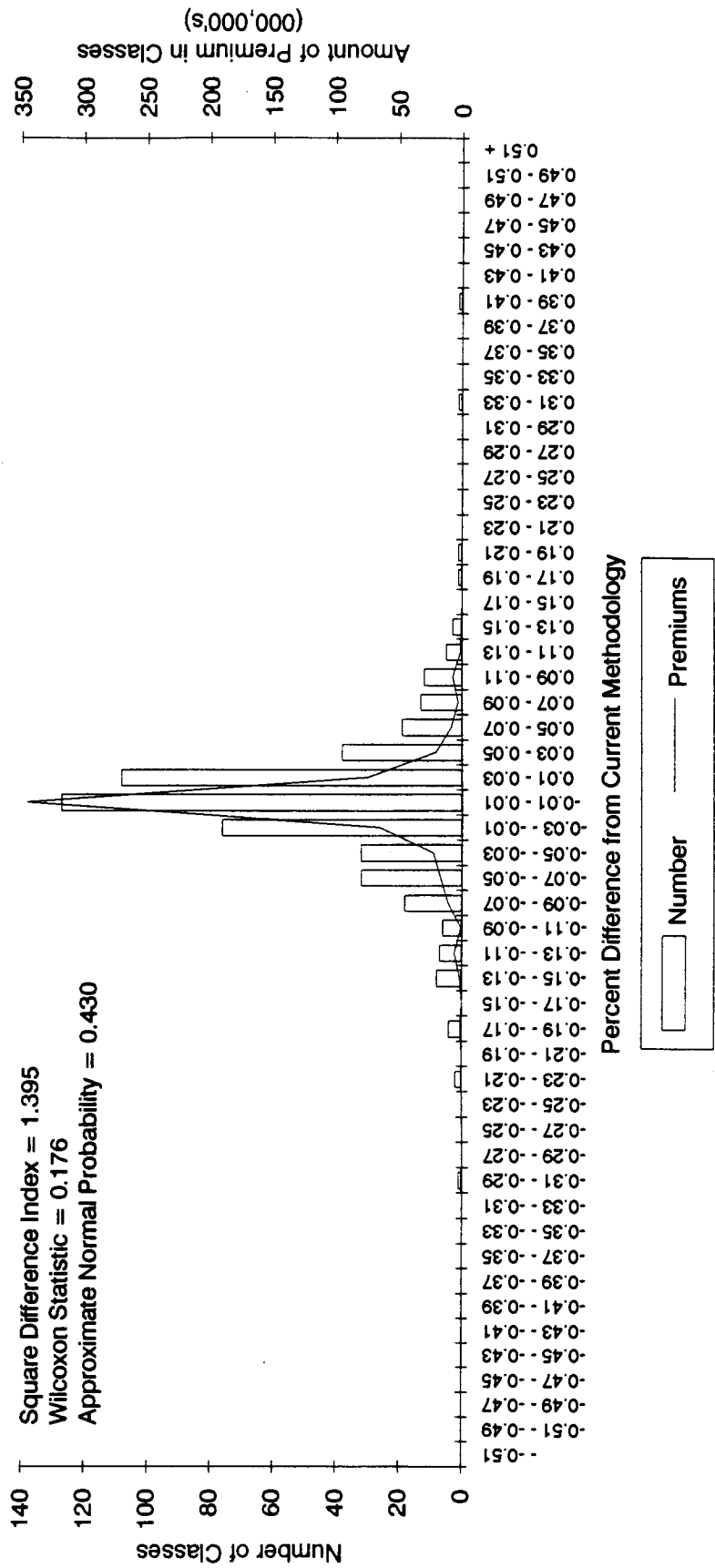


Oregon, 1988 Revision
Five Years of Data

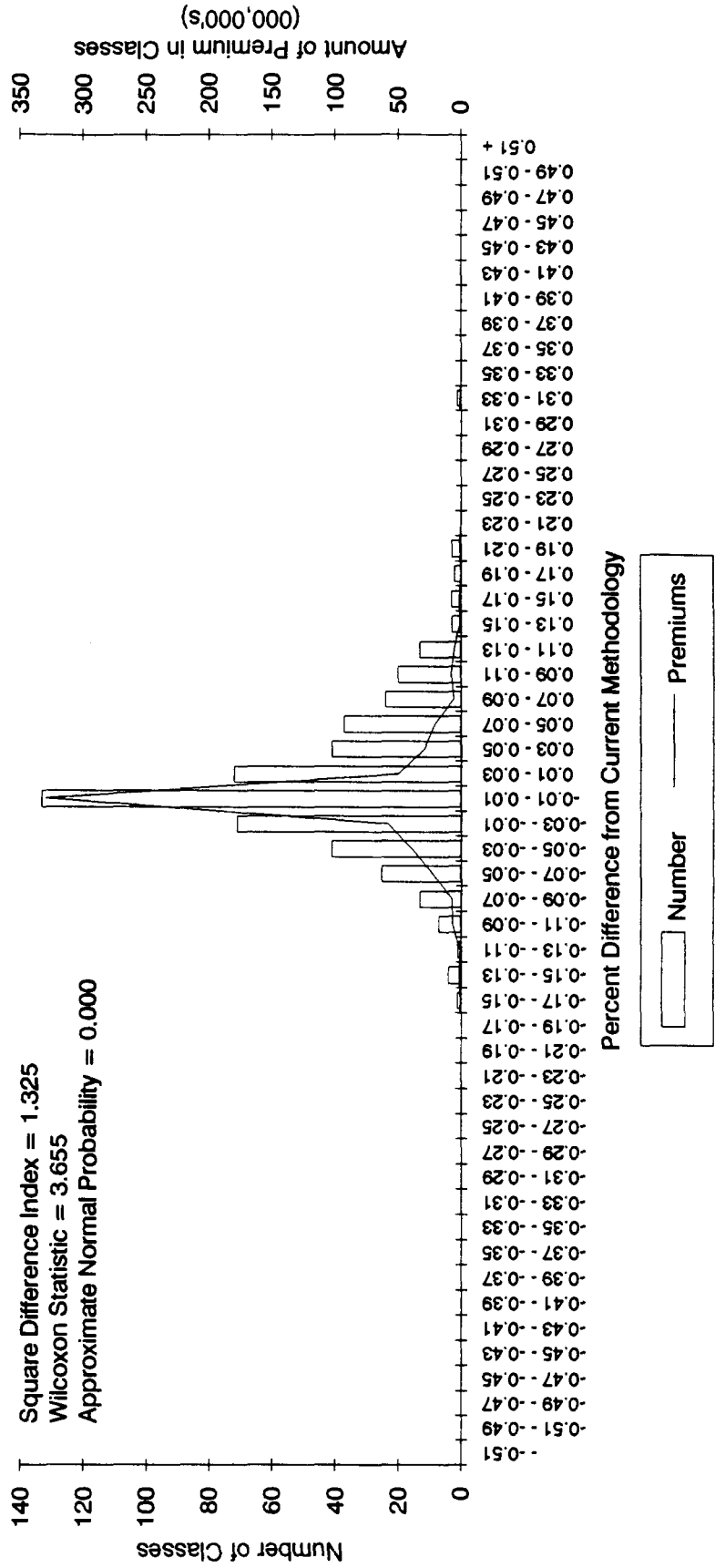
Square Difference Index = 3.157
 Wilcoxon Statistic = -1.088
 Approximate Normal Probability = 0.862



Oregon, 1988 Revision Payroll Based Credibility

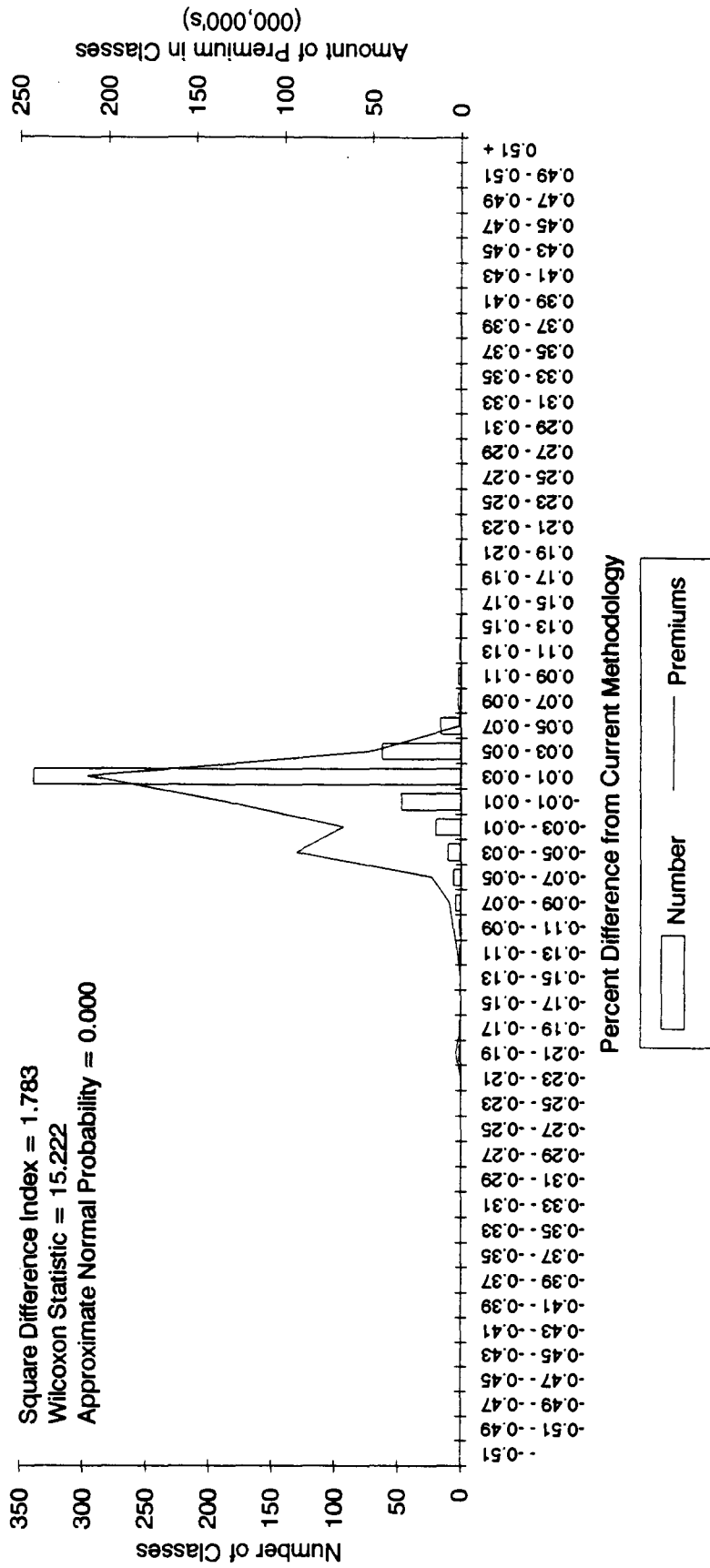


Oregon, 1988 Revision
 Double Full Credibility Standard

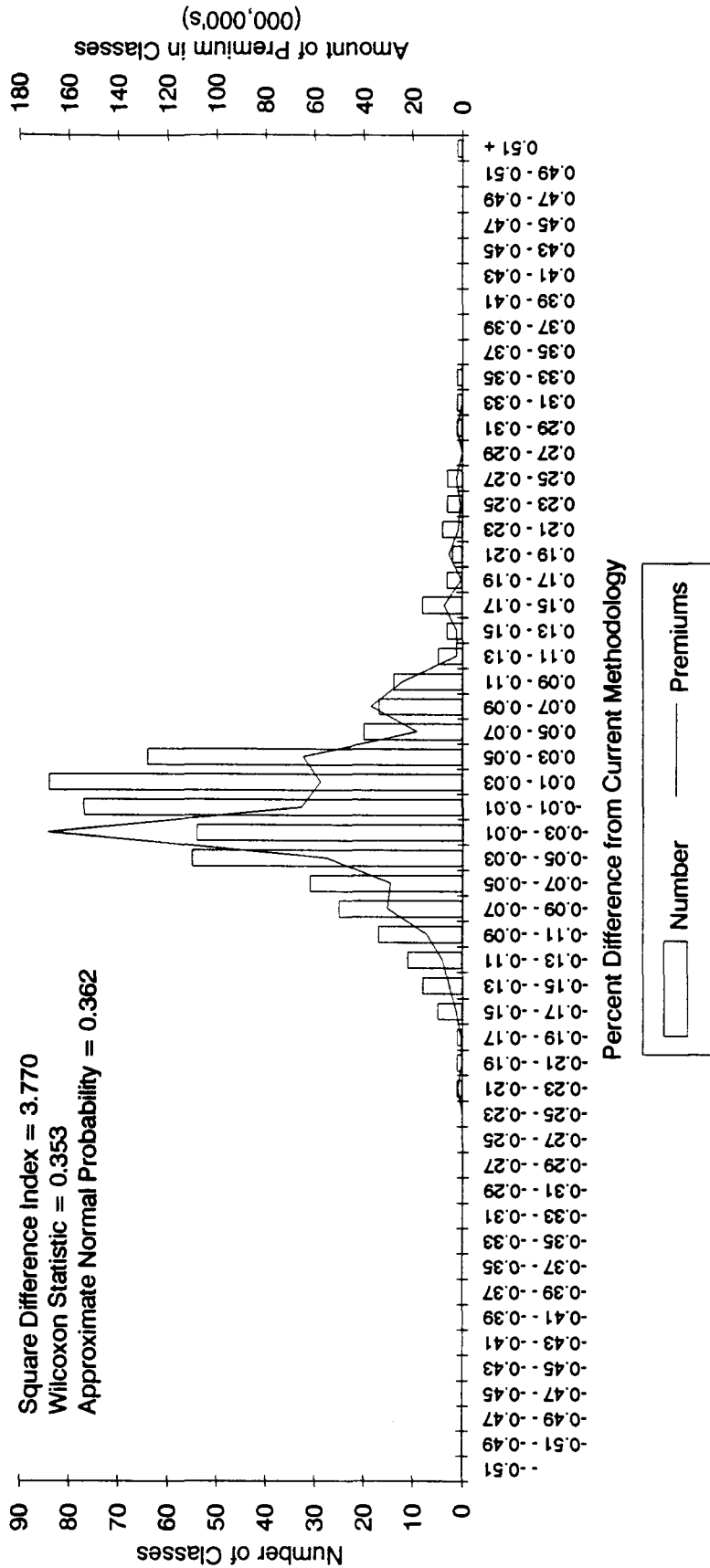


Oregon, 1988 Revision
Half Current Loss Limitation

Square Difference Index = 1.783
Wilcoxon Statistic = 15.222
Approximate Normal Probability = 0.000

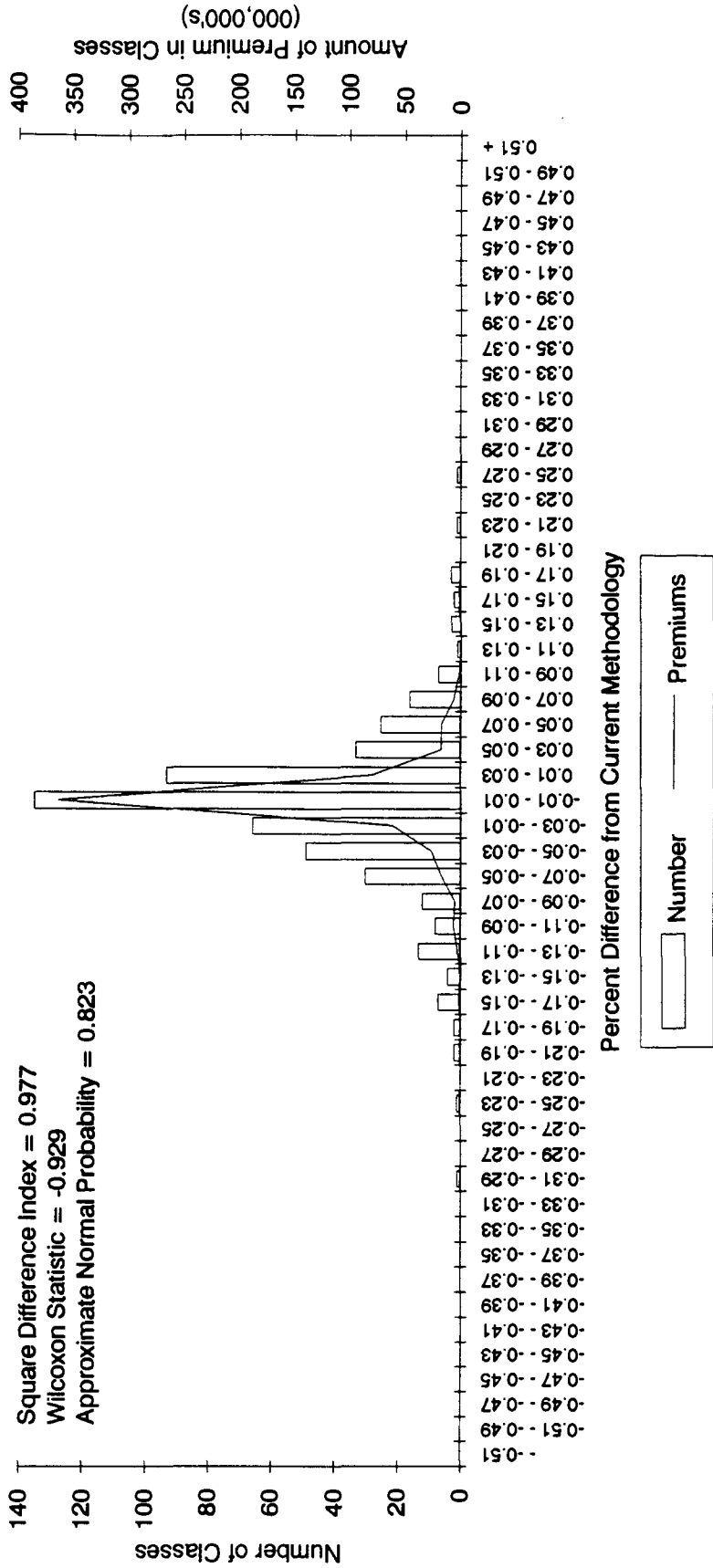


Oregon, 1989 Revision
Five Years of Data

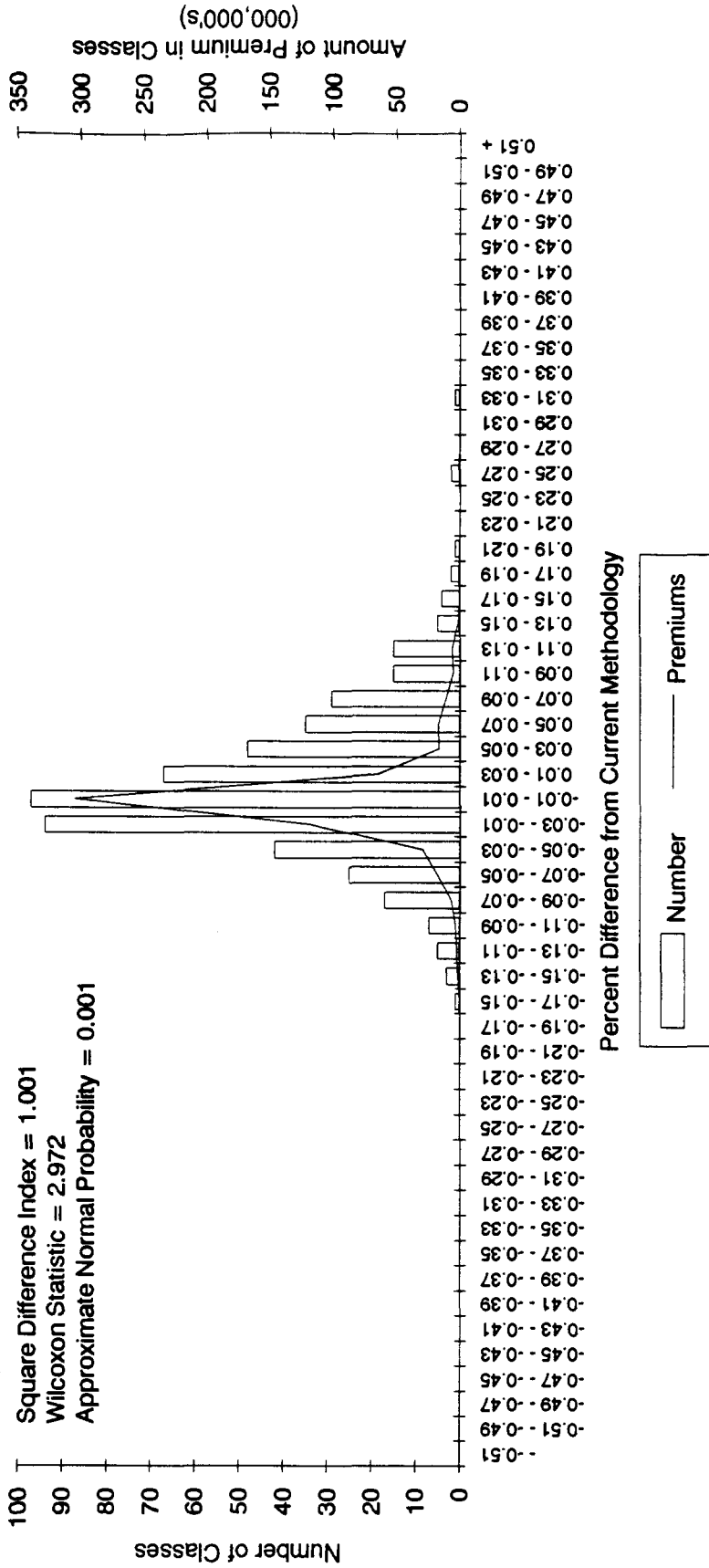


Oregon, 1989 Revision
Payroll Based Credibility

Square Difference Index = 0.977
 Wilcoxon Statistic = -0.929
 Approximate Normal Probability = 0.823

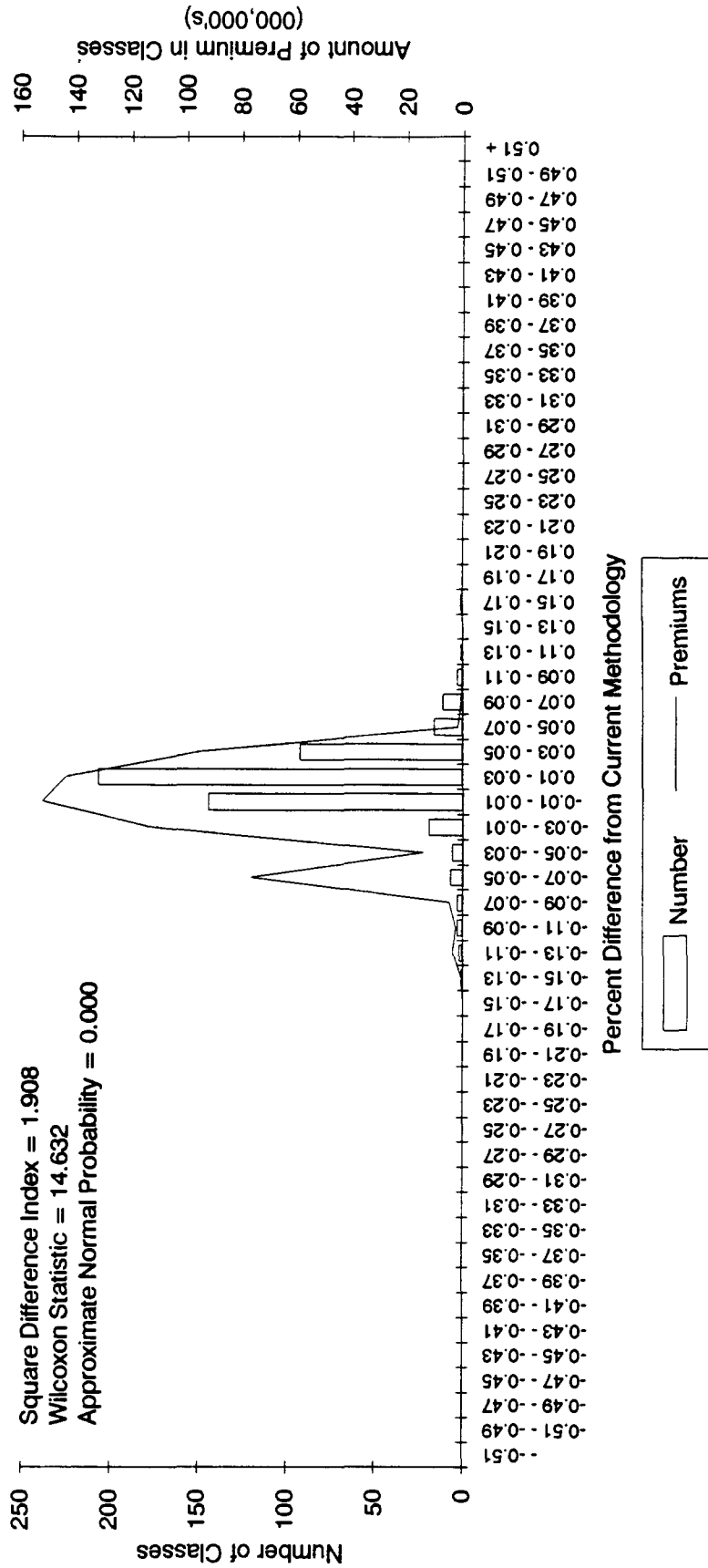


**Oregon, 1989 Revision
Double Full Credibility Standard**

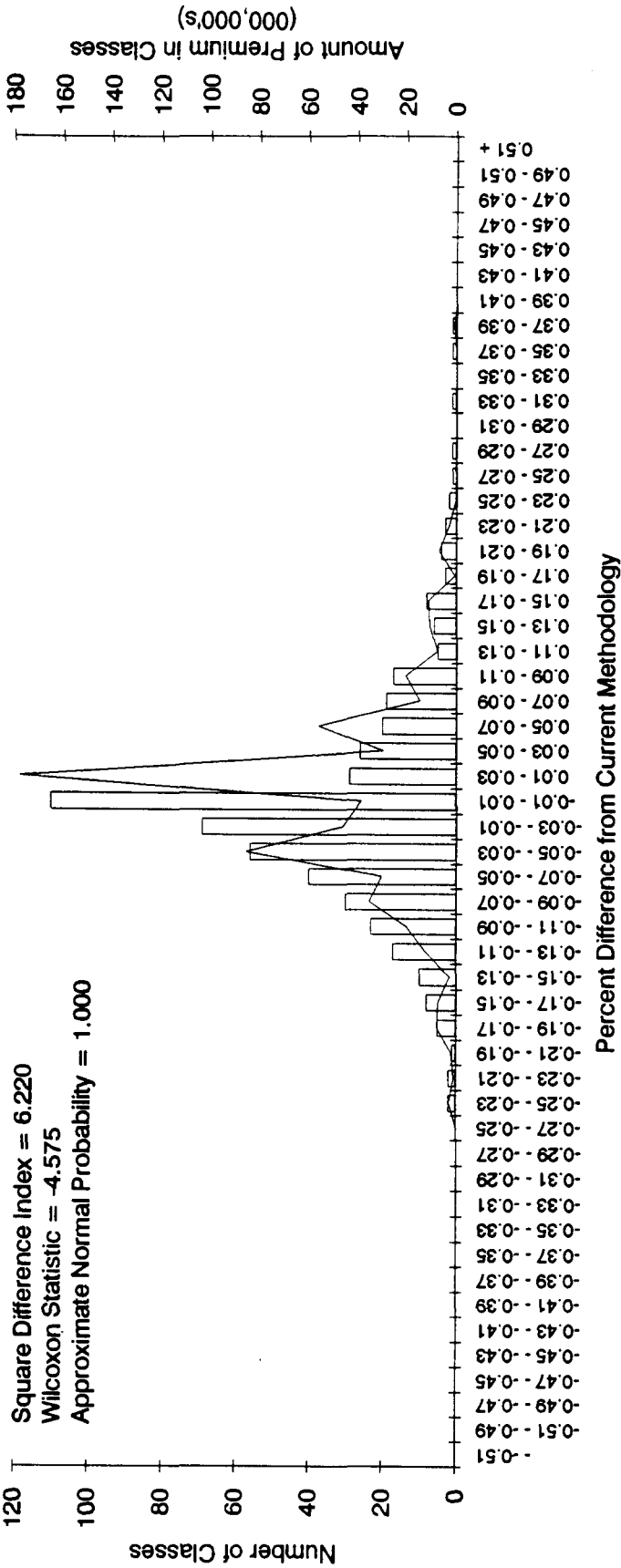


**Oregon, 1989 Revision
Half Current Loss Limitation**

Square Difference Index = 1.908
 Wilcoxon Statistic = 14.632
 Approximate Normal Probability = 0.000

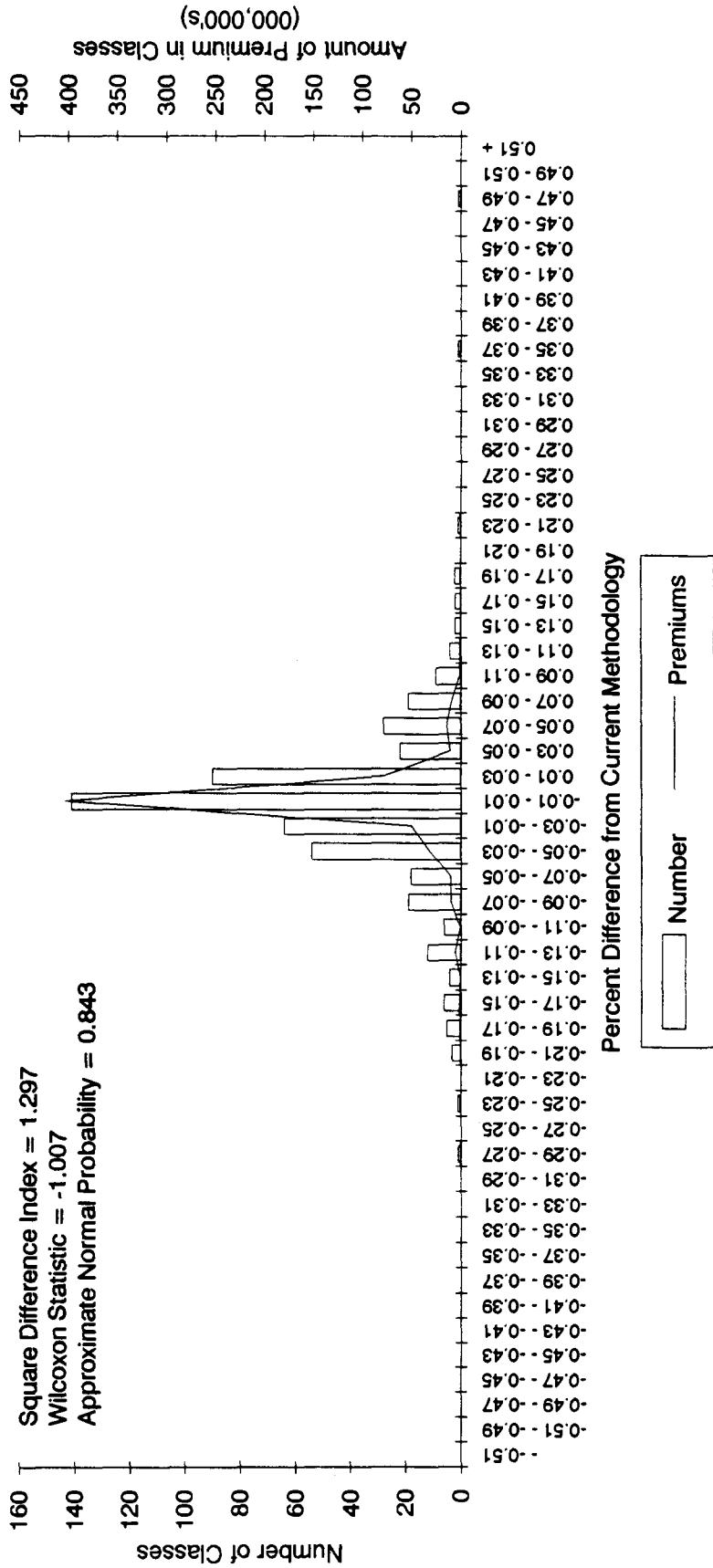


Oregon, 1990 Revision
Five Years of Data

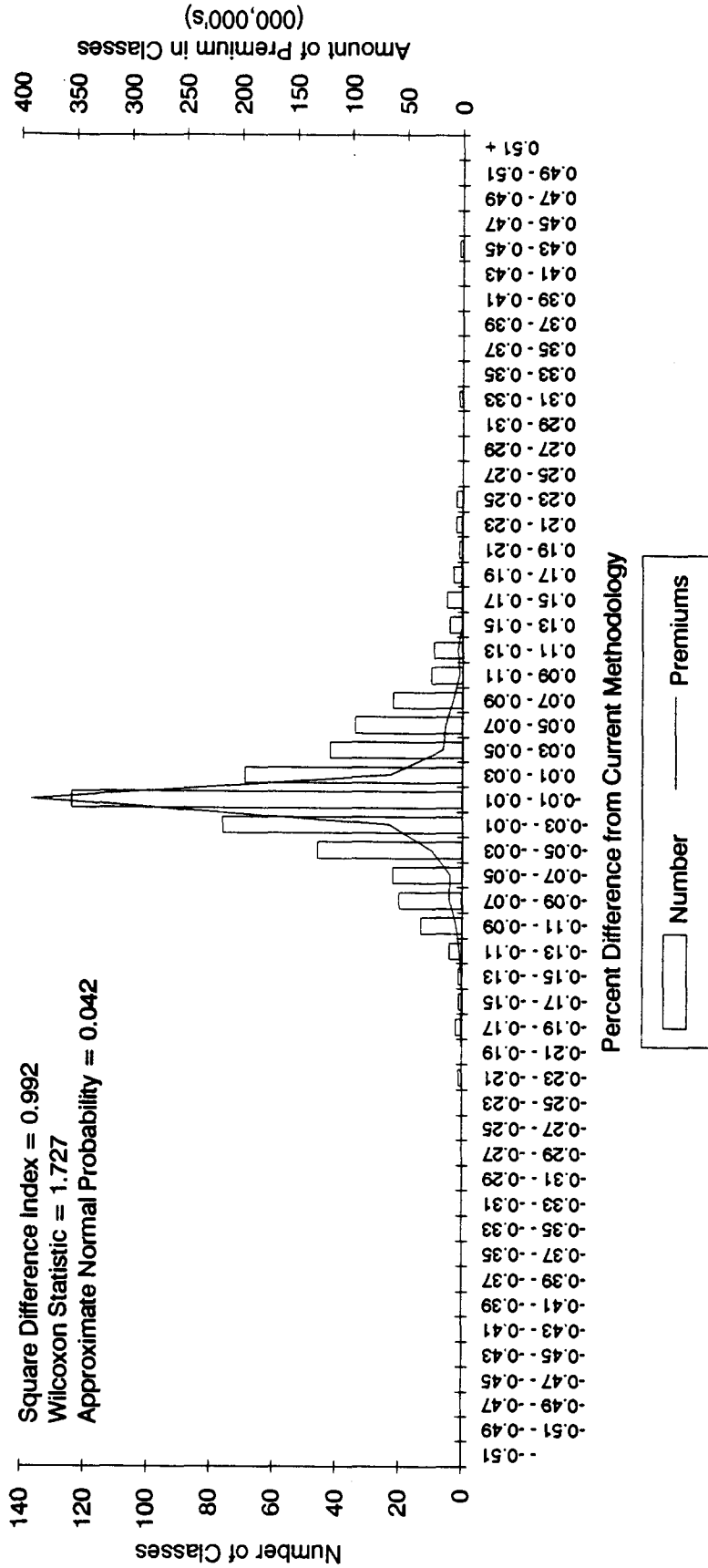


Oregon, 1990 Revision
Payroll Based Credibility

Square Difference Index = 1.297
Wilcoxon Statistic = -1.007
Approximate Normal Probability = 0.843

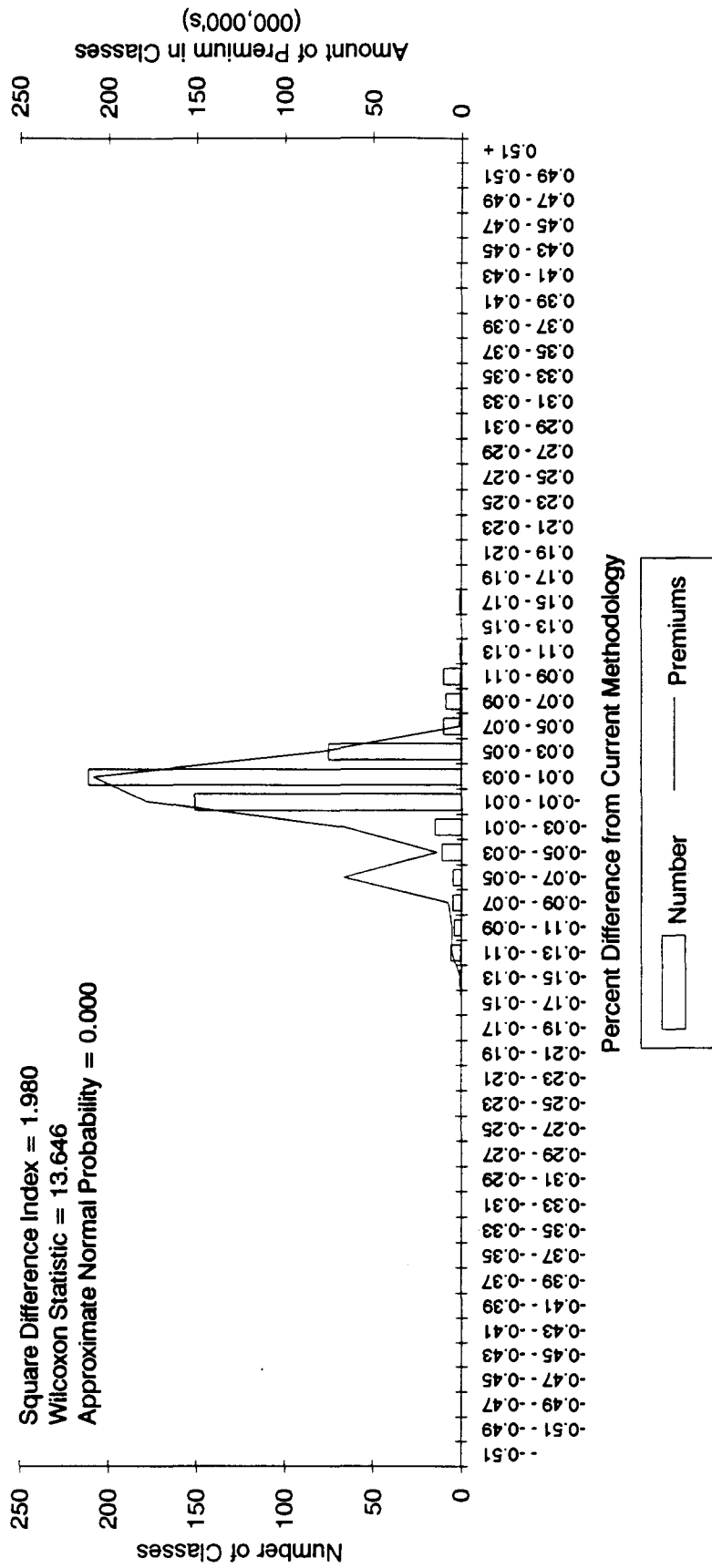


**Oregon, 1990 Revision
Double Full Credibility Standard**



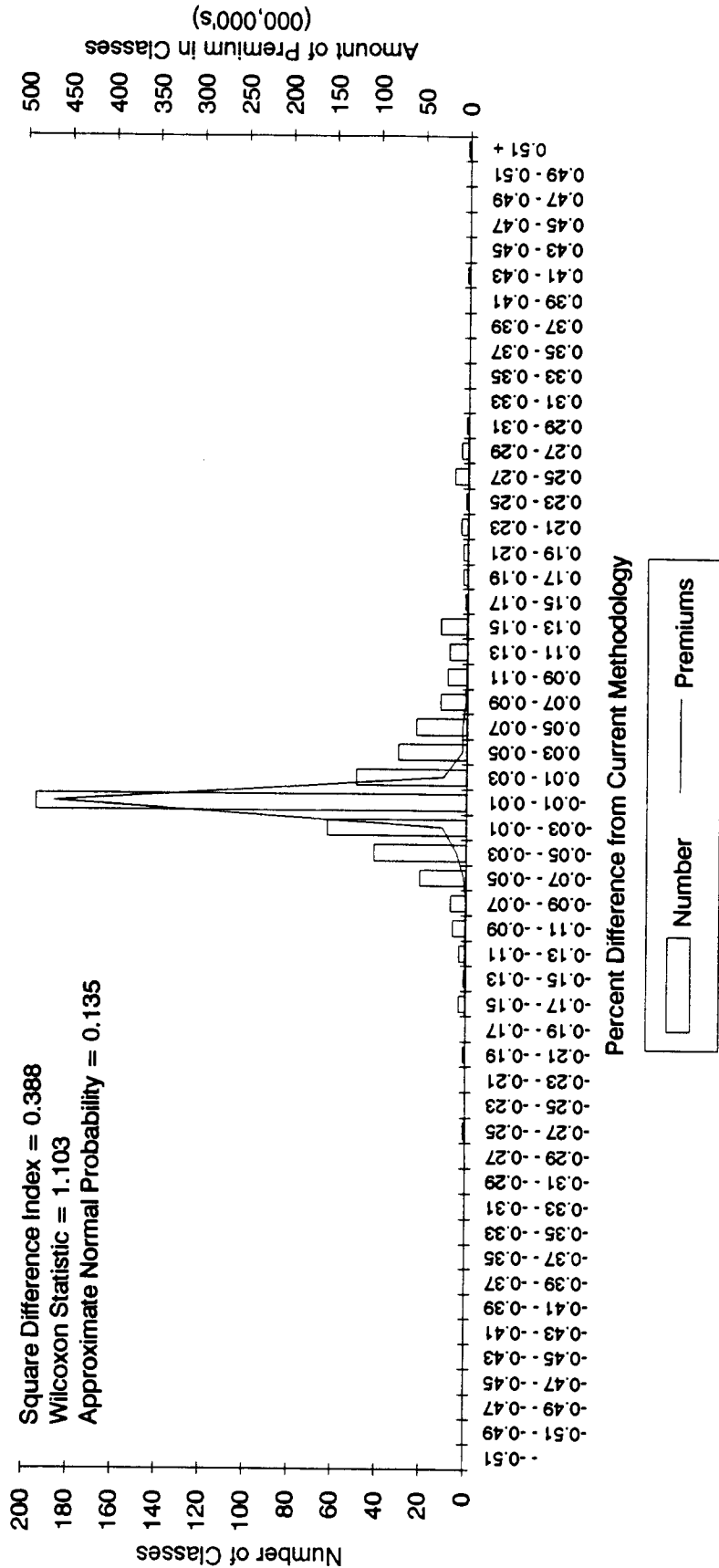
**Oregon, 1990 Revision
Half Current Loss Limitation**

Square Difference Index = 1.980
 Wilcoxon Statistic = 13.646
 Approximate Normal Probability = 0.000



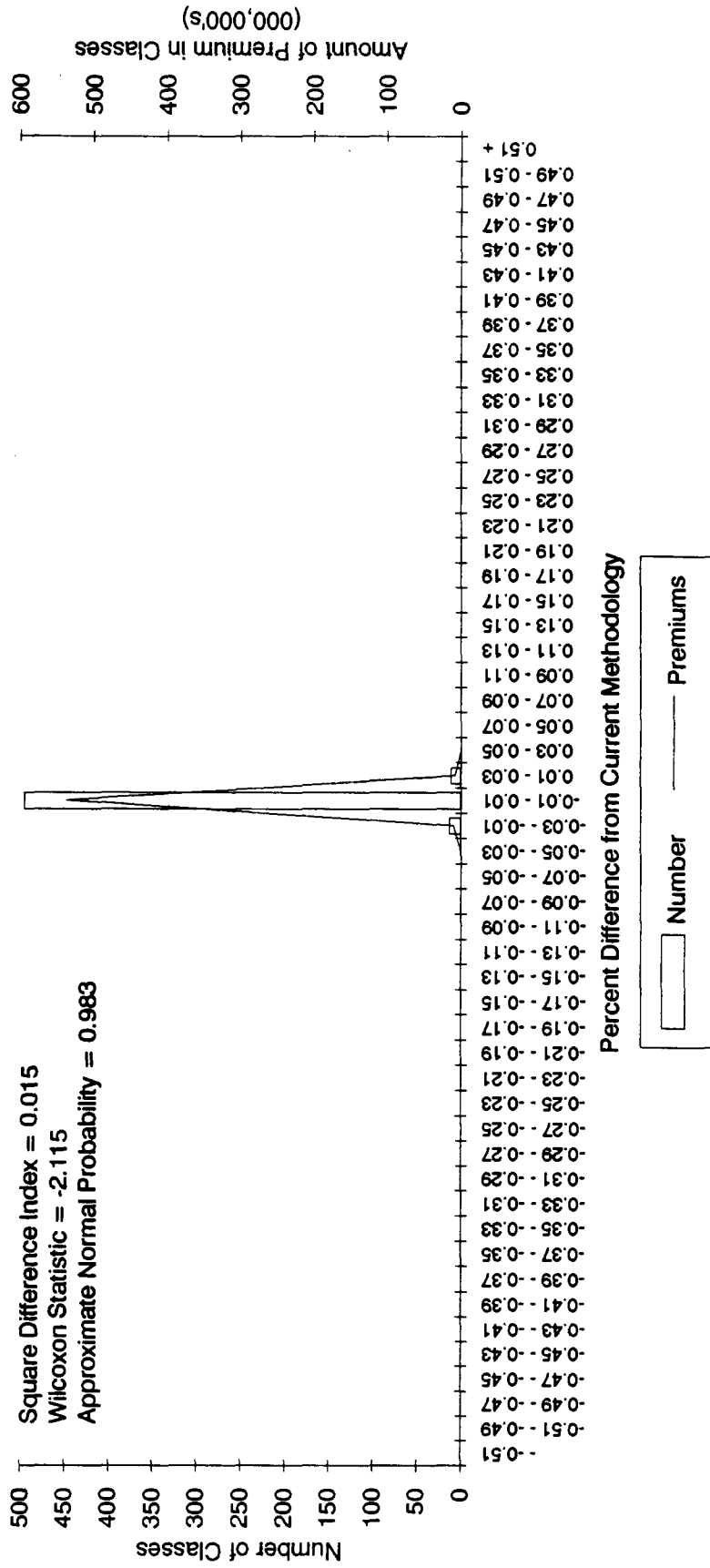
**Oregon, 1990 Revision
Alternate Regional Pure Premiums**

Square Difference Index = 0.388
 Wilcoxon Statistic = 1.103
 Approximate Normal Probability = 0.135

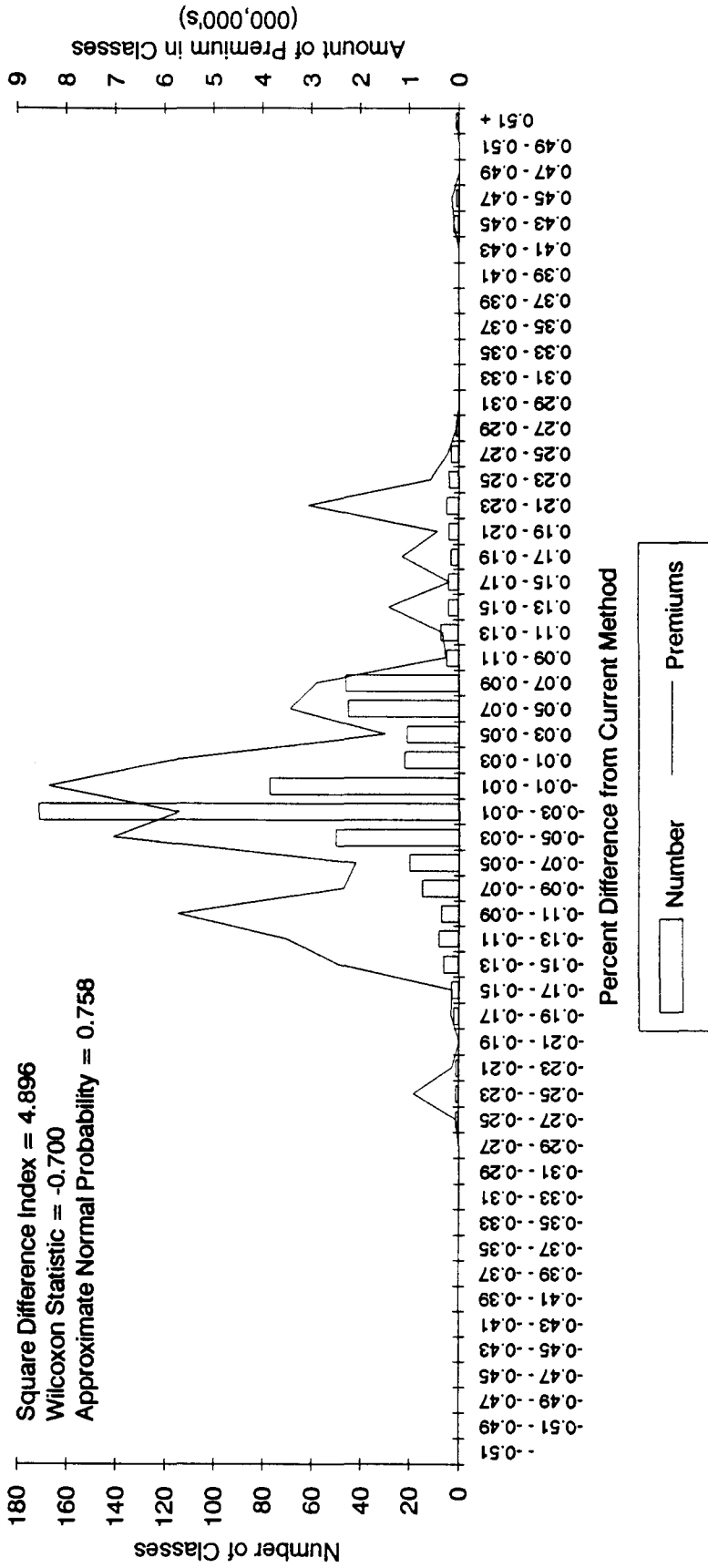


Oregon, 1990 Revision
Alternate Trend Application

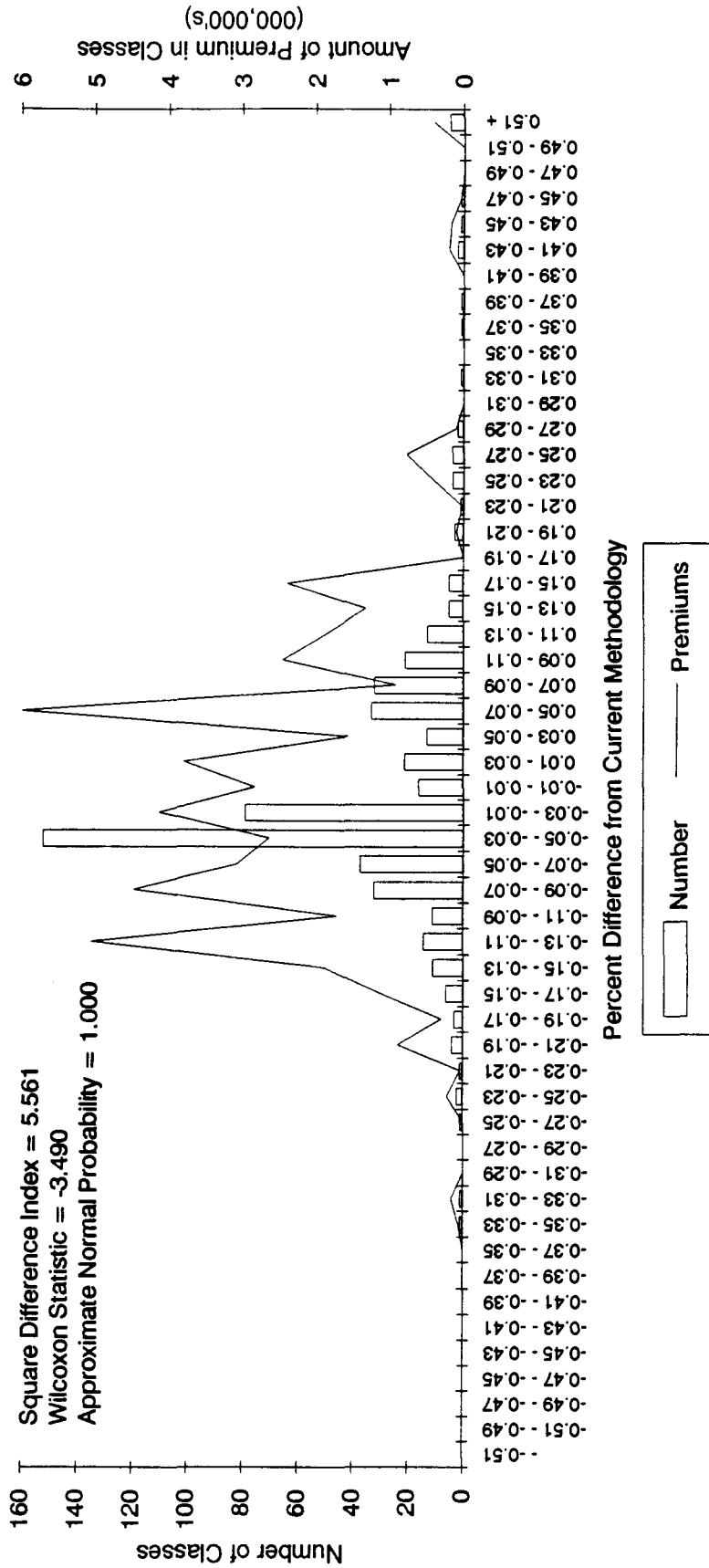
Square Difference Index = 0.015
Wilcoxon Statistic = -2.115
Approximate Normal Probability = 0.983



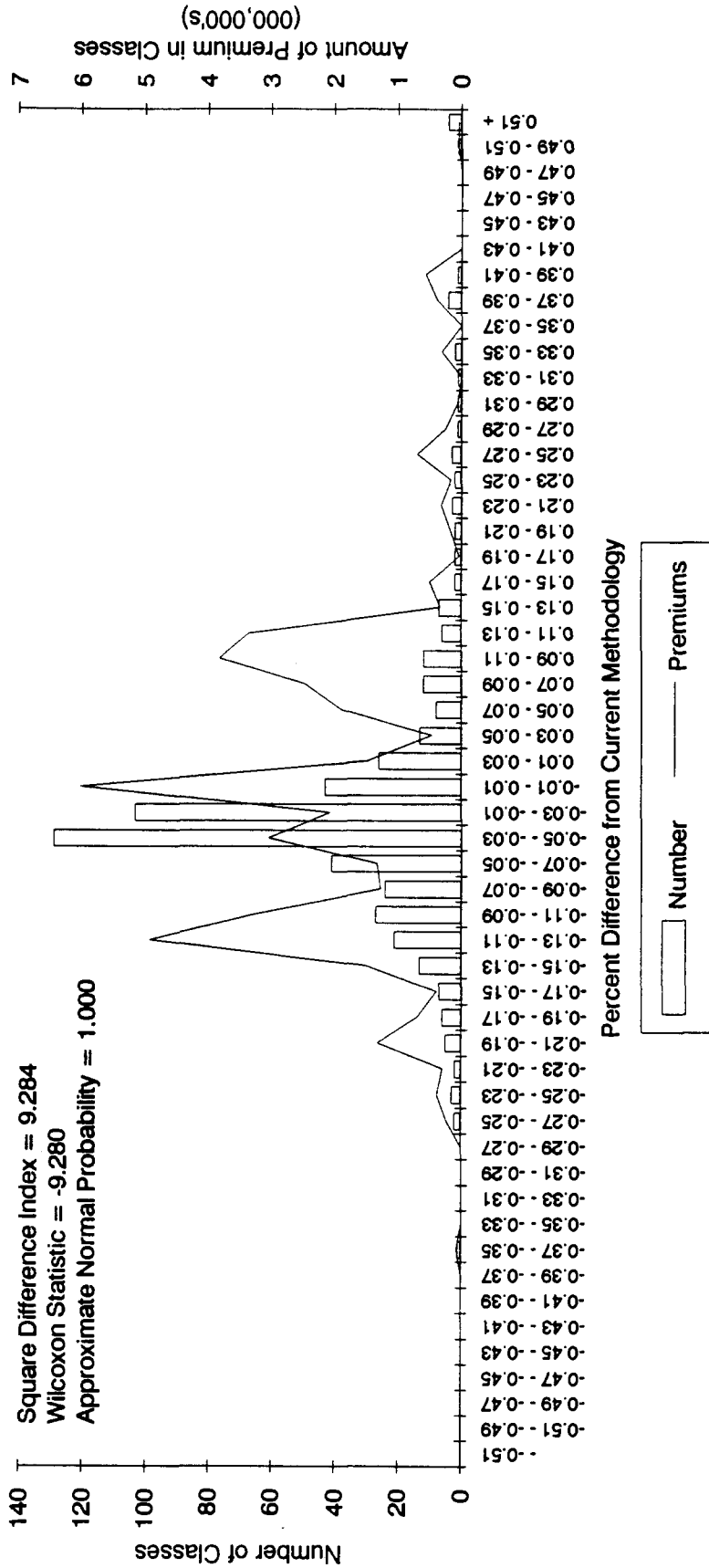
Utah, 1988 Revision
Five Years of Data



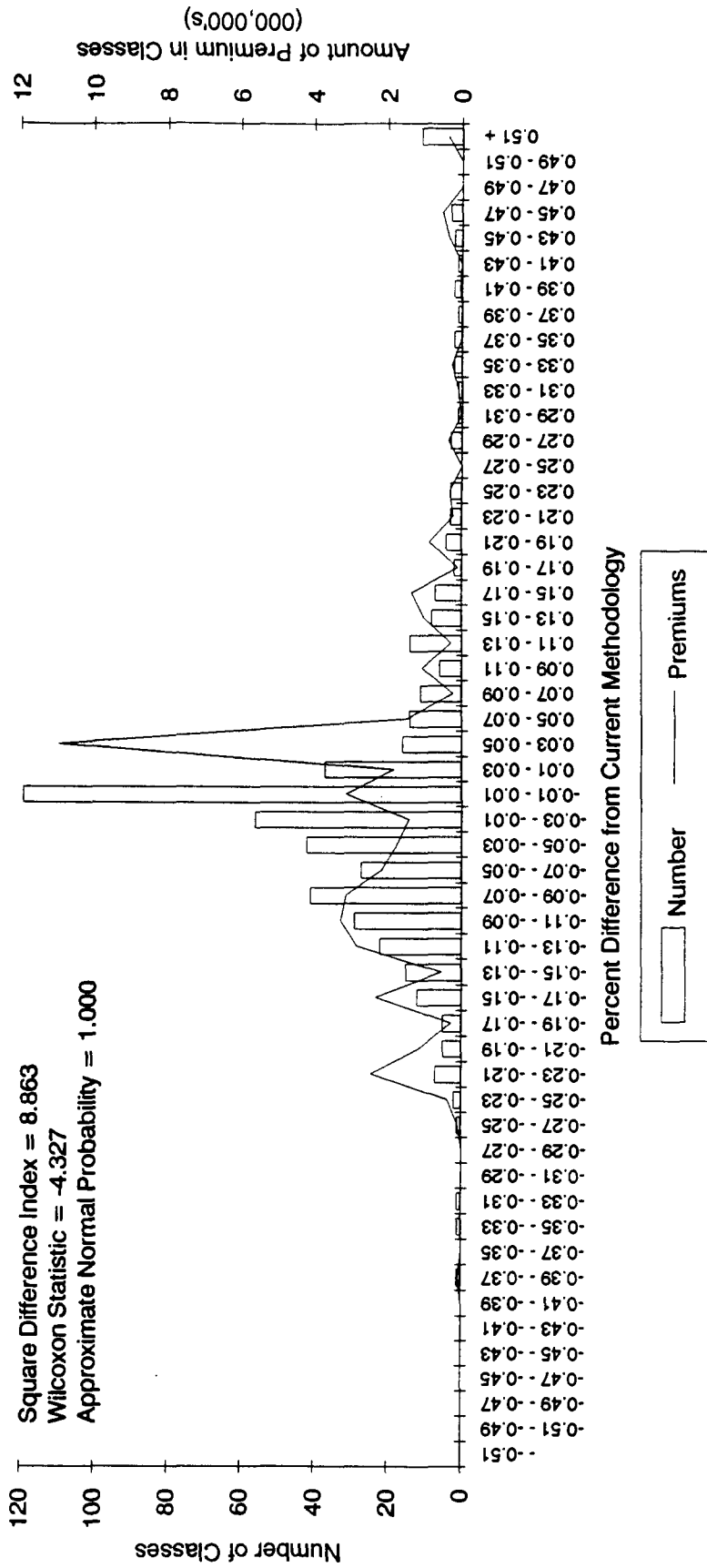
Utah, 1989 Revision
Five Years of Data



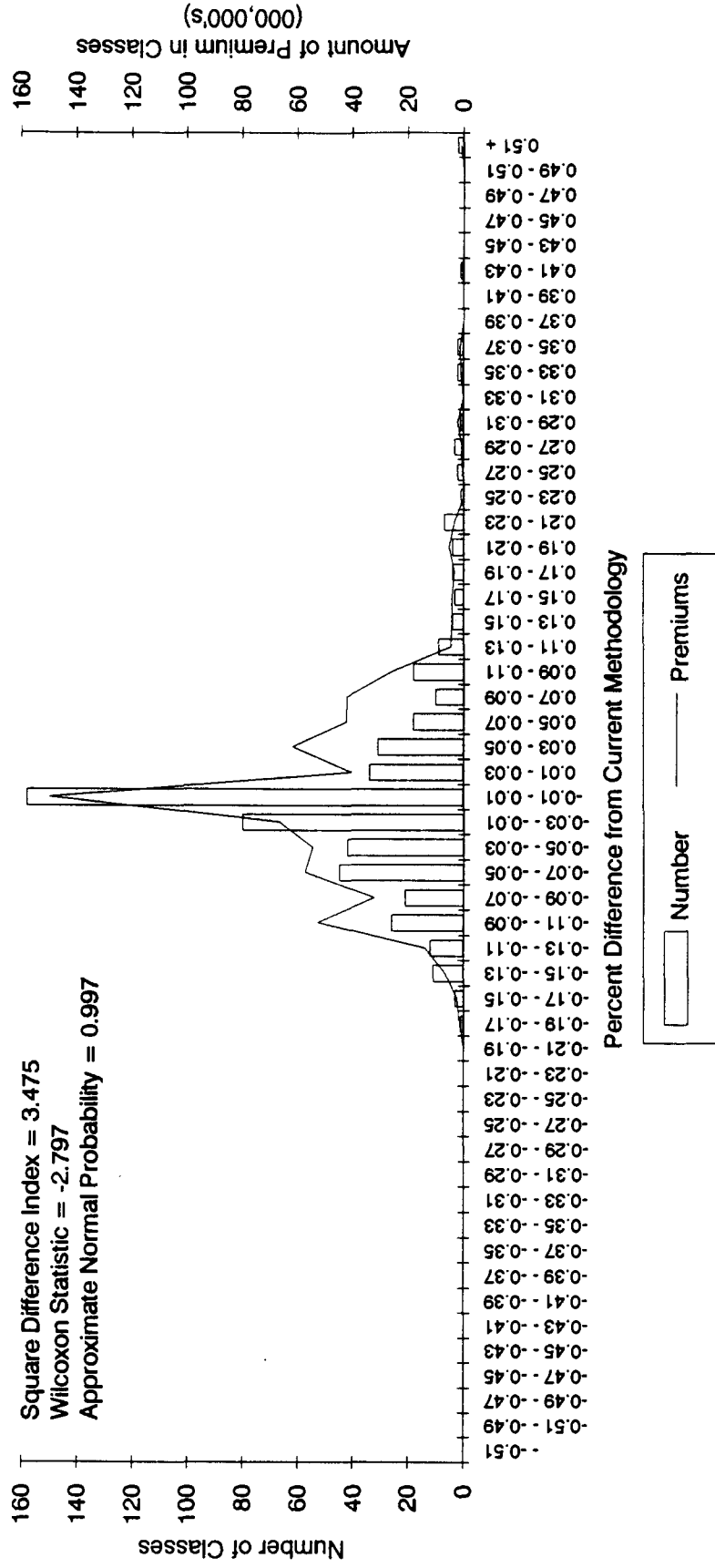
Utah, 1990 Revision
Five Years of Data



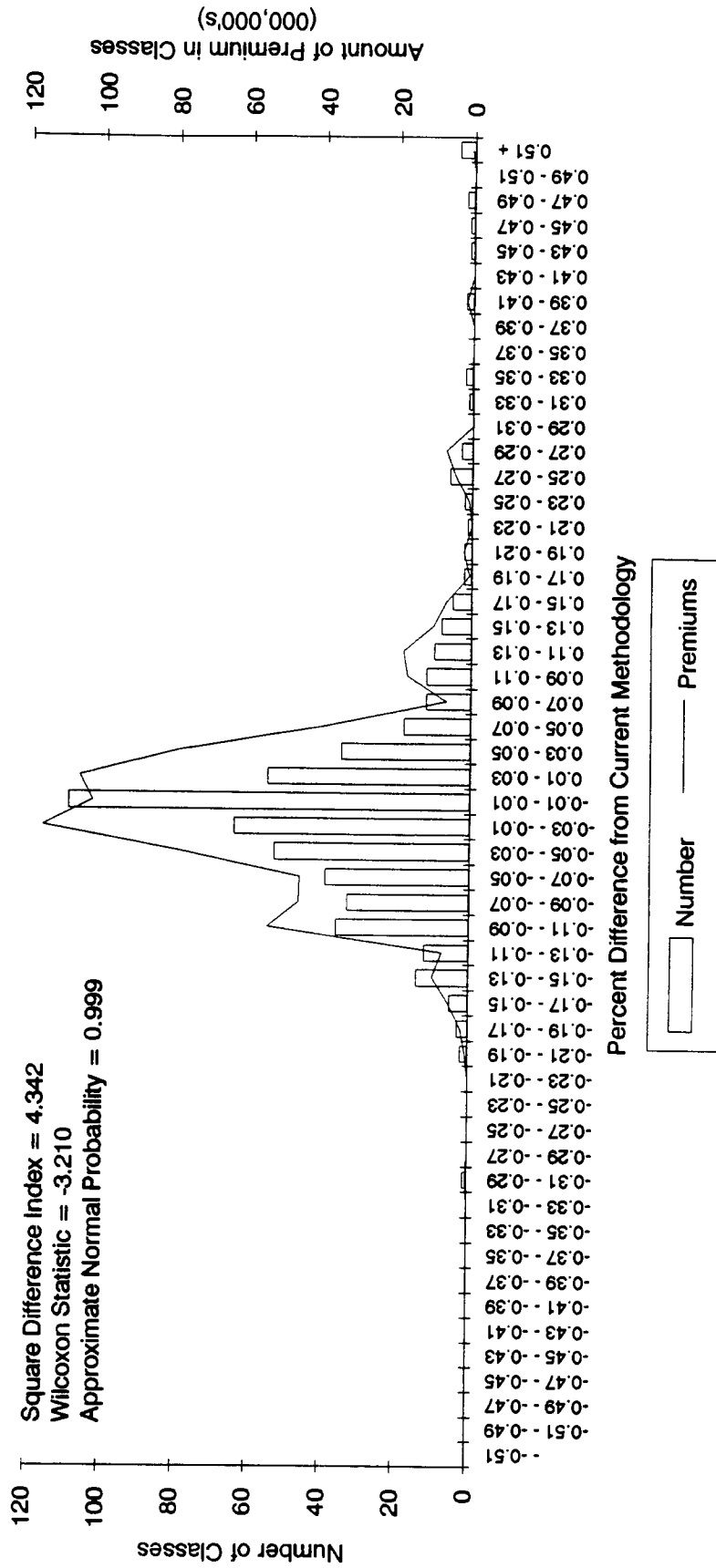
Utah, 1991 Revision
Five Years of Data



Wisconsin, 1989 Revision
Five Years of Data



Wisconsin, 1990 Revision
Five Years of Data



APPENDIX G

CLASSIFICATION RATEMAKING

Appendix G

Calculations Supplied by NCCI

Exhibits G-1 and G-2 summarize the results of calculations performed by NCCI extending our tests of relative accuracy of using five years of experience, as compared with three to six other states, of first report as well as some modifications to those tests. We strongly recommend consulting Section X of this part of this examination report, pages 77 through 79, for a more complete discussion of these additional tests.

By way of summary, we understand that NCCI applied our tests of relative accuracy to first report data in six states for which actual loss data was not available at the time of our primary analysis. These states are Florida, Louisiana, Michigan, North Carolina, Oregon, and Utah. In addition, we understand that NCCI applied these same tests to second report data for the original five states used for this test; Colorado, Connecticut, Illinois, Maine, and Nebraska.

Other tests we understand NCCI performed involved modification to the methodology outlined in this examination report. The first modification removed the adjustment using the ratio of standard to manual premium in our calculations. They also replaced actual losses at first or second report with those losses developed to an expected ultimate level.

Exhibit G-1 presents these additional tests applied to the original five states. Exhibit G-2 shows the results for the six additional states.

Additional Comparisons of Actual vs. Expected Losses

State		NCCI Calculations Using				
		First Report Data	Second Report Data	Manual Premium	Development from First Report	Development from Second Report
Colorado	Number of Classes		485	486	486	485
	Wilcoxon Statistic		0.69	1.23	0.82	0.80
	Mean Square Error (3 Years of Data)		110,872	84,667	156,017	161,378
	Mean Square Error (5 Years of Data)		106,904	80,370	147,772	155,912
	P[Type I Error]		24.5%	10.9%	20.6%	21.2%
	Underwriting Test Group 1:					
	Actual/Expected (3 Years of Data)		107.0%		108.0%	107.0%
	Actual/Expected (5 Years of Data)		99.0%		99.0%	99.0%
	Underwriting Test Group 2:					
	Actual/Expected (3 Years of Data)		94.0%		94.0%	94.0%
	Actual/Expected (5 Years of Data)		101.0%		101.0%	101.0%
	P[Type II Error]		N/A		N/A	N/A
	Connecticut	Number of Classes		466	464	464	466
Wilcoxon Statistic			1.23	0.97	1.23	1.10
Mean Square Error (3 Years of Data)			233,134	156,417	307,311	358,192
Mean Square Error (5 Years of Data)			197,394	136,844	270,261	308,496
P[Type I Error]			10.9%	16.6%	10.9%	13.6%
Underwriting Test Group 1:						
Actual/Expected (3 Years of Data)			116.0%		116.0%	117.0%
Actual/Expected (5 Years of Data)			110.0%		109.0%	110.0%
Underwriting Test Group 2:						
Actual/Expected (3 Years of Data)			85.0%		87.0%	85.0%
Actual/Expected (5 Years of Data)			90.0%		92.0%	90.0%
P[Type II Error]			N/A		N/A	N/A

Additional Comparisons of Actual vs. Expected Losses

State		NCCI Calculations Using				
		First Report Data	Second Report Data	Manual Premium	Development from First Report	Development from Second Report
Illinois	Number of Classes		524	523	523	524
	Wilcoxon Statistic		0.50	1.39	0.76	0.55
	Mean Square Error (3 Years of Data)		178,320	137,492	216,612	214,954
	Mean Square Error (5 Years of Data)		177,963	133,093	216,220	216,567
	P[Type I Error]		30.9%	8.2%	22.4%	29.1%
	Underwriting Test Group 1:					
	Actual/Expected (3 Years of Data)		102.0%		101.0%	101.0%
	Actual/Expected (5 Years of Data)		96.0%		96.0%	95.0%
	Underwriting Test Group 2:					
	Actual/Expected (3 Years of Data)		99.0%		99.0%	99.0%
	Actual/Expected (5 Years of Data)		104.0%		104.0%	104.0%
	P[Type II Error]		N/A		N/A	N/A
	Maine	Number of Classes		410	409	409	410
Wilcoxon Statistic			2.24	2.79	0.92	1.75
Mean Square Error (3 Years of Data)			375,691	256,277	1,115,727	847,787
Mean Square Error (5 Years of Data)			365,040	248,501	1,092,074	825,916
P[Type I Error]			1.3%	0.3%	18.0%	4.0%
Underwriting Test Group 1:						
Actual/Expected (3 Years of Data)			109.0%		102.0%	106.0%
Actual/Expected (5 Years of Data)			104.0%		97.0%	101.0%
Underwriting Test Group 2:						
Actual/Expected (3 Years of Data)			95.0%		99.0%	97.0%
Actual/Expected (5 Years of Data)			97.0%		101.0%	100.0%
P[Type II Error]			N/A		N/A	N/A

Additional Comparisons of Actual vs. Expected Losses

State		NCCI Calculations Using				
		First Report Data	Second Report Data	Manual Premium	Development from First Report	Development from Second Report
Nebraska	Number of Classes		427	427	427	427
	Wilcoxon Statistic		0.88	0.90	0.86	0.57
	Mean Square Error (3 Years of Data)		91,148	114,136	183,727	118,796
	Mean Square Error (5 Years of Data)		90,493	113,108	182,733	118,567
	P[Type I Error]		18.9%	18.4%	19.5%	28.4%
	Underwriting Test Group 1:					
	Actual/Expected (3 Years of Data)				105.0%	
	Actual/Expected (5 Years of Data)				97.0%	
	Underwriting Test Group 2:					
	Actual/Expected (3 Years of Data)				96.0%	
	Actual/Expected (5 Years of Data)				103.0%	
	P[Type II Error]				N/A	

Additional Comparisons of Actual vs. Expected Losses

State		NCCI Calculations Using					
		First Report Data	Second Report Data	Manual Premium	Development from First Report	Development from Second Report	
Florida	Number of Classes	510		510	510		
	Wilcoxon Statistic	1.27		1.64	1.23		
	Mean Square Error (3 Years of Data)	217,349		206,592	702,517		
	Mean Square Error (5 Years of Data)	217,063		206,502	706,194		
	P[Type I Error]	10.2%		5.1%	10.9%		
	Underwriting Test Group 1:						
	Actual/Expected (3 Years of Data)	103.0%			103.0%		
	Actual/Expected (5 Years of Data)	98.0%			98.0%		
	Underwriting Test Group 2:						
	Actual/Expected (3 Years of Data)	97.0%			98.0%		
	Actual/Expected (5 Years of Data)	102.0%			102.0%		
	P[Type II Error]	26.0%			N/A		
	Louisiana	Number of Classes	487		487	487	
		Wilcoxon Statistic	-1.48		-1.61	-2.32	
Mean Square Error (3 Years of Data)		136,202		134,742	240,936		
Mean Square Error (5 Years of Data)		133,433		133,713	239,533		
P[Type I Error]		93.1%		94.6%	99.0%		
Underwriting Test Group 1:							
Actual/Expected (3 Years of Data)		104.0%			102.0%		
Actual/Expected (5 Years of Data)		99.0%			97.0%		
Underwriting Test Group 2:							
Actual/Expected (3 Years of Data)		95.0%			98.0%		
Actual/Expected (5 Years of Data)		101.0%			104.0%		
P[Type II Error]		15.0%			N/A		

Additional Comparisons of Actual vs. Expected Losses

State		NCCI Calculations Using				
		First Report Data	Second Report Data	Manual Premium	Development from First Report	Development from Second Report
Michigan	Number of Classes	424		424	424	
	Wilcoxon Statistic	0.42		-0.08	0.17	
	Mean Square Error (3 Years of Data)	184,662		172,870	405,295	
	Mean Square Error (5 Years of Data)	179,539		171,286	400,371	
	P[Type I Error]	33.7%		53.2%	43.3%	
	Underwriting Test Group 1:					
	Actual/Expected (3 Years of Data)	106.0%			105.0%	
	Actual/Expected (5 Years of Data)	99.0%			98.0%	
	Underwriting Test Group 2:					
	Actual/Expected (3 Years of Data)	95.0%			96.0%	
	Actual/Expected (5 Years of Data)	101.0%			102.0%	
	P[Type II Error]	7.0%			N/A	
	North Carolina	Number of Classes	508		508	508
Wilcoxon Statistic		1.16		0.76	1.33	
Mean Square Error (3 Years of Data)		93,645		101,298	132,090	
Mean Square Error (5 Years of Data)		90,230		99,549	126,619	
P[Type I Error]		12.3%		22.4%	9.2%	
Underwriting Test Group 1:						
Actual/Expected (3 Years of Data)		106.0%			107.0%	
Actual/Expected (5 Years of Data)		99.0%			100.0%	
Underwriting Test Group 2:						
Actual/Expected (3 Years of Data)		94.0%			93.0%	
Actual/Expected (5 Years of Data)		101.0%			100.0%	
P[Type II Error]		4.0%			N/A	

Additional Comparisons of Actual vs. Expected Losses

State		NCCI Calculations Using					
		First Report Data	Second Report Data	Manual Premium	Development from First Report	Development from Second Report	
Oregon	Number of Classes	458		458	458		
	Wilcoxon Statistic	1.33		1.11	0.90		
	Mean Square Error (3 Years of Data)	121,629		128,891	283,379		
	Mean Square Error (5 Years of Data)	121,018		128,085	286,343		
	P[Type I Error]	9.2%		13.3%	18.4%		
	Underwriting Test Group 1:						
	Actual/Expected (3 Years of Data)	106.0%			103.0%		
	Actual/Expected (5 Years of Data)	101.0%			99.0%		
	Underwriting Test Group 2:						
	Actual/Expected (3 Years of Data)	95.0%			97.0%		
	Actual/Expected (5 Years of Data)	99.0%			101.0%		
	P[Type II Error]	19.0%			N/A		
	Utah	Number of Classes	424		424	424	
		Wilcoxon Statistic	-0.17		-0.76	-0.11	
Mean Square Error (3 Years of Data)		127,387		163,435	270,778		
Mean Square Error (5 Years of Data)		126,832		162,178	266,873		
P[Type I Error]		56.7%		77.6%	54.4%		
Underwriting Test Group 1:							
Actual/Expected (3 Years of Data)		103.0%			103.0%		
Actual/Expected (5 Years of Data)		94.0%			94.0%		
Underwriting Test Group 2:							
Actual/Expected (3 Years of Data)		98.0%			98.0%		
Actual/Expected (5 Years of Data)		104.0%			105.0%		
P[Type II Error]		24.0%			N/A		

NAIC

Examination of NCCI

Section II: Ratemaking Procedures
Evaluation of NCCI Ratemaking Methodologies

Volumes VII through X

Book 4

**RATEMAKING PROCEDURES
EVALUATION OF RATEMAKING METHODOLOGIES**

**NCCI EXAMINATION
VOLUME VII - SECTION IIB - PART 5
LAW AMENDMENTS**

December 6, 1991

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I. INTRODUCTION

The National Council on Compensation Insurance (NCCI) is frequently called upon to estimate the impact of actual or proposed statutory revisions. Furthermore, their methods are sometimes used by consultants to evaluate and comment on proposed legislation. This section of the report will discuss the NCCI methodologies used to determine the rate level changes due solely to actual or potential statutory revisions.

In our analysis, we have separated the types of statutory revisions into two categories: "formula" benefit changes and "non-formula" benefit changes. NCCI defines formula changes as those that can be estimated directly from the use of various tables and distributions, while all other changes are considered non-formula. For use in this report, a formula change will be any benefit revision that involves one or more of the following items:

- Changes in maximum weekly benefit,
- Changes in benefit level as a percentage of gross wages,
- Changes in waiting periods,
- Changes in retroactive periods,
- Changes in escalation rates,
- Changes in medical fee schedules.

All other benefit changes will be considered non-formula. A law change can include some formula components and some non-formula components.

As a historical note, the long term impact of the benefit changes evaluated by NCCI has generally been small. To illustrate this fact, Exhibit 1 provides the countrywide components of rate level changes evaluated by NCCI for the past 25 years, separated into the categories of experience changes and benefit changes. This exhibit which is based on information contained in the NCCI Annual Statistical Report, 1991 edition, (Annual Statistical Bulletin) shows that on a countrywide basis over the past six years,

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the benefit changes have been small both in absolute magnitude (an average of +1.1%) and also in relative magnitude (13.2% of the experience average change of 8.4%). In the five years prior to that time, benefit changes were slightly higher ranging from +2.7% to +5.0%, and the experience changes during that time period were much smaller.

In general, over the 25 year history shown, the only time period during which benefit changes were consistently high was the early 1970's. During that period, many states were dramatically increasing their benefit levels in response to the National Commission on Workers Compensation Study.

The benefit changes included in Exhibits 1-3 are only those where NCCI or another rating bureau has calculated the impact. Changes in benefit provisions where the rating bureau has not calculated an impact would not be reflected. For example, changes in administrative systems are generally not evaluated as benefit changes by NCCI. Also, the benefit changes in these Exhibits are based on the rating bureau's original estimate. The effect of changes which are not evaluated by the rating bureau and the difference between the actual benefit effect and the rating bureau's estimate of the effect are eventually reflected as experience changes. For example, some of the large experience changes observed in the mid 1970's may be due to delayed recognition of larger than expected law change effects.

Exhibit 2 shows a distribution of benefit level changes by size over the past 5 years based on information contained in the Annual Statistical Bulletin. Of the 288 benefit changes with effective dates from 1985 through 1989, 240 (83%) were benefit increases or decreases of no more than 2.5%. Only 16 (6%) were increases or decreases of greater than 5%. This indicates that at least by numbers, a large majority of NCCI benefit calculations have been for relatively small amounts over the past five years.

However, this is not to imply that benefit issues are unimportant. For states with perceived problems in their workers compensation systems, these national averages offer little in the way of comfort.

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As states focus on workers compensation cost containment, it is important that the methodologies used by the NCCI to estimate the impact of legislative changes on the workers compensation systems are as accurate as possible.

In this section of the report, we will address the following objectives of the RFP:

1. A review of NCCI's procedures for determining the expected loss changes due to revisions in weekly benefits, waiting periods, escalation provisions, and medical fee schedules (Section II.b. Objective 5a).
2. A review of NCCI's performance in analyzing non-formula benefit changes (Section II.b. Objective 5c).
3. Various questions on the Wage Distribution Table including:
 - a. Should the 1973 Standard Wage Distribution Table be Updated? (Section II.b. Objective 5b.)
 - b. Should different wage distribution tables be used for different class groups? (Section II.b. Objective 5d.)

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II. SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

A. Formula Benefit Changes

Most formula benefit changes depend on tables of distributions of wages, dependency status, type of injury and other factors. Since the tables currently in use by NCCI are based on data from the early 1970's, we tested the sensitivity of results to potential errors in these tables. Generally, the results were not sensitive to variations in the tables. This does not mean that updates are not necessary. First, the use of 1970's tables in the NCCI formulas fosters an appearance of inappropriate methodology which may not always be corrected by the inclusion of documentation as to its reasonableness. Second, the tables are not necessarily accurate for benefit changes outside the norms considered in our sensitivity test. NCCI should consider updating and revising its tables (Section III.B, Page 18). NCCI informed us that soon they will use an updated Wage Distribution Table and that they will annually monitor this table. In addition, they are reviewing other tables. In addition, NCCI should replace its standard rate filing package with a more descriptive summary of the fundamental issues being priced (Section III.C, Page 18).

1. Wage Distribution Tables

Revisions in the weekly minimums and maximums for indemnity benefits are the most common kind of formula benefit change. The most significant factors in the evaluation of those benefit changes are distributions known as "Wage Distribution Tables." Although there is later data available with which to construct alternative wage tables using statewide data, the NCCI generally uses a wage distribution table based on 1973 countrywide data. Based on our tests, pricing effects are relatively insensitive to the choice of wage table (Section V.A., Page 55).

2. Dependency and Other Distributions

Most other distributions used in formula benefit pricing are based on data collected at about the same time as the 1973 Wage Distribution Table. Since then, a large number of social and economic events have occurred that could alter the distributions. However, we have examined the sensitivity of the overall formula

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pricing of a change in the weekly maximums and minimums based on changes in family size, dependency status and other factors. We have found the overall pricing effect to be fairly insensitive to these potential changes. Thus, the formula benefit change pricing seems to be working satisfactorily, despite the age of the underlying distributions (Section IV.C.1, Page 46).

However, we recommend that NCCI consider updating duration tables and continue to monitor durations on an ongoing basis. Using a single countrywide table for all states may not be the best way to reflect the impact of changes in waiting periods or retroactive periods (Section III.C.2, Page 25).

3. Medical Fee Schedules

Medical Fee Schedule changes are generally evaluated using a distribution of medical procedures developed in 1967. This distribution is cross tabulated with the fees on the schedule in order to price the effects of changes. However, since 1967, there have been dramatic technological changes in the practice of medicine. For example, some currently commonplace procedures did not exist in the early 1960's. Thus, when a fee schedule is implemented for the first time, or is adjusted substantially, there is a likelihood that the current NCCI methodology will not perform adequately.

Since medical cost containment is an important and timely topic, we believe it is appropriate that NCCI update its distributions and refine its methodologies for pricing medical fee schedules. The current NCCI procedures cannot readily measure the impact of medical cost containment measures (Section III.C.4, Page 36). NCCI has informed us that they will shortly have available data useful for evaluating medical cost containment measures.

4. Relationship of Benefit Changes to Trend

It is essential that the same procedures used in the trend calculation to adjust benefits to current level be used in the evaluation of law amendments. Therefore, changes made to benefit pricing methodology should be consistent with changes made to the benefit on-level calculations in the trend methodology (Section III.C.6, Page 39).

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B. Non-formula Benefit Changes

We have developed a classification of 8 categories where we expect non-formula changes to occur in the upcoming years. These are (Section IV.B., Page 41):

- Compensability
- Objective standards for permanent partials
- Changes in compensation for permanent partial
- Changes in rehabilitation programs
- Changes in benefit administration
- Changes to reduce litigation
- Attempts to decrease interdependence of economic conditions (e.g, unemployment) and workers compensation benefits
- Medical cost containment issues

Our recommendations regarding the pricing of non-formula benefit changes are summarized below (Section IV.D., Pages 51):

- Improve the method of identifying law changes significant enough to require the use of non-formula techniques. In some non-formula situations, NCCI appears to apply formula techniques when those techniques are not appropriate. In other more recent cases, NCCI has applied new data sources and new estimation techniques.
- Increase the utilization of state specific information regarding the workers compensation benefit system being analyzed.

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- Rely on input from non-actuarial areas in developing pricing models. This would include utilizing experts from other disciplines such as economics, legal claims, etc.
- Develop a data collection model facilitating retroactive review of the effects of major benefit changes. This would include establishment of measures to test the actual versus expected impact of critical elements in the law revision.
- Improve models to measure the effect of changes in benefit administration.
- Develop models that better analyze changes in benefit utilization.
- Improve the explanatory material included with a benefit pricing report.

C. Wage Distribution Tables

Our analysis of updated wage table information indicates that only small changes in the overall pricing would result from its use. However, since wage data will be collected in the future in all states with the new Detailed Claim Information (DCI) system, we recommend that NCCI update its wage distribution tables and consider the use of statewide tables, once the revised DCI data is available (Section V.A., Page 56).

Our analysis showed that use of separate wage distribution tables by classification group would have very little effect on the overall pricing.

However, use of separate wage tables for each classification group could substantially affect the rates by classification group under certain circumstances. We recommend additional research into the use of separate wage tables for classification ratemaking (Section V.B., Page 59).

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III. REVIEW OF FORMULA TYPE CHANGES

NCCI has developed a series of tables and statistical distributions that are used to evaluate all benefit changes. While some benefit revisions can be estimated directly from the tables and distributions, other changes require the use of additional data. This has given rise to the use of the terms "formula" benefit changes and "non-formula" benefit changes. A law change can include some formula components and some non-formula components.

In this section, we will discuss:

- A. Basic Pricing Parameters
- B. Data and Tables Used
- C. NCCI Formula Pricing Methodology

A. Basic Pricing Parameters

The NCCI categorizes claims by type of injury as follows:

- Medical Only
- Temporary Total
- Permanent Partial (Major and Minor)
- Permanent Total
- Death

Each of the last four categories can give rise to both medical losses and indemnity losses. In all benefit pricing calculations, separate estimates are performed by type of injury for indemnity, whereas one overall calculation is performed for medical. These separate effects are then weighted together based on the percentage of total losses represented by each type of injury. The weights are determined based on data obtained from the Workers Compensation Statistical Plan (WCSP).

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For reporting purposes under the WCSP, each insurer assigns each claim to exactly one of the five categories listed above. As the injury progresses and as new information is received, the category (status) of a claim may change from report to report.

Uniform classification of injuries among insurers and across states is important. Obtaining such uniformity is complicated because workers compensation statutes may classify injuries using varying definitions of categories. Some states classify benefits as total or partial, but do not categorize their permanency. Other states have a permanent impairment benefit, but not a permanent partial benefit.

To obtain uniformity, WCSP gives instructions as to how to classify injuries. According to WCSP, a permanent partial claim is:

- "1. Any permanent injury which does not involve permanent total disability.
2. Any temporary injury which satisfies one of the following criteria:
 - a. The duration of disability benefits exceeds or is expected to exceed one full year. No loss is to be reported as temporary total if the duration of total disability exceeds or is expected to exceed 52 weeks.
 - b. A lump sum settlement is made or, in the judgement of the carrier, will be required to settle future benefits.
 - c. The extent of liability for future payments cannot be determined."

In nearly all states, permanent partial benefits form a significant block of the total benefit dollars. Exhibit 3 shows that the percentage of total indemnity costs contributed by permanent partial injuries has been increasing for nearly all states.

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The categorization of permanent partial claims into major and minor is handled internally by NCCI based on the size of the incurred indemnity benefits for a particular claim. Claims with indemnity costs below the cutoff value are assigned to minor, while claims at or above the cutoff are assigned to major. The cutoff amount is known as the "critical value". In most formula benefit change situations, the difference between permanent partial major and permanent partial minor has little significance for benefit pricing even though NCCI separately estimates cost effects for both categories. Issues relating to the classification of claims into permanent partial major and permanent partial minor are discussed further in Appendix A.

B. Data and Tables Used

The key elements of NCCI's formula pricing are (1) the features of the old and new laws and (2) a series of tables. The important features of the laws, and the categories of injuries that are typically affected are shown in Table 1.

<u>Variable</u>	<u>Table 1</u>				
	<u>Benefit Affected</u>				
	<u>Fatal</u>	<u>PT</u>	<u>PPD</u>	<u>TTD</u>	<u>Medical</u>
% Change in Compensation Rate	+	+	+	+	
Min/Max Weekly Benefit	+	+	+	+	
Maximum Aggregate Benefit	+	+			
Duration of Benefit	+	+	+		
Burial	+				
Remarriage/Dowry	+				
Special Funds	+				
Social Security	+	+			
Escalation	+	+		+	
Waiting/Retro Period				+	
Minimum Payment for Dependent	+	+			
Additional Dependents	+				

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Note: + means that the variable often or always needs to be examined, but it may not be required for pricing. A blank indicates that the variable is not typically required for pricing. PT represents Permanent Total, PPD is Permanent Partial, TTD is Temporary Total.

The most important tables used by NCCI in benefit evaluations are the following:

1. 1973 Standard Wage Distribution Table
2. Temporary Total Accident Distribution Table
3. Injury Tables (Separate tables exist for Fatal, Permanent Total and Permanent Partial.)
4. Countrywide Medical Fee Frequency Distribution Tables
5. Life Annuity Tables and Discount Rates
6. Widow's Age and Remarriage Rates

Also important are:

7. Statewide Average Weekly Wage (SAWW)
8. Social Security Offset

These tables and issues related to the SAWW and Social Security are discussed below:

1. 1973 Standard Wage Distribution Table

This table shows a distribution of wages around the average wage. This table was derived based on 1973 data and appears in Exhibit 4.

The 1973 Standard Wage Distribution Table (Wage Distribution Table) is used to estimate the average weekly benefit for injured workers under the workers compensation benefit structure. The table displays the percentage of total workers and the percentage of total wages at various relativities to the statewide average wage.

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For example, the table shows that 58.4% of the workers earn less than 1.0 times the statewide average weekly wage. (See Exhibit 4, Column A at R = 1.0). The aggregate wages of these workers amount to 40.9% of the total wages in the state. (See Exhibit 4, Column B at R = 1.0).

The distributions in the Wage Distribution Table are used to calculate the average weekly benefit under both the new and old benefit structures, for each type of injury, and within each type of injury for each component of the benefit.

From the Wage Distribution Table, we can identify three intervals for each percentage rate of compensation. The first interval includes all workers earning wages so small that their average weekly benefits, calculated as a percentage of their average weekly wage, would be below the statutory minimum. Their actual compensation will be higher than the statutory percentage compensation rate.

The second interval includes workers earning average weekly wages within the constraints of the minimum and maximum allowable benefit and any aggregate limits applicable. Their compensation will equal the statutory percentage compensation rate times the actual wage.

The third interval consists of workers whose average weekly benefits, calculated as a percentage of their average weekly wage, would be larger than the statutory maximum. Their compensation will equal the maximum weekly benefit and their compensation will be less than the statutory percentage compensation rate.

Using the wage table, NCCI can calculate (1) the average weekly benefit in each interval and (2) the percentage of the total statewide workers in each interval. Then, the statewide average weekly benefit considering the statewide average weekly wage and minimum and maximum weekly benefits is calculated as the average of the benefits in each of the three intervals described above. This calculation appears in numerous areas of the benefit calculation formula for each component of the benefit structure.

Exhibit 5 shows a simplified example of calculating the average weekly benefit.

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NCCI performs a slightly different (although equivalent) calculation than we have described. Instead of calculating the average weekly benefit in each interval, they instead calculate the "effective" average weekly wage that results in the statutory benefit for each interval. By weighting together the effective average weekly wage in each interval, NCCI calculates a "Limit Factor", which is applied to the statewide average weekly wage. The Limit Factor times the statewide average weekly wage times the benefit percentage rate yields the statewide average weekly benefit. The Limit Factor indicates the percent of wages subject to the statutory benefit rate. The change in Limit Factor could also be used to measure the change in subject wages when the statutory benefit rate is changed.

The wage table is the single most important table that affects the formula benefit calculations. It will be discussed and analyzed in more detail in Section V.

2. Temporary Total Accident Distribution Table

This table (Exhibit 6) is used to estimate the impact of changes in waiting periods (the number of days a worker must be disabled before indemnity benefits begin) and retroactive periods (the number of days a worker must be disabled before indemnity benefits are paid retroactively from the first day of disability).

The table was derived from a study of disability durations conducted in the early 1970's.

3. Injury Tables

This series of tables displays various distributions and details for fatal, permanent total and permanent partial claims. The current injury tables were developed via a special call for information issued to insurance carriers in the early 1970's.

a. Fatal Disability Table

This table (Exhibit 7) displays a distribution of dependency status and provides the average dependent age used to value benefit changes. The fatal injury table includes the number of cases (i.e., frequency), the type of person receiving compensation (e.g., none, widow alone, widow with child(ren),

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orphan(s), parent(s), sibling(s) and others), the average number of dependents for each case, the computed average arithmetic age and the average pension age.

The column labelled average arithmetic age is used in the valuation of benefit provisions limited to a specified duration or subject to a maximum aggregate amount payable; the column labelled average pension age is used in the valuation of benefit provisions equivalent to a life annuity.

b. Accident Distribution - Permanent Total Disability Table

This table (Exhibit 8) displays a distribution of part of body injured, a distribution of ages, and a distribution of body part and average age.

c. Major Permanent Partial Disability Table and Minor Permanent Partial Disability Table

These tables (Exhibit 9 for Major and Exhibit 10 for Minor) display a distribution of part of body injured, separately for scheduled injuries and "other" (non-scheduled) injuries. For each body part, the percentage loss of use, the average healing period, and the average age of the injured worker is displayed.

A scheduled injury is an injury that is specifically listed in the statute along with a specific benefit level. The definition of a scheduled injury will vary by state depending on what specific body parts are enumerated in the statute. For scheduled injuries, loss of use is expressed as percent of the particular member affected. For non-scheduled injuries, loss of use is expressed as a percentage of the whole man. For purposes of law change evaluations, the percentages of loss of use of a particular member (as expressed for scheduled injuries) can be converted to percentages of a whole man based on standards such as the "American Medical Association Guides to the Evaluation of Permanent Impairment."

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Evaluating injuries as a percent of the whole man is a phenomenon we expect to see more frequently in future legislation. This issue is discussed further in Section IV.

4. Countrywide Medical Fee Frequency Distribution Tables

These tables (Exhibits 11 and 12) are used to evaluate medical fee changes. Exhibit 11 displays a frequency distribution by medical procedure code and Exhibit 12 displays an excerpt of definitions of some of the codes. The medical procedure tables are based on studies conducted in the 1960's. Clearly, the use of such an old distribution is a cause for concern since there are medical procedures in common use today that did not even exist 20 years ago. This issue, and the methodology utilized for pricing medical fee changes, will be discussed in a later section.

NCCI treats the establishment of a schedule, when there is none in effect, as a non-formula change.

5. Life Annuity Tables and Discount Rates

The annuity values are based on the United States, 1979-81 Life Table for the Total Population (for injured workers) and Life Table for Females (for spouses). (Copies are included in Appendix B.) Tables are prepared with interest and escalation rates that may vary from state to state. For many states, NCCI uses a 3.5% interest rate, based on the 3.5% statutory discount rate that at one time was in effect for most states. The escalation rate depends on the statutory provisions of the workers compensation law.

The use of an interest rate in the benefit pricing is not intended to impact the overall rate level calculations. The overall rate level is based on projected undiscounted aggregate financial data for loss projections and a profit provision that implies a treatment of investment income that varies among the states.

The use of a constant 3.5% interest rate is a convenience to simplify the benefit calculations. The cost to insurers of providing annuity benefits depends on a complex set of considerations including the cost of capital, income taxes, required surplus, and liquidity. The actual rate used has little impact for formula changes. The issue could be significant in non-formula situations. Finally, if a state converted from non-

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escalating benefits to escalating benefits (or vice versa) the effect could be significant and may need to be treated as a non-formula change.

6. Widow's age and Remarriage Rates

The age distribution of widows alone and widows with child(ren) along with their expected remarriage rate is based on the NCCI 1979 Remarriage Tables. This table was based on remarriage data from the 1930's to the 1970's. (Copy is included in Appendix B.)

7. Statewide Average Weekly Wage

Workers compensation systems generally use a statewide average weekly wage (SAWW) to define benefit parameters (e.g., the minimum and maximum weekly compensation benefits). This SAWW is determined by a state agency, typically the Department of Labor. In Texas, for example, the SAWW for statutory purposes, is based on the average weekly wages for manufacturing production workers as determined by the Texas Employment Commission.

In the NCCI benefit evaluation process, NCCI also needs a SAWW which estimates the average weekly wages for workers compensation claimants. NCCI estimates the SAWW for all private sector non-agricultural employment from the Bureau of Labor Statistics "Current Population Survey" (CPS) data. NCCI updates its SAWW annually.

Differences between the NCCI SAWW (used to estimate the average claimant wage) and the state's SAWW (used to define benefit levels) are to be expected. The important fact to note is that the maximum benefit is tied to the statutory SAWW, not the NCCI's SAWW.

8. Social Security Offset

Several state laws provide that the payment of social security benefits acts to reduce workers compensation benefits. These offsets will apply only to permanent total benefits or to fatal benefits. The average social security benefits that a worker or his family are entitled to depend on the worker's status (i.e., disability or survivorship / retirement) and the dependency distribution. The rules controlling the calculation of

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the social security benefit are complex and NCCI attempts to estimate the proper social security benefit due to a worker based on the worker's age, dependency status and a history of the average weekly wage in the state.

Most of the tables discussed above, in Sections 1-8, are derived from data from the 1970's, or even earlier. This leads to the appearance that benefit pricings will be inaccurate due to the use of outdated information. Although, this is not generally the case, NCCI should consider updating and revising its tables.

C. NCCI Formula Pricing Methodology

The first item NCCI sets forth in their pricing is a comparison of benefits under the old law and the corresponding benefits under the new law. A sample of this comparison is shown in Exhibit 13 (based on a benefit change in Nebraska). These summaries are so concise, that it is often difficult for the outside reader to ascertain the important elements. We believe that the summaries produced by NCCI should be replaced by a more descriptive summary of the fundamental issues being priced.

A typical NCCI filing then proceeds to evaluate the law change effect on each type of injury. In this section, we summarize NCCI's analysis. For ease of reference, our discussion will follow the format of Exhibit 13:

1. Fatal Benefits
2. Total Disability Benefits (Permanent Total or Temporary Total)
3. Permanent Partial Benefits

In addition, we will discuss two other topics:

4. Medical Fee Schedule Changes
5. Escalation

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1. Fatal Benefits

Based on the 1990 NCCI Annual Statistical Bulletin, the percent of incurred benefits attributable to fatal cases ranges from a low of 0.6% in Hawaii to a high of 7.6% in South Dakota, with most states falling in the 1-4% range. Therefore, fatal benefits comprise a small percentage of total benefits, generally less than any other benefit type. However, the fatal benefit cost elements being evaluated tend to be relatively objective, so NCCI will use a detailed model to evaluate the cost changes, despite the likelihood that the rate level impacts will be minor.

The cost of fatal benefits, in most states, are determined by some or all of the following components:

Fatal Benefits Statutory Components

- % Rate of Compensation,
- Minimum/Maximum Weekly Benefits,
- Maximum Aggregate Payable,
- Duration of Benefits,
- Burial Allowances,
- Remarriage Awards,
- Special Fund Assessment,
- Social Security Offset,
- Escalation of Benefits.

To evaluate the cost of fatal benefits pre and post law, the NCCI procedure uses the following data and information:

Data and Information Used

- the Statewide Average Weekly Wage (SAWW),
- Wage Distribution Table,
- Accident Frequency and Average Age by Dependency,
- Average Age of Widows and Expected Remarriage Rates,
- Average Social Security Weekly Benefits,
- Life Annuity Tables.

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Our goal is to describe and comment on the reasonableness of the general methodology used by NCCI to evaluate the cost of fatal benefits due to the statutory provisions listed above.

a. Description of Methodology

The cost of fatal benefits is generally divided into (1) the cost of dependency, (2) cost of burial, (3) cost of remarriage and (4) cost of special funds. We describe the process in general terms below. A more detailed summary of a sample NCCI fatal benefit calculation is included as Appendix B.

(1) Cost of Dependency

The valuation of dependent benefits is determined by the present value of the applicable average (weekly) benefits payable over a specified time duration defined by law. For example, in the case of widows, the duration is generally for life or remarriage while a duration for a dependent child may be to age 18, or 21 if a student.

An annuity value is used to calculate the present value of a unit of benefit payable for the appropriate duration. The annuity value considers the type of benefit (e.g., deferred annuity or annuity certain) and the duration of benefits (e.g., life or term, escalated or unescalated).

In some states, there is a maximum dollar limit to the fatal indemnity benefits. This dollar limit is then used to adjust the estimated duration of the life annuities.

An annuity certain, which is used for evaluating benefits for children, implies the benefits are certain (definite) for the eight year duration. Apparently NCCI considers the probability of the child not surviving too low to reflect in this benefit calculation. The probability of the last-survivor status failing is small, and we concur that it would be a pointless complication to reflect this detail here.

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(2) Cost of Burial

Burial benefits are based on the number of fatal cases and the burial allowance under the statutory law amendment both pre and post law.

(3) Cost of Remarriage

The statutory benefit for remarriage is generally a lump sum award for a specified number of years (e.g., two years). In some states, such as Colorado, this benefit applies only if there are no dependent children. Therefore, the remarriage benefits are computed based on the average of the present value of benefits if widows remarry (1) without dependent child(ren) and (2) with dependent child(ren). The later benefit value is calculated as if remarriage were delayed eight years. The eight year offset represents the period of time for a child of average age (10 years old) to reach age 18, when benefits for dependent children cease.

(4) Cost of Special Funds

The special fund assessment is usually based on the number of non-dependency fatal cases and the special fund dollar amount required under the statutory law amendment both pre and post law.

b. Analysis and Comments

While the composition of the typical family may have changed significantly since the early 1970's, the effect on the benefit change valuations may be reduced because the NCCI method uses the same family structure before and after the benefit change.

To test this hypothesis, we assumed a new dependency distribution and new remarriage rates and repriced a sample fatal benefit change using the standard NCCI distribution and our assumed test distribution (Exhibits 14 and 15). As expected, the effect on the fatal category is not significant.

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Even if the effect were significant on fatal cases, indemnity benefits for fatal cases are a small percentage of the total benefit dollar, so even a substantial inaccuracy in the fatal calculation would have a small effect on the overall benefit pricing.

2. Total Disability Benefits (Permanent Total and Temporary Total)

The cost of total disability benefits, in most states, is determined by the following components:

Total Disability Benefits Statutory Components

- % Rate of Compensation,
- Minimum/Maximum Weekly Benefits,
- Duration of Benefits,
- Waiting Period/Retroactive Period,
- Minimum Benefits Payable (if dependents),
- Social Security Offset,
- Additional Benefits (if dependents).

The significance of the individual components will vary from state to state.

This section provides an overview of the NCCI procedures used to evaluate changes in permanent total disability benefits and temporary total disability benefits. Appendices C and D provide detailed examples of the NCCI calculations for permanent total and temporary total benefits, respectively.

With the exception of Delaware, New Mexico, and Pennsylvania, permanent total indemnity benefits in most states form a small percentage of the total benefit dollar (i.e., less than 5% in most cases).

Permanent total disability claims are evaluated on the basis that the injured worker is unable to engage in any gainful employment due to the injury. Depending on the state, permanent disability status may be awarded based on the seriousness of the injury, the loss of earning capacity, the ability to find employment and other factors.

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Most states also have a presumptive permanent total disability status if the injured worker suffers a specific set of injuries tabulated in the statute.

Temporary total disability implies the worker is expected to return to full time work after a disability period.

a. Description of Methodology

(1) Permanent Total Disability

In the NCCI model, the cost of permanent total disability benefits depends on the state average weekly wage, the duration of benefits, social security offsets, if any, and other statutory benefits. In addition, the duration of benefits may also depend on the number and age of dependents.

The calculations are detailed since they reflect many factors, including the following, as relevant to a particular state:

Life annuities,

Deferred annuities,

Escalation,

Social Security Disability and Retirement Benefits (which have their own set of complex underlying formulas).

NCCI's formula methodology typically does not attempt to measure changes in the frequency of permanent totals that may result from the benefit change. That effect, if any, would be a non-formula change.

The accident distribution by age and dependency used for the evaluation of permanent total disability benefits is based on the Workers Compensation Injury Table for Fatal Disability (Exhibit 7).

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Where appropriate, the benefits may be offset by social security benefits.

(2) Temporary Total Disability

The cost of temporary total disability benefits depend on the statutory waiting period (i.e., the minimum days lost before workers compensation benefits become available), the retroactive period (i.e., the minimum days lost after which the worker can recoup the disability benefits for the waiting period), the state average weekly benefits and the total days of disability.

In a small number of states, temporary total benefits may be subject to escalation, if the period of disability is long enough. For example, in Maine, total disability is subject to escalation on the third anniversary of the date of injury. Also, Connecticut escalates total disability on the anniversary of the injury date.

b. Analysis and Comments

(1) Permanent Total Disability

As with fatal benefits, permanent total indemnity benefits in most states form a small percentage of the total benefit dollar, so the overall formula pricing is relatively insensitive to the accuracy of the permanent total pricing. Moreover, by using the same benefit duration before and after the benefit change, the table accuracy does not significantly affect the results. Therefore, the key component in the accuracy of the pricing is the performance of the wage tables.

(2) Temporary Total Disability

The distribution of durations impacts the pricing only if there is a change in waiting period or retroactive period. This is an infrequent occurrence. Otherwise, the same distribution of durations is assumed to apply under both the old law and the new law. Therefore, as with

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the other injury types studied so far, the key component of the formula benefit calculation is the wage table.

The frequency of short duration cases is based on estimates since NCCI only captures data when there has been a claim (i.e., when the waiting period has been exceeded). Since waiting periods vary by state, there is still some actual data available to price short term disabilities. However, the data for short term durations is based on the smallest sample size and is therefore subject to the greatest uncertainty. NCCI should be able to update the duration tables based on DCI data. The duration of temporary total cases is affected by a number of factors including the following:

- i. Extent of injury,
- ii. Effectiveness of medical treatment,
- iii. Incentives for return to work.

Forces that may have changed these factors, since the duration tables were constructed in the early 1970's, include the following:

Changes in the industrial mix (i.e., changes from manufacturing to service based economy),

Advances in medical technology,

Changes in family composition and other demographic factors,

Changes in economic cycles.

We recommend that NCCI consider updating the duration tables and continue to monitor durations on an ongoing basis. It seems likely that the duration of claims will be influenced by the waiting periods and retroactive periods in the state. For example, if a state has a 21 day retroactive period, it seems likely that there will be a cluster of

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disabilities lasting exactly 21 days, while a state with a 14 day retroactive period would have its cluster at the 14 day point. Therefore, using a single countrywide table in all states may not be the best way to reflect the impact of changes in waiting periods or retroactive periods.

One of the goals of a workers compensation system is to mitigate the hardship of loss of wages when a worker is injured. This goal is balanced by an alternative aim which is to speed the return to work. Most workers compensation systems attempt to balance these goals by paying the worker 66 2/3% of his pre-injury wage, subject to minimums and maximums that vary by state.

The 66 2/3% benefit is tax free and therefore the worker is receiving a higher percentage when the benefit is compared to his net wages (take home pay). If the workers compensation benefit is above or close to the pre-injury take home pay, then the worker may be financially better off collecting workers compensation than returning to employment. Thus, the level of workers compensation benefits affects the incentives for return to work.

When there is a significant change in the average weekly benefit, the incentives for return to work are likely to be modified. This issue is commonly referred to as "utilization". Utilization deals with both the frequency issue (i.e. changes in the number of filed claims) and the duration issue (i.e. changes in the length of time out of work).

The NCCI procedure does not normally include utilization adjustments. However, when there is an increase of more than 5% in the wage replacement rate, the NCCI procedure is to include a factor to reflect increased utilization. Increases of this magnitude were common in the 1970's and were uncommon in the 1980's, but a number of states have recently considered significant increases in temporary total benefit levels. It would be desirable for the NCCI to have better tools available to study this issue. The topic of utilization will be discussed more in Section IV.

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3. Permanent Partial Benefits

Permanent partial benefits form a significant block of the total benefit dollars in most states. The percentage ranges from approximately 30% to approximately 70%. Permanent partial indemnity benefits form the largest percentage of total indemnity benefits in all states. Due to the wide variation in the types of benefits contained in the permanent partial benefit package, this area is the most difficult to price under a formula structure.

The definition of a permanent partial injury varies by state. While many states do not use the term "permanent partial" in their statutes, those states do provide additional benefits to workers, who after a return to work, still exhibit residual impairment because of the work related injury.

The process of adjudicating the existence and/or degree of a residual impairment varies by state. The process may involve the courts and/or administrative adjudicators. Impairments may be assessed using doctors retained by each party to the dispute, or by using an independent medical examiner, or both of these. In practice, each state is somewhat unique in terms of its adjudication process. When states are considering revising their workers compensation systems, the issue of how to determine eligibility and impairment is frequently raised. NCCI's models do not now address the cost effects of different procedural and adjudicatory approaches.

NCCI segregates permanent partial injuries into major permanent partial and minor permanent partial. In the sections below, we outline the methods that NCCI uses to price a law effect for major permanent partial and for minor permanent partial. Finally, we describe some considerations when the "critical values" used to distinguish major and minor for permanent partial injuries are not current.

Benefits for major permanent partial and minor permanent partial injuries can usually be divided into two parts: healing period and permanent partial disability benefits. The permanent partial disability benefits are further subdivided into scheduled injury benefits and non-scheduled injury benefits.

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During the healing period, the worker is totally disabled and receives the statutory total disability benefits. Once a permanent partial injured employee is able to return to some gainful employment, the employee may have diminished earning capacity and/or diminished bodily functions. The permanent partial award amount is the compensation for diminished earning capacity and/or diminished bodily functions.

Benefits for diminished bodily functions are usually classified as either scheduled or non-scheduled benefits. Scheduled benefits relate to injuries specifically listed in the individual state workers compensation statutes with specific benefits. For example, loss of use of an arm may entitle the worker to 100 weeks of benefits at 66 2/3% of the worker's average weekly wage subject to the statutory minimums and maximums.

Non-scheduled injuries are those permanent partial injuries which do not specifically appear in a state's schedule of injuries. These are compensated based on either wage loss, loss of earning capacity, some type of impairment rating schedule, or other means.

Finally, some states have additional benefits for permanent partial injuries, for example, vocational rehabilitation benefits. Some states offer both an impairment benefit and a wage loss type of benefit.

Critical values are dollar amounts that NCCI uses to distinguish permanent partial major claims from permanent partial minor claims. (Critical values are discussed in more detail in Appendix A.) These critical values have not kept pace with inflation. Thus, injuries that were once considered minor and were used to generate the distributions in the injury table for minor injuries, could currently be classified as major. This would cause a problem when calculated benefit changes are significantly different for major and minor permanent partial injuries. Based on benefit changes in all states from 1985-1989, we observed only four cases out of 288 benefit changes where the difference between the benefit change for permanent partial major exceeded the change for permanent partial minor by more than 4.6%. In those cases, solutions for dealing with the problem include the following:

- Calculate a combined effect for major and minor using combined injury table distributions. This approach has been followed by NCCI in some states (e.g., Colorado, Florida, New Mexico, Rhode Island and Texas).

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- Estimate the effects on major and minor by the use of external data which reflects the actual experience as reported.

NCCI has a process for updating critical values which will eventually eliminate this issue. The process involves updating critical values by 10% per year until they reach the indicated amount based on a 1989 study which adjusted the original 1966 critical values for subsequent benefit changes and cost level changes. (See Appendix A for more details.)

a. Description of Methodology

For benefit change valuation purposes, NCCI generally segregates the benefits due to an employee into two categories, the "healing period" and the permanent award. The permanent award is further divided into two components. In this section, we will describe the standard NCCI methodology for calculating the effect of a law change on each of these three parts separately, that is, permanent partial scheduled benefits, permanent partial non-scheduled benefits, and healing period benefits.

The key components of the NCCI valuation are presented in the following table:

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(1) Permanent Partial Scheduled Injury Benefits

% rate of compensation for schedules permanent partial benefits,
minimum/maximum weekly benefits for scheduled permanent partial benefits,
duration of benefits for scheduled permanent partial benefits,

(2) Permanent Partial Non-Scheduled Injury Benefits

% rate of compensation for non-schedules permanent partial benefits,
minimum/maximum weekly benefits for non-scheduled permanent partial benefits,
duration of benefits for non-scheduled permanent partial benefits,

(3) Healing Period Benefits

% rate of compensation for healing period,
minimum/maximum weekly benefits for healing period,
duration of benefits for healing period,

(4) Other

Other benefits, such as rehabilitation, if any.

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A discussion of these components follows:

(1) Permanent Partial Scheduled Injury Benefits

To calculate the monetary effect of a law amendment on scheduled injuries, NCCI tabulates the following information on a pre and post law basis:

- i. Distribution of injuries by type.
- ii. The number of weeks of compensation payable under the statute, by injury type.
- iii. The state average weekly benefit cost for the type of injury.

The product (i)x(ii)x(iii) would give an estimate of the monetary effect pre and post law change.

The actual implementation of all these calculations involves a significant amount of detailed analysis. A complete description of the methodology appears in Appendix E, Part A.

If the only law change is a revision in the weekly minimums and maximums, then the number of weeks of compensation payable would be the same under the new law as under the old law. In such a simplified situation, the only data needed could be the percentage of benefits attributable to the schedule and the percentage attributable to the healing period.

However, in the sample state shown in Appendix E, Part A, more detail is needed. The scheduled permanent partial benefits have varying percentage compensation rates, so that a breakdown of the percentages for the healing period and a breakdown for each level of permanent

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partial benefits is needed. The degree of detail required depends on the nature of the law change.

(2) Permanent Partial Non-Scheduled Injury Benefits

The calculation of benefits for permanent partial non-scheduled injuries is very similar to the calculation for scheduled injuries, in that NCCI uses an estimate of the number of weeks of benefits that are payable and an estimate of the average benefit. In a "wage loss" state NCCI must also estimate the average wage loss for a person who sustains a permanent partial non-scheduled injury. NCCI estimates that a 40% wage loss reduction applies for major permanent partial injuries and a 25% wage loss reduction for minor permanent partial injuries. Additional details on the permanent partial non-scheduled benefit calculation are contained in Appendix E, Part B.

(3) Healing Period Benefits

The calculation of the cost of healing period benefits is also very similar to the calculation of the cost of scheduled benefits. NCCI separately estimates a duration of healing period benefits and an average cost of healing period benefits. Typically, NCCI assumes that the duration of healing period benefits will be the same under the "old law" and the "new law", while the average cost of healing period benefits will change. Details underlying this calculation appear in Appendix E, Part C.

(4) Other

If other benefits are due, NCCI estimates their cost based on the statutory provisions.

b. Analysis and Comments

NCCI's permanent partial benefits calculation are typically based on the following tables and assumptions:

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- i. Injury Table of major permanent partial injuries.
- ii. 1973 Standard Wage Distribution Table.
- iii. Assumption that the percentage of wage loss is 40% for major permanent partial and 25% for minor permanent partial for non-schedules injuries.
- iv. 1979 Total Population Annuity Table with interest rate of 3.5% and an escalation rate of 0.00% per annum. (Used to obtain annuities for non-scheduled benefits.)

Typically, the average weekly benefit is the only component that is changing from the old law evaluation to the new law evaluation. The effect of this change is measured by use of the 1973 Wage Distribution Table. The other three items in the list above are used to calculate the weights to be applied to various components that have changes in average weekly benefits from the old law to the new law.

A number of steps in the calculation use present value calculations. The standard NCCI benefit calculation displays little documentation of how the present values are calculated.

As we noted for the injury types previously discussed, the most significant factor in the formula benefit pricing for permanent partial is the wage table calculation. Generally for other components, the same distributions are applied both before and after the benefit change. Therefore, the calculated effect is relatively insensitive to the distributions used.

There is little empirical data on non-scheduled permanent partial benefits. Therefore, a great deal of reliance on the assumptions regarding wage loss and duration of benefits is necessary. These assumptions may not be critical for formula benefit changes, since the assumptions only impact the weights for various weekly benefits. More analysis is needed for a non-formula benefit change.

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4. Medical Fee Schedule Changes

There are two types of medical fee schedules in use. The first kind lists each procedure and assigns it a dollar value. The second kind is known as a relative value schedule. Here, each procedure is assigned a number of units, which reflect the relative cost of the procedure. A "conversion factor" is used to convert the units to dollars. Some states have a schedule reflecting both absolute dollars for some kinds of procedures and relative values for other procedures.

a. Description of Methodology

Two kinds of pricing will be required in considering medical fee schedules: (1) pricing the initial implementation, and (2) pricing changes to the fee schedules. In this section, we will only discuss the pricing of medical fee schedule changes. NCCI regards (and we concur) that the implementation of a medical fee schedule is a non-formula benefit change.

NCCI uses its distribution of medical procedures (Exhibit 11) and compares that to the procedures in the fee schedule. All procedures that appear in both are called "matchable items." Procedures that appear in the state's medical fee schedule, but not in the NCCI table, are known as non-matchable. When there is a change in a medical fee schedule, the percentage effect on non-matchable items is assumed to be the same as for matchable items. Based on sample data we reviewed, matchable items in two states were 73% and 77% of the total cost of fee schedule items. (What is matchable and non-matchable will vary by state.)

Exhibit 16 shows examples of the material included in typical NCCI rate filings for pricing a medical fee schedule change. There is relatively little detailed support in the filing material. Given the level of detail provided for the indemnity formula benefit calculations, it would be appropriate to display the frequency and cost distributions under the old medical fee schedule and the new medical fee schedule.

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The effect of the medical fee schedule is then weighted with other medical costs and hospital costs to generate an overall percentage change. (Exhibit 16) These weights are based on a countrywide analysis.

b. Analysis and Comments

The technique for evaluating medical fee schedule changes is straightforward. That is, tabulate the counts and amounts of procedures under the old cost structure, and then perform the same evaluation under the new cost structure. The key to correct pricing, therefore, lies in using the correct distribution of procedures. The NCCI frequency distribution derived in the 1960's is substantially out of date. For example, a CAT Scan is a well known and expensive procedure that is often used today, but did not even exist in the 1960's.

The move towards newer and more expensive technologies is often cited as a factor causing medical costs to rise faster than the overall rate of inflation. Future efforts in controlling rising workers compensation costs are likely to be directed at medical cost containment. The NCCI law change data base seems incapable of measuring this kind of effect.

If a medical fee schedule is revised in order to keep up with overall cost level increases, then the benefit effect calculation is not sensitive to the distribution used. For example, Exhibit 17 shows a medical fee pricing where all conversion factors increased by 9%. In such a simple situation, a distribution is not even needed. However, if a medical fee schedule is revised in a non-uniform manner, then valuation accuracy depends on having an accurate distribution of the majority of procedures.

The current NCCI standard distribution, which is substantially out of date will not meet this goal. NCCI is attempting to revise their distribution using data obtained from medical auditing firms. In the meantime, they continue to use it in most states.

A problem cited with some fee schedules is that changes in utilization of medical services can defeat the cost controlling mechanisms of the fee

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schedule. NCCI's pricing mechanism also appears incapable of capturing this phenomenon.

Finally, when a fee schedule is installed for the first time, accurate pricing requires a distribution of current procedures and their costs. As noted above, this kind of change is considered a non-formula adjustment. Here, the NCCI must make use of external data sources due to the shortcoming of their 1960 data base. The NCCI obtains data from companies that perform medical bill reviews.

Medical cost containment is frequently cited as a problem for workers compensation. The percentage of total costs contributed by medical expenses has increased from 30% of total costs to 40% of total costs over the past decade. There is likely to be increased attention focused on medical costs, and therefore, it is necessary that the NCCI improve its ongoing data collection capabilities for medical costs and frequencies in order to both price and monitor the issues of medical costs.

5. Escalation

Some states have provisions that allow for escalation of benefits. The escalation process varies from state to state. For example, escalation may apply to all benefits that exceed a certain duration or it may apply only to specific types of injury (typically fatalities or permanent totals). The escalation may start one year after the injury date or it may begin after a longer delay. Finally, the amount of escalation may depend on the actual change in the CPI or some other index, or the amount of escalation may be capped.

a. Description of Methodology

The sample benefit revisions we reviewed in the previous sections did not have escalation provisions in their statutes. In states with unlimited escalation, NCCI will typically use a 6% escalation in their calculations. In states where escalation is capped, NCCI will either use the cap value or estimate the effect of the cap.

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b. Analysis and Comments

In a formula change where the escalation rate is not changing, the treatment of escalation is not significant since the same annuity factor (or equivalently, duration of benefits) will be used for old law and new law. However, if the escalation provisions are changing in a formula benefit calculation, the issue of how to reflect escalation becomes more important, since different annuity factors will apply under the old law and the new law. We find that NCCI's treatment of escalation appears to be reasonable for formula benefit changes. In cases where escalation rates are being modified, we recommend that NCCI filings include more substantiation of its annuity calculations.

Furthermore, if escalation were being modified for permanent partial claims, then we would have a higher level of concern regarding the accuracy of the calculations. In the example discussed in Appendix E, Part B, regarding the annuity calculations for non-scheduled major permanent partial, we observed a lack of detailed support for the derivation of the annuity factors included with the standard filing material. In addition, based on the NCCI model, the wage loss attributable to the non-scheduled portion of major permanent partial formed more than 60% of the total major permanent partial benefit package. Therefore, in such a case it would be important to obtain accurate annuity figures to measure the impact of a change in escalation.

6. Relationship of Benefit Changes to Trend

The goal of the NCCI benefit evaluation model is to estimate the change in loss dollars associated with a change in benefit parameters. However, NCCI uses this information as input to the ratemaking process which aims to compare an estimated future level of losses to an estimated future exposure base.

As discussed, in the trend chapter of the Examination, Section II.B.3, benefit changes can be expressed in either of two ways: (1) as a percentage change in absolute loss amounts, as is done in the NCCI model, or (2) as a change in loss amounts relative to payroll. In the second method, a change in maximum and minimum benefits based on a change in statewide average wages generally produces no effect.

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If applied consistently, the two methods should produce similar results in many ratemaking situations. Assuming benefit increases over time, Method 1 starts with higher adjusted past loss ratios, but will require less trend; Method 2 will apply higher trends to lower past loss ratios. The difference between the two methods tends to become more discernable as older years of data are used for trending, as Method 2 avoids the distortion in current NCCI adjustment procedures which is noted in Section IX of the trend section of this examination.

A simple example of this principle appears in Appendix F. In states where there are only indemnity benefit changes that match wage inflation (i.e., the percentage relationship between the maximum benefit, the minimum benefit and the statewide average weekly wage remains constant), this principle can be applied by making no adjustments at all to past losses.

In states where benefits change irregularly, a simple way to perform these calculations is to first determine "benefit relativities"; that is, the cost of past benefit levels and the prospective benefit level divided by the cost of an unlimited benefit level (a benefit level without any minimums or maximums). Each of these calculations would be performed using the average wage levels in effect during each of the past experience periods and then for the average wage level projected to be in effect prospectively. Using such a methodology, the adjustment to past loss ratios is determined by dividing the prospective "benefit relativity" by the various "benefit relativities" that existed in the past. (This calculation is simpler when benefit changes are not dramatic at any one time. When a dramatic benefit change occurs, then the expected change in utilization needs to be recognized. This consideration is not, however, unique or different with Method 2 as opposed to Method 1.)

It should be noted that, unlike Method 1, Method 2 requires past loss ratios to be adjusted to a prospective benefit relativity even if there has been no recent law change. In states without automatic benefit adjustments, it might mean that this adjustment would decrease, rather than increase, past indemnity loss ratios at current rate level. This corresponds to the fact that benefit levels decrease relative to exposures when benefits are not changed as the average wage increases. The trend section of this examination explores aspects of the current NCCI methodology (Method 1) in greater detail.

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In Section II.B.3 (Trend), recommendations were made regarding the methodology for calculating the impact of benefit changes. It is essential that the same approach be used in trend calculations and in overall ratemaking calculations. We recommend that for states where NCCI implements the alternate approach (Method 2) for trend, then the same change should be made in the benefit evaluation methodology.

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IV. REVIEW OF NON-FORMULA BENEFIT CHANGES

The identification of a benefit change as a "formula" benefit change or a "non-formula" benefit change is not clear cut. We asked the NCCI to supply us with all "non-formula" benefit change filings over the past five years. They supplied us with the following five benefit evaluations:

Florida, Effective 7/1/90

Oregon, Effective 7/1/90

New Mexico, Effective 1/1/91

Washington DC Effective 3/1/91

Texas Effective 1/1/91

According to NCCI, a formula change is any change that can be priced by the existing databases, and a non-formula change is a change that requires additional data and information. We consider a formula change will be any benefit revision that involves only one or more of the following items:

- Changes in maximum weekly benefit,
- Changes in benefit level as a percentage of gross wage,
- Changes in waiting periods,
- Changes in retroactive periods,
- Changes in escalation rates,
- Changes in medical fee schedules.

The difference in definitions is significant, because it highlights the issue of when NCCI should use non-formula methodologies.

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Our objective for the review of NCCI's non-formula techniques was to review the effectiveness of NCCI when presented with non-formula type law changes. To accomplish this objective, we did the following:

- Listed the kinds of non-formula changes proposed in the states shown above.
- Identified types of non-formula changes that can be expected to occur in the future.
- Listed the alternative techniques and data sources NCCI used in the states shown above.
- Outlined an alternative approach to pricing non-formula benefit changes.
- Discussed public perception of NCCI's role in benefit pricing.

Our results are described below.

A. Typical Non-Formula Changes

Based on our review of the benefit pricing filing material submitted to us by the NCCI (for the states noted above), we observed the following non-formula issues:

1. Wage loss percentages - FL, TX
2. Wage loss depends on permanent impairment rating - FL
3. Compensability of pre-existing condition - OR
4. Occupational disease standards - OR
5. Use of managed care - OR

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6. Standards for disability ratings - OR, TX
7. Eliminate "Economic Permanent Totals" - NM
8. Guidelines for rating permanent partial - NM
9. Vocational rehabilitation changes - NM, DC
10. Changes to benefit administration - TX

B. Future Non-Formula Changes

Based on these 10 items, and our additional research, we have developed a classification of 8 categories where we expect non-formula changes to occur in the upcoming years. These categories are:

1. Compensability,
2. Objective standards for the evaluation of permanent partial injuries,
3. Changes in compensation for permanent partial,
4. Changes in rehabilitation programs,
5. Changes in benefit administration,
6. Changes to reduce litigation,
7. Attempts to decrease interdependence of economic conditions (e.g, unemployment) and workers compensation benefits,
8. Medical cost containment issues.

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Each of these areas is discussed below.

1. Compensability

This category includes all attempts to restrict or more clearly define what injuries will be covered by workers compensation. Examples include changes in coverage for heart attacks, stress claims, and occupational disease. Coverage of pre-existing conditions or second injury issues would also fall into this category.

2. Objective standards for the evaluation of permanent partial injuries

This item would include the use of guidelines for disability ratings, such as the AMA guide, as well as modifications based on age, education, and other factors. In some states, if all injuries are required to be evaluated by guidelines, then the difference between scheduled and non-scheduled injuries is reduced. However, to estimate the impact of cost changes under such a system, NCCI would require more detailed information on non-scheduled injuries.

3. Changes in compensation for permanent partial injuries

This item would include conversion to a wage loss system, removal of a wage loss system, and changes in wage loss systems. It could also include changes in the definitions of wage earning capacity and of disability. Some of the issues here overlap with the standards for the evaluation of permanent partial injuries cited above.

4. Changes in rehabilitation programs

States are constantly changing their approaches towards vocational rehabilitation. Some states are making the programs mandatory, while others are converting mandatory programs to optional programs.

5. Changes in benefit administration

A prime recent example is Texas, which revised the entire approach to handling and adjudicating claims. Other states have considered changes in the use of independent medical examiners and in staffing levels at Workers Compensation Commissions.

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An important component of benefit administration is the area of dispute resolution. We expect that a number of states will be enacting legislation that will impact this area. Examples of possible changes include encouraging/or requiring informal hearings, adding or subtracting layers to the chain of the dispute resolution mechanism, encouraging/discouraging the use of lump sum settlements, as well as many other potential changes.

The issue of changes in the permissibility of lump sum settlements is an important consideration, but is not reflected in NCCI pricing models.

6. Changes to reduce litigation

While this area relates closely to changes in benefit administration (e.g. regulations regarding informal conferences), states may also change how lawyers are reimbursed for representing claimants.

7. Attempts to decrease interdependence of economic conditions and workers compensation benefits

This would include changes in "deemed wages", changes in job search requirements, and other factors. (Deemed wages are the wages an injured employee is considered to have earned based on an offer of employment.)

For example, the New Mexico law change enacted January 1, 1991, changed the definition of permanent total to include only "presumptive" permanent total cases, that is, total loss of use of two major members. The previous definition allowed permanent total to be awarded if the injured worker was unable to work in a suitable occupation.

In Maine, the November, 1987 law change restricted permanent total to presumptive cases and those cases failing a statewide work search requirement. The statute says

"Any employee who has reached maximum medical improvement and is able to perform full-time remunerative work in the ordinary competitive labor

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market in the State, regardless of the where the availability of such work in and around his community, is not eligible for compensation under this section."

We expect to see other attempts to unlink the condition of the economy from the amount of workers compensation benefits.

8. Medical cost containment

This would include changes in physician selection rights, changes in managed care requirements, changes in the use of chiropractors, adoption of utilization guidelines and other factors.

C. NCCI Approach to Non-Formula Changes

This issue is affected by recent staffing changes at NCCI. In the past, the benefit pricing unit at NCCI consisted of approximately 6 people reporting through the Vice President of National Affairs, to a Senior Vice President, to the Chief Operating Officer. In the current structure, the Benefits Pricing Unit reports to the Senior Vice President, one step closer to the President, and more important, staffing will increase to approximately 22 people.

These substantial changes may make our comments or analysis based on the past structure irrelevant for future activities. However, we will describe some of the issues relating to NCCI's past performance as these may provide some guidance as to how NCCI might best focus its efforts.

1. What is a non-formula rate change?

We previously described the difference between our definition of formula changes and NCCI's definition. In the chapter on formula pricing, we noted that NCCI tools worked effectively in situations fitting our strict definition of formula changes. This is due to the relative insensitivity of wage tables and other distributions to the normal formula law changes. If the distributions might shift from old law versus new law, or if the type of change is broader than the typical change, we would consider it to be a

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non-formula change. We believe it is important that NCCI recognize when its tools will be appropriate and when they will not be appropriate.

2. What alternative techniques or data sources did the NCCI use in their analyses?

Even when NCCI recognizes a proposed benefit change as non-formula, they still structure their pricing efforts around the formula pricing components. That is, pricing by type of injury and using, to the extent possible, the tables and relationships of the formula pricing. However, they add external data inputs.

In our review of the 5 non-formula rate filings, we observed the use of a number of alternative data sources including:

- Surveys of claims personnel,
- Insurance department studies,
- Experience in other states,
- Samples of claims at the Workers Compensation Commission,
- Local Workers Compensation Commission reports,
- Detailed Claim Information data,
- Government statistical reports,
- Studies/Surveys with local insurance claims personnel and local state agencies.

Regarding alternative techniques, we noted the use of the following:

- Evaluation of Claim files under alternative legislation,

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- Use of estimates derived by other parties (e.g. in Florida, NCCI used some of the findings of another consulting firm in estimating the impact of some of the law change provisions on medical costs),
- Greater reliance on assumptions of distributions. For example, for a Texas law evaluation, assumptions had to be made regarding the distribution of losses subject to attorneys fees.

Clearly, the extra data and techniques noted above can be a valuable addition to the pricing approach. We find that all of the items listed above have the potential to add additional insight to the pricing process. However, a review of the actual application of the data and techniques noted above is beyond the scope of our assignment.

A key issue is knowing when the formula approach does not apply. NCCI has been inconsistent in this extremely important area.

D. Framework for Pricing Non-Formula Benefit Changes

The pricing of non-formula changes in benefit levels is a complex problem. It is complex for reasons that include the following:

- Reliable estimates cannot be derived from purely "mechanical" models.
- The pricing depends on judgement regarding the choice of data to be used and the assumptions to be applied in producing a pricing model.
- The pricing models are subject to the use of alternative assumptions that would, in turn, lead to different results.

If the situation involved merely tabulating frequencies and costs under the current system and then calculating revised costs only under the revised system, the problem would be approachable on a purely mechanical level. This is the approach NCCI follows in their formula benefit pricing. Given a sufficiently detailed and up-to-date data base, any benefit change that only affected the relative price of components

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could be evaluated. However, it is possible that the required size and detail of the data base could make the pricing problem monumental.

Unfortunately, workers' compensation is a more complex system than that. The overall cost of the system is affected by costs and frequencies of claims. However, frequencies are influenced by behaviors, and behaviors will change based on various incentives. As legislation is changed, incentives will change.

The cost of a workers compensation system is affected by many external factors. For example, we have compiled the following list which itemizes a number of factors that could reasonably be expected to impact on the number of workers compensation claims filed in a given state.

1. Benefit Level

A number of studies have researched the question of the relationship between the frequency of claims and the benefit level/wage replacement rate. A number of these studies have concluded that increases in benefit levels are highly correlated with increases in claim frequency. (NCCI procedures rarely reflect this relationship.)

2. Unemployment Rate

As unemployment levels change, the rate of workers compensation claim filings may also change. In addition, the rating mechanism charges employers based on current payrolls. This may result in a mismatch for insurers between exposure to loss and premium income.

3. Work Force Age

A more experienced work force may tend to have a different level of claims activity than a less experienced work force. Furthermore, older workers may be subject to more injuries, or their injuries may be more serious. Injured workers near retirement may have a reduced incentive to return to work.

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4. Income Level

A highly paid work force may tend to file fewer claims since their wage replacement rate may be very low. On the other hand, once a claim is filed, the level of attorney involvement may differ by wage level and the settlement value of the claim may differ. These factors may cause a different distribution of small and large claims based on income level.

5. Safety

A safer work place would tend to give rise to fewer claims.

6. Medical Insurance Availability

If no other medical insurance is available, this may tend to encourage the use of the workers compensation system.

7. Attorney Involvement

The size and interest of the attorney population may affect the level of claim filings. In addition, the workers compensation law and its provisions for compensating attorneys is a related issue.

8. Administrative Process

If the Workers Compensation Commission is perceived as permissive, this may tend to encourage claim filings. Additionally, if the administrative process is backlogged, this may have complex impacts on the frequency and size of workers compensation claims.

9. Unionization

Unions may tend to keep the work force more informed of their rights and remedies.

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10. Self-Insurance

If the "better" risks in a market self-insure, the remainder will tend to have a higher claim frequency.

Clearly, a pricing model, that reflected all of the above factors and their inter-relationship would be complex. Even though all variables cannot be fully considered, the most important changes NCCI could make to improve their ability to more accurately price non-formula benefit changes are the following:

1. Improve the method of identifying law changes significant enough to require the use of non-formula techniques. NCCI might use sensitivity tests to judge when results are highly dependent on old or untested assumptions. For each of the key elements in a benefit pricing analysis, NCCI could estimate the cost impacts using a range of benefit values for those assumptions. Then they could demonstrate how the outcomes would vary based on changes in the input assumptions.

Another mechanical trigger might be a comparison between the actual average claim size based on WCSP data compared to the average claim size derived from the NCCI pricing mechanism. (This topic is discussed in Appendix E.) Large differences could indicate that the pricing mechanism does not properly reflect the operation of the workers compensation system in the state being studied.

Other possible means to improve the recognition of law changes significant enough to require non-formula techniques would involve greater use of local advisors.

2. Increase the utilization of state specific information regarding the workers compensation benefit system in the jurisdiction being analyzed. A potential criticism of the NCCI has been that all the tables and formulas underlying their benefit pricing are based on countrywide data. This can be a more acute problem when the state enacting revised legislation is in a "crisis" mode. Local representatives at that point may feel that their state is far from average. To address this problem, NCCI is planning on expanding their DCI call to all states.

This is a valuable step in the right direction. Moreover, current efforts by the NAIC and the International Association of Industrial Accident Boards and Commissions

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(IAIABC) are resulting in recommendations for the capture of additional data. We feel that it is crucial that more data be available, and if data requirements can be common among the states, this will improve the quality of research. We have not explored what the appropriate level of data elements should be for evaluating workers compensation systems. A review of the extent of additional data collection is beyond the scope of our assignment.

3. Rely on input from non-actuarial areas (e.g., economics, claims, legal, etc.) in developing pricing models. The workers compensation benefit system is impacted by many forces and has many different players participating in the process. At a minimum, input from local claims personnel and local attorneys should be evaluated. Other sources of insight could include local Workers Compensation Commission members and Insurance Department personnel.

4. Develop a data collection model facilitating retroactive review of the effects of major benefit changes. This would include establishment of measures to test the actual versus expected impact of critical elements in the law revision. For example, if a benefit change was expected to impact utilization, then data measuring the frequency and duration of injuries by type both before the legislative change and after the legislative change could be used to evaluate the effect of the legislation. NCCI has already proposed a number of such procedures to their member companies. Exhibit 18 displays the minutes of a Rates Committee meeting on this topic.

5. Improve models to measure the effect of changes in benefit administration. The Texas benefit changes effective 1/1/91 overhauled the benefit administration and the dispute resolution. However, many states enact smaller adjustments that attempt to increase the efficiency of the benefit delivery process or modify time frames for adjudication. The current NCCI approach attempts to model the way the workers compensation law looks on paper, but typically does not reflect the practical aspects of administration.

6. Develop models to better analyze potential changes in benefit utilization. It would be desirable to have tools available to estimate the changes in the frequency and duration of benefits for both temporary total and permanent partial claims based on changes in other system cost elements. The duration of claims can also be affected

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by staffing levels at the Workers Compensation Commission, the extent of legal involvement, and other system elements.

7. Improve the explanatory material included with the benefit pricing report. Currently, for formula benefit changes NCCI provides a large amount of details, but essentially no explanation of what they are doing. For formula benefit changes NCCI should reduce the material included in a filing, but it should develop a clear supplemental report that describes the procedures and explains the methodologies. For non-formula benefit changes, NCCI should increase the amount of explanatory material and indicate clearly, assumptions used and the data sources.

E. Public Perception of NCCI's Benefit Pricing Methodology

We interviewed a number of parties involved with various aspects of workers compensation and asked for comments regarding their perception of how the NCCI prices benefit changes. (This involved telephone interviews with 8 persons from labor, management, research, workers compensation agencies, and other areas.)

While we do not regard our limited sample as complete or a thorough random sample, we believe that the comments are interesting and lend some valuable insight into our research.

Generally, those interviewed believe NCCI benefit pricings are difficult to understand. Most interviewees also stated that they found the NCCI personnel to be cooperative and reasonable. However, the lack of intuitive understanding of the material by the recipients reduces the confidence in the conclusions.

We agree with these observations. We find that the benefit formulas and pricing are difficult to understand, even for parties with substantial expertise in the area. Moreover, in non-formula valuations, the problems are more pronounced.



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V. TESTS OF THE WAGE DISTRIBUTION TABLE

A. Updating the 1973 Standard Wage Distribution Table

1. Background

In general, NCCI uses the 1973 Standard Wage Distribution table in all of its benefit calculations. For a recent filing in Texas, they were asked to support whether the use of this table was appropriate. In response to this request, they produced a graph showing the difference between the 1973 wage table and an average table constructed from states with available DCI data. This graph, (Exhibit 19), seems to indicate very little difference between the 1973 table and the average DCI table. In addition, we measured how the individual state tables differed from the 1973 Standard Table.

2. Analysis and Comments

We tested the average change in weekly benefits for a sample revision in temporary total disability costs based on a change in the maximum benefit.

The pricing parameters used were as follows:

	Pre <u>Law</u>	Post <u>Law</u>
% Rate of Compensation	66.67%	66.67%
Minimum Weekly Compensable Wage	\$ 0.00	\$ 0.00
Maximum Weekly Compensable Wage	\$380.77	\$415.38
Average Weekly Wage	\$353.07	\$353.07

We priced this component of a benefit change with the 1973 Standard table and several individual DCI State tables. (See Exhibit 20 for details underlying our calculations.) We generated the following outcomes:

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<u>Wage Table Used</u>	(1) <u>Benefit Change</u>	(2) =[(1)/1973 Std]-1.0 <u>Ratio to Base</u>
1973 Standard	3.5%	Base
Wisconsin	4.1%	+0.6%
New York	4.3%	0.8%
Florida	3.6%	0.1%
USL&H	2.3%	-1.2%

Column (2) shows the effect on the benefit calculation from changing from the 1973 Standard Wage Table to various state tables.

These results show that for the sample benefit calculation, the effect of table changes is under 1%, except for USL&H.

Even though the differences in benefit pricing from using various wage tables are slight, it seems prudent to revise the distributions underlying benefit pricing more frequently than once every twenty years. However, it is reassuring that the key ingredient to the formula benefit pricing appears to produce stable results. We recommend that once the revised DCI data is available, NCCI study the possibility of using state DCI generated wage tables in all states.

We believe the use of state wage tables may be feasible. Arthur Anderson & Company (AA&Co.) did some preliminary analysis of data reported through the DCI that is used to generate the state by state wage tables. Although they did not study the source data at a company level, they reviewed the conversion process from company reports to DCI files. Based on their preliminary findings, the wage data in the DCI appeared to be of reasonable quality. The DCI captures wage data for a sample of injured workers. Wage tables are constructed based on a wage distribution of injured workers only, as opposed to all workers.

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B. Wage Distribution Tables for Class Groups

1. Background

To study the effect of varying the wage tables by class group, we requested that NCCI use DCI data to construct wage tables by Industry Group (i.e., Manufacturing, Contracting, and All Other) for the four largest DCI states, Florida, Illinois, Michigan, and Pennsylvania. Using this additional information, we conducted a series of tests as follows:

- Test 1. For each industry group for each state, we observed the percentage of total workers and the percentage of total wages at various relativities to the statewide average wage (Exhibit 21).
- Test 2. For the state that had the largest spread between the average weekly wage among the Class Groups (Illinois), we tested the sensitivity of the standard NCCI pricing formula using the standard NCCI pricing formula and a revised pricing formula that measures the effects separately by industry group under two scenarios:
- a. Change the maximum weekly benefit from 100% of the statewide average weekly wage to 150%. This test was selected as a potentially large benefit change that would not be expected to occur very often.
 - b. The maximum weekly benefit increases 10%. This test was selected as representing a common type of benefit adjustment.

The results of the two tests appear in Exhibits 22 and 23.

2. Analysis and Comments

As described in Section III, the Wage Distribution Table is used to estimate the average weekly benefit for injured workers under the workers compensation benefit structure. The table displays the percentage of total workers (known as the "A ratio" or "A value") and the percentage of total wages (known as the "B ratio" or "B value") at various relativities to the statewide average wage.

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Test 1. The graphs seem to indicate that the "A" and "B" ratios do not vary much from state to state for each classification group. A closer examination of the actual values shows that this is generally the case. For example, in the manufacturing group, at $R = 1.0$, the "A" values for the four states are as follows:

<u>State</u>	<u>"A" Value</u>
Florida	60.9%
Illinois	55.6%
Michigan	55.1%
Pennsylvania	61.5%

This indicates that in Florida, for example, 60.9% of the workers earn less than the statewide average wage. The amount of data available in some of the individual class group categories by state is sometimes small. For example, the contracting group Table for Pennsylvania was constructed based on only 46 claims. Therefore some of the results observed may tend to be unreliable. In any case, the more practical considerations of how benefit pricing may vary by use of alternative tables is discussed below.

Test 2a. Based on this test, we observed that the alternative methodology produced a higher indicated change for the benefit adjustment (+3.0% versus +2.5%). This is a relatively small difference, and as noted, it is based on a rather substantial benefit change, which should not occur with great frequency. However, the relative changes by industry group are substantially different ranging from a low of +0.9% (manufacturing) to a high of +8.0% (contracting) (Exhibit 22).

Test 2b. This test produced a smaller spread between the totals by industry group as compared to the standard NCCI method (+1.4% versus +1.0%). Again, the alternative model produced a higher result. However, it is interesting to note that the spread between manufacturing and contracting is still significant (+0.5% for manufacturing +4.1% for contracting) (Exhibit 23).

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In terms of the overall rate level calculations, reflecting class differences in the wage tables may produce slightly different results than the current procedure. We are not sure of the ultimate effect, since our test tables were based on small data samples from only a single state. This factor by itself is of concern, but it is not persuasive enough to require future action.

The effects by industry group do appear to have the potential to vary widely. This may have implications for classification ratemaking. For example, in determining the classification group differential, a wage trend index is applied. Investigating whether this index overlaps with differences in benefit pricing by classification group is an area for future research.

However, it is important to be aware that our results are based on one state that had a high spread between the average wages by classification group. Different results may be obtained if a broader investigation is undertaken. We recommend that NCCI consider future research into this area.

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EXHIBITS



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SUMMARY OF EXHIBITS

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COUNTRYWIDE CHANGES IN WORKERS COMPENSATION*

PREMIUM LEVEL

YEAR	(1) EXPERIENCE REVIEW		(2) BENEFIT CHANGE		(3) OVERALL CHANGE	
	ANNUAL CHANGE (%)	CUMULATIVE INDEX (%)	ANNUAL CHANGE (%)	CUMULATIVE INDEX (%)	ANNUAL CHANGE (%)	CUMULATIVE INDEX (%)
	1965	BASE	0.0	BASE	0.0	BASE	0.0
1966	0.2	0.2	3.3	3.3	3.5	3.5
1967	-1.3	-1.1	4.1	7.5	2.7	6.3
1968	-2.5	-3.6	2.2	9.9	-0.4	5.9
1969	-0.9	-4.5	4.2	14.5	3.3	9.4
1970	-1.3	-5.7	2.8	17.7	1.5	11.0
1971	-0.8	-6.5	2.9	21.1	2.1	13.3
1972	1.2	-5.4	5.9	28.2	7.2	21.5
1973	1.0	-4.5	6.3	36.3	7.4	30.5
1974	2.2	-2.4	5.9	44.3	8.2	41.2
1975	7.1	4.5	7.7	55.4	15.3	62.8
1976	9.7	14.6	6.7	65.8	17.0	90.5
1977	9.2	25.1	1.8	68.8	11.2	111.8
1978	7.2	34.1	3.8	75.2	11.3	135.7
1979	4.2	39.7	2.1	78.9	6.4	150.8
1980	0.2	40.0	2.7	83.7	2.9	158.1
1981	-5.0	33.0	3.1	89.4	-2.1	152.7
1982	-5.5	25.7	4.3	97.5	-1.4	149.2
1983	-3.1	21.8	5.0	107.4	1.7	153.4
1984	-2.2	19.1	2.7	113.0	0.4	154.4
1985	10.3	31.4	1.7	116.6	12.2	185.4
1986	7.5	41.3	1.3	119.4	8.9	210.8
1987	8.8	53.7	0.7	120.9	9.6	240.6
1988	7.4	65.1	1.4	124.0	8.9	270.9
1989	5.6	74.3	0.5	125.1	6.1	293.5
(4) 1990	10.7	93.0	1.0	125.1	11.8	339.9

Based on NCCI Statistical Bulletin, 1990-1991 Editions

* Countrywide includes all states except those with monopolistic state funds.
State rate changes weighted together based on direct premium.

(1) Includes the effect of miscellaneous changes

(4) For the first three quarters

DISTRIBUTION OF BENEFIT LEVEL CHANGES BY SIZE

1985-1989

SIZE OF CHANGE -----	NUMBER OF BENEFIT CHANGES -----	PERCENT OF TOTAL -----
LESS THAN -5.0%	5	2%
BETWEEN -5.0 AND -2.6%	7	2%
BETWEEN -2.5% AND -0.1%	12	4%
BETWEEN 0.0% AND +2.4%	228	79%
BETWEEN 2.4% AND +4.9%	25	9%
5.0% OR MORE	11	4%
 TOTAL	 288	 100%

Based on NCCI Annual Statistical Bulletin, 1990 Edition

Notes:

1. Number of benefit increases or decreases of no more than 2.5% is $(12 + 228) = 240$ or 83%.
2. Number of benefit increases or decreases greater than 5.0% is $(5 + 11) = 16$ or 6%.

DISTRIBUTION OF INCURRED BENEFITS BY INJURY TYPE

STATE	NCCI BULLETIN	(1)	(2)	(3)	(4)
		PERMANENT PARTIAL (%)	MEDICAL (%)	INDEMNITY (%) 100% - (2)	PERM PARTIAL AS A % OF INDEMNITY (1)/(3)
ALABAMA	1987	32.5	49.6	50.4	64.5
	1990	32.7	52.3	47.7	68.6
ALASKA	1987	50.9	29.9	70.1	72.6
	1990	48.1	35.6	64.4	74.7
ARIZONA	1987	39.5	49.7	50.3	78.5
	1990	37.1	54.4	45.6	81.4
ARKANSAS	1987	39.6	45.7	54.3	72.9
	1990	36.9	48.6	51.4	71.8
CALIFORNIA	1987	48.8	42.8	57.2	85.3
	1990	48.7	43.7	56.3	86.5
COLORADO	1987	36.8	42.7	57.3	64.2
	1990	57.6	30.7	69.3	83.1
CONNECTICUT	1987	50.9	30.7	69.3	73.4
	1990	52.3	28.5	71.5	73.1
DELAWARE	1987	33.1	32.1	67.9	48.7
	1990	26.6	39.9	60.1	44.3
DIST. OF COL.	1987	50.2	28.7	71.3	70.4
	1990	47.1	40.2	59.8	78.8
FLORIDA	1987	34.1	47.3	52.7	64.7
	1990	44.2	41.2	58.8	75.2
GEORGIA	1987	41.7	43.5	56.5	73.8
	1990	40.8	46.3	53.7	76.0
HAWAII	1987	42.0	39.8	60.2	69.8
	1990	45.7	40.5	59.5	76.8
IDAHO	1987	41.8	37.5	62.5	66.9
	1990	40.8	39.2	60.8	67.1
ILLINOIS	1987	50.9	31.5	68.5	74.3
	1990	50.7	32.7	67.3	75.3
INDIANA	1987	22.3	56.6	43.4	51.4
	1990	26.9	53.0	47.0	57.2
IOWA	1987	45.9	32.4	67.6	67.9
	1990	47.6	36.9	63.1	75.4
KANSAS	1987	44.0	38.6	61.4	71.7
	1990	44.8	39.6	60.4	74.2

DISTRIBUTION OF INCURRED BENEFITS BY INJURY TYPE

STATE	NCCI BULLETIN	(1)	(2)	(3)	(4)
		PERMANENT PARTIAL (%)	MEDICAL (%)	INDEMNITY (%) 100% - (2)	PERM PARTIAL AS A % OF INDEMNITY (1)/(3)
KENTUCKY	1987	39.3	41.2	58.8	66.8
	1990	38.0	48.3	51.7	73.5
LOUISIANA	1987	46.7	39.0	61.0	76.6
	1990	45.9	41.3	58.7	78.2
MAINE	1987	70.7	17.9	82.1	86.1
	1990	56.2	29.0	71.0	79.2
MARYLAND	1987	51.8	34.0	66.0	78.5
	1990	43.6	38.3	61.7	70.7
MASSACHUSETTS	1987				N/A
	1990				N/A
MICHIGAN	1987	51.2	33.6	66.4	77.1
	1990	51.3	32.0	68.0	75.4
MINNESOTA	1987	56.0	28.6	71.4	78.4
	1990	52.1	31.7	68.3	76.3
MISSISSIPPI	1987	35.0	50.8	49.2	71.1
	1990	36.6	50.7	49.3	74.2
MISSOURI	1987	42.4	38.4	61.6	68.8
	1990	42.7	39.3	60.7	70.3
MONTANA	1987	61.3	23.3	76.7	79.9
	1990	60.2	31.0	69.0	87.2
NEBRASKA	1987	36.8	43.5	56.5	65.1
	1990	38.8	43.1	56.9	68.2
NEW HAMPSHIRE	1987	48.0	34.7	65.3	73.5
	1990	50.8	34.6	65.4	77.7
NEW JERSEY	1987	46.3	32.4	67.6	68.5
	1990	47.7	36.9	63.1	75.6
NEW MEXICO	1987	44.4	41.5	58.5	75.9
	1990	43.5	37.4	62.6	69.5
NEW YORK	1987	44.8	31.8	68.2	65.7
	1990	44.5	32.8	67.2	66.2
NORTH CAROLINA	1987	34.2	49.4	50.6	67.6
	1990	36.7	46.8	53.2	69.0
OKLAHOMA	1987	44.0	35.7	64.3	68.4
	1990	50.0	35.7	64.3	77.8

DISTRIBUTION OF INCURRED BENEFITS BY INJURY TYPE

STATE	NCCI BULLETIN	(1)	(2)	(3)	(4)
		PERMANENT PARTIAL (%)	MEDICAL (%)	INDEMNITY (%) 100% - (2)	PERM PARTIAL AS A % OF INDEMNITY (1)/(3)
OREGON	1987	48.4	35.7	64.3	75.3
	1990	41.0	40.7	59.3	69.1
PENNSYLVANIA	1987	19.2	35.9	64.1	30.0
	1990	23.9	37.1	62.9	38.0
RHODE ISLAND	1987	69.8	20.4	79.6	87.7
	1990	65.9	21.5	78.5	83.9
SOUTH CAROLINA	1987	43.3	41.0	59.0	73.4
	1990	48.5	38.2	61.8	78.5
SOUTH DAKOTA	1987	36.8	42.8	57.2	64.3
	1990	37.6	36.8	63.2	59.5
TENNESSEE	1987	40.4	43.1	56.9	71.0
	1990	43.4	43.0	57.0	76.1
TEXAS	1987	33.5	40.3	59.7	56.1
	1990	36.6	38.6	61.4	59.6
UTAH	1987	32.8	52.6	47.4	69.2
	1990	28.6	57.8	42.2	67.8
VERMONT	1987	44.4	33.3	66.7	66.6
	1990	42.5	35.2	64.8	65.6
VIRGINIA	1987	43.0	42.9	57.1	75.3
	1990	40.5	46.4	53.6	75.6
WISCONSIN	1987	41.9	40.3	59.7	70.2
	1990	43.4	39.8	60.2	72.1
MEDIAN	1987	43.2	38.8	61.2	70.7
	1990	43.6	39.3	60.8	74.5

OF STATES WHERE
COLUMN (4) INCREASED
FROM 1987 TO 1990

31 OUT OF 44

BASED ON NCCI STATISTICAL BULLETINS 1987, 1990

The 1973 Standard Wage Distribution Table

R = Ratio to Average Wage
A = Percentage of workers receiving not more than the percentage of
the average wage indicated by column R
B = Percentage of wages received by the % of workers in column A

R	A	B	R	A	B	R	A	B
0.05	0.1068	0.0030	2.40	98.8248	96.4991	4.75	99.9210	99.5369
0.10	0.3511	0.0222	2.45	98.9702	96.8502	4.80	99.9245	99.5542
0.15	0.8384	0.0845	2.50	99.1283	97.2237	4.85	99.9277	99.5700
0.20	1.4357	0.1903	2.55	99.2172	97.4447	4.90	99.9290	99.5762
0.25	2.1432	0.3483	2.60	99.3278	97.7304	4.95	99.9316	99.5881
0.30	2.9058	0.5629	2.65	99.3962	97.9051	5.00	99.9337	99.5984
0.35	3.7375	0.8393	2.70	99.4464	98.0372	5.05	99.9357	99.6093
0.40	4.7328	1.2173	2.75	99.5127	98.2151	5.10	99.9390	99.6258
0.45	6.1073	1.8188	2.80	99.5551	98.3291	5.15	99.9415	99.6393
0.50	8.2201	2.8537	2.85	99.5867	98.4178	5.20	99.9438	99.6516
0.55	11.6032	4.6692	2.90	99.6240	98.5226	5.25	99.9453	99.6594
0.60	15.3290	6.7892	2.95	99.6515	98.6021	5.30	99.9483	99.6752
0.65	20.5672	10.1290	3.00	99.6742	98.6709	5.35	99.9488	99.6778
0.70	25.9600	13.7452	3.05	99.6888	98.7150	5.40	99.9498	99.6836
0.75	32.3089	18.2868	3.10	99.7116	98.7817	5.45	99.9508	99.6892
0.80	37.5110	22.2523	3.15	99.7288	98.8358	5.50	99.9539	99.7064
0.85	42.9709	26.6884	3.20	99.7427	98.8809	5.55	99.9552	99.7130
0.90	48.2321	31.2144	3.25	99.7614	98.9448	5.60	99.9559	99.7174
0.95	53.1109	35.7149	3.30	99.7825	99.0090	5.65	99.9569	99.7228
1.00	58.4036	40.9066	3.35	99.7922	99.0422	5.70	99.9584	99.7318
1.05	62.9643	45.6459	3.40	99.7995	99.0666	5.75	99.9607	99.7447
1.10	67.1858	50.1850	3.45	99.8141	99.1161	5.80	99.9623	99.7537
1.15	70.6767	54.0985	3.50	99.8211	99.1404	5.85	99.9656	99.7730
1.20	74.0989	58.1398	3.55	99.8308	99.1747	5.90	99.9674	99.7840
1.25	77.0678	61.7560	3.60	99.8403	99.2088	5.95	99.9684	99.7903
1.30	79.9516	65.5218	3.65	99.8457	99.2272	6.00	99.9701	99.8007
1.35	82.2534	68.5701	3.70	99.8511	99.2463	6.05	99.9712	99.8069
1.40	84.5435	71.7325	3.75	99.8575	99.2701	6.10	99.9722	99.8131
1.45	86.3620	74.3294	3.80	99.8616	99.2854	6.15	99.9727	99.8161
1.50	87.9326	76.6547	3.85	99.8657	99.3029	6.20	99.9734	99.8210
1.55	89.1240	78.4667	3.90	99.8731	99.3315	6.25	99.9753	99.8315
1.60	90.4193	80.4994	3.95	99.8774	99.3499	6.30	99.9758	99.8349
1.65	91.6370	82.4738	4.00	99.8800	99.3594	6.35	99.9763	99.8380
1.70	92.4497	83.8454	4.05	99.8835	99.3739	6.40	99.9775	99.8468
1.75	93.2448	85.2260	4.10	99.8871	99.3886	6.45	99.9780	99.8504
1.80	93.9290	86.4398	4.15	99.8949	99.4207	6.50	99.9816	99.8762
1.85	94.5674	87.5957	4.20	99.8970	99.4295	6.55	99.9831	99.8855
1.90	95.1329	88.6605	4.25	99.9000	99.4429	6.60	99.9848	99.8964
1.95	95.7436	89.8715	4.30	99.9033	99.4574	6.65	99.9851	99.8978
2.00	96.2339	90.8451	4.35	99.9058	99.4689	6.70	99.9861	99.9047
2.05	96.6383	91.6662	4.40	99.9086	99.4807	6.75	99.9871	99.9118
2.10	97.1239	92.6803	4.45	99.9091	99.4831	6.80	99.9877	99.9149
2.15	97.4920	93.4767	4.50	99.9122	99.4965	6.85	99.9892	99.9259
2.20	97.8424	94.2425	4.55	99.9142	99.5052	6.90	99.9897	99.9290
2.25	98.1208	94.8736	4.60	99.9155	99.5113	6.95	99.9902	99.9321
2.30	98.3723	95.4400	4.65	99.9173	99.5197	7.00	99.9917	99.9429
2.35	98.6285	96.0369	4.70	99.9197	99.5309			

SAMPLE CALCULATION OF AVERAGE WEEKLY BENEFITS
BASED ON 1973 STANDARD WAGE DISTRIBUTION TABLE

(1) % RATE OF COMPENSATION	50.0%
(2) MINIMUM WEEKLY BENEFIT	\$25.00
(3) MAXIMUM WEEKLY BENEFIT	\$150.00
(4) STATE AVERAGE WEEKLY WAGE (SAWW)	\$200.00
(5) MAXIMUM WAGE BASED ON (2) (2)/(1)	\$50.00
(6) MINIMUM WAGE BASED ON (3) (3)/(1)	\$300.00

(7)	(8)	(9)	(10)	(11)	(12)
WAGE INTERVAL MIN MAX	WAGE TABLE "R" FACTOR NEAREST .05	WAGE TABLE "A" FACTOR (%)	WAGE TABLE "B" FACTOR (%)	AVG WEEKLY WAGE (4)*(10)/(9)	AVG WEEKLY BENEFIT SUBJ TO MAX & MIN (1)*(11)
\$0 - \$ 50.00	0.00 - 0.25	2.1432	0.3483	32.50	\$25.00
\$ 50.00 - \$300.00	0.25 - 1.50	85.7894	76.3064	177.89	\$88.95
\$300.00 -	1.50 -	12.0674	23.3453	386.92	\$150.00

(13) STATE AVERAGE WEEKLY WAGE	\$200.00
(14) STATE AVERAGE WEEKLY BENEFIT	\$94.95

NOTES:

- Column (7) is based on columns (5) and (6).
- Column (8), the "R" factor, is the ratio of the wages in column (7) to the SAWW in column (4).
- Columns (9) and (10) are from the 1973 Standard Wage Distribution Table.
The "A" factor from the Wage Distribution Table is the percentage of workers earning not more than "R" times the average wage.
The "B" factor from the Wage Distribution Table is the percentage of wages earned by the percent of workers in "A".
- Column (12) must be at least the minimum weekly compensation from (2) and at most the maximum weekly compensation from (3).
- Column (13) is the sum of the product of columns (9) and (11).
- Column (14) is the sum of the product of columns (9) and (12).

SPECIAL CALL FOR ACCIDENT STATISTICS DISTRIBUTION OF DURATIONS

Temporary Total Accident Distribution According to Duration of Disability

(1) Disability Period (Days)	(2) Total Cases	(3) Summation of Col. 2 Upward	(4) Days Disability Lasting Col. 1 and Over
1	8,973	103,371	3,060,329
2	8,198	94,398	2,956,958
3	6,236	86,200	2,862,560
4	7,077	79,964	2,776,360
5	6,437	72,887	2,696,396
7	4,854	61,294	2,557,059
8	2,351	56,440	2,495,765
9	2,407	54,089	2,439,325
10	2,865	51,682	2,385,236
11	2,665	48,817	2,333,554
12	2,156	46,152	2,284,737
13	1,891	43,996	2,238,585
14	2,860	42,105	2,194,589
15	1,563	39,245	2,152,484
16	1,621	37,682	2,113,239
17	1,703	36,061	2,075,557
18	1,486	34,358	2,039,496
19	1,096	32,872	2,005,138
20	888	31,776	1,972,266
21	2,009	30,888	1,940,490
22	854	28,879	1,909,602
23	910	28,025	1,880,723
24	961	27,115	1,852,698
25	762	26,154	1,825,583
26	590	25,392	1,799,429
27	467	24,802	1,774,037
28	1,480	24,335	1,749,235
29	532	22,855	1,724,900
30	604	22,323	1,702,045
31	655	21,719	1,679,722
32	603	21,064	1,658,003
33	437	20,461	1,636,939
34	376	20,024	1,616,478
35	894	19,648	1,596,454
36	389	18,754	1,576,806
37	390	18,365	1,558,052
38	442	17,975	1,539,687
39	424	17,533	1,521,712
40	287	17,109	1,504,179
41	274	16,822	1,487,070
42	1,160	16,548	1,470,248
43 - 49	2,692	15,388	1,453,700 - 1,366,629

SPECIAL CALL FOR ACCIDENT STATISTICS DISTRIBUTION OF DURATIONS

Temporary Total Accident Distribution According
to Duration of Disability

(1) Disability Period (Days)	(2) Total Cases	(3) Summation of Col. 2 Upward	(4) Days Disability Lasting Col. 1 and Over
50 - 56	2,155	12,696	1,353,205 - 1,281,192
57 - 63	1,725	10,541	1,270,007 - 1,210,298
64 - 70	1,258	8,816	1,201,053 - 1,150,461
71 - 77	987	7,558	1,142,491 - 1,099,160
78 - 84	807	6,571	1,092,325 - 1,054,427
85 - 91	626	5,764	1,048,409 - 1,015,082
92 - 98	544	5,138	1,009,770 - 979,894
99 - 105	423	4,594	975,102 - 948,240
106 - 112	342	4,171	943,909 - 919,548
113 - 119	273	3,829	915,620 - 893,144
120 - 126	271	3,556	889,496 - 868,653
127 - 133	231	3,285	865,275 - 846,026
134 - 140	217	3,054	842,900 - 824,849
141 - 147	196	2,837	821,900 - 805,306
148 - 154	167	2,641	802,615 - 787,062
155 - 161	137	2,474	784,524 - 769,952
162 - 168	130	2,337	767,578 - 753,784
169 - 175	116	2,207	751,530 - 738,480
176 - 182	129	2,091	736,343 - 723,948
183 - 189	86	1,962	721,921 - 710,316
190 - 196	92	1,876	708,412 - 697,317
197 - 203	62	1,784	695,503 - 684,914
204 - 210	74	1,722	683,169 - 672,957
211 - 217	73	1,648	671,280 - 661,521
218 - 224	55	1,575	659,919 - 650,588
225 - 231	63	1,520	649,050 - 640,049
232 - 266	220	1,457	638,570 - 592,396
267 - 301	203	1,237	591,139 - 552,653
302 - 336	95	1,034	551,611 - 518,088
337 - 371	104	939	517,143 - 486,802
372 - 406	80	835	485,961 - 458,672
407 - 441	67	755	457,909 - 433,213
442 - 476	64	688	432,519 - 410,069
477 - 511	58	624	409,434 - 389,141
512 - 581	80	566	388,570 - 352,003
582 - 651	65	486	351,514 - 320,191
652 and Over	-	421	319,770 - xxx

Based on Survey of Claims Closed in 1974

NATIONAL COUNCIL ON COMPENSATION INSURANCE

Workmen's Compensation Injury Table
Fatal Disability

No. of Cases*	Person Receiving Compensation	No. of Dependents	Average Age †			
			Arithmetic	Pension	Pension with 5% Escalation	Pension with 6% Escalation
<u>1,000</u>						
147 (139)	None	0	xx	xx	xx	xx
356 (342)	Widow alone	1	51 (50)	31 (29)	25	23
136 (155)	Widow and Child	1 1	36 (35) 10 (8)	31 (31) - -	28 -	27 -
129 (177)	Widow and Children	1 2	36 (35) 10 (8)	31 (31) - -	28 -	27 -
82 (64)	Widow and Children	1 3	36 (35) 10 (8)	31 (31) - -	28 -	27 -
42 (32)	Widow and Children	1 4	36 (35) 10 (8)	31 (31) - -	28 -	27 -
22 (13)	Widow and Children	1 5	36 (35) 10 (8)	31 (31) - -	28 -	27 -
16 (15)	Widow and Children (more than 5)	1 7 (ave.)	36 (35) 10 (8)	31 (31) - -	28 -	27 -
16 (18)	Orphans	1	11 (11)	-	-	-
10 (10)	Orphans	2	11 (11)	-	-	-
7 (4)	Orphans	3	11 (11)	-	-	-
3 (2)	Orphans	4	11 (11)	-	-	-
1 (2)	Orphan	5	11 (11)	-	-	-
13 (40)	Parent	1	61 (61)	61 (61)	58	57
17 (27)	Parents	2	49 (56)	50 (56)	48	48
1 (4)	Brother or Sister	1	23 (43)	-	-	-
2 (1)	Other dependent	1	21 (43)	-	-	-
(15)	Other categories					

*Only classifications which occurred are listed. 11397 cases were reduced proportionally to 1,000.

†Numbers in parentheses are from the current injury table

Based on WCSP Data from Policy Years 1968 - 1973

NATIONAL COUNCIL ON COMPENSATION INSURANCE

Accident Distribution - Permanent Total Disability

<u>Type of Injury:</u>	<u>No. of</u>
<u>Other Combinations (Contd.)</u>	<u>Cases</u>
Foot (Loss of Use) & Paralysis	1
Foot (Loss of Use) & Mental & Back	1
Eye (Loss of Use) & Mental	9
Eye (Loss of Use) & Mental & Back	1
Arms (Loss of Use) & Mental	1
Arms (Loss of Use) & Back	4
Arms (Loss of Use) & Mental & Back	1
Arm, Leg (Loss of Use) & Mental	4
Arm, Leg (Loss of Use) & Back	3
Arm, Leg (Loss of Use) & Mental & Back	1
Arm, Leg (Loss of Use) & Mental & Paralysis	3
Arm, Eye (Loss of Use) & Mental	1
Hands (Loss of Use) & Mental	1
Hands (Loss of Use) & Back	1
Legs (Loss of Use) & Mental	3
Legs (Loss of Use) & Back	13
Legs (Loss of Use) & Paralysis	17
Legs (Loss of Use) & Mental & Back	3
Legs (Loss of Use) & Back & Paralysis	16
Legs (Loss of Use) & Mental, Back & Paralysis	3
Leg, Foot (Loss of Use) & Back	3
Feet (Loss of Use) & Mental	1
Feet (Loss of Use) & Back	1
Eyes (Loss of Use) & Mental	5
Eyes (Loss of Use) & Back	1
Eyes (Loss of Use) & Mental & Back	1
Arms, Leg (Loss of Use) & Mental	3
Arm, Hand, Leg (Loss of Use) & Back	1
Arm, Hand, Foot (Loss of Use) & Mental	2
Arm, Legs (Loss of Use) & Mental	1
Arm, Eyes (Loss of Use) & Mental	1
Hands, Leg (Loss of Use) & Back	1
Leg, Eyes (Loss of Use) & Mental	1
Arms, Legs (Loss of Use) & Mental	2
Arms, Legs (Loss of Use) & Paralysis	8
Arms, Legs (Loss of Use) & Mental & Paralysis	1
Arms, Legs (Loss of Use) & Back & Paralysis	1
Arms, Eyes (Loss of Use) & Mental	1
Hands, Legs (Loss of Use) & Mental	1
<u>Hand (Amputation) & Arm, Leg (Loss of Use) & Mental</u>	<u>1</u>
Total	211

NATIONAL COUNCIL ON COMPENSATION INSURANCE

Accident Distribution - Permanent Total Disability

<u>Type of Injury:</u> <u>Amputation Cases - Avg. Age 40</u>	<u>No. of</u> <u>Cases</u>	<u>Type of Injury:</u> <u>Loss of Use Cases - Avg. Age 45</u>	<u>No. of</u> <u>Cases</u>
Arm	14	Arm	32
Arms	3	Arms	6
Hand	15	Hand	19
Hands	6	Hands	8
Leg	26	Leg	107
Legs	10	Legs	18
Foot	3	Foot	33
Feet	3	Feet	3
Eye	2	Eye	16
Eyes	0	Eyes	10
Arm, Hand & Feet	1	Arm & Hand	3
Arm & Leg	1	Arm & Leg	13
Arm & Legs	1	Hand & Leg	2
Hand & Legs	1	Leg & Foot	6
<u>Hand & Foot</u>	<u>1</u>	Foot & Eye	1
		Arm & Legs	2
		Arm & Eyes	2
		Arm, Hand & Eye	1
		Arms & Legs	1
		Hands & Legs	2
		<u>Arm, Legs, Feet</u>	<u>1</u>
Total	87	Total	286

NATIONAL COUNCIL ON COMPENSATION INSURANCE

Accident Distribution - Permanent Total Disability

<u>Type of Injury:</u>	<u>No. of Cases</u>
<u>Amputation & Loss of Use Cases - Avg. Age 51</u>	
Arm (Amputation) & Foot (Loss of Use)	1
Arm (Amputation) & Arm, Leg (Loss of Use)	1
Hand (Amputation) & Arm (Loss of Use)	1
Hand (Amputation) & Hand (Loss of Use)	1
Leg (Amputation) & Arm (Loss of Use)	1
Leg (Amputation) & Leg (Loss of Use)	2
Leg (Amputation) & Foot (Loss of Use)	1
Leg (Amputation) & Hand, Foot (Loss of Use)	1
<u>Foot (Amputation) & Leg (Loss of Use)</u>	<u>2</u>
Total	11

<u>Type of Injury:</u>	<u>No. of Cases</u>
<u>Other Permanent Total - Avg. Age 46</u>	
Head/Mental Impair.	315
Back or Spine	991
Paralysis	72
Mental & Back	30
Mental & Paralysis	7
Back & Paralysis	14
Mental, Back & Paralysis	2
<u>All Others</u>	<u>2,177</u>
Total	3,608

<u>Type of Injury:</u>	<u>No. of Cases</u>
<u>Other Combinations</u>	
Arm (Amputation) & Mental	1
Arm (Amputation) & Back	1
Leg (Amputation) & Mental	1
Leg (Amputation) & Paralysis	1
Foot (Amputation) & Mental	1
Arm, Hand (Amputation) & Mental	1
Arm, (Loss of Use) & Mental	13
Arm (Loss of Use) & Back	15
Arm (Loss of Use & Mental & Back	3
Hand (Loss of Use) & Mental	2
Hand (Loss of Use) & Back	3
Leg (Loss of Use) & Mental	12
Leg (Loss of Use) & Back	27
Foot (Loss of Use) & Mental	1
Foot (Loss of Use) & Back	5

NATIONAL COUNCIL ON COMPENSATION INSURANCE

Age Distribution - Permanent Total Disability

<u>Age Group</u>	<u>No. Of Cases†</u>
Under 15	4 (2)
15 - 19	128 (45)
20 - 24	307 (110)
25 - 29	410 (137)
30 - 34	494 (177)
35 - 39	571 (251)
40 - 44	697 (237)
45 - 49	771 (309)
50 - 54	794 (309)
55 - 59	818 (360)
60 - 64	621 (376)
65 - 69	187 (287)
70 - 74	95 (154)
75 - 79	35 (68)
80 - 84	7 (13)
<u>85 - 89</u>	<u>3 -</u>
Total	5,942(2,835)
Average Age - Arithmetic	46 (50)
Pension	47 (50)
Pension (5% Esc.)	44
Pension (6% Esc.)	43

†Numbers in parentheses are from the current injury table.

Based on WCSP Data from Policy Years 1968 - 1973

MAJOR - PERMANENT PARTIAL DISABILITY
ACCIDENT DISTRIBUTION - AVERAGE PERCENT LOSS OF USE - AVERAGE HEALING PERIOD

<u>Point and Nature of Injury</u>	<u>Total No. Of Cases</u>	<u>% Loss</u>	<u>Avg. Healing Period (Wks)</u>	<u>Average Age</u>
<u>A. MAJOR MEMBERS (SCHEDULE INJURIES)</u>				
Arm:				
Dism. above elbow	15	100	40	44
Dism. at elbow	9	100	21	42
Dism. below elbow	23	100	18	36
Loss of use	547	53	27	42
Hand:				
Dismemberment	37	100	29	33
Loss of use	937	56	20	37
Leg:				
Dism. above knee	14	100	49	49
Dism. at knee	26	100	26	39
Dism. below knee	17	100	39	37
Loss of use	982	53	34	42
Foot:				
Dismemberment	21	100	26	37
Loss of use	469	51	25	39
Eye:				
Enucleation	22	100	20	39
Loss of vision	256	88	14	37
Hearing: (both ears)	24	56	3	52
Back (Schedule)	<u>445</u>	<u>43</u>	<u>49</u>	<u>41</u>
Total	3,844	xx	28	40.

B. OTHER MAJOR PERMANENT PARTIAL INJURIES*

Head	105	46	37	38
Back	1,560	41	42	40
Hernia	71	53	9	44
Heart attack	67	46	17	49
Neck	38	40	37	40
Mental	13	45	59	37
Multiple injuries	819	47	25	39
Other general	<u>240</u>	<u>44</u>	<u>27</u>	<u>40</u>
Total/Avg. (Other PP)	2,913	44	34	40

Based on Survey of Claims Closed in 1974

*% loss related to whole man.

MINOR - PERMANENT PARTIAL DISABILITY
ACCIDENT DISTRIBUTION - AVERAGE PERCENT LOSS OF USE - AVERAGE HEALING PERIOD

<u>Point and Nature of Injury</u>	<u>Total No. of Cases</u>	<u>% Loss</u>	<u>Average Healing Period (Weeks)</u>	<u>Average Age</u>
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A. MINOR MEMBERS (SCHEDULE INJURIES)

Thumb:				
Dism. 1 phalange	192	100	6	36
Dism. 2 or more phalanges	39	100	6	37
Loss of use	1,351	25	4	36

Index Finger:				
Dism. 1 phalange	398	100	5	36
Dism. 2 or more phalanges	150	100	8	36
Loss of use	1,777	32	4	36

Middle Finger:				
Dism. 1 phalange	265	100	3	35
Dism. 2 or more phalanges	91	100	7	35
Loss of use	1,250	29	3	36

Ring Finger:				
Dism. 1 phalange	157	100	4	37
Dism. 2 or more phalanges	71	100	4	32
Loss of use	805	31	3	36

Little Finger:				
Dism. 1 phalange	122	100	2	37
Dism. 2 or more phalanges	63	100	5	37
Loss of use	780	36	3	36

Great Toe:				
Dism. 1 phalange	16	100	6	31
Dism. 2 or more phalanges	10	100	12	40
Loss of use	411	26	4	37

Other Toes:				
Dismemberment	38	100	9	33
Loss of use	172	29	2	39

Hearing: (One Ear)	<u>80</u>	<u>37</u>	<u>3</u>	<u>41</u>
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Total	8,238	xx	4	36
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B. MAJOR MEMBERS (SCHEDULE INJURIES)

Arm loss of use	2,139	13	10	39
Hand loss of use	2,537	13	8	37
Leg loss of use	3,183	13	13	37
Foot loss of use	1,662	13	10	38
Loss of vision	261	15	4	35
Hearing: (Both ears)	75	17	3	47
Back (Schedule)	<u>1,515</u>	<u>11</u>	<u>18</u>	<u>37</u>

Total	11,372	xx	11	38
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-2-

(CONTD.)

<u>Point and Nature of Injury</u>	<u>Total No. of Cases</u>	<u>% Loss</u>	<u>Average Healing Period (Weeks)</u>	<u>Average Age</u>
<u>C. OTHER PERMANENT PARTIAL INJURIES*</u>				
Head	596	6	7	35
Back	4,627	10	15	36
Hernia	143	7	10	41
Heart attack	68	12	5	51
Neck	135	11	12	37
Mental	20	11	6	37
Multiple injuries	1,248	11	12	37
Other general	<u>872</u>	<u>8</u>	<u>9</u>	<u>37</u>
Total/Avg. (Other PP)	7,709	10	13	

*% loss related to whole man.

Based on Survey of Claims Closed in 1974

COUNTRYWIDE MEDICAL FEE FREQUENCY DISTRIBUTION

<u>Code</u>	<u>Cases</u>	<u>Cost</u>	<u>Code</u>	<u>Cases</u>	<u>Cost</u>	<u>Code</u>	<u>Cases</u>	<u>Cost</u>
0001	67	890	0355	7	75	0798	5	264
0002	41	804	0356	21	157	0800	2	230
0003	43	1,249	0501	1	10	0802	3	225
0004	21	744	0506	10	285	0803	1	35
0005	17	631	0516	1	68	0807	10	660
0006	17	686	0537	2	207	0811	1	119
0007	7	310	0561	2	250	0815	1	50
0008	35	1,857	0566	1	100	0817	1	95
0071	528	3,286	0567	2	165	0820	1	80
0072	325	1,329	0576	2	275	0821	2	185
0073	112	843	0577	4	633	0823	1	150
0074	138	529	0581	1	392	0824	1	135
0076	843	8,065	0595	1	50	0827	11	608
0077	3	22	0618	1	200	0830	5	565
0078	452	3,203	0634	4	970	0842	10	254
0079	640	2,686	0635	2	730	0844	4	300
0114	9	136	0642	1	250	0852	82	1,571
0130	113	1,119	0681	1	45	0853	28	1,082
0131	23	338	0686	6	175	0854	12	477
0140	5	37	0687	2	140	0885	21	28
0145	6	45	0688	1	177	0886	1	125
0190	3	275	0699	4	465	0887	1	154
0191	1	25	0701	1	75	0890	1	335
0230	32	512	0703	2	93	0895	2	160
0231	11	236	0720	9	968	0897	1	300
0238	3	310	0721	3	360	0901	1	110
0261	2	60	0740	2	147	0904	1	66
0262	3	163	0747	4	235	0907	2	133
0265	75	1,477	0752	2	250	0914	8	511
0266	27	336	0761	13	342	0920	1	30
0267	36	1,102	0762	2	50	0930	3	225
0276	2	60	0767	2	188	0933	4	208
0288	6	264	0772	1	21	0934	2	135
0289	6	373	0775	4	425	0935	4	570
0295	6	296	0778	2	92	0938	1	60
0309	1	150	0780	1	155	0944	1	50
0351	1	10	0782	1	200	0955	1	50
0352	15	91	0785	1	125	0961	8	571
0353	2	200	0791	2	80	0962	1	50
0354	23	115	0792	1	50	0963	1	200

COUNTRYWIDE MEDICAL FREQUENCY DISTRIBUTION

<u>Code</u>	<u>Cases</u>	<u>Cost</u>	<u>Code</u>	<u>Cases</u>	<u>Cost</u>	<u>Code</u>	<u>Cases</u>	<u>Cost</u>
0967	35	907	1418	5	42	2131	1	108
0970	2	130	1424	14	198	2151	1	25
0980	46	833	1430	1	250	2154	1	100
0982	15	213	1431	1	100	2183	1	30
1001	1	125	1450	5	70	2558	1	165
1003	1	65	1487	4	715	3131	1	90
1008	25	3,192	1517	7	78	3136	1	125
1010	1	150	1519	2	300	3137	1	300
1013	1	125	1535	2	200	3200	1	205
1017	2	28	1553	2	150	3311	1	10
1046	18	171	1580	16	1,345	3631	41	5,280
1047	1	10	1581	2	180	3634	2	297
1074	9	2,110	1582	1	150	3635	5	860
1075	6	2,130	1583	3	230	3638	8	1,511
1082	9	1,432	1584	1	15	3643	1	135
1141	1	250	1585	5	860	3646	1	104
1144	2	155	1586	1	125	3661	1	175
1151	1	150	1587	2	253	3662	1	200
1170	2	325	1640	1	150	4001	1	10
1177	2	500	1682	3	110	5017	1	430
1215	2	20	1686	1	10	5021	1	205
1216	1	167	1708	1	250	5026	1	400
1217	4	85	1725	3	300	5031	1	345
1223	1	22	1737	18	1,120	5048	1	600
1227	1	50	1802	2	57	5060	1	13
1238	1	100	1803	2	122	5084	1	45
1232	4	76	1851	6	124	5085	6	120
1242	1	13	1854	6	85	5298	1	21
1256	1	35	1856	13	137	5312	1	35
1267	1	32	1860	1	27	5319	4	60
1284	8	353	1862	1	5	5343	2	153
1297	1	47	1865	6	73	5344	2	425
1301	1	215	1867	5	76	5400	31	269
1304	1	45	1871	3	73	5402	1	10
1315	2	21	1875	3	29	5406	1	25
1326	3	8	1878	1	40	5431	6	86
1350	1	6	1885	4	113	5445	290	2,695
1357	1	167	1891	1	15	5447	7	85
1401	8	109	1950	1	300	5448	26	296
1413	10	181	2101	4	445	5465	5	50

CONTINUED MEDICAL FEE FREQUENCY DISTRIBUTION

Code	Cases	Cost	Code	Cases	Cost	Code	Cases	Cost
5496	1	10	7207	72	504	8634	5	150
5503	1	400	7209	460	6,797	8654	7	107
5521	1	10	7210	80	1,225	8657	5	39
5544	1	350	7211	21	444	8681	3	7
5561	1	125	7214	65	896	8708	17	125
5691	1	25	7217	47	677	8720	3	28
5692	1	6	7225	28	1,043	8726	5	39
5701	1	5	7250	13	159	8738	7	36
5723	1	5	7251	12	162	8743	2	11
5731	2	21	7252	145	1,742	8799	48	367
5741	57	453	7253	17	178	8853	3	4
5742	12	153	7254	39	395	8903	2	36
5743	4	31	7255	50	568	8914	15	64
5831	6	57	7256	201	1,336	8930	3	7
5851	1	75	7257	280	2,403	8932	13	43
7000	1	23	7258	359	2,629	8933	2	7
7001	1	10	7300	18	199	8934	30	117
7002	5	220	7301	6	95	8941	3	7
7007	3	48	7303	5	67	8990	-	13,078
7010	5	100	7304	163	1,742	9001D	2,819	17,893
7012	2	30	7304A	39	454	9001N	52	349
7015	5	82	7305	107	1,033	9002D	108	1,465
7016	13	136	7306	221	2,041	9003D	4,045	17,080
7026	47	1,012	7307	340	3,082	9004D	5,666	25,597
7027	30	503	7308	40	395	9004N	12	70
7028	1	28	7309	13	93	9005D	403	2,368
7030	5	24	7350	6	77	9006D	87	832
7031	3	6	7351	1	15	9007D	47	620
7032	1	88	7356	3	39	9008	1	10
7033	3	36	7358	5	126	9011D	38	245
7035	2	35	7370	2	68	9011N	3	21
7100	115	1,336	7372	2	60	9012	3	85
7100x	2	13	7478	1	10	9013D	32	163
7101	6	170	7520	1	15	9014D	43	206
7107	5	70	7626	3	60	9014N	40	205
7110	86	1,074	7656	15	75	9020D	644	4,972
7112	2	15	8620	5	39	9020N	58	735
7204	148	2,168	8624	3	53	9021D	19	211
7205	7	151	8626	2	21	9022	22	935
7206	14	399	8628	45	256	9023D	2,969	14,623

NATIONAL COUNCIL ON COMPENSATION INSURANCE

FEBRUARY 3, 1967

COUNTRYWIDE MEDICAL FEE FREQUENCY DISTRIBUTION

<u>Code</u>	<u>Cases</u>	<u>Cost</u>
9023N	17	101
9024D	109	882
9024N	18	339
9025D	24	190
9026D	211	5,628
9027	99	2,751
9028	87	2,852
9040	715	1,649
9041	4	9
9042	1	3-
9043	483	2,654
9050	8	40
9101	12	153
9102	1	15
9201	2	135
9304	1	10
9320	3	50
9330	2	50
9404	62	238
9405	10	39
9440	19	174
9445	2	22
9450	1	95
9451	2	85
9453	22	66
9461	1	7
9465	547	2,157
9466	169	792
9467	1,808	7,945
9468	2	10
9469	228	1,211
9470	4	20
9471	146	446
9472	254	1,224
9473	20	126
9474	48	240
9475	4	7
9477	639	2,352
9478	13	39
9997	-	46,262
9998	-	117,419
9999	-	52,845
TOTALS	31,688	492,331

PATHOLOGY

PROCEDURE

BLOOD

8602	Agglutination for febrile diseases, first antigen	8671	Eosinophile count.....
8603	each additional antigen	8619	Factors 5 and 7.....
8604	Alcohol, blood	8748	Fibrinogen
8683	Ammonium sulfate turbidity	8675	Flocculation tests (Kline, Kahn, etc.) each
8747	Ammonia, blood	8621	Galactose tolerance
8605	Amylase, blood	8681	Hematocrit
8306	Antistreptolysin titer	8677	Hemoglobin, carbon monoxide (qualitative)
8608	Ascorbic acid	8678	methemoglobin (qualitative)
8750	Barbiturate, qualitative	8679	suphemoglobin (qualitative)
8751	quantitative	8684	Heterophile antibody with absorption
8399	Basophilic aggregates (L-E cells) smear preparations	8685	without absorption
8607	L-E chemical test	8625	Hydroxycorticosteroids
8610	bilirubin, total	8690	Icterus index
8611	Bilirubin (Van den Berg) indirect	8625	Inulin clearance
	direct and delayed	8673	Iron, serum
8614	Bleeding time	8674	Iron binding capacity
8617	Blood culture, aerobic and anaerobic, screening	8627	Irregular antibodies, screening
8618	definitive	8635	antibody identification
8620	Blood, red cell count	8744	Lactic dehydrogenase
8622	hemoglobin determination	8670	Latex fixation
8621	white cell count	8691	Lead
8626	differential count	8629	Leucine aminopeptidase
8628	complete count (CBC)	8692	Lipase
8631	Bone marrow, collection and evaluation of material	8693	Lipids, total
8636	evaluation of material only	8694	phospholipids
8637	Bromides	8630	Macroglobulins, screening
8638	Bromsulphalein	8639	cryoglobulins, screening
8640	C-reactive protein	8631	Magnesium
8641	Calcium	8695	Non-protein nitrogen
8646	Cephalin flocculation	8699	Oxycorticoids
8650	Chlorides	8698	Oxygen, blood
8652	Cholesterol	8696	Oxygen content (arterial blood)
8653	Cholesterol esters	8669	Paternity testing, per individual
8613	Cholinesterase	8703	pH blood
8989	Circulation time	8700	Phosphatase, acid
8656	Clot retraction	8633	prostatic fraction
8643	CO ₂ combining power	8701	alkaline
8647	arterial puncture	8702	Phosphorus
8648	CO ₂ content (arterial)	8630	Platelet agglutination
8658	Coagulation time (Lee & White)	8704	Platelet count
8659	other methods	8642	Platelet pack, preparation
8615	Cold agglutinins	8706	Potassium
8661	Complement fixation tests (Wassermann, etc.)	8797	Protein bound iodine
8662	Complement fixation, quantitative	8704	Prothrombin time
8644	Congo red	8710	Prothrombin utilization
8739	Coombs test, direct	8711	Red cell fragility
8753	indirect	8713	Reticulocyte count
8666	Creatine	8672	Rh genotype
8681	Creatinin	8716	Rh titer
8689	Creatinine clearance	8752	Salicylates
8740	Crossmatch, blood, with saline, albumin and Coombs techniques	8720	Sedimentation rate
8667	Electrophoresis pattern, protein	8709	Sickle cell preparation
8668	lipoprotein	8722	Smears for parasites (malaria, etc.)
8616	hemoglobin	8645	Smear, peripheral blood evaluation
		8726	Sugar
		8728	Sugar tolerance, 3 hours
		8729	5 hours
		8649	Sulfonamide level
		8746	Thiocyanate
		8631	Thorn test

8673	Thromboplastin generation.....
8751	Thymol turbidity.....
8753	Total protein.....
8754	and albumin-globulin ratio.....
8755	albumin-globulin ratio.....
8682	TPI or RPCF.....
8745	Transaminase, glutamic oxalacetic.....
8653	glutamic pyruvic.....
8737	Typing, blood (ABO only).....
8732	Rh (D) only (including Dc).....
8751	Urea.....
8743	Urea clearance.....
8655	Urea nitrogen.....
8657	Uric acid.....
8680	Venipuncture only.....
8753	Vitamin A.....
8755	Volume, blood (dye method).....
8668	Zinc sulfate turbidity.....
8730	Procedure not listed, Blood.....

RADIOISOTOPE DIAGNOSTIC TESTS

8757	Radio-iodine uptake, thyroid.....
8758	uptake with hand scan.....
8759	Blood plasma volume (RISA).....
8760	Blood loss—intestinal (radio-chromate or radio-iron).....
8761	Circulation time (as with RISA).....
8762	Fat absorption (blood levels and/or stool excretion) radio-iodinated triolein.....
8763	radio-iodinated triolein and oleic acid.....
8764	Liver function (as with radio-iodinated rose bengal).....
8765	Protein bound radio-iodine plasma or conversion ratio.....
8766	Radio-cyanocobalamin absorption (Schilling test).....
8767	Radio-iron metabolism—plasma clearance.....
8768	red cell turnover.....
8769	Radio-tri-iodo-thyronine (in vitro) red cell uptake.....
8770	Red cell survival (as with radio-chromate).....
8771	Red cell volume (as with radio-chromate).....
8772	Renal function (as with radio-iodohippurate sodium).....
8773	Radioactive isotope diagnostic procedure not listed.....

FECES

8813	Culture for bacteria, screening.....
8814	definitive.....
8807	Fat content, quantitative.....
8804	Iron hematoxylin stain.....
8801	Routine chemical, fat (qualitative).....
8802	starch (qualitative).....
8803	Routine microscopic, wet preparation (parasites).....
8805	Routine chemical and microscopic examination, including parasites.....
8808	Trypsin (gelatin digestion).....

GASTRIC OR DUODENAL CONTENTS

8810	Gastric contents, intubation and collection, independent procedure.....
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8821	Gastric contents, microscopic.....
8821	chemical, acid, single.....
8827	chemical, acid, fractional.....
8828	chemical, acid, fractional with histamine.....
8829	chemical, papain.....
8830	tubeless.....
8831	Duodenal contents, microscopic.....
8831	enzyme determination, each.....
8831	Smear for TB, concentrated.....
8831	Culture for TB, concentrated.....

SERIAL FLUID

8861	Colloidal gold (nastic, carbon, etc).....
8873	Culture for bacteria, screening.....
8874	definitive.....
8878	Osmolality tests.....
8878	Quantitative chemical tests (see Blood).....
8853	Routine chemical (Pandy).....
8855	Routine microscopic (cell count).....
8866	Standard test for syphilis, each.....
8871	Smear for bacteria.....

SPUTUM

8891	Culture, direct, screening.....
8892	direct, definitive.....
8893	after concentration.....
8893	for fungi.....
8891	Smear, direct.....
8894	after concentration.....
8890	Tracheal wash with culture for TB.....

TISSUES

8900	Autopsy examination.....
8904	consultation on prepared slide.....
8917	Cytology study (Papancolaou smear).....
8905	smear and block technique.....
8901	Surgical, gross only.....
8903	gross and microscopic.....
8907	frozen section (includes permanent section) per tissue.....
8911	culture for bacteria, screening.....
8912	culture for bacteria, definitive.....

URINE

8933	Bence Jones protein.....
8947	Bile pigments.....
8923	Calcium, 24-hour.....
8945	Calcium, quantitative (Sulkowitch).....
8924	Catecholamines.....
8934	Complete routine (chemical and microscopic).....
8930	chemical, qualitative.....
8932	microscopic.....
8935	Concentration and dilution tests.....
8943	Culture for bacteria, screening.....
8945	definitive.....
8941	for tuberculosis.....
8905	Osmolality tests.....
8938	Phenosulfonphthalein.....
8942	Porphobilinogen.....
8939	Porphyrins, qualitative.....
8940	quantitative.....

- 8948 Quantitative chemical tests (see Blood)
- 8955 Quantitative functional (Addis).....
- 8954 Serotonin, qualitative.....
- 8955 quantitative.....
- 8951 Smear for bacteria.....
- 8957 Sugar fermentation.....
- 8931 Sugar, quantitative.....
- 8967 Urinary 17-ketosteroids.....
- 8958 11-oxysteroids.....
- 8969 gonadotropins.....
- 8926 pregnandiol.....
- 8927 17-hydroxycorticosteroids.....
- 8928 estrogens.....

MISCELLANEOUS

- 8997 Animal inoculation, miscellaneous.....
- 8951 Antibiotic sensitivity, (pyogenic) disc
 technique, single disc.....
- 8984 up to 10 discs.....
- 8985 tube dilution technique, per antibiotic
- 8953 Autoogenous vaccine.....
- 8956 Basal metabolic rate (BMR).....
- 8981 Biologic test for pregnancy (A-Z, Fried-
 man, etc.).....
- 8962 (Frog).....

- 8935 Darkfield examination, skin lesion.....
- 8966 blood.....
- 8975 Direct smear without stain.....
- 8972 Exclusion test for phaeoconocytoma
 (Regitine, etc.).....
- 8977 Guinea pig for TB.....
- 8978 Miscellaneous animal inoculation for bac-
 teria.....
- 8976 Miscellaneous culture for micro-organisms
 screening.....
- 8979 definitive.....
- 8974 Miscellaneous smear for micro-organisms
 with stain.....
- 8913 Paper chromatography.....
- 8914 Procedures not listed, miscellaneous.....
- 8981 Semen analysis, complete.....
- 8982 hanging drop method.....
- 8987 Skin tests with bacterial extracts (each)
 (Brucella, Frei, etc.).....
- 8991 Stone analysis, qualitative.....
- 8992 quantitative.....
- 8915 Sweat test.....
- 8999 Ventilation studies, complete (respiromet-
 er) including spiogram, timed vital ca-
 pacity, maximal breathing capacity,
 with interpretation and report.....
- 8919 Viral studies.....
- 8925

EXHIBIT I

Summary of the Principal Benefit Changes Due to
Legislative Bill No. 292, Effective 7-1-88

	Effective 5-30-87	Effective 7-1-88
FATAL:		
<hr/>		
% Rate of Compensation		
Widow		66 2/3%
Widow and Children		75%
One Orphan		66 2/3%
Two or more Orphans		75%
One Parent		25%
Two Parents		50%
Other Dependents		25% for each
Max. Aggregate % Rate of Comp.		75%
Min./Max. Weekly Benefit +	\$49.00 / \$235.00	\$49.00 / \$245.00
Duration: Widows		Life or remarriage
Children		Until age 18 or 25 if a student
Other Dep.		During dependency
Remarriage Award		2 years lump sum
Funeral Allowance		\$2,000

TOTAL DISABILITY:

% Rate of Compensation		66 2/3%
Min./Max. Weekly Benefit +	\$49.00 / \$235.00	\$49.00 / \$245.00
Duration		Period of Disability
Waiting period/Retroactive after		7 days/ 41 days

PERMANENT PARTIAL
DISABILITY - SCHEDULE:

% Rate of Compensation		66 2/3%
Min./Max. Weekly Benefit +	\$49.00 / \$235.00	\$49.00 / \$245.00
Duration		As per schedule

EXHIBIT I (Cont.)

Summary of the Principal Benefit Changes Due to
Legislative Bill No. 292, Effective 7-1-88

Effective
5-30-87

Effective
7-1-88

NON-SCHEDULE:

‡ Rate of Compensation
Min./Max. Weekly Benefit
Maximum Duration, Including
Healing Period

- /\$235.00

66 2/3% wage loss
- /\$245.00
300 weeks

HEALING PERIOD:

Temporary Total
Benefit

+ If the employee's wages are less than the minimum, then he receives his full wages.

CALCULATION OF EFFECT OF LAW AMENDMENT ON FATAL BENEFIT COSTS
BASED ON NCCI DISTRIBUTIONS AND REMARRIAGE TABLE

	10/1/88 -----	7/1/89 -----
1. COST OF DEPENDENCY	\$86,763,623	\$89,846,238
2. BURIAL COST (1,000 cases * \$1,000 per case)	\$1,000,000	\$1,000,000
3. SPECIAL FUND ASSESSMENT (147 non-dependency cases * \$1,150)	\$169,050	\$169,050
4. COST OF REMARRIAGE AWARD	\$1,561,506	\$1,617,037
5. TOTAL COST OF FATAL BENEFITS (1) + (2) + (3) + (4)	\$89,494,179	\$92,632,325
6. EFFECT		1.035

NOTES:

1. The data is based on a recent Arizona filing and assumes the NCCI distribution of dependent survivors and a remarriage decrement in the computation of the annuities.
2. The remarriage awards are based on a two year lump sum benefit, the NCCI frequency distributions and the NCCI calculation of the remarriage values.

COST OF FATAL BENEFITS BASED ON NCCI DISTRIBUTIONS

(1) # CASES	(2) TYPE OF DEPENDENTS	(3) AVERAGE AGE	(4) ANNUITY VALUE	(5) AVG WEEKLY BENEFITS EFF 10/1/88	(6) COST OF BENEFITS EFF 10/1/88	(7) AVG WEEKLY BENEFITS EFF 7/1/89	(8) COST OF BENEFITS EFF 7/1/89
147	NONE						
356	WIDOW ALONE	28	811.32	105.73	30,537,987	109.49	31,623,988
136	WIDOW WITH 1 CHILD	29 10	519.97 363.80	105.73 151.05	7,476,794 7,473,471	109.49 156.41	7,742,686 7,738,666
129	WIDOW WITH 2 CHILD	29 10	519.97 363.80	105.73 196.36	7,091,959 9,215,214	109.49 203.33	7,344,165 9,542,318
162	WIDOW WITH 3+ CHILD	29 10	519.97 363.80	105.73 201.40	8,906,181 11,869,630	109.49 208.56	9,222,905 12,291,609
16	1 ORPHAN	11	323.11	75.52	390,420	78.23	404,430
10	2 ORPHAN	11	323.59	120.84	391,026	125.13	404,908
7	3 ORPHAN	11	323.59	166.15	376,351	172.05	389,716
4	4+ ORPHAN	11	323.59	201.40	260,684	208.56	269,952
13	PARENT	61	689.33	75.72	678,549	78.23	701,042
17	PARENTS	50	883.60	120.84	1,815,162	125.13	1,879,603
3	SIBLINGS ETC	22	1,236.74	75.52	280,195	78.23	290,250
1,000					86,763,623		89,846,238

(9) EFFECT OF COST OF DEPENDENCY

1.036

NOTES:

1. The data is based on a recent Arizona filing and NCCI's distribution of dependent survivors.

CALCULATION OF EFFECT OF LAW AMENDMENT ON FATAL BENEFIT COSTS
BASED ON ALTERNATE DISTRIBUTION AND NO REMARRIAGE

	10/1/88 -----	7/1/89 -----
1. COST OF DEPENDENCY	\$90,480,988	\$93,695,932
2. BURIAL COST (1,000 cases * \$1,000 per case)	\$1,000,000	\$1,000,000
3. SPECIAL FUND ASSESSMENT (309 non-dependency cases * \$1,150)	\$355,350	\$355,350
4. COST OF REMARRIAGE AWARD	\$0	\$0
5. TOTAL COST OF FATAL BENEFITS (1) + (2) + (3) + (4)	\$91,836,338	\$95,051,282
6. EFFECT		1.035

NOTES:

1. The data is based on a recent Arizona filing and assumes an alternate distribution of dependent survivors and no remarriage decrement in the computation of the annuities.
2. The remarriage award is based on a two year lump sum benefit but also assumes no widows remarry.

COST OF FATAL BENEFITS BASED ON AN ALTERNATE FREQUENCY DISTRIBUTION AND NO REMARRIAGE

(1) # CASES	(2) TYPE OF DEPENDENTS	(3) AVERAGE AGE	(4) ANNUITY VALUE	(5) AVG WEEKLY BENEFITS EFF 10/1/88	(6) COST OF BENEFITS EFF 10/1/88	(7) AVG WEEKLY BENEFITS EFF 7/1/89	(8) COST OF BENEFITS EFF 7/1/89
309	NONE						
356	WIDOW ALONE	28	1218.78	105.73	45,874,733	109.49	47,506,143
136	WIDOW WITH 1 CHILD	29 10	846.77 363.80	105.73 151.05	12,175,943 7,473,471	109.49 156.41	12,608,947 7,738,666
129	WIDOW WITH 2 CHILD	29 10	846.77 363.80	105.73 196.36	11,549,240 9,215,214	109.49 203.33	11,959,957 9,542,318
0	WIDOW WITH 3+ CHILD	29 10	846.77 363.80	105.73 201.40	0 0	109.49 208.56	0 0
16	1 ORPHAN	11	323.11	75.52	390,420	78.23	404,430
10	2 ORPHAN	11	323.59	120.84	391,026	125.13	404,908
7	3 ORPHAN	11	323.59	166.15	376,351	172.05	389,716
4	4+ ORPHAN	11	323.59	201.40	260,684	208.56	269,952
13	PARENT	61	689.33	75.72	678,549	78.23	701,042
17	PARENTS	50	883.60	120.84	1,815,162	125.13	1,879,603
3	SIBLINGS ETC	22	1236.74	75.52	280,195	78.23	290,250
1000					90,480,988		93,695,932

(9) EFFECT OF COST OF DEPENDENCY

1.036

NOTES:

1. The data is based on a recent Arizona filing and assumes an alternate distribution of dependent survivors and no remarriage decrement.

COLORADO LAW MEMO

Changes Resulting from the Medical Fee
Schedule Change

EFFECTIVE: August 1, 1988

Increase in the Conversion Factors Applied to Medical Fee Schedule

TOTAL EFFECT: +2.9%

COLORADO LAW MEMO

MEMORANDUM

Re: **Evaluation of the Effect on Colorado
Compensation Costs Resulting from Medical
Fee Schedule Change, Effective 8/1/88**

This memorandum presents the principles underlying the calculation of the effect on compensation costs resulting from the adoption of the Colorado Department of Labor and Employment Workers Compensation. The Fee Schedule Change is effective August 1, 1988. According to standard principles and procedures, the effect was determined by comparing the monetary cost prior to the change with the monetary cost under the new schedule.

Communication with the Fee Schedule Coordinator informed us that whereas adoption of more current CPT coding necessitated considerable change to the Fee Schedule - especially introduction of new and deletion of old codes - relative values were generally left unchanged and new conversion factors were adopted together with some administrative rule changes. Accordingly, our pricing concentrates on the impact of adopting the revised conversion factors. For each medical cost category, fee items were matched with the Medical Cost Distribution of the National Council. The matched fee procedure's prior and revised conversion factors were then weighted by the relative frequencies from the Medical Cost Distribution. Because the 1988 schedule stipulates different conversion factors for the reimbursement of hospitals and physicians, both factors were afforded their respective weight in determining the frequency distribution based on the 1988 conversion factors. The comparison results in an increase in the cost of matched procedures, unmatched were assumed to undergo the same proportional increase. The effect of these changes in Medical Fee costs were further weighted by the complete Medical Cost Distribution to determine the overall effect on medical benefit costs to be an 8.7% increase. Finally, the overall effect on benefit costs, calculated to be a 2.9% increase, is determined from a weighted average of the effects on medical and indemnity benefits using the losses incurred during the latest two policy periods as weights.

The following exhibits are attached:

- Exhibit I - Impact by Type of Injury of the Medical Fee Changes on Benefit Costs, Effective August 1, 1988
- Exhibit I-A - Overall Effect of the Medical Fee Changes on Benefit Costs, Effective August 1, 1988
- Exhibit II - Determination of the Effect of the August 1, 1988 Medical Fee Changes on Total Medical Costs
- Exhibit III - Determination of the Effect of the August 1, 1988 Medical Fee Changes on Matched Fee Items

COLORADO LAW MEMO

EXHIBIT I

Impact by Type of Injury of the Medical Fee Changes
on Benefit Costs, Effective August 1, 1988

<u>Type of Injury</u>	<u>Percentage of Losses*</u>	<u>Effect (%)</u>
Fatal	4.4%	0.0
Permanent Total	4.4%	0.0
Major Permanent Partial	49.6%	0.0
Minor Permanent Partial	4.0%	0.0
Temporary Total	4.8%	0.0
Indemnity	67.2%	0.0 **
Medical	32.8%	+8.7
Total Effect	100.0%	+2.9 **

* Losses for policies becoming effective during the 24-month period ending 2-28-86 on the 7-1-88 law level and developed to an ultimate basis by serious, non-serious injuries.

** Weighted Average.

COLORADO LAW MEMO

EXHIBIT I-A

Overall Effect of the Medical Fee Changes
on Benefit Costs, Effective August 1, 1988

<u>Type of Injury</u>	<u>(1) Losses*</u>	<u>(2) Effect</u>	<u>(3) Modified Losses (1)x(2)</u>
Fatal	41,060,257	1.000	41,060,257
Permanent Total	40,822,776	1.000	40,822,776
Major Permanent Partial	462,803,330	1.000	462,803,330
(Serious)	(544,686,363)	(1.000)	(544,686,363)
Minor Permanent Partial	37,584,014	1.000	37,584,014
Temporary Total	44,483,181	1.000	44,483,181
(Non-Serious)	(82,067,195)	(1.000)	(82,067,195)
Medical	305,715,440	1.087	332,312,683
Total/Effect	932,468,998	1.029	959,066,241

* Combined losses for policies becoming effective during the 24-month period ending 2-28-86 on the 7-1-88 law level and developed to an ultimate basis by serious, non-serious injuries.

COLORADO LAW MEMO

EXHIBIT II

Determination of the Effect of the August 1, 1988
Medical Fee Changes on Total Medical Costs

<u>Medical Cost Frequency Distribution</u>	<u>(1) Medical Cost*</u>	<u>(2) Rate of Change</u>	<u>(3) Modified Costs (1)x(2)</u>
Matchable Frequency Items	199,948	1.156	231,140
Balance of Fee Schedule Items	75,857	1.156+	87,691
Hospital and Miscellaneous Items	<u>216,526</u>	<u>1.000</u>	<u>216,526</u>
	492,331	1.087	535,357

* From National Council Medical Cost Frequency Distribution Study.

+ Effect assumed to be the same as for matchable items.

COLORADO LAW MEMO

EXHIBIT III

Determination of the Effect of the August 1, 1988 Fee Changes on Matched Fee Items

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Medical Cost Item	Frequency Dist. in Units*	8-1-87 Conversion Factors	Modified Freq. Distribution on 8-1-87 Factors (2)x(3)	8-1-88 Conversion Factors (5)	Hospital Reimbursement Services (6)	Physician Hospital Services (7)	Percentages (8)	Modified Freq. Distribution on 8-1-88 Factors (2)x((7)x(5)+(8)x(6)) (9)
Medicine	117,665	5.15	605,975	5.55	7.60	80%	20%	701,283
Anesthesia	1,126	26.25	29,558	31.00	N/A	100%	0%	34,906
Surgery	3,732	62.40	232,877	69.40	N/A	100%	0%	259,001
Radiology	6,298	15.00	94,470	15.25	19.65	25%	75%	116,828
Pathology	130	9.75	1,268	12.70	18.10	25%	75%	2,178
Total			964,148					1,114,196

Effect of Matched Items 1.156

* Based on MCCI Medical Cost Frequency Distribution Tables and Colorado Industrial Commission's Workmen's Compensation Relative Value Study.

COLORADO LAW MEMO

Change Resulting from the Revised
Medical Fee Schedule Conversion Factors

EFFECTIVE 8-1-89

OVERALL EFFECT

-1.4 %

COLORADO LAW MEMO

EXHIBIT I

Impact by Type of Injury of the Medical Fee Changes
on Benefit Costs, Effective August 1, 1989

Type of Injury	Percentage of Losses*	Effect(%)
Fatal	3.9%	0.0
Permanent Total	4.3%	0.0
Major Permanent Partial	54.3%	0.0
Minor Permanent Partial	3.3%	0.0
Temporary Total	3.5%	0.0
Indemnity	69.3%	0.0 **
Medical	30.7%	- 4.4
Total	100.0%	- 1.4 **

* Losses for policies becoming effective during the 24-month period ending 2-28-87 on the 7-1-89 law level and developed to an ultimate basis by type of injury.

** Weighted Average.

COLORADO LAW MEMO

EXHIBIT I-A

Overall Effect of the Medical Fee Changes
on Benefit Costs, Effective August 1, 1989

Type of Injury	(1) Losses*	(2) Effect	(3) Modified Losses (1)x(2)
Fatal	48,949,739	1.000	48,949,739
Permanent Total	53,958,754	1.000	53,958,754
Major Permanent Partial	679,185,115	1.000	679,185,115
(Serious)	(782,093,608)	(1.000)	(782,093,608)
Minor Permanent Partial	40,857,447	1.000	40,857,447
Temporary Total	43,838,062	1.000	43,838,062
(Non-Serious)	(84,695,509)	(1.000)	(84,695,509)
Medical	384,332,051	0.956	367,421,441
Total/Effect	1,251,121,168	0.986	1,234,210,558

* Losses for policies becoming effective during the 24-month period ending 2-28-87 on the 7-1-89 law level and developed to an ultimate basis by type of injury.

COLORADO LAW MEMO

EXHIBIT II

Calculation of the Effect of the Proposed Medical Fee
Changes on Total Medical Costs

Medical Cost Frequency Distribution	(1) Medical Cost*	(2) Rate of Change	(3) Modified Costs (1)x(2)
Matchable Frequency Items	199,948	0.998	199,548
Balance of Fee Schedule Items	75,857	0.998 +	75,705
Other Medical Costs	46,262	1.000	46,262
Hospital Charges	170,264	0.877	149,322
	<u>492,331</u>	<u>0.956</u>	<u>470,837</u>

* From National Council Medical Cost Frequency Distribution Study.

+ Effect assumed to be the same as for matchable items.

COLORADO LAW MEMO

EXHIBIT III

Determination of the Effect of the Proposed
Medical Fee Changes on Hospital Charges

1. Proposed Medical DRG per diem	650
2. Proposed Surgical DRG per diem	950
3. Estimated Cost Effect for (1) and (2)	86%
4. Percent of Workers' Compensation Cases Treated by "Freestanding" Institutions	12%
5. Effect $([1.00 - (4)] \times (3) + [(4) \times 1.000])/100$	0.877



National Council on Compensation Insurance

COLORADO LAW MEMO

EXHIBIT IV

Determination of the Effect of the August 1, 1989 Fee Changes on Matched Fee Items

Medical Cost Item	(1) Frequency Dist. in Units*	(2) 8-1-88 Physician Reimburs.	(3) Hospital Reimburs.	(4) Physician Reimburs.	(5) 8-1-89 Factors	(6) Hospital Services	(7) Physician Services	(8) Hospital Services (1)*[(6)*(2)+(7)*(3)]	(9) Modified Frequency at 8-1-89 (1)*[(6)*(4)+(7)*(5)]
Medicine	117,665	5.55	7.60	5.37	7.60	88%	12%	681,280	663,631
Anesthesia	1,126	31.00	N/A	31.75	N/A	100%	0%	34,906	35,751
Surgery	3,732	69.40	N/A	73.15	N/A	100%	0%	259,001	272,996
Radiology	6,298	15.25	19.65	15.50	19.65	55%	45%	108,515	109,396
Pathology	130	12.70	18.10	13.88	18.10	55%	45%	1,968	2,051
Total								1,085,670	1,083,825

Effect of Matched Items

0.998

* Based on NCCI Medical Cost Frequency Distribution Tables and Colorado Industrial Commission's Workmen's Compensation Relative Value Study

OREGON

Changes Resulting from the Enactment of
House Bill 2292

EFFECTIVE JANUARY 1, 1986

Change in the Medical Fee Schedule From an Allowable Charge at the 90th
Percentile to a Mandatory Charge at the 75th Percentile

TOTAL EFFECT: -3.2%

TABLE OF CONTENTS

- Exhibit I - Impact by Type of Injury of House Bill 2292, Effective 1-1-86
- Exhibit I-A - Overall Effect of the Increase in Benefits Due to HB2292 Effective 1-1-86
- Exhibit II - The Effect on Medical Costs of House Bill 2292, Effective 1-1-86

EXHIBIT I

Impact by Type of Injury Due to
House Bill 2292, Effective 1-1-86

<u>Type of Injury</u>	<u>Percentage of Losses*</u>	<u>Effect(%)</u>
Death	3.4%	0.0
Permanent Total	2.4%	0.0
Major Permanent Partial	25.2%	0.0
Minor Permanent Partial	20.6%	0.0
Temporary Total	9.5%	0.0
Indemnity	61.1%	0.0**
Medical	38.9%	-8.3
Total	100.0%	-3.2**

* Losses for policies becoming effective during the 24-month period ending 12-31-82 on the SB165 1-1-86 law level and developed to an ultimate basis by type of injury.

** Weighted Average.

EXHIBIT I-A

Overall Effect Due to House Bill 2292, Effective 1-1-86

<u>Type of injury</u>	(1) <u>Losses*</u>	(2) <u>Effect</u>	(3) <u>Modified Losses (1)x(2)</u>
Death	19,356,179	1.000	19,356,179
Permanent Total	13,993,105	1.000	13,993,105
Major Permanent Partial	144,637,880	1.000	144,637,880
(Serious)	(177,987,164)	(1.000)	(177,987,164)
Minor Permanent Partial	118,673,309	1.000	118,673,309
Temporary Total	54,704,448	1.000	54,704,448
(Non-Serious)	(17,337,757)	(1.000)	(173,377,757)
Medical	223,532,958	0.917	204,979,722
Total/Effect	574,897,879	0.968	556,344,643

* Losses for policies becoming effective during the 24-month period ending 12-31-82 on the SB165 1-1-86 law level and developed to an ultimate basis by type of injury.

EXHIBIT II

The Effect on Medical Costs of House Bill 2292, Effective 1-1-86

House Bill 2292 sets the maximum allowable charge for procedures covered by the medical fee schedule at the 75th percentile. Currently, law allows doctors to request, on a case-by-case basis, billing as high as the 90th percentile. (Doctors do not need special permission up to the 75th percentile.)

Conversations with claims personnel indicate that 90% of the doctors are currently billing at the 90th percentile, the other 10% at the 75th percentile. In addition, we estimate that 55% of all medical costs are covered by the medical fee schedule. This results in an effect on medical costs of:

$$\frac{((\frac{75}{90})(.90) + (\frac{75}{90})(.10)) \times .55) + .45}{((\frac{90}{90})(.90) + (\frac{75}{90})(.10)) \times .55) + .45} = .917$$

TABLE OF CONTENTS

- Exhibit I - Impact by Type of Injury of the Medical Fee Change, Effective 1-1-90
- Exhibit II - Overall Effect of the Medical Fee Change on Benefit Costs, Effective 1-1-90
- Exhibit III - Determination of the Effect of the Medical Fee Change on Medical Costs, Effective 1-1-90
- Exhibit IV - Determination of the Cost and Effect of Adopting the 1-1-90 Conversion Factors to the 1974 California Relative Value Study

EXHIBIT I

Impact by Type of Injury of the Medical Fee Change,
Effective 1-1-90

<u>Type of Injury</u>	<u>Percentage of Losses*</u>	<u>Effect(%)</u>
Fatal	2.8%	0.0
Permanent Total	0.6%	0.0
Major Permanent Partial	29.0%	0.0
Minor Permanent Partial	3.8%	0.0
Temporary Total	10.3%	0.0
Indemnity	46.5%	0.0 **
Medical	53.5%	+ 5.0
Total	100.0%	+ 2.7 **

* Losses for policies becoming effective during the 24-month period ending 4-30-87 on the 7-1-89 law level and developed to an ultimate basis by serious, non-serious, and medical categories.

** Weighted Average.



EXHIBIT II

Overall Effect of the Medical Fee
Change on Benefit Costs, Effective 1-1-90

Type of Injury	(1) Losses*	(2) Effect	(3) Modified Losses (1)x(2)
Fatal	1,821,212	1.000	1,821,212
Permanent Total	372,032	1.000	372,032
Major Permanent Partial (Serious)	19,181,507 (21,374,751)	1.000 (1.000)	19,181,507 (21,374,751)
Minor Permanent Partial	2,517,499	1.000	2,517,499
Temporary Total (Non-Serious)	6,823,350 (9,340,849)	1.000 (1.000)	6,823,350 (9,340,849)
Medical	35,394,968	1.050	37,164,716
Total/Effect	66,110,568	1.027	67,880,316

* Losses for policies becoming effective during the 24-month period ending 4-30-87 on the 7-1-89 law level and developed to an ultimate basis by serious, non-serious, and medical categories.



EXHIBIT III

Determination of the Effect of the Medical Fee Change
on Medical Costs, Effective 1-1-90

Cost Item	(1) N.C.C.I. Medical Cost Distribution	(2) Effect of 1-1-90 Medical Fee	(3) Modified Cost (1)x(2)
Revised/Matched Fees	212,845	1.090	232,001
Unmatched Fees	62,960	1.090 +	68,626
Hospital Costs	170,264	1.000	170,264
Other Costs	46,262	1.000	46,262
Total/Effect	492,331	1.050	517,153

+ Unmatched fees assumed to increase the same as matched fees.

UTAH LAW MEMO

Change Resulting from the Revised
Medical Fee Schedule Conversion Factors

EFFECTIVE 1-1-90

Change in Conversion Factor for:

Surgery	from	13.00	to	14.17	(9.0%)
Medicine	from	1.00	to	1.09	(9.0%)
Restorative Medicine	from	1.00	to	1.09	(9.0%)
Radiology	from	1.05	to	1.14	(9.0%)
Pathology	from	1.00	to	1.09	(9.0%)
Anesthesia	from	20.52	to	22.37	(9.0%)

OVERALL EFFECT: + 2.7 %



EXHIBIT IV

Determination of the Cost and Effect of Adopting the 1-1-90
Conversion Factors to the 1974 California Relative Value Study

	(1) 1974 Unit Value x Freq.	(2) 7-1-89 Conversion Factor	(3) 1-1-90 Conversion Factor	(4) 7-1-89 Cost (1)x(2)	(5) 1-1-90 Cost (1)x(3)
Surgery	3,968.9	13.00	14.17	51,596	56,239
Medicine	79,665.6	1.00	1.09	79,666	86,836
Restorative Medicine	16,236.0	1.00	1.09	16,236	17,697
Radiology	9,631.0	1.05	1.14	10,113	10,979
Pathology	1,672.0	1.00	1.09	1,672	1,822
Anesthesia	9,048.0	20.52	22.37	185,665	202,404
(6) Total Cost = Sum of Col. (4), Sum of Col. (5)				344,948	375,977
(7) Effect = Sum of Col. (5) / Sum of Col. (4)					1.090

MINUTES
RATES COMMITTEE
MEETING OF APRIL 3, 1990

RC-89-12

Update on Joint Meeting Projects

Background:

At the February 17, 1988 joint Actuarial and Rates Committee meeting, the members prioritized issues of long term prospects for Workers Compensation and set goals for the top ten items.

Discussion:

Staff provided a final report on the one outstanding Joint Meeting Project: Benefits Utilization Growth and Retrospective Review of Law Changes. The Proceedings of the Workers Compensation Congress, which includes a paper on Benefit Utilization, were distributed. The Congress paper on Benefit Utilization summarizes research efforts to measure changes in utilization that accompany increases in workers compensation benefits. The paper of the Proceedings reflects input received at and subsequent to the Workers Compensation Congress.

Attached please find a report on the two recent NCCI research papers on Benefit Utilization and a report on the proposed studies concerning Retrospective Review of Law Changes provided at the meeting. The study proposals will be reviewed by the Claims Committee at its next meeting.

NATIONAL COUNCIL ON COMPENSATION INSURANCE
April 3, 1990

RETROSPECTIVE REVIEW OF LAW CHANGES

SUMMARY:

Significant changes in the various workers' compensation statutes have been enacted in recent years. The legislation has addressed many aspects of the system: indemnity benefits, dispute resolution, attorney fees, medical fee reimbursement schedules, utilization reviews, and safety programs. Many of these features are very difficult to price on a prospective basis. However, a retrospective review of the actual impact of certain major legislation would provide insights that would help to more accurately price similar law changes in the future.

OUTLINE OF PROPOSED STUDY, BY TOPIC:

I. Introduction of a Medical Fee Schedule

Issues: We do not capture data on current and customary charges which are needed for comparison with the schedule. Also, implementation of a medical fee schedule may be followed by increased utilization. We do not have the necessary information to measure this. Our current procedure is to modify the medical trend factor.

Example: Michigan or Texas

Proposal: A special calendar call to capture paid medical losses before and after the effective date of the fee schedule. The call would capture number of procedures [CPT code] and average payment.

Priority: A

II. Change in Basis of Permanent Partial Award

Issues: There are several methods used to determine Permanent Partial awards: schedule combined with non-schedule, wage loss, loss of earning capacity or impairment rating. Some methods are less predictable and involve more litigation than others. As a result, some states have changed the basis for determining their awards. We do not have access to data that would allow us to adequately price the effect of changing from one method to another, or of comparing awards under different systems.

Example: Oregon Prospective: Colorado

Proposal: A special call for data on Permanent Partial losses, including nature and cause of injury, basis for award, disability rating, modification (if applicable), attorney involvement and fees, duration of benefits and total loss. The data would be collected on an accident year basis before and after the law change.

Priority: A

III. Dispute Resolution

Issues: There are several topics under this general heading: appeals under trial de novo, where evidence and decisions at prior administrative hearings are inadmissible; the role played by the Workers' Compensation Board in contested cases; and attorney compensation.

Example: Trial de Novo: Oregon Prospective: Texas
Attorney Fees: New Mexico

Proposal: (1) Trial de novo: A special accident year study comparing percent of all claims that are contested before and after the law change, including information on actual verdicts on appeal. (2) Attorney Fees: Special accident year calls to track average awards with and without attorney involvement, percent of cases with attorney involvement and attorney fees before and after the effective date of the law change.

Priority: A

IV. Wage Loss

Issues: Currently, we do not have sufficient information to compare wage loss and schedule/impairment-based Permanent Partial awards. In addition, post-injury wages and deemed earnings have not been monitored since wage loss was introduced. This information is needed to accurately measure losses under wage loss systems.

Example: Florida, Louisiana

Proposal: A special accident year detail call for wage loss data capturing pre-injury wage, post-injury wage, deemed earnings, as well as information on nature and cause of injury and impairment rating.

Priority: B

V. Benefit Utilization

Issues: Significant changes in statutory benefits are believed to affect behavior. Specifically, large increases in benefits are accompanied by increases in the number of workers' compensation claims filed and the length of time for which benefits are paid. Many states increased benefits provided under workers' compensation in response to the recommendations of the National Commission. Wage replacement rates were increased, along with increases in minimum and maximum weekly benefits and durations for permanent injuries. Retroactive periods were shortened. More recently, reversals are occurring in states that are trying to curb increasing costs. Proposals are being drafted to limit durations to a fixed maximum number of weeks, and increase retroactive periods.

Example: Increase: New Hampshire
Decrease: Maine

Proposal: (1) A special accident year call to measure frequency and severity by benefit type before and after the effective date of the legislation, separately for age groups, general occupational headings, marital status/whether spouse is employed. (2) Continuation of research begun by Economic and Social Research Department in this area.

Priority: B

VI. Change in Average Weekly Wage Calculation

Issues: Several changes in the average weekly wage calculation have been made in various states: use of spendable wage as the base, inclusion of certain fringe benefits and applying different rules to part-time and/or seasonal workers.

Example: District of Columbia

Proposal: A data call containing the following claimant information: gross and net wage, fringe benefit additions, age, occupation, whether seasonal or part-time worker. Additionally, comparisons of average indemnity benefits before and after the law change.

Priority: C

VII. Work Environment

Issues: There are two major topics under this heading -- safety programs and drug/alcohol abuse.

SAFETY PROGRAMS: Recent legislation and legislative proposals have addressed safety consciousness from both employer and employee standpoints. Employers are being required to establish safety programs that meet certain standards. Incentives are generally either pricing credits for employers who meet the standards and/or fines or debits for employers in violation. Employees who violate established standards or fail to use necessary safety equipment lose all or part of their benefits.

DRUG/ALCOHOL ABUSE: Stricter standards and greater testing authority are being added to the statutes. Employees generally lose all or part of their benefits when alcohol/drug impairment contributes to an accident.

Example: Florida

Proposal: Special studies to collect data on percent of claims involving safety violations, or use of drugs/alcohol. Also to be collected is information on penalties assessed (employer as well as employee) and any benefit reductions. This data may only be available in claim files.

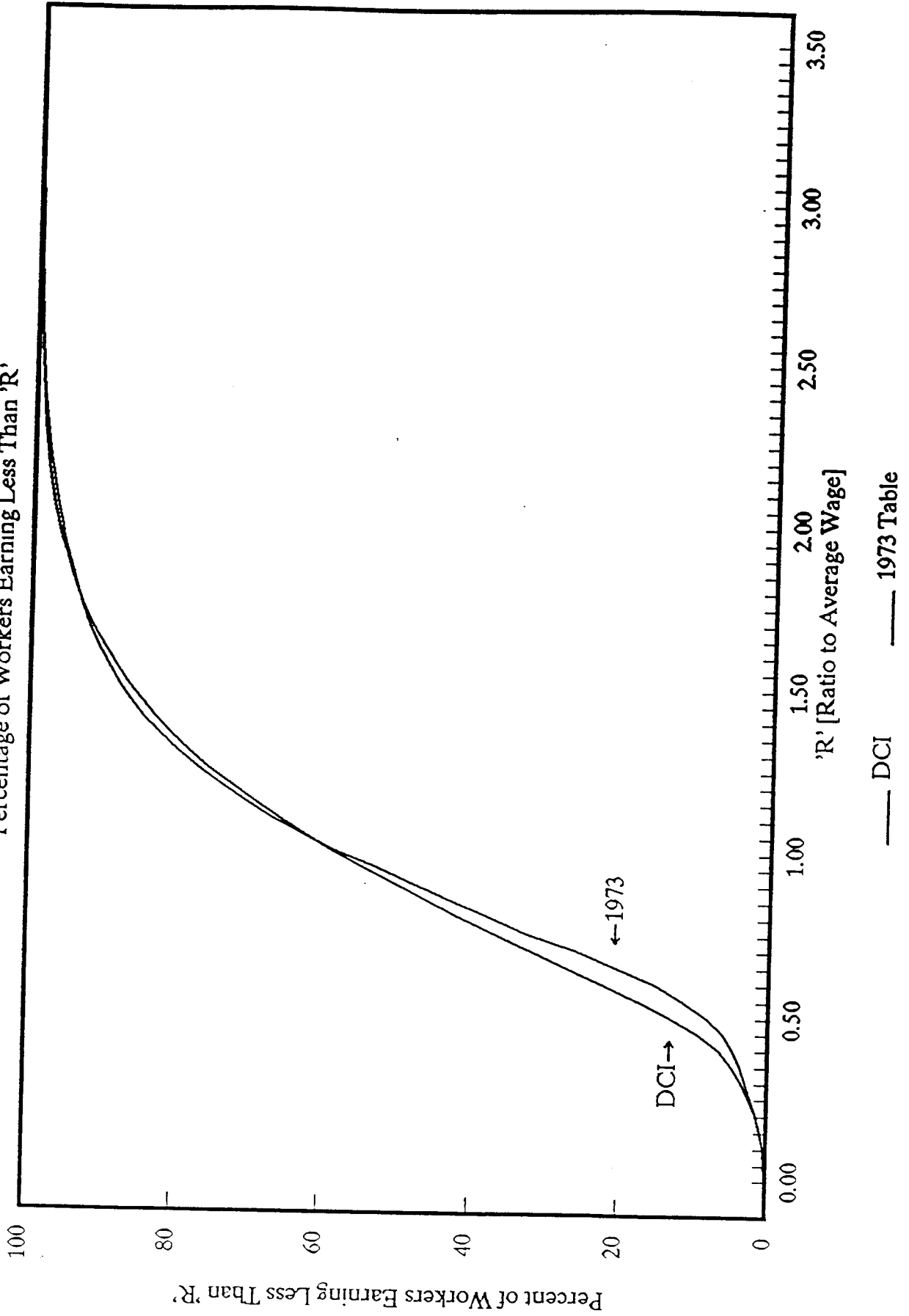
Priority: C

Additional Comments: The DCI is being expanded to capture data from all states, and to capture additional information in response to the NAIC reporting proposal. The new DCI will help us monitor many of these types of changes in the future, and will allow us to do more direct pricing and analysis as the file is built up. However, it will be several years before enough data will be collected for this purpose.

This proposal concentrates on retrospective analyses of significant prior legislation. Texas recently passed SB 1, which takes effect on January 1, 1991. A claims study comparing costs before and after SB 1 may be needed to accurately measure the true impact of this legislation.

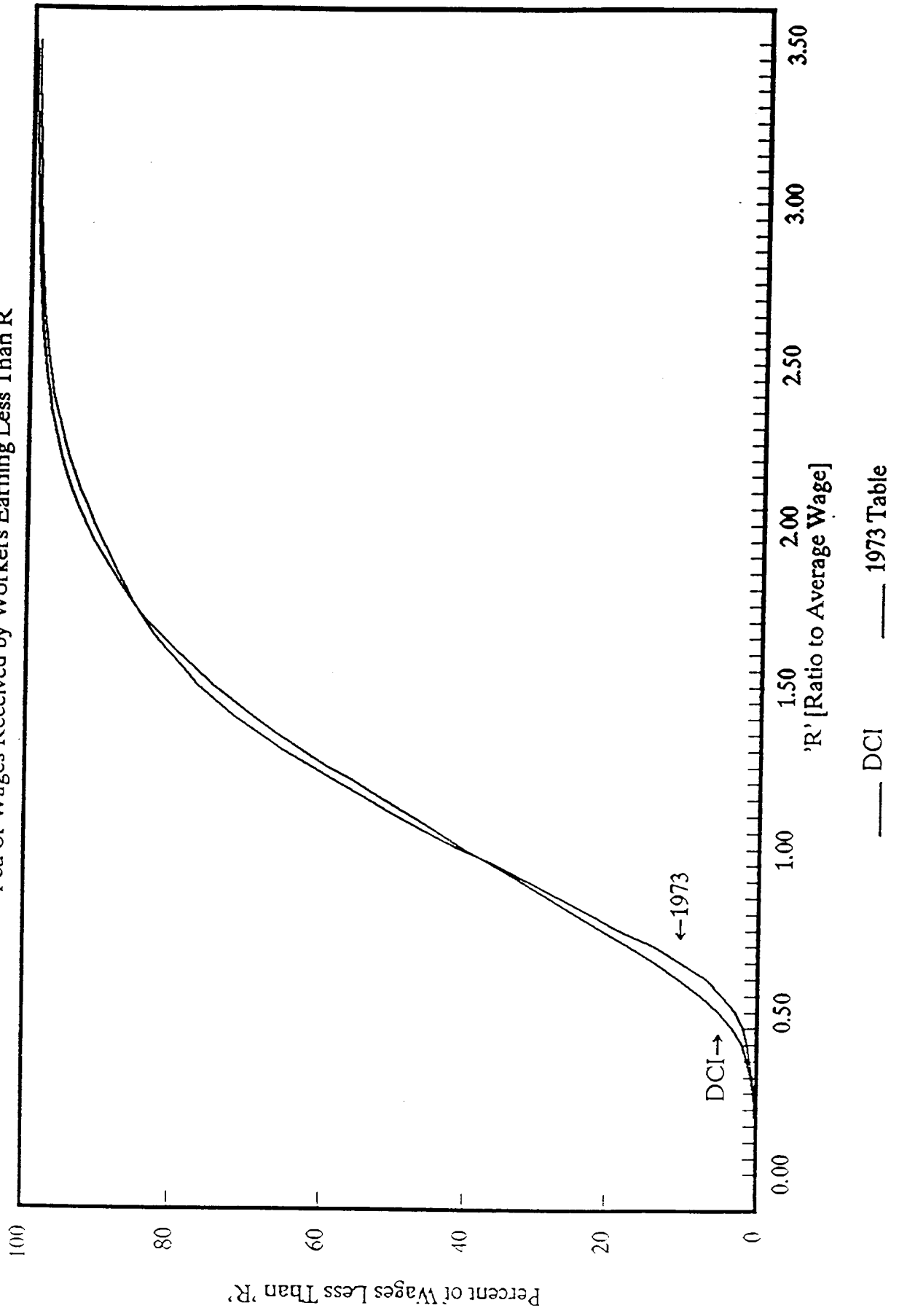
Comparison of DCI to 1973 Table

Percentage of Workers Earning Less Than 'R'



Comparison of DCI to 1973 Table

Pct. of Wages Received by Workers Earning Less Than R



EFFECTS OF WAGE DISTRIBUTION TABLE ON TEMPORARY TOTAL DISABILITY COSTS

WAGE DISTRIBUTION TABLE	AVERAGE WEEKLY BENEFIT		EFFECT ON TEMPORARY TOTAL COSTS (%)
	EFF 10/1/88	EFF 7/1/89	
1973 STANDARD	\$201.42	\$208.58	3.5%
WISCONSIN	\$204.36	\$212.72	4.1%
NEW YORK	\$197.54	\$206.11	4.3%
FLORIDA	\$196.83	\$203.95	3.6%
USL&HW	\$213.01	\$217.92	2.3%

NOTES:

1. The calculation of the average weekly benefits is from Exhibit 20, Sheets 2-6.
2. The calculation of Temporary Total disability costs is from Exhibit 20, Sheets 7-11.

AVERAGE WEEKLY BENEFITS BASED ON 1973 STANDARD WAGE DISTRIBUTION TABLE

	(A) PRE LAW	(B) POST LAW
(1) STATE	ARIZONA	ARIZONA
(2) EFFECTIVE DATE	10/1/88	7/1/89
(3) TYPE OF INJURY	TOTAL DISABILITY	TOTAL DISABILITY
(4) % RATE OF COMPENSATION	66.67%	66.67%
(5) MINIMUM WEEKLY WAGE	\$0.00	\$0.00
(6) MAXIMUM WEEKLY WAGE	\$380.77	\$415.38
(7) AVG WEEKLY WAGE BASED ON 12 MONTHS ENDING 12/31/87	\$353.07	\$353.07
(8) MINIMUM WEEKLY COMPENSATION	\$0.00	\$0.00
(4)*(5)		
(9) MAXIMUM WEEKLY COMPENSATION	\$253.85	\$276.92
(4)*(6)		
(10) WAGE TABLE "R" FACTOR AT MINIMUM	0.000	0.000
(5)/(7)		
(11) WAGE TABLE "R" FACTOR AT MAXIMUM	1.078	1.176
(6)/(7)		

(12A)	(13A)	(14A)	(15A)	(16A)	(17A)
WAGE INTERVAL	WAGE TABLE "R" FACTOR	WAGE TABLE "A" FACTOR	WAGE TABLE "B" FACTOR	AVG WEEKLY WAGE	AVG WEEKLY BENEFIT
MIN	NEAREST .05	(%)	(%)	(7A)*(15A)/(14A)	(4A)*(16A)
\$0 - \$380.77	0.00 - 1.10	67.1858	50.1850	263.73	\$175.82
\$380.77 -	1.10 -	32.8142	49.8150	535.99	\$253.85

(18A) AVERAGE WEEKLY WAGES AND BENEFITS \$353.07 \$201.42

(12B)	(13B)	(14B)	(15B)	(16B)	(17B)
WAGE INTERVAL	WAGE TABLE "R" FACTOR	WAGE TABLE "A" FACTOR	WAGE TABLE "B" FACTOR	AVG WEEKLY WAGE	AVG WEEKLY BENEFIT
MIN	NEAREST .05	(%)	(%)	(7B)*(15B)/(14B)	(4B)*(16B)
\$0 - \$415.38	0.00 - 1.20	74.0989	58.1398	277.03	\$184.69
\$415.38 -	1.20 -	25.9011	41.8602	570.62	\$276.92

(18B) AVERAGE WEEKLY WAGES AND BENEFITS \$353.07 \$208.58

NOTES:

- Columns (14A), (14B), (15A) and (15B) are from the referenced Wage Distribution Table.
- The "R" factor is the ratio of the actual wage to the average wage.
- The "A" factor from the Wage Distribution Table is the percentage of workers earning not more than "R" times the average wage.
- The "B" factor from the Wage Distribution Table is the percentage of wages earned by the percent of workers in "A".
- Columns (17A) & (17B) must be at least the minimum weekly compensation from (8) and at most the maximum weekly compensation from (9).

AVERAGE WEEKLY BENEFITS BASED ON WISCONSIN WAGE DISTRIBUTION TABLE

	(A) PRE LAW	(B) POST LAW
(1) STATE	ARIZONA	ARIZONA
(2) EFFECTIVE DATE	10/1/88	7/1/89
(3) TYPE OF INJURY	TOTAL DISABILITY	TOTAL DISABILITY
(4) % RATE OF COMPENSATION	66.67%	66.67%
(5) MINIMUM WEEKLY WAGE	\$0.00	\$0.00
(6) MAXIMUM WEEKLY WAGE	\$380.77	\$415.38
(7) AVG WEEKLY WAGE BASED ON 12 MONTHS ENDING 12/31/87	\$353.07	\$353.07
(8) MINIMUM WEEKLY COMPENSATION	\$0.00	\$0.00
(4)*(5)		
(9) MAXIMUM WEEKLY COMPENSATION	\$253.85	\$276.92
(4)*(6)		
(10) WAGE TABLE "R" FACTOR AT MINIMUM	0.000	0.000
(5)/(7)		
(11) WAGE TABLE "R" FACTOR AT MAXIMUM	1.078	1.176
(6)/(7)		

(12A)	(13A)	(14A)	(15A)	(16A)	(17A)
WAGE INTERVAL	WAGE TABLE "R" FACTOR NEAREST .05	WAGE TABLE "A" FACTOR (%)	WAGE TABLE "B" FACTOR (%)	AVG WEEKLY WAGE	AVG WEEKLY BENEFIT
MIN	MAX			(7A)*(15A)/(14A)	(4A)*(16A)
\$0 - \$380.77	0.00 - 1.10	63.6900	47.6600	264.21	\$176.14
\$380.77 -	1.10 -	36.3100	52.3400	508.94	\$253.85

(18A) AVERAGE WEEKLY WAGES AND BENEFITS \$353.07 \$204.36

(12B)	(13B)	(14B)	(15B)	(16B)	(17B)
WAGE INTERVAL	WAGE TABLE "R" FACTOR NEAREST .05	WAGE TABLE "A" FACTOR (%)	WAGE TABLE "B" FACTOR (%)	AVG WEEKLY WAGE	AVG WEEKLY BENEFIT
MIN	MAX			(7B)*(15B)/(14B)	(4B)*(16B)
\$0 - \$415.38	0.00 - 1.20	71.6000	56.9600	280.88	\$187.25
\$415.38 -	1.20 -	28.4000	43.0400	535.08	\$276.92

(18B) AVERAGE WEEKLY WAGES AND BENEFITS \$353.07 \$212.72

NOTES:

- Columns (14A), (14B), (15A) and (15B) are from the referenced Wage Distribution Table.
- The "R" factor is the ratio of the actual wage to the average wage.
- The "A" factor from the Wage Distribution Table is the percentage of workers earning not more than "R" times the average wage.
- The "B" factor from the Wage Distribution Table is the percentage of wages earned by the percent of workers in "A".
- Columns (17A) & (17B) must be at least the minimum weekly compensation from (8) and at most the maximum weekly compensation from (9).

AVERAGE WEEKLY BENEFITS BASED ON NEW YORK WAGE DISTRIBUTION TABLE

	(A) PRE LAW	(B) POST LAW
(1) STATE	ARIZONA	ARIZONA
(2) EFFECTIVE DATE	10/1/88	7/1/89
(3) TYPE OF INJURY	TOTAL DISABILITY	TOTAL DISABILITY
(4) % RATE OF COMPENSATION	66.67%	66.67%
(5) MINIMUM WEEKLY WAGE	\$0.00	\$0.00
(6) MAXIMUM WEEKLY WAGE	\$380.77	\$415.38
(7) AVG WEEKLY WAGE BASED ON 12 MONTHS ENDING 12/31/87	\$353.07	\$353.07
(8) MINIMUM WEEKLY COMPENSATION	\$0.00	\$0.00
(9) MAXIMUM WEEKLY COMPENSATION (4)*(5)	\$253.85	\$276.92
(10) WAGE TABLE "R" FACTOR AT MINIMUM (5)/(7)	0.000	0.000
(11) WAGE TABLE "R" FACTOR AT MAXIMUM (6)/(7)	1.078	1.176

(12A)	(13A)	(14A)	(15A)	(16A)	(17A)
WAGE INTERVAL MIN MAX	WAGE TABLE "R" FACTOR NEAREST .05	WAGE TABLE "A" FACTOR (%)	WAGE TABLE "B" FACTOR (%)	AVG WEEKLY WAGE (7A)*(15A)/(14A)	AVG WEEKLY BENEFIT (4A)*(16A)
\$0 - \$380.77	0.00 - 1.10	62.6000	43.5900	245.85	\$163.90
\$380.77 -	1.10 -	37.4000	56.4100	532.53	\$253.85

(18A) AVERAGE WEEKLY WAGES AND BENEFITS \$353.07 \$197.54

(12B)	(13B)	(14B)	(15B)	(16B)	(17B)
WAGE INTERVAL MIN MAX	WAGE TABLE "R" FACTOR NEAREST .05	WAGE TABLE "A" FACTOR (%)	WAGE TABLE "B" FACTOR (%)	AVG WEEKLY WAGE (7B)*(15B)/(14B)	AVG WEEKLY BENEFIT (4B)*(16B)
\$0 - \$415.38	0.00 - 1.20	69.4300	51.6000	262.40	\$174.93
\$415.38 -	1.20 -	30.5700	48.4000	559.00	\$276.92

(18B) AVERAGE WEEKLY WAGES AND BENEFITS \$353.07 \$206.11

NOTES:

- Columns (14A), (14B), (15A) and (15B) are from the referenced Wage Distribution Table.
- The "R" factor is the ratio of the actual wage to the average wage.
- The "A" factor from the Wage Distribution Table is the percentage of workers earning not more than "R" times the average wage.
- The "B" factor from the Wage Distribution Table is the percentage of wages earned by the percent of workers in "A".
- Columns (17A) & (17B) must be at least the minimum weekly compensation from (8) and at most the maximum weekly compensation from (9).

AVERAGE WEEKLY BENEFITS BASED ON FLORIDA WAGE DISTRIBUTION TABLE

	(A) PRE LAW	(B) POST LAW
(1) STATE	ARIZONA	ARIZONA
(2) EFFECTIVE DATE	10/1/88	7/1/89
(3) TYPE OF INJURY	TOTAL DISABILITY	TOTAL DISABILITY
(4) % RATE OF COMPENSATION	66.67%	66.67%
(5) MINIMUM WEEKLY WAGE	\$0.00	\$0.00
(6) MAXIMUM WEEKLY WAGE	\$380.77	\$415.38
(7) AVG WEEKLY WAGE BASED ON 12 MONTHS ENDING 12/31/87	\$353.07	\$353.07
(8) MINIMUM WEEKLY COMPENSATION (4)*(5)	\$0.00	\$0.00
(9) MAXIMUM WEEKLY COMPENSATION (4)*(6)	\$253.85	\$276.92
(10) WAGE TABLE "R" FACTOR AT MINIMUM (5)/(7)	0.000	0.000
(11) WAGE TABLE "R" FACTOR AT MAXIMUM (6)/(7)	1.078	1.176

(12A)		(13A)	(14A)	(15A)	(16A)	(17A)
WAGE INTERVAL	MAX	WAGE TABLE "R" FACTOR NEAREST .05	WAGE TABLE "A" FACTOR (%)	WAGE TABLE "B" FACTOR (%)	AVG WEEKLY WAGE (7A)*(15A)/(14A)	AVG WEEKLY BENEFIT (4A)*(16A)
\$0 - \$380.77		0.00 - 1.10	68.9000	50.0800	256.63	\$171.09
\$380.77 -		1.10 -	31.1000	49.9200	566.73	\$253.85

(18A) AVERAGE WEEKLY WAGES AND BENEFITS \$353.07 \$196.83

(12B)		(13B)	(14B)	(15B)	(16B)	(17B)
WAGE INTERVAL	MAX	WAGE TABLE "R" FACTOR NEAREST .05	WAGE TABLE "A" FACTOR (%)	WAGE TABLE "B" FACTOR (%)	AVG WEEKLY WAGE (7B)*(15B)/(14B)	AVG WEEKLY BENEFIT (4B)*(16B)
\$0 - \$415.38		0.00 - 1.20	74.5100	56.6600	268.49	\$178.99
\$415.38 -		1.20 -	25.4900	43.3400	600.32	\$276.92

(18B) AVERAGE WEEKLY WAGES AND BENEFITS \$353.07 \$203.95

NOTES:

- Columns (14A), (14B), (15A) and (15B) are from the referenced Wage Distribution Table.
- The "R" factor is the ratio of the actual wage to the average wage.
- The "A" factor from the Wage Distribution Table is the percentage of workers earning not more than "R" times the average wage.
- The "B" factor from the Wage Distribution Table is the percentage of wages earned by the percent of workers in "A".
- Columns (17A) & (17B) must be at least the minimum weekly compensation from (8) and at most the maximum weekly compensation from (9).

AVERAGE WEEKLY BENEFITS BASED ON USL&HW WAGE DISTRIBUTION TABLE

	(A) PRE LAW	(B) POST LAW
(1) STATE	ARIZONA	ARIZONA
(2) EFFECTIVE DATE	10/1/88	7/1/89
(3) TYPE OF INJURY	TOTAL DISABILITY	TOTAL DISABILITY
(4) % RATE OF COMPENSATION	66.67%	66.67%
(5) MINIMUM WEEKLY WAGE	\$0.00	\$0.00
(6) MAXIMUM WEEKLY WAGE	\$380.77	\$415.38
(7) AVG WEEKLY WAGE BASED ON 12 MONTHS ENDING 12/31/87	\$353.07	\$353.07
(8) MINIMUM WEEKLY COMPENSATION	\$0.00	\$0.00
(9) MAXIMUM WEEKLY COMPENSATION	\$253.85	\$276.92
(10) WAGE TABLE "R" FACTOR AT MINIMUM	0.000	0.000
(11) WAGE TABLE "R" FACTOR AT MAXIMUM	1.078	1.176

(12A)		(13A)	(14A)	(15A)	(16A)	(17A)
WAGE INTERVAL		WAGE TABLE "R" FACTOR NEAREST .05	WAGE TABLE "A" FACTOR (%)	WAGE TABLE "B" FACTOR (%)	AVG WEEKLY WAGE	AVG WEEKLY BENEFIT
MIN	MAX				(7A)*(15A)/(14A)	(4A)*(16A)
\$0 -	\$380.77	0.00 - 1.10	78.3700	67.1700	302.61	\$201.74
\$380.77 -		1.10 -	21.6300	32.8300	535.89	\$253.85

(18A) AVERAGE WEEKLY WAGES AND BENEFITS \$353.07 \$213.01

(12B)		(13B)	(14B)	(15B)	(16B)	(17B)
WAGE INTERVAL		WAGE TABLE "R" FACTOR NEAREST .05	WAGE TABLE "A" FACTOR (%)	WAGE TABLE "B" FACTOR (%)	AVG WEEKLY WAGE	AVG WEEKLY BENEFIT
MIN	MAX				(7B)*(15B)/(14B)	(4B)*(16B)
\$0 -	\$415.38	0.00 - 1.20	84.5700	74.4300	310.74	\$207.16
\$415.38 -		1.20 -	15.4300	25.5700	585.09	\$276.92

(18B) AVERAGE WEEKLY WAGES AND BENEFITS \$353.07 \$217.92

NOTES:

- Columns (14A), (14B), (15A) and (15B) are from the referenced Wage Distribution Table.
- The "R" factor is the ratio of the actual wage to the average wage.
- The "A" factor from the Wage Distribution Table is the percentage of workers earning not more than "R" times the average wage.
- The "B" factor from the Wage Distribution Table is the percentage of wages earned by the percent of workers in "A".
- Columns (17A) & (17B) must be at least the minimum weekly compensation from (8) and at most the maximum weekly compensation from (9).

CALCULATION OF TEMPORARY TOTAL DISABILITY COSTS USING USL&HW WAGE TABLE

	PRE LAW EFF 10/1/88 -----	POST LAW EFF 7/1/89 -----
(1) WAITING PERIOD (DAYS)	7	7
(2) RETROACTIVE PERIOD (DAYS)	13	13
(3) DAYS OF DISABILITY BASED ON (1)	2,495,765	2,495,765
(4) TOTAL CASES BASED ON (2)	42,105	42,105
(5) ADDITIONAL DAYS BASED ON RETROACTIVE PERIOD (1)*(4)	294,735	294,735
(6) COST IN DAYS (3) + (5)	2,790,500	2,790,500
(7) COST IN WEEKS	398,643	398,643
(8) AVERAGE WEEKLY BENEFIT	214.98	219.89
(9) COST IN \$ (7)*(8)	85,700,272	87,657,609
(10) EFFECT OF BENEFITS CHANGE		1.023

NOTE:

1. Columns (1) and (2) are based on Arizona law.
2. Columns (3) and (4) are based on the Special Call For Accident Statistics Distribution of Durations.
3. Column (8) is the appropriate average weekly benefit adjusted for the additional \$10 monthly dependency benefit, if appropriate.

CALCULATION OF TEMPORARY TOTAL DISABILITY COSTS USING 1973 STANDARD WAGE TABLE

	PRE LAW EFF 10/1/88 -----	POST LAW EFF 7/1/89 -----
(1) WAITING PERIOD (DAYS)	7	7
(2) RETROACTIVE PERIOD (DAYS)	13	13
(3) DAYS OF DISABILITY BASED ON (1)	2,495,765	2,495,765
(4) TOTAL CASES BASED ON (2)	42,105	42,105
(5) ADDITIONAL DAYS BASED ON RETROACTIVE PERIOD (1)*(4)	294,735	294,735
(6) COST IN DAYS (3) + (5)	2,790,500	2,790,500
(7) COST IN WEEKS	398,643	398,643
(8) AVERAGE WEEKLY BENEFIT	203.39	210.55
(9) COST IN \$ (7)*(8)	81,080,000	83,934,284
(10) EFFECT OF BENEFITS CHANGE		1.035

NOTE:

1. Columns (1) and (2) are based on Arizona law.
2. Columns (3) and (4) are based on the Special Call For Accident Statistics Distribution of Durations.
3. Column (8) is the appropriate average weekly benefit adjusted for the additional \$10 monthly dependency benefit, if appropriate.

CALCULATION OF TEMPORARY TOTAL DISABILITY COSTS USING WISCONSIN WAGE TABLE

	PRE LAW EFF 10/1/88 -----	POST LAW EFF 7/1/89 -----
(1) WAITING PERIOD (DAYS)	7	7
(2) RETROACTIVE PERIOD (DAYS)	13	13
(3) DAYS OF DISABILITY BASED ON (1)	2,495,765	2,495,765
(4) TOTAL CASES BASED ON (2)	42,105	42,105
(5) ADDITIONAL DAYS BASED ON RETROACTIVE PERIOD (1)*(4)	294,735	294,735
(6) COST IN DAYS (3) + (5)	2,790,500	2,790,500
(7) COST IN WEEKS	398,643	398,643
(8) AVERAGE WEEKLY BENEFIT	206.33	214.69
(9) COST IN \$ (7)*(8)	82,252,010	85,584,666
(10) EFFECT OF BENEFITS CHANGE		1.041

NOTE:

1. Columns (1) and (2) are based on Arizona law.
2. Columns (3) and (4) are based on the Special Call For Accident Statistics Distribution of Durations.
3. Column (8) is the appropriate average weekly benefit adjusted for the additional \$10 monthly dependency benefit, if appropriate.

CALCULATION OF TEMPORARY TOTAL DISABILITY COSTS USING NEW YORK WAGE TABLE

	PRE LAW EFF 10/1/88 -----	POST LAW EFF 7/1/89 -----
(1) WAITING PERIOD (DAYS)	7	7
(2) RETROACTIVE PERIOD (DAYS)	13	13
(3) DAYS OF DISABILITY BASED ON (1)	2,495,765	2,495,765
(4) TOTAL CASES BASED ON (2)	42,105	42,105
(5) ADDITIONAL DAYS BASED ON RETROACTIVE PERIOD (1)*(4)	294,735	294,735
(6) COST IN DAYS (3) + (5)	2,790,500	2,790,500
(7) COST IN WEEKS	398,643	398,643
(8) AVERAGE WEEKLY BENEFIT	199.51	208.08
(9) COST IN \$ (7)*(8)	79,533,265	82,949,635
(10) EFFECT OF BENEFITS CHANGE		1.043

NOTE:

1. Columns (1) and (2) are based on Arizona law.
2. Columns (3) and (4) are based on the Special Call For Accident Statistics Distribution of Durations.
3. Column (8) is the appropriate average weekly benefit adjusted for the additional \$10 monthly dependency benefit, if appropriate.

CALCULATION OF TEMPORARY TOTAL DISABILITY COSTS USING FLORIDA WAGE TABLE

	PRE LAW EFF 10/1/88 -----	POST LAW EFF 7/1/89 -----
(1) WAITING PERIOD (DAYS)	7	7
(2) RETROACTIVE PERIOD (DAYS)	13	13
(3) DAYS OF DISABILITY BASED ON (1)	2,495,765	2,495,765
(4) TOTAL CASES BASED ON (2)	42,105	42,105
(5) ADDITIONAL DAYS BASED ON RETROACTIVE PERIOD (1)*(4)	294,735	294,735
(6) COST IN DAYS (3) + (5)	2,790,500	2,790,500
(7) COST IN WEEKS	398,643	398,643
(8) AVERAGE WEEKLY BENEFIT	198.8	205.92
(9) COST IN \$ (7)*(8)	79,250,228	82,088,567
(10) EFFECT OF BENEFITS CHANGE		1.036

NOTE:

1. Columns (1) and (2) are based on Arizona law.
2. Columns (3) and (4) are based on the Special Call For Accident Statistics Distribution of Durations.
3. Column (8) is the appropriate average weekly benefit adjusted for the additional \$10 monthly dependency benefit, if appropriate.

Wage Distribution Table
Industrial Group: Manufacturing

R	Florida		Illinois		Michigan		Pennsylvania	
	A	B	A	B	A	B	A	B
0.10	0.1145	0.0042	0.1451	0.0025	0.2275	0.0100	*	*
0.20	0.2862	0.0343	0.1814	0.0097	0.8039	0.1033	*	*
0.30	0.8586	0.1768	0.5806	0.1137	2.5937	0.5716	*	*
0.40	1.9462	0.5677	1.9956	0.6393	6.6282	2.0149	0.7407	0.2745
0.50	7.7275	3.2509	7.6923	3.2198	13.7874	5.2311	5.1852	2.3409
0.60	16.8288	8.2650	16.1829	7.9183	22.6301	10.0808	14.8148	7.4621
0.70	30.5667	17.2117	26.1248	14.3720	30.9571	15.4691	23.7037	13.2651
0.80	42.7590	26.3614	35.1959	21.1725	39.6481	21.9933	37.0370	23.2409
0.90	52.7762	34.8854	46.4078	30.7184	47.9751	29.0625	49.6296	33.7566
1.00	60.9044	42.6198	55.5878	39.4207	55.1494	35.8750	61.4815	44.9130
1.10	68.1168	50.1848	65.5660	49.9293	62.6270	43.7123	66.6667	50.3402
1.20	74.0126	56.9400	73.4761	59.0070	68.8002	50.8024	70.3704	54.5178
1.30	78.9926	63.1330	80.0435	67.2301	75.2920	58.9119	81.4815	68.4042
1.40	82.4843	67.8627	85.5588	74.6644	81.7685	67.6390	85.9259	74.4047
1.50	85.1746	71.7452	89.6952	80.6668	86.5312	74.5378	87.4074	76.5412
1.60	88.0939	76.2907	92.5617	85.1264	89.8225	79.6178	91.1111	82.2875
1.70	90.5552	80.3337	94.4122	88.1743	91.9763	83.1526	93.3333	85.9466
1.75	91.7001	82.3020	95.3919	89.8641	93.0381	84.9819	95.5556	89.7708
1.85	93.7607	86.0063	96.7707	92.3550	94.8734	88.2888	97.0370	92.4918
2.05	96.5083	91.3362	98.4761	95.6547	96.9361	92.3059	97.7778	93.9886
Wage Relativities:	1.01179		0.95834		1.02923		0.92193	
Claim Count:	1,747		2,756		6,593		135	

Notes: Data provided by NCCI.

* Number not provided by NCCI.

R is the ratio of wage to state average wage.

A is the percentage of workers earning less than or equal to R times the state average wage.

B is the percentage of wages received by the percentage of workers in column A.

Wage Distribution Table
Industrial Group: Contracting

R	Florida		Illinois		Michigan		Pennsylvania	
	A	B	A	B	A	B	A	B
0.10	0.1200	0.0041	*	*	0.1483	0.0043	*	*
0.20	0.3599	0.0487	0.5426	0.0679	0.5189	0.0577	*	*
0.30	0.8397	0.1718	1.3953	0.2856	2.1497	0.4811	*	*
0.40	2.7189	0.8417	4.8062	1.5193	6.5234	2.0406	4.3478	1.5310
0.50	7.4370	3.0003	11.9380	4.7591	13.8621	5.3506	10.8696	4.5455
0.60	15.7137	7.6458	19.9225	9.1572	22.5723	10.1622	23.9130	12.0266
0.70	25.6297	14.0940	27.5969	14.1558	31.6160	16.0295	32.6087	17.5565
0.80	38.1447	23.4492	35.1938	19.8067	40.4744	22.6589	39.1304	22.5739
0.90	48.4606	32.2019	41.3178	25.0396	48.5545	29.5210	54.3478	35.5551
1.00	59.0564	42.2736	47.4419	30.8920	56.4492	37.0064	60.8696	41.8347
1.10	67.9728	51.6281	54.3411	38.1677	63.3062	44.2170	69.5652	50.8489
1.20	75.1299	59.8606	64.8837	50.2735	69.7924	51.6532	78.2609	61.0246
1.25	78.2487	63.6886	68.1395	54.2661	72.4240	54.8765	82.6087	66.4238
1.45	86.4454	74.7321	88.4496	81.8090	81.7643	67.3986	84.7826	69.5699
1.60	91.6433	82.6400	98.2171	96.5567	87.4722	76.0960	86.9565	73.0302
1.70	93.4826	85.6693	98.9922	97.8336	90.7339	81.4838	89.1304	76.7066
1.95	96.8413	91.7578	*	*	96.1453	91.2847	91.3043	80.8596
2.10	98.1208	94.3414	99.7674	99.2526	97.4796	93.9804	93.4783	85.3653
2.15	98.2807	94.6817	*	*	97.9615	95.0044	95.6522	89.9341
2.20	98.4806	95.1150	*	*	98.6657	96.5429	97.8261	94.6879
Wage Relativities:	1.16843		1.47015		1.28356		1.40093	
Claim Count:	2,501		1,290		2,698		46	

Notes: Data provided by NCCI.

* Number not provided by NCCI.

R is the ratio of wage to state average wage.

A is the percentage of workers earning less than or equal to R times the state average wage.

B is the percentage of wages received by the percentage of workers in column A.

Wage Distribution Table
Industrial Group: All Other

R	Florida		Illinois		Michigan		Pennsylvania	
	A	B	A	B	A	B	A	B
0.10	0.1465	0.0078	0.3974	0.0168	0.6380	0.0250	0.4230	0.0186
0.20	0.8348	0.1199	1.8700	0.2578	2.2030	0.2806	1.3897	0.1725
0.30	3.5296	0.8111	5.7504	1.2409	7.1265	1.5386	5.0755	1.1352
0.40	7.7622	2.3022	11.1501	3.1657	14.2169	4.0383	11.9033	3.5201
0.50	13.8254	5.0700	20.0327	7.1863	23.4140	8.1903	21.6314	7.8941
0.60	24.3556	10.8595	29.1959	12.2425	32.0453	12.9659	31.3595	13.2571
0.70	35.9695	18.4259	37.7747	17.8106	40.1589	18.2164	40.4230	19.1187
0.80	45.3134	25.4452	46.0496	24.0029	47.3095	23.5961	46.5257	23.6942
0.90	54.1740	32.9635	52.3843	29.4016	53.8341	29.1337	53.4743	29.5894
1.00	61.9801	40.3714	58.6022	35.3005	60.3226	35.3001	58.8520	34.6801
1.10	68.4095	47.1288	64.6096	41.5994	65.0054	40.2167	63.8671	39.9069
1.20	73.7698	53.2828	69.7522	47.5112	69.5558	45.4442	68.7613	45.5349
1.30	77.8559	58.3736	73.7494	52.5030	73.6247	50.5315	72.9305	50.7484
1.40	81.1804	62.8552	77.9336	58.1614	76.6101	54.5501	76.7372	55.8954
1.50	84.2414	67.2912	81.6036	63.4905	79.9687	59.4145	80.7855	61.7845
1.60	86.4089	70.6491	85.6475	69.7585	83.0143	64.1520	84.2296	67.1096
1.70	88.1810	73.5707	88.8266	75.0186	85.3136	67.9444	86.9486	71.5936
1.80	90.0996	76.9316	91.3511	79.4536	87.8897	72.4497	92.0846	80.6191
1.90	91.8864	80.2354	93.8523	84.0915	90.3936	77.0849	95.1057	86.1889
2.00	93.3509	83.0877	95.3717	87.0370	92.5003	81.1941	96.5559	89.0076
Wage Relativities:	0.93529		0.88507		0.88470		0.99522	
Claim Count:	6,828		4,278		8,307		1,655	

Notes: Data provided by NCCI.

* Number not provided by NCCI.

R is the ratio of wage to state average wage.

A is the percentage of workers earning less than or equal to R times the state average wage.

B is the percentage of wages received by the percentage of workers in column A.

STATE Y LAW MEMO

**Calculation of Change in Average Weekly Benefit
 For Temporary Total
 Major Law Revision**

(1)	(2) Average Weekly Benefit Effective	(3)	(4)
Methodology	7/01/90	7/01/91	Percentage Change
-----	-----	-----	-----
(A) NCCI	\$253.29	\$259.56	2.48%
(B) Alternative	\$250.36	\$257.86	3.00%

Notes: (A) is from Exhibit 22, Sheet 2 and Sheet 3
 (B) is from Exhibit 22, Sheet 4
 (4) = (3) / (2) - 1

STATE Y LAW MEMO

Calculation of Average Weekly Benefit
Effective 7/01/90

1) Class of Injury	Temporary Total All Cases
2) Nominal Rate of Compensation	0.6667
3) Minimum Weekly Compensation	\$0.00
4) Maximum Weekly Compensation	\$458.23
5) Average Weekly Wage for the 12 months ending 12/31/1988	\$391.29

(A) Wage Interval	(B) Ratio to Average (A) / (5)	(C) Percentage in Interval of Workers	(D) Interval of Wages	(E) Average Wage In Interval (5)x(D)/(C)	(F) Average Benefit In Interval
-----	-----	-----	-----	-----	-----
0.00 - 687.31	0.00 - 1.75	93.2448	85.2260	\$357.64	\$238.44 (a)
687.31 & over	1.75 & over	6.7552	14.7740	\$855.77	\$458.23 (b)

Average Weekly Benefit [(Sum (C) x (F)) / 100]: \$253.29

Notes: (a) Equals (E) x (2) = average wage within interval x nominal rate of compensation
(b) Maximum weekly compensation.

STATE Y LAW MEMO

Calculation of Average Weekly Benefit
Effective 7/01/91

1) Class of Injury	Temporary Total All Cases
2) Nominal Rate of Compensation	0.6667
3) Minimum Weekly Compensation	\$0.00
4) Maximum Weekly Compensation	\$687.35
5) Average Weekly Wage for the 12 months ending 12/31/88	\$391.29

(A) Wage Interval	(B) Ratio to Average (A) / (5)	(C) Percentage in Interval of Workers	(D) Interval of Wages	(E) Average Wage In Interval (5)x(D)/(C)	(F) Average Benefit In Interval
0.00 -1,030.97	0.00 - 2.65	99.3962	97.9051	\$385.42	\$256.96 (a)
1,030.97 & over	2.65 & over	0.6038	2.0949	\$1,357.59	\$687.35 (b)
Average Weekly Benefit [(Sum (C) x (F)) / 100]:					\$259.56

Notes: (a) Equals (E) x (2) = average wage within interval x nominal rate of compensation
(b) Maximum weekly compensation.

STATE Y LAW MEMO

Calculation of Change in Average Weekly Benefit
For Temporary Total

(1) INDUSTRY GROUP -----	(2) Average Weekly Benefit Effective 7/01/90 -----	(3) 7/01/91 -----	(4) Percent Change -----	(5) Claim Counts -----
A. Manufacturing	\$245.69	\$247.99	0.94%	2,756
B. Contracting	\$353.78	\$382.07	8.00%	1,290
C. All Other	\$222.18	\$226.76	2.06%	4,278
D. Average	\$250.36	\$257.86	3.00%	
E. Change in Average Weekly Benefit: [(D column 3) / (D column 2) - 1]				3.00%

- Notes: (A) is from Exhibit 22, Sheet 5 and Sheet 8
 (B) is from Exhibit 22, Sheet 6 and Sheet 9
 (C) is from Exhibit 22, Sheet 7 and Sheet 10
 (D) is the weighted average of the appropriate column where the weights are the claim counts.
 (5) See Exhibit 24

STATE Y LAW MEMO

Calculation of Average Weekly Benefit
Effective 7/01/90
Industrial Group: Manufacturing

1) Class of Injury	Temporary Total All Cases
2) Nominal Rate of Compensation	0.6667
3) Minimum Weekly Compensation	\$0.00
4) Maximum Weekly Compensation	\$458.23
5) Average Weekly Wage for Industrial Group Manufacturing for the 12 months ending 12/31/88	\$374.99

(A) Wage Interval	(B) Ratio to Average (A) / (5)	(C) Percentage in Interval of Workers	(D) Interval of Wages	(E) Average Wage In Interval (5)x(D)/(C)	(F) Average Benefit In Interval
0.00 - 687.31	0.00 - 1.83	96.4514	91.7710	\$356.79	\$237.87 (a)
687.31 & over	1.83 & over	3.5486	8.2290	\$869.57	\$458.23 (b)

Average Weekly Benefit [(Sum (C) x (F)) / 100]: \$245.69

Notes: (5) = 391.29 x 0.95834

(a) Equals (E) x (2) = average wage within interval x nominal rate of compensation

(b) Maximum weekly compensation.

STATE Y LAW MEMO

Calculation of Average Weekly Benefit
Effective 7/01/90
Industrial Group: Contracting

1) Class of Injury	Temporary Total All Cases
2) Nominal Rate of Compensation	0.6667
3) Minimum Weekly Compensation	\$0.00
4) Maximum Weekly Compensation	\$458.23
5) Average Weekly Wage for Industrial Group Contracting for the 12 months ending 12/31/88	\$575.25

(A) Wage Interval	(B) Ratio to Average (A) / (5)	(C) Percentage in Interval of Workers	(D) Interval of Wages	(E) Average Wage In Interval (5)x(D)/(C)	(F) Average Benefit In Interval
0.00 - 687.31	0.00 - 1.19	64.0000	49.2320	\$442.52	\$295.03 (a)
687.31 & over	1.19 & over	36.0000	50.7680	\$811.24	\$458.23 (b)
Average Weekly Benefit [(Sum (C) x (F)) / 100]:					\$353.78

Notes: (5) = 391.29 x 1.47015

(a) Equals (E) x (2) = average wage within interval x nominal rate of compensation

(b) Maximum weekly compensation.

STATE Y LAW MEMO

Calculation of Average Weekly Benefit
Effective 7/01/90
Industrial Group: All Other

1) Class of Injury	Temporary Total All Cases
2) Nominal Rate of Compensation	0.6667
3) Minimum Weekly Compensation	\$0.00
4) Maximum Weekly Compensation	\$458.23
5) Average Weekly Wage for Industrial Group All Other for the 12 months ending 12/31/88	\$346.32

(A) Wage Interval	(B) Ratio to Average (A) / (5)	(C) Percentage in Interval of Workers	(D) Interval of Wages	(E) Average Wage In Interval (5)x(D)/(C)	(F) Average Benefit In Interval
0.00 - 687.31	0.00 - 1.98	95.1753	86.6500	\$315.30	\$210.21 (a)
687.31 & over	1.98 & over	4.8247	13.3500	\$958.27	\$458.23 (b)

Average Weekly Benefit [(Sum (C) x (F)) / 100]: \$222.18

- Notes: (5) = 391.29 x 0.88507
 (a) Equals (E) x (2) = average wage within interval x nominal rate of compensation
 (b) Maximum weekly compensation.

STATE Y LAW MEMO

Calculation of Average Weekly Benefit
Effective 7/01/91
Industrial Group: Manufacturing

1) Class of Injury	Temporary Total All Cases
2) Nominal Rate of Compensation	0.6667
3) Minimum Weekly Compensation	\$0.00
4) Maximum Weekly Compensation	\$687.35
5) Average Weekly Wage for Industrial Group Manufacturing for the 12 months ending 12/31/88	\$374.99

(A) Wage Interval	(B) Ratio to Average (A) / (5)	(C) Percentage in Interval of Workers	(D) Interval of Wages	(E) Average Wage In Interval (5)x(D)/(C)	(F) Average Benefit In Interval
0.00 -1,030.97	0.00 - 2.75	99.8186	98.6930	\$370.76	\$247.19 (a)
1,030.97 & over	2.75 & over	0.1814	1.3070	\$2,701.82	\$687.35 (b)

Average Weekly Benefit [(Sum (C) x (F)) / 100]: \$247.99

Notes: (5) = 391.29 x 0.95834

- (a) Equals (E) x (2) = average wage within interval x nominal rate of compensation
- (b) Maximum weekly compensation.

STATE Y LAW MEMO

Calculation of Average Weekly Benefit
Effective 7/01/91
Industrial Group: Contracting

1) Class of Injury	Temporary Total All Cases
2) Nominal Rate of Compensation	0.6667
3) Minimum Weekly Compensation	\$0.00
4) Maximum Weekly Compensation	\$687.35
5) Average Weekly Wage for the 12 months ending 12/31/88 For Industry Group	\$575.25

(A) Wage Interval	(B) Ratio to Average (A) / (5)	(C) Percentage in Interval of Workers	(D) Interval of Wages	(E) Average Wage In Interval (5)x(D)/(C)	(F) Average Benefit In Interval
0.00 -1,030.97	0.00 - 1.79	99.4729	98.6757	\$570.64	\$380.45 (a)
1,030.97 & over	1.79 & over	0.5271	1.3243	\$1,445.25	\$687.35 (b)
Average Weekly Benefit [(Sum (C) x (F)) / 100]:					\$382.07

Notes: (5) = 391.29 x 1.47015

(a) Equals (E) x (2) = average wage within interval x nominal rate of compensation

(b) Maximum weekly compensation.

STATE Y LAW MEMO

Calculation of Average Weekly Benefit
Effective 7/01/91
Industrial Group: All Other

1) Class of Injury	Temporary Total All Cases
2) Nominal Rate of Compensation	0.6667
3) Minimum Weekly Compensation	\$0.00
4) Maximum Weekly Compensation	\$687.35
5) Average Weekly Wage for Industrial Group All Other for the 12 months ending 12/31/88	\$346.32

(A) Wage Interval	(B) Ratio to Average (A) / (5)	(C) Percentage in Interval of Workers	(D) Interval of Wages	(E) Average Wage In Interval (5)x(D)/(C)	(F) Average Benefit In Interval
0.00 -1,030.97	0.00 - 2.98	99.3127	96.1645	\$335.34	\$223.57 (a)
1,030.97 & over	2.98 & over	0.6873	3.8355	\$1,932.74	\$687.35 (b)

Average Weekly Benefit [(Sum (C) x (F)) / 100]: \$226.76

Notes: (5) = 391.29 x 0.88507

(a) Equals (E) x (2) = average wage within interval x nominal rate of compensation
(b) Maximum weekly compensation.

STATE Y LAW MEMO

Calculation of Change in Average Weekly Benefit
For Temporary Total
Minor Law Revision

(1)	(2)	(3)	(4)
Methodology	Average Weekly Benefit Effective 7/01/90	7/01/91	Percentage Change
-----	-----	-----	-----
(A) NCCI	\$253.29	\$255.90	1.03%
(B) Alternative	\$250.36	\$253.83	1.39%

Notes: (A) is from Exhibit 23, Sheet 2 and Sheet 3.
(B) is from Exhibit 23, Sheet 4.
(4) = (3) / (2) - 1.

STATE Y LAW MEMO

Calculation of Average Weekly Benefit
Effective 7/01/90

1) Class of Injury	Temporary Total All Cases
2) Nominal Rate of Compensation	0.6667
3) Minimum Weekly Compensation	\$0.00
4) Maximum Weekly Compensation	\$458.23
5) Average Weekly Wage for the 12 months ending 12/31/88	\$391.29

(A) Wage Interval	(B) Ratio to Average (A) / (5)	(C) Percentage in Interval of Workers	(D) Interval of Wages	(E) Average Wage In Interval (5)x(D)/(C)	(F) Average Benefit In Interval
0.00 - 687.31	0.00 - 1.75	93.2448	85.2260	\$357.64	\$238.44 (a)
687.31 & over	1.75 & over	6.7552	14.7740	\$855.77	\$458.23 (b)

Average Weekly Benefit $[(\text{Sum } (C) \times (F)) / 100]:$ \$253.29

Notes: (a) Equals (E) x (2) = average wage within interval x nominal rate of compensation
(b) Maximum weekly compensation.

STATE Y LAW MEMO

Calculation of Average Weekly Benefit
Effective 7/01/1991

1) Class of Injury	Temporary Total All Cases
2) Nominal Rate of Compensation	0.6667
3) Minimum Weekly Compensation	\$0.00
4) Maximum Weekly Compensation	\$504.05
5) Average Weekly Wage for the 12 months ending 12/31/88	\$391.29

(A) Wage Interval	(B) Ratio to Average (A) / (5)	(C) Percentage in Interval of Workers	(D) Interval of Wages	(E) Average Wage In Interval (5)x(D)/(C)	(F) Average Benefit In Interval
0.00 - 756.04	0.00 - 1.95	95.7436	89.8715	\$367.29	\$244.87 (a)
756.04 & over	1.95 & over	4.2564	10.1285	\$931.11	\$504.05 (b)

Average Weekly Benefit [(Sum (C) x (F)) / 100]: \$255.90

Notes: (a) Equals (E) x (2) = average wage within interval x nominal rate of compensation
(b) Maximum weekly compensation.

STATE Y LAW MEMO

Calculation of Change in Average Weekly Benefit
For Temporary Total

(1)	(2)	(3)		(4)
Industry Group	Average Weekly Benefit Effective		Percent Change	Claim Counts
	7/01/90	7/01/91		
A. Manufacturing	\$245.69	\$246.81	0.46%	2,756
B. Contracting	\$353.78	\$368.14	4.06%	1,290
C. All Other	\$222.18	\$223.88	0.77%	4,278
D. Average	\$250.36	\$253.83	1.39%	
E. Change in Average Weekly Benefit: [(D column 3) / (D column 2) - 1]				1.39%

- Notes: (A) is from Exhibit 23, Sheet 5 and Sheet 6.
 (B) is from Exhibit 23, Sheet 6 and Sheet 9.
 (C) is from Exhibit 23, Sheet 7 and Sheet 10.
 (D) is the weighted average of the appropriate column where the weights are the claim counts.
 (5) See Exhibit 24.

STATE Y LAW MEMO

Calculation of Average Weekly Benefit
Effective 7/01/90
Industrial Group: Manufacturing

1) Class of Injury	Temporary Total All Cases
2) Nominal Rate of Compensation	0.6667
3) Minimum Weekly Compensation	\$0.00
4) Maximum Weekly Compensation	\$458.23
5) Average Weekly Wage for Industrial Group Manufacturing for the 12 months ending 12/31/88	\$374.99

(A) Wage Interval	(B) Ratio to Average (A) / (5)	(C) Percentage in Interval of Workers	(D) Wages	(E) Average Wage In Interval (5)x(D)/(C)	(F) Average Benefit In Interval
0.00 - 687.31	0.00 - 1.83	96.4514	91.7710	\$356.79	\$237.87 (a)
687.31 & over	1.83 & over	3.5486	8.2290	\$869.57	\$458.23 (b)

Average Weekly Benefit [(Sum (C) x (F)) / 100]: \$245.69

Notes: (5) = 391.29 x 0.95834

(a) Equals (E) x (2) = average wage within interval x nominal rate of compensation

(b) Maximum weekly compensation.

STATE Y LAW MEMO

Calculation of Average Weekly Benefit
Effective 7/01/90
Industrial Group: Contracting

1) Class of Injury	Temporary Total All Cases
2) Nominal Rate of Compensation	0.6667
3) Minimum Weekly Compensation	\$0.00
4) Maximum Weekly Compensation	\$458.23
5) Average Weekly Wage for Industrial Group Contracting for the 12 months ending 12/31/88	\$575.25

(A) Wage Interval	(B) Ratio to Average (A) / (5)	(C) Percentage in Interval of Workers	(D) Wages	(E) Average Wage In Interval (5)x(D)/(C)	(F) Average Benefit In Interval
0.00 - 687.31	0.00 - 1.19	64.0000	49.2320	\$442.52	\$295.03 (a)
687.31 & over	1.19 & over	36.0000	50.7680	\$811.24	\$458.23 (b)

Average Weekly Benefit [(Sum (C) x (F)) / 100]: \$353.78

Notes: (5) = 391.29 x 1.47015

(a) Equals (E) x (2) = average wage within interval x nominal rate of compensation

(b) Maximum weekly compensation.

STATE Y LAW MEMO

Calculation of Average Weekly Benefit
Effective 7/01/90
Industrial Group: All Other

1) Class of Injury	Temporary Total All Cases
2) Nominal Rate of Compensation	0.6667
3) Minimum Weekly Compensation	\$0.00
4) Maximum Weekly Compensation	\$458.23
5) Average Weekly Wage for Industrial Group All Other for the 12 months ending 12/31/88	\$346.32

(A) Wage Interval	(B) Ratio to Average (A) / (5)	(C) Percentage in Interval of Workers	(D) Wages	(E) Average Wage In Interval (5)x(D)/(C)	(F) Average Benefit In Interval
0.00 - 687.31	0.00 - 1.98	95.1753	86.6500	\$315.30	\$210.21 (a)
687.31 & over	1.98 & over	4.8247	13.3500	\$958.27	\$458.23 (b)

Average Weekly Benefit [(Sum (C) x (F)) / 100]: \$222.18

Notes: (5) = 391.29 x 0.88507

- (a) Equals (E) x (2) = average wage within interval x nominal rate of compensation
- (b) Maximum weekly compensation.

STATE Y LAW MEMO

Calculation of Average Weekly Benefit
Effective 7/01/91
Industrial Group: Manufacturing

1) Class of Injury	Temporary Total All Cases
2) Nominal Rate of Compensation	0.6667
3) Minimum Weekly Compensation	\$0.00
4) Maximum Weekly Compensation	\$504.05
5) Average Weekly Wage for Industrial Group Manufacturing for the 12 months ending 12/31/88	\$374.99

(A) Wage Interval	(B) Ratio to Average (A) / (5)	(C) Percentage in Interval of Workers	(D) Interval of Wages	(E) Average Wage In Interval (5)x(D)/(C)	(F) Average Benefit In Interval
0.00 - 756.04	0.00 - 2.02	98.3019	95.3014	\$363.54	\$242.37 (a)
756.04 & over	2.02 & over	1.6981	4.6986	\$1,037.61	\$504.05 (b)

Average Weekly Benefit [(Sum (C) x (F)) / 100]: \$246.81

Notes: (5) = 391.29 x 0.95834

- (a) Equals (E) x (2) = average wage within interval x nominal rate of compensation
- (b) Maximum weekly compensation.

STATE Y LAW MEMO

Calculation of Average Weekly Benefit
Effective 7/01/91
Industrial Group: Contracting

1) Class of Injury	Temporary Total All Cases
2) Nominal Rate of Compensation	0.6667
3) Minimum Weekly Compensation	\$0.00
4) Maximum Weekly Compensation	\$504.05
5) Average Weekly Wage for the 12 months ending 12/31/88 For Industry Group	\$575.25

(A) Wage Interval	(B) Ratio to Average (A) / (5)	(C) Percentage in Interval of Workers	(D) Interval of Wages	(E) Average Wage In Interval (5)x(D)/(C)	(F) Average Benefit In Interval
0.00 - 756.04	0.00 - 1.31	73.3644	60.9834	\$478.18	\$318.80 (a)
756.04 & over	1.31 & over	26.6356	39.0166	\$842.65	\$504.05 (b)

Average Weekly Benefit [(Sum (C) x (F)) / 100]: \$368.14

Notes: (5) = 391.29 x 1.47015

(a) Equals (E) x (2) = average wage within interval x nominal rate of compensation

(b) Maximum weekly compensation.

STATE Y LAW MEMO

Calculation of Average Weekly Benefit
Effective 7/01/91
Industrial Group: All Other

1) Class of Injury	Temporary Total All Cases
2) Nominal Rate of Compensation	0.6667
3) Minimum Weekly Compensation	\$0.00
4) Maximum Weekly Compensation	\$504.05
5) Average Weekly Wage for Industrial Group All Other for the 12 months ending 12/31/88	\$346.32

(A) Wage Interval	(B) Ratio to Average (A) / (5)	(C) Percentage in Interval of Workers	(D) Interval of Wages	(E) Average Wage In Interval (5)x(D)/(C)	(F) Average Benefit In Interval
0.00 - 756.04	0.00 - 2.18	96.9752	90.3595	\$322.69	\$215.14 (a)
756.04 & over	2.18 & over	3.0248	9.6405	\$1,103.78	\$504.05 (b)

Average Weekly Benefit [(Sum (C) x (F)) / 100]: \$223.88

Notes: (5) = 391.29 x 0.88507

(a) Equals (E) x (2) = average wage within interval x nominal rate of compensation

(b) Maximum weekly compensation.

State Y

Claim Counts and Average Wage For State Y By Accident Year

Accident Year	Claim Counts	Average Wage
-----	-----	-----
1985	1,403	342.155
1986	1,555	363.458
1987	1,588	370.028
1988	1,796	383.144
1989	1,982	383.307
Total	8,324	

Claim Counts and Wage Relativities For State Y By Industry Group

Industry Group	Claim Counts	Wage Relativity
-----	-----	-----
Manufacturing	2,756	0.95834
Contracting	1,290	1.47015
All Other	4,278	0.88507
Total	8,324	

Data is from NCCI.

State Y

Industrial Group: Manufacturing

Wage Distribution Table

R = Ratio to Average Wage

A = Percentage of workers receiving not more than the percentage of the average wage indicated by column R.

B = Percentage of wages received by the % of workers in column A.

R	A	B	R	A	B
0.05	0.1089	0.0003	1.55	90.8563	82.4378
0.10	0.1451	0.0025	1.60	95.5617	85.1264
0.20	0.1814	0.0097	1.65	93.5414	86.7150
0.25	0.2540	0.0248	1.70	94.4122	88.1743
0.30	0.5806	0.1137	1.75	95.3919	89.8641
0.35	0.8345	0.1964	1.80	95.9724	90.8950
0.40	1.9956	0.6393	1.85	96.7707	92.3550
0.45	4.6444	1.7660	1.90	97.4964	93.7192
0.50	7.6923	3.2198	1.95	97.7866	94.2778
0.55	12.0464	5.5250	2.00	98.1858	95.0658
0.60	16.1829	7.9183	2.05	98.4761	95.6547
0.65	20.9361	10.8862	2.10	98.6938	96.1045
0.70	26.1248	14.3720	2.15	99.0203	96.8004
0.75	30.5878	17.6038	2.20	99.2017	97.1931
0.80	35.1959	21.1725	2.25	99.2743	97.3549
0.85	40.5298	25.5763	2.30	99.3832	97.6030
0.90	46.4078	30.7184	2.35	99.5283	97.9398
0.95	51.0885	35.0333	2.40	99.5646	98.0269
1.00	55.5878	39.4207	2.45	99.6009	98.1157
1.05	60.0145	43.9633	2.55	99.6372	98.2006
1.10	65.5660	49.9293	2.65	99.6734	98.3015
1.15	69.9927	54.9162	2.70	99.7460	98.4950
1.20	73.4761	59.0070	2.75	99.8186	98.6930
1.25	76.1974	62.3346	2.85	99.8549	98.7960
1.30	80.0435	67.2301	2.90	99.8911	98.9005
1.35	82.9463	71.0747	3.05	99.9274	99.0104
1.40	85.5588	74.6644	3.70	99.9637	99.1437
1.45	87.4456	77.3483	23.60	100.0000	100.0000
1.50	89.6952	80.6668			

Table was produced by NCCI.

State Y

Industrial Group: Contracting

Wage Distribution Table

R = Ratio to Average Wage

A = Percentage of workers receiving not more than the percentage of the average wage indicated by column R.

B = Percentage of wages received by the % of workers in column A.

R	A	B	R	A	B
0.05	0.1550	0.0003	1.55	96.6667	94.1128
0.20	0.5426	0.0679	1.60	98.2171	96.5567
0.25	0.8527	0.1340	1.65	98.6047	97.1867
0.30	1.3953	0.2856	1.70	98.9922	97.8336
0.35	2.5581	0.6667	1.75	99.2248	98.2364
0.40	4.8062	1.5193	1.80	99.5349	98.7855
0.45	8.2171	2.9799	1.90	99.6124	98.9305
0.50	11.9380	4.7591	2.10	99.7674	99.2526
0.55	15.8915	6.8417	2.25	99.8450	99.4233
0.60	19.9225	9.1572	2.70	99.9225	99.6297
0.65	23.7209	11.5336	4.80	100.0000	100.0000
0.70	27.5969	14.1558			
0.75	32.3256	17.5618			
0.80	35.1938	19.8067			
0.85	37.5194	21.7233			
0.90	41.3178	25.0396			
0.95	43.7984	27.3358			
1.00	47.4419	30.8920			
1.05	50.2326	33.7554			
1.10	54.3411	38.1677			
1.15	60.4651	45.0661			
1.20	64.8837	50.2735			
1.25	68.1395	54.2661			
1.30	72.3256	59.6076			
1.35	77.5194	66.4866			
1.40	82.1705	72.8909			
1.45	88.4496	81.8090			
1.50	93.2558	88.9093			

Table was produced by NCCI.

State Y

Industrial Group: All Other

Wage Distribution Table

R = Ratio to Average Wage

A = Percentage of workers receiving not more than the percentage of the average wage indicated by column R.

B = Percentage of wages received by the % of workers in column A.

R	A	B	R	A	B
0.05	0.1870	0.0015	2.05	96.0496	88.4107
0.10	0.3974	0.0168	2.10	96.5171	89.3785
0.15	0.7948	0.0687	2.15	96.8209	90.0242
0.20	1.8700	0.2578	2.20	97.0781	90.5830
0.25	3.6699	0.6676	2.25	97.2651	90.9983
0.30	5.7504	1.2409	2.30	97.4521	91.4235
0.35	7.9243	1.9474	2.35	97.7326	92.0744
0.40	11.1501	3.1657	2.40	98.0598	92.8494
0.45	15.3343	4.9533	2.45	98.2001	93.1894
0.50	20.0327	7.1863	2.50	98.4572	93.8276
0.55	24.5208	9.5370	2.55	98.5741	94.1237
0.60	29.1959	12.2425	2.60	98.6676	94.3643
0.65	33.7307	15.0840	2.65	98.8780	94.9182
0.70	37.7747	17.8106	2.70	98.9481	95.1047
0.75	42.1692	20.9961	2.80	98.9715	95.1699
0.80	46.0496	24.0029	2.85	99.0416	95.3681
0.85	48.9715	26.4135	2.90	99.0884	95.5026
0.90	52.3843	29.4016	2.95	99.2987	96.1217
0.95	55.9140	32.6740	3.10	99.3689	96.3359
1.00	58.6022	35.3005	3.15	99.4624	96.6289
1.05	61.6410	38.4109	3.25	99.4857	96.7047
1.10	64.6096	41.5994	3.30	99.5325	96.8585
1.15	67.1108	44.4091	3.35	99.6026	97.0905
1.20	69.7522	47.5112	3.45	99.6260	97.1701
1.25	71.9729	50.2373	3.55	99.6494	97.2528
1.30	73.7494	52.5030	3.60	99.6727	97.3361
1.35	75.7831	55.1974	3.70	99.6961	97.4222
1.40	77.9336	58.1614	3.80	99.7195	97.5110
1.45	79.5933	60.5253	4.00	99.7662	97.6968
1.50	81.6036	63.4905	4.60	99.7896	97.8039
1.55	83.7307	66.7367	5.80	99.8130	97.9385
1.60	85.6475	69.7585	6.25	99.8364	98.0838
1.65	86.9331	71.8498	6.45	99.8597	98.2336
1.70	88.8266	75.0186	6.50	99.8831	98.3851
1.75	89.7148	76.5492	7.65	99.9299	98.7415
1.80	91.3511	79.4536	8.55	99.9532	98.9414
1.85	92.4264	81.4194	19.75	99.9766	99.4026
1.90	93.8523	84.0915	25.60	100.0000	100.0000
1.95	94.8808	86.0696			
2.00	95.3717	87.0370			

Table was produced by NCCI.

LAW AMENDMENTS

TECHNICAL APPENDICES

- A. Critical Values
- B. Fatal Injuries
- C. Permanent Total Injuries
- D. Temporary Total Injuries
- E. Permanent Partial Injuries
- F. Trend and Benefit On-Level Factors

LAW AMENDMENTS

LAW AMENDMENTS

SUMMARY OF TECHNICAL APPENDICES

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	Exhibit A3, Sheet 1	Effect of Unescalated Critical Values on Permanent Partial Claims
	Exhibit A3, Sheet 2	Workers Compensation Claim Characteristics
Appendix B	Exhibit B1, Sheet 1	Principal Benefit Changes
	Exhibit B1, Sheet 2	Social Security Benefits for Fatal and Permanent Total Cases
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LAW AMENDMENTS

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LAW AMENDMENTS: TECHNICAL APPENDIX A

CRITICAL VALUES

This Appendix will address some issues related to the concept of "critical values". Critical values are claim size amounts that NCCI uses to distinguish major permanent partial claims from minor permanent partial claims.

Until the late 1960's, major and minor permanent partial injuries were distinguished based on the reporting insurance company's qualitative evaluation of the injury. Cases with 25% or less impairment were to be categorized as minor and cases with greater than 25% impairment were to be categorized as major.

Commencing January 1, 1967, a quantitative value for each state was established (the critical value). The critical value was selected by state in order to keep the proportion of major and minor claims similar to the proportions that existed under the qualitative categorization. The advantage of the critical value system was that companies no longer had to categorize claims into major and minor, based on what many insurers felt was subjective criteria. Instead, the categorization could be handled "objectively" by the computer systems at NCCI.

For the next two decades, critical values were adjusted based solely on changes in benefit level pricing. Wage and other inflation measures were not used to adjust the critical values. Thus, over the course of time, claims that were once minor (since they were below the critical value) became major as inflation pushed them past an unescalated critical value.

Exhibit A3 shows the effect in a sample state of the drift in critical values. At time zero, the average permanent partial claim size is \$20,000 (major and minor combined) and the critical value is also \$20,000. 23% of the total permanent partial claims are major while 72% of total permanent partial dollar are from major.

After 10 years of inflation, at 5% per year, if the critical value is unescalated then 35.1% of total permanent partial claims are major and 82.4% of total permanent partial dollars are major.

The exhibit also shows results after 20 years of inflation.

LAW AMENDMENTS: TECHNICAL APPENDIX A

If the critical values were escalated, then the relative proportions of claims and dollars in the major category would remain constant.

Currently, NCCI is attempting to adjust the critical values in all states to realign them to their original purpose. Since the indicated shift in critical value generally exceeds 50% (ranging from -2% in Oregon to +381% in Washington DC, as displayed in Exhibit A1), the change is being implemented with a transition program. During that transition time, care must be taken in interpreting any data based on splitting permanent partial claims into major and minor categories. NCCI memos describing the critical value issue and their proposed solution are attached as Exhibit A2.

For most practical purposes, the transition will create no difficulties. There would be a significant impact only if the pricing produced substantially different effects for major and minor permanent partial claims. Based on benefit changes in all states from 1985-1989, we only observed 4 cases out of 288 benefit changes where the difference between the benefit change for permanent partial major differed from the change for permanent partial minor by more than 4.6%. These are displayed below:

<u>State</u>	<u>Year</u>	<u>Change for Major</u>	<u>Change for Minor</u>	<u>Difference</u>
Maine	1987	-57.4	-18.1	39.3
Montana	1987	-28.0	-53.2	25.2
Maryland	1988	+0.5	-23.8	24.3
Mass.	1986	-18.7	- 2.0	16.7

Future law changes aimed at cost containment may have different impacts on seriously injured workers as compared to less seriously injured workers. In that case, accurate distinctions between permanent partial major and permanent partial minor claims would be useful, and caution is required in using the separate major permanent partial and minor permanent partial distributions during the transition.

INDICATED SHIFT IN CRITICAL VALUES

(1)	(2)	(3)	(4)
STATE	CRITICAL VALUES SELECTED 1988	INDICATED CRITICAL VALUES	PERCENT CHANGE [(3)/(2) - 1.0]
AL	22,000	33,000	50%
AK	31,500	68,000	116%
AR	17,500	22,500	29%
AZ	10,000	12,000	20%
CO	25,000	69,500	178%
CT	22,000	40,500	84%
DC	15,500	74,500	381%
FL	20,000	39,000	95%
GA	16,000	25,500	59%
HI	20,000	30,000	50%
ID	42,500	60,500	42%
IL	23,500	44,000	87%
IN	15,500	25,000	61%
IA	22,500	47,000	109%
KS	17,000	30,000	76%
KY	14,000	26,000	86%
LA	14,000	32,000	129%
ME	29,000	64,500	122%
MD	31,000	35,000	13%
MI	22,500	39,000	73%
MS	16,000	24,500	53%
MO	21,500	25,000	16%
MT	21,500	56,000	160%
NE	20,500	29,500	44%
NH	14,000	31,500	125%
NM	26,000	38,500	48%
NC	18,500	30,500	65%
OK	20,500	20,500	0%
OR	24,000	23,500	-2%
RI	11,000	33,500	205%
SC	16,000	29,000	81%
SD	25,000	36,000	44%
TN	19,500	30,000	54%
UT	12,000	15,500	29%
VT	22,500	32,500	44%
VA	17,000	44,500	162%
WI	22,500	34,000	51%

NOTES:

1. Data is based on NCCI memo dated Jan. 31, 1989 regarding "Updated Critical Value Procedures".
2. Column (2) is the selected critical value for 1988.
3. Column (3) is the Indicated Critical Value based on the 1966 major/minor split for benefit changes and cost changes.
4. Column (4) is column (3) divided by column (2) minus 1.0. Required change in critical value.
5. NCCI memos on Critical Values are included in Exhibit 2.



National
Council on
Compensation
Insurance

Inter-Office
Correspondence

To: Pure Premiums

Date: January 31, 1989

From: Lynne Woody

Re: Updated Critical Value Procedures

The current procedure for updating the critical value for a state is to increase the current value by 10% and round to the nearest \$500. As a result of an investigation by Eric Chen and Gina Paglialonga, our critical value update procedure has been revised. The new calculation is briefly described below. Refer to the attached Critical Value Report for greater detail.

Prior to 1966, losses were reported by specific type of injury and a major/minor split was based on the type of injury. In 1966, the procedure was changed to base the major/minor split on the indemnity amount of each claim as opposed to the type of injury. The change in procedure was intended to have no effect. Over time, however, the critical value did not keep up with inflation. In the procedure being implemented, the 1966 split is updated for major and minor permanent partial benefit changes occurring since then. Using the Payroll and Loss Detail file, an indemnity amount (the critical value) corresponding to the percentage split is derived.

Implementation of this procedure is as follows. The critical value will continue to be increased by 10% until it reaches the critical value calculated using the updated 1966 distribution. If the current critical value exceeds the critical value using the adjusted 1966 distribution, the critical value will not be changed. An example of the implementation is shown.

<u>Current</u>	<u>Updated by 10%</u>	<u>Using Adj. 1966 Distr.</u>	<u>New Critical Value</u>
17,000	18,500	15,000	17,000
17,000	18,500	17,500	17,500
17,000	18,500	29,000	18,500

The critical values based on the adjusted 1966 distribution were calculated in October 1987 by Eric Chen and Gina Paglialonga. The critical values are attached. This page will be recalculated in August 1989, and annually in August thereafter. Until updated, we will use the values to determine the appropriate critical value.



National
Council
on Compensation
Insurance

Inter-Office
Correspondence

To: Pure Premiums

Date: November 15, 1989

From: Bonnie Maxie

Re: Critical Value Update

The 1989 update of the critical value table using the adjusted 1966 distribution has been completed. The table is updated by calculating the 1966 percentage split of major and minor permanent partial losses. The split is then adjusted for benefit changes occurring since 1966. The payroll and loss detail file is used to derive an indemnity amount corresponding to the major percentage. This indemnity amount is the new critical value.

The results of the 1989 update are as follows: In 35 of 37 states, the critical value using the 1966 distribution is significantly higher than the current critical value, therefore the increase of the current critical value is limited to 10%. In the remaining 2 states, the critical value using the 1966 distribution is lower than the current critical value. Steps to update these values are outlined below.

Updates of the current critical values will follow the current procedure. The critical value will be increased by 10% and rounded to the nearest \$500 until it reaches the critical value using the 1966 distribution. If the current critical value exceeds the critical value using the adjusted 1966 distribution by more than 20%, the critical value will be decreased by 10% and rounded to the nearest \$500. If the current critical value exceeds the critical value using the adjusted 1966 distribution by less than 20%, and there is a significant benefit decrease at the time, the current critical value may decrease. An example of this procedure is shown.

<u>Current</u>	<u>Updated by 10%</u>	<u>Using Adj. 1966 Distr.</u>	<u>New Critical Value</u>
\$22,000	\$24,000	\$16,000	\$20,000
22,000	24,000	20,000	22,000
22,000	24,000	23,000	23,000
22,000	24,000	26,000	24,000

A table of the critical values calculated for each state using the 1966 adjusted distribution is attached.

cc: R. Blanco M. Dolan
S. Fandrey B. Spidell
B. Llewellyn J. Thorne
J. Mallon L. Woody
J. Mayotte B. Yenke



National
Council on
Compensation
Insurance

Interoffice Correspondence

To: Pure Premiums

Date: December 6, 1990

From: Bonnie Maxie

Re: Critical Value Update

The 1990 update of the critical value limits has been completed. Since many states are still very far from the limits, only the following states were updated: Arizona, Arkansas, Indiana, Maine, Maryland, Missouri, Oklahoma, Oregon, South Dakota, Tennessee and Utah.

Calculation of the selected critical valued for 1988 and 1989 will follow the current procedure. The critical value will be increased by 10% and rounded to the nearest \$500 until it reaches the critical value limit using the 1966 adjusted distribution. If the selected critical value exceeds the critical value limit by more than 20%, the selected critical value is decreased by 10%. No states fell into this category. If the selected critical value exceeds the critical value limit by less than 20%, the selected critical value will not be changed. Only Oregon fell into this category. An example is shown.

<u>Current</u>	<u>Updated by 10%</u>	<u>Using Adj. 1966 Dist.</u>	<u>New Critical Value</u>
\$22,000	\$24,000	\$16,000	\$20,000
22,000	24,000	20,000	22,000
22,000	24,000	23,000	23,000
22,000	24,000	26,000	24,000

A table of the selected 1988 and 1989 critical values and the critical value limits is attached.

TABLE VII-1

CRITICAL VALUES

The reporting of permanent partial injuries is to be made under the rules of the Unit Statistical Plan through the use of injury Code 9. All permanent partials not reported under the Option A of the Three Year Fixed Rate Policy procedure will be sorted by the National Council's data processing equipment into Major and Minor based on the following state critical values.

If Option A is selected for reporting experience under Three Year Fixed Rate Policies, such losses will be reported as 3 or 4, for major or minor, respectively.

FOR POLICIES EFFECTIVE*

State	1-1-74 to 12-31-74	1-1-75 to 12-31-75	1-1-76 to 12-31-76	1-1-77 to 12-31-77	1-1-78 to 12-31-78	1-1-79 to 12-31-79	1-1-80 to 12-31-80	1-1-81 to 12-31-81	1-1-82 to 12-31-82	1-1-83 to 12-31-83	1-1-84 to 12-31-84	1-1-85 to 12-31-85	1-1-86 to 12-31-86	1-1-87 to 12-31-87
Alabama	9,000	9,500	12,000	12,500	13,000	13,000	13,500	14,000	14,000	14,500	15,000	16,500	18,000	20,000
Alaska	11,500	11,500	15,500	21,000	19,000	20,000	20,000	20,000	20,500	20,500	21,500	23,500	26,000	28,500
Arizona	6,500	6,500	6,500	6,500	7,000	7,000	7,000	7,000	7,000	7,000	7,000	7,500	8,000	9,000
Kansas	7,000	7,000	7,000	8,000	8,500	9,000	10,500	11,000	11,500	12,000	12,000	13,000	14,500	16,000
Colorado	12,000	12,500	16,500	16,500	16,500	16,500	16,500	17,000	17,000	17,000	17,000	18,500	20,500	22,500
Connecticut	12,000	12,500	12,500	13,000	13,500	14,500	14,500	15,000	15,000	15,000	15,000	16,500	18,000	20,000
District of Col.	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	11,000	10,500	11,500	12,500	14,000
Florida	8,500	9,500	9,500	10,000	10,000	10,000	(A)							
Georgia	6,500	7,500	8,000	8,000	8,000	10,000	10,000	10,000	10,000	11,000	11,000	12,000	13,000	14,500
Illinois	7,500	9,500	10,000	10,500	11,000	11,000	11,000	12,000	12,500	13,000	13,500	15,000	16,500	18,000
Indiana	16,000	17,000	18,000	19,500	21,000	21,500	21,500	22,000	26,000	28,000	29,000	32,000	35,000	38,500
Iowa	9,500	9,500	14,500	15,500	15,500	16,000	16,000	16,000	16,000	16,000	16,000	17,500	19,500	21,500
Kentucky	7,500	8,000	8,000	8,000	9,500	9,500	10,000	10,000	10,000	10,000	10,500	11,500	12,500	14,000
Louisiana	10,500	11,000	12,500	14,000	14,500	14,500	14,500	14,500	15,000	15,500	15,500	17,000	18,500	20,500
Maine	6,500	8,000	8,500	9,000	10,000	10,500	10,500	11,000	11,000	11,500	11,500	12,500	14,000	15,500
Massachusetts	14,000	14,000	15,000	17,000	17,500	17,500	17,500	8,000	8,500	9,500	9,500	10,500	11,500	12,500
Michigan	8,000	8,000	9,500	10,000	11,500	12,000	12,000	13,000	13,000	13,500	13,500	14,500	15,500	16,500
Minnesota	10,000	19,000	19,000	19,000	20,500	20,500	20,500	20,500	20,500	20,500	19,500	21,500	24,000	26,500
Mississippi	9,500	10,000	13,000	15,000	15,500	16,500	16,500	17,500	19,000	20,000	21,000	23,000	25,500	28,000
Missouri	12,000	12,000	12,500	12,500	13,000	13,500	13,500	14,000	16,000	16,000	15,500	17,000	18,500	20,500

TABLE VII-1 (CONT'D)

CRITICAL VALUES

FOR POLICIES EFFECTIVE*

State	1-1-74 to 1-1-75		1-1-76 to 1-1-77		1-1-78 to 1-1-79		1-1-80 to 1-1-81		1-1-82 to 1-1-83		1-1-84 to 1-1-85		1-1-86 to 1-1-87	
	12-31-74	12-31-75	12-31-76	12-31-77	12-31-78	12-31-79	12-31-80	12-31-81	12-31-82	12-31-83	12-31-84	12-31-85	12-31-86	12-31-87
Nebraska	14,500	14,500	17,000	17,500	19,500	19,500	19,500	20,000	17,500	18,000	18,500	N/A	N/A	N/A
Mississippi	7,500	8,000	8,000	9,500	10,000	10,000	10,000	10,000	10,500	10,500	11,000	12,000	13,000	14,500
Missouri	7,500	8,500	8,500	9,000	9,000	10,000	10,000	10,500	12,000	12,500	14,500	16,000	17,500	19,500
Tennessee	9,500	9,500	10,000	10,000	10,500	10,500	10,500	11,000	11,000	11,000	14,500	16,000	17,500	19,500
Texas	10,070	10,500	11,000	11,000	12,500	13,000	13,500	13,500	13,500	13,500	14,000	15,500	17,000	18,500
Vermont	8,000	8,000	8,500	8,500	9,000	9,000	9,000	9,000	9,000	9,000	9,500	10,500	11,500	12,500
Virginia	9,000	10,000	12,000	13,500	15,000	15,500	15,500	16,000	17,000	17,000	17,500	19,500	21,500	23,500
Washington	8,500	8,500	10,500	11,000	11,000	11,000	11,500	11,500	11,500	11,500	12,500	14,000	15,500	17,000
West Virginia	6,500	6,500	6,500	6,500	6,500	9,000	9,000	10,000	14,000	15,000	16,000	17,500	19,500	20,500
Wisconsin	17,500	17,500	18,500	18,500	21,000	21,000	22,000	22,000	24,000	24,000	24,000	26,500	26,500	24,000
Wyoming	6,500	7,000	7,000	7,000	7,000	7,000	7,500	7,500	7,500	7,000	7,500	8,000	9,000	10,000
Alabama	6,500	8,500	8,500	10,000	10,500	10,500	10,500	10,500	11,000	11,000	11,000	12,000	13,000	14,500
Arkansas	9,000	10,000	11,000	12,500	13,500	14,500	15,000	15,500	16,000	16,500	17,000	18,500	20,500	22,500
California	8,000	9,000	10,000	10,000	11,000	11,000	11,500	12,000	12,500	13,000	13,000	14,500	16,000	17,500
Colorado	6,000	6,000	6,500	7,000	7,000	7,000	7,500	7,500	7,500	8,000	8,000	9,000	10,000	11,000
Florida	9,500	9,500	10,000	11,500	13,000	13,500	13,500	14,000	14,500	15,000	15,500	17,000	18,500	20,500
Georgia	8,500	9,000	10,500	10,500	11,000	11,000	11,000	11,000	13,500	11,500	11,500	12,500	14,000	15,500
Illinois	8,500	8,500	9,500	10,000	11,000	11,000	11,000	12,000	14,500	14,500	15,500	17,000	18,500	20,500

Major: Incurred indemnity above critical value.
 Minor: Incurred indemnity at or below critical value.

Not Applicable
 Not Yet Available

CRITICAL VALUE AND MAJOR LOSS PERCENTAGE

STATE	SELECTED CRITICAL VALUE 1988	1989	CRIT. VAL. W/ 1966 ADJ. DIST.	LEVEL TO WHICH 1966 DIST. IS ADJ.
AL	22,000	24,000	33,000 (38.29)	07/01/86
AK	31,500	34,500	68,000 (44.52)	01/01/86
AR	17,500	19,500	22,500 (42.63)	07/01/87
AZ	10,000	11,000	12,000 (80.26)	01/01/88
CO	25,000	27,500	69,500 (17.52)	07/01/86
CT	22,000	N/A	40,500 (36.80)	10/01/86
DC	15,500	17,000	74,500 (38.72)	01/01/86
FL	20,000	N/A	39,000 (49.30)	07/01/86
GA	16,000	N/A	25,500 (41.41)	07/01/86
HI	20,000	22,000	30,000 (45.49)	01/01/86
ID	42,500	47,000	60,500 (23.08)	01/01/86
IL	23,500	26,000	44,000 (35.70)	07/15/86
IN	15,500	N/A	25,000 (30.57)	07/01/86
IA	22,500	25,000	47,000 (36.81)	07/01/86
KS	17,000	N/A	30,000 (41.72)	07/01/86
KY	14,000	N/A	26,000 (54.22)	01/01/86
LA	14,000	15,500	32,000 (59.02)	09/01/86
MA	29,000	32,000	64,500 (40.25)	11/20/87
MD	31,000	34,000	35,000 (40.44)	01/01/88
MI	22,500	25,000	39,000 (63.01)	01/01/86
MS	16,000	N/A	24,500 (39.48)	07/01/86
MO	21,500	N/A	25,000 (28.60)	07/01/87
MT	21,500	N/A	56,000 (25.94)	07/01/86
NE	20,500	22,500	29,500 (38.62)	09/06/85
NH	14,000	15,500	31,500 (46.63)	07/01/86
NM	26,000	N/A	38,500 (46.78)	07/01/86
NC	18,500	N/A	30,500 (27.58)	07/01/86
OK	20,500	20,500	20,500 (44.25)	11/01/87
OR	24,000	N/A	23,500 (37.23)	01/01/88
RI	11,000	N/A	33,500 (55.46)	09/01/86
SC	16,000	N/A	29,000 (33.89)	01/01/86
SD	25,000	N/A	36,000 (37.36)	07/01/87
TN	19,500	N/A	30,000 (41.04)	07/01/87
UT	12,000	13,000	15,500 (64.88)	07/01/87
VT	22,500	25,000	32,500 (46.44)	07/01/86
VA	17,000	18,500	44,500 (34.77)	07/01/86
WI	22,500	N/A	34,000 (33.72)	01/01/86

NAIC

EFFECT OF UNESCALATED CRITICAL VALUES ON PERMANENT PARTIAL CLAIMS

ASSUMPTIONS AT TIME 0:

OVERALL AVERAGE PERMANENT PARTIAL SIZE	20,000
CRITICAL VALUE	20,000

CALCULATIONS BASED ON NCCI EXHIBIT V-C (3)

AVERAGE MINOR PERMANENT PARTIAL	7,301	A =	76.7%
AVERAGE MAJOR PERMANENT PARTIAL	61,803	B =	28.0%
% OF PERMANENT PARTIAL CLAIMS THAT ARE MAJOR	23.3%	R =	1.00
% OF PERMANENT PARTIAL DOLLARS THAT ARE MAJOR	72.0%		

ASSUMPTIONS AT TIME 10:

OVERALL AVERAGE PERMANENT PARTIAL SIZE	32,578	ASSUMES AN ANNUAL INFLATION RATE OF 5.0%.
CRITICAL VALUE	20,000	

CALCULATIONS BASED ON NCCI EXHIBIT V-C (3)

AVERAGE MINOR PERMANENT PARTIAL	8,835	A =	64.9%
AVERAGE MAJOR PERMANENT PARTIAL	76,479	B =	17.6%
% OF PERMANENT PARTIAL CLAIMS THAT ARE MAJOR	35.1%	R =	0.61
% OF PERMANENT PARTIAL DOLLARS THAT ARE MAJOR	82.4%		

ASSUMPTIONS AT TIME 20:

OVERALL AVERAGE PERMANENT PARTIAL SIZE	53,066	ASSUMES AN ANNUAL INFLATION RATE OF 5.0%.
CRITICAL VALUE	20,000	

CALCULATIONS BASED ON NCCI EXHIBIT V-C (3)

AVERAGE MINOR PERMANENT PARTIAL	10,734	A =	52.9%
AVERAGE MAJOR PERMANENT PARTIAL	100,611	B =	10.7%
% OF PERMANENT PARTIAL CLAIMS THAT ARE MAJOR	47.1%	R =	0.38
% OF PERMANENT PARTIAL DOLLARS THAT ARE MAJOR	89.3%		

NOTES:

R IS RATIO OF CRITICAL VALUE TO OVERALL AVERAGE SIZE.
A & B BASED ON EXHIBIT A3, SHEET 2 (NCCI EXHIBIT V-C (3)). A IS PERCENTAGE OF CLAIMS LESS THAN R. B IS PERCENTAGE OF TOTAL DOLLARS FROM THOSE CLAIMS.
FORMULA FOR AVERAGE MINOR IS OVERALL AVERAGE SIZE TIMES B DIVIDED BY A.
FORMULA FOR AVERAGE MAJOR IS OVERALL AVERAGE SIZE TIMES 1.0 LESS B DIVIDED BY 1.0 LESS A.
OVERALL AVERAGE SIZE AND CRITICAL VALUE AT TIME 0 SELECTED BY JUDGEMENT.

EXHIBIT V-C (3)

Distribution of Incurred Losses by Size of Loss
Permanent and Temporary Partial Claims Only

"R"	MEDICAL		INDEMNITY		TOTAL	
	"A"	"B"	"A"	"B"	"A"	"B"
0.125	36.0%	2.4%	28.3%	2.2%	27.0%	2.2%
0.25	47.7%	5.6%	45.2%	6.9%	43.5%	6.7%
0.50	59.5%	11.5%	60.4%	14.3%	58.8%	14.2%
0.75	68.3%	18.0%	70.2%	21.5%	68.9%	21.7%
1.00	74.7%	24.4%	76.7%	28.0%	75.5%	28.2%
1.25	79.4%	30.2%	81.0%	33.4%	80.3%	34.1%
1.50	83.3%	36.0%	84.2%	38.1%	83.7%	39.4%
1.75	85.9%	40.7%	86.8%	42.7%	86.4%	44.0%
2.00	89.1%	47.1%	89.5%	48.2%	89.3%	49.9%
2.50	91.8%	54.0%	92.1%	54.8%	92.0%	56.7%
3.00	93.9%	60.0%	93.9%	60.2%	93.9%	62.4%
3.50	95.1%	64.5%	95.2%	64.5%	95.2%	67.0%
4.00	96.1%	68.4%	96.2%	68.4%	96.3%	71.2%
4.50	96.8%	71.6%	96.8%	71.3%	97.0%	74.4%
5.00	97.6%	75.6%	97.6%	75.3%	97.8%	78.5%
6.00	98.4%	80.1%	98.3%	79.6%	98.5%	82.8%
7.00	98.8%	83.2%	98.8%	83.0%	98.9%	85.6%
8.00	99.0%	85.0%	99.1%	85.1%	99.2%	87.7%
9.00	99.3%	87.0%	99.3%	86.9%	99.4%	89.1%
10.00	99.4%	88.4%	99.4%	88.2%	99.5%	90.5%
11.00	99.5%	89.4%	99.5%	89.3%	99.6%	91.7%
12.00	99.6%	90.6%	99.6%	90.0%	99.6%	92.3%
13.00	99.7%	91.3%	99.6%	91.1%	99.7%	93.0%
14.00	99.7%	91.9%	99.7%	92.0%	99.8%	93.7%
15.00	99.7%	92.4%	99.7%	92.5%	99.8%	94.4%
16.00	99.8%	92.9%	99.8%	93.2%	99.8%	94.8%
17.00	99.8%	93.4%	99.8%	93.7%	99.9%	95.5%
18.00	99.8%	93.7%	99.8%	93.9%	99.9%	95.7%
19.00	99.8%	94.2%	99.9%	94.5%	99.9%	96.0%
All Claims	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

"R" is the ratio to the average incurred size of loss.

"A" is the percentage of claims not in excess of "R" times the average incurred size of loss.

"B" is the percentage of incurred losses attributed to those claims not in excess of "R" times the average incurred size of loss.

**LAW AMENDMENTS:
TECHNICAL APPENDIX B**

FATAL INJURIES

The purpose of this Appendix is to describe the details of the methodology employed by NCCI in pricing total fatal disability benefits.

Exhibit B1, Sheets 1-2 display NCCI's summary of the benefits provisions and the law amendment change including a summary of social security offset provisions for fatal disability cases. For this revision, the only change is an increase in the maximum weekly benefit from \$354.69 to \$371.21.

For purposes of this Appendix we will assume that the calculation of the average weekly workers compensation benefits have been computed elsewhere in accordance with the statutory provisions and NCCI's estimate of the state average weekly wage (SAWW). Sample calculations of average weekly benefits using NCCI's formulas appear in Appendix E.

Exhibit B2 is NCCI's exhibit summarizing the calculation of the effect of the law amendment change on fatal disability benefits. Line 1 covers the cost of fatal benefits for the period when the dependents are not eligible for social security benefits and therefore the full workers compensation fatal benefits are received. The NCCI calculation of the old law value is shown in Exhibit B3. The new law calculation is analogous and is not shown in this Appendix.

Line 2 covers the cost of fatal benefits when the dependents receive social security benefits and therefore the workers compensation fatal benefits are reduced. The NCCI calculation of the old law value is shown in Exhibit B4. The new law calculation is analogous and is not shown in this Appendix.

Line 3 is the cost of burial, that is the product of the number of fatal cases (in the sample distribution) and the burial allowance under the statutory provisions, both pre and post-law change.

Line 4 is the cost of special funds. For this state, this is the number of non-dependency fatal cases times the subsequent injury fund assessment dictated by statute.

LAW AMENDMENTS: TECHNICAL APPENDIX B

Line 5 is the cost of remarriage benefits. Out of the sample of 1,000 fatal cases, 356 involve a widow alone (i.e., no children) and 427 involve a widow with one or more children.

The present values of benefits payable to widows in each category is multiplied by the average number in each group. This sum is then multiplied by the two year lump sum award (104 weeks) at the appropriate benefit level (\$236.07 under the old law and \$238.55 under the new law). This calculation is displayed in the footnotes.

Line 6 is the total cost of fatal benefits, that is the sum of lines 1-5. Line 7 is the overall effect of the law change, that is, the total cost in dollars based on the new law divided by the total cost in dollars based on the old law.

Exhibit B3 is an example of the NCCI calculation of fatal disability benefits for dependents not receiving social security benefits. This exhibit is used to calculate the values shown in Line 1 of Exhibit B2. In this exhibit, the cost of fatal benefits is computed over the period of time when the dependents are not eligible for social security benefits. (Note that the cost of fatal benefits for these dependents over the period of time when they receive social security benefits and, thus, reduced workers compensation fatal benefits is included as Exhibit B4.)

Column (1) is the average number of cases out of every 1,000 cases corresponding to the dependency status in column (2). The distribution is based on the Injury Table.

Column (2) consists of the distinct dependency subgroups which are eligible for fatal disability benefits.

Column (3) contains the average number of dependents associated with column (2).

Column (4) is the average age of dependents for each subgroup. (Based on the Workmen's Compensation Injury Table.)

Column (5) contains the type of annuity describing the benefit. The annuity symbol expresses the period of time over which the benefits are applicable. The average age

LAW AMENDMENTS: TECHNICAL APPENDIX B

of the widow is 51 (and the average age of the deceased spouse is age 54). Consequently, they receive the full workers compensation benefit, provided they do not remarry, over the next 9 years. This is reflected in the use of 9 year term life annuity for a person aged 51.

Column (6) contains the present value of an annuity of one dollar per week based on a 3.5% interest rate and the United States, 1979-81 Life Table for Females. Note that the interest rate and mortality table are not displayed in a typical filing.

Column (7) is the average weekly workers compensation fatal benefits for each subgroup based on the pre-law change average weekly wage and the minimum and maximum benefit provisions. The calculation of these values is shown in Exhibit B5.

Column (8) is the total fatal benefit cost in dollars associated with each annuity period computed by multiplying columns (1), (6) and (7).

Exhibit B4 is an example of the NCCI calculation of fatal disability benefits for dependents receiving social security benefits. In this exhibit, the cost of fatal benefits is computed over the period of time when the dependents receive social security benefits and, thus, reduced workers compensation fatal benefits. Column (1) through column (6) have the same definition as the columns in Exhibit B3.

Column (7) is the reduced statutory workers compensation benefit calculated in Exhibit B5, and is based on the size of the workers compensation benefit and the social security benefit. In many cases, the reduced statutory workers compensation benefit is zero, since the social security benefit is greater than the workers compensation benefit. The calculation of these values is shown in Exhibit B4.

Column (8) has the same definition as column (8) in Exhibit B3.

Note that the combined benefits for a specific subgroup in Exhibits B3 and B4 is the total benefit for that subgroup. For example, the total fatal benefits for a widow alone consist of the full workers compensation fatal benefit for a 9 year term life annuity (Exhibit B3) and a reduced fatal benefit for a 9 year deferred life annuity (Exhibit B4).

LAW AMENDMENTS: TECHNICAL APPENDIX B

Exhibit B5 is an example of the NCCI calculation of the reduced workers compensation average weekly benefit for dependents receiving social security benefits as specified in Exhibit B1, Sheet 2 and shown in Exhibit B4. Column (A) is the dependency status. Column (B) contains the primary social security benefit based on NCCI's interpretation of the social security structure. Column (C) represents the initial social security benefit. This is computed as column (B) times the applicable percent from Exhibit B1, Sheet 2 and assumes an annual 5% increase in social security benefits. Column (D) is the previously calculated workers compensation fatal benefit. Column (E) is the reduced workers compensation benefit. The appropriate reduction is based on Exhibit B1, Sheet 1.

Exhibit B6 is an example of the NCCI calculation of the present value of the widows' remarriage benefit. Widows who remarry are eligible for a 2 year lump sum benefit. The present values are computed only for widows alone or widows with no dependent children eligible for the fatal benefits (i.e., over 18 or 19 if a student) provided they do not remarry. The percent of widows who remarry and are eligible for the 2 year lump is the present value for the appropriate column divided by the number of widows sampled. Note that the fractions .0964 and .0733 are carried to Exhibit B2 to estimate the cost of remarriage.

Exhibit B7 displays annuity tables used by NCCI. Separate tables are included for Total Population, Female Population, and Remarriage Annuities. These tables are not included in a typical NCCI filing.

The calculation of the remaining subgroups and the pre-law and post-law benefits invoke the same methodology as described above. Therefore, we have not included these as exhibits.

EXHIBIT I

Summary of Principal Benefit Changes Due to the Annual
Maximum Weekly Benefit Change, Effective 7-1-89

Fatal	7-1-88	7-1-89
% Rate of Compensation		66 2/3%
Min./Max. Weekly Benefit	\$88.67*/\$354.69+	\$92.80*/\$371.21+
Duration: Widow, Child(ren)		Life or Remarriage To age 18, or 21 if a student
Others		Life
Burial Allowance		\$2,000
Subsequent Injury Fund (non-dependency cases)		\$15,000
Remarriage Award (if no dep. children)		Two year lump sum
Social Security Benefit Offset		W.C. Benefit reduced by 100% Initial S.S. Benefit
Total Disability		
% Rate of Compensation		66 2/3%
Min./Max. Weekly Benefit	\$354.69+	\$371.21+
Duration		Period of disability
Social Security Benefit Offset		W.C. Benefit reduced by 50% Initial S.S. Benefit
Waiting Period/Retroactive after, days		3/14
Minimum Payable (in dep. cases)		6 years of W.C. Benefits
Permanent Partial Disability		
Weekly Benefit: Schedule		Fixed at \$150.00
Non-Schedule		Fixed at \$120.00
Healing Period		Same as Temp. Total
Duration: Schedule		As per Schedule
Non-Schedule		Life Expectancy x % Disability
Maximum Amount Payable:		
Schedule		\$150.00 x Schedule
Non-Schedule		\$37,560
Minimum Payable		Amount determined due

EXHIBIT IX-C

Summary of Social Security Benefits
for Fatal and Permanent Total Disability Cases

(1) Dependency	(2) Payee	(3) Fraction of Primary Payable*	(4) Conditions of Payment
Widow Alone	Widow	100%	Age 65
Widow Alone	Widow	82.9	Age 62
Widow Alone	Widow	71.5	Age 60
Widow and Children	Widow	75	While caring for child under age 18
	Each Child	75	Until age 18, or 19 if a student
Orphans	Each Child	75	Until age 18, or 19 if a student
One Parent	Parent	82.5	Age 62
Two Parents	Parents	150	Age 62
PERMANENT TOTAL DISABILITY +			
Worker Alone	Worker	100	After a five month waiting period**
Worker and Wife	Worker	100	After a five month waiting period**
	Wife	50	Age 65
	Wife	37.5	Age 62
Worker, Wife and Children	Worker	100	After a five month waiting period**
	Wife	50	While caring for child, under 18
	Each Child	50	19 if a student
Worker and Children	Worker	100	After a five month waiting period**
	Each Child	50	Until age 18, or 19 if a student

All aggregate benefits are limited to the family maximum benefit. The five month waiting period also applies to members of the worker's family.

At age 65 the disability benefit becomes a retirement benefit.



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EXHIBIT III

Calculation of the Effect of the Annual Maximum Weekly
Benefit Change on Fatal Benefits Costs, Effective 7-1-89

	7-1-88	7-1-89
	<u> </u>	<u> </u>
1. Cost of Dependency - Dependents Not Receiving Survivorship Benefits (Exhibit III-A,C)	73,041,370	73,808,696
2. Cost of Dependency - Dependents Receiving Survivorship Benefits (Exhibit III-B,D)	10,860,275	11,333,799
3. Cost of Burial (\$2,000 x 1,000 cases)	2,000,000	2,000,000
4. Cost of Subsequent Injury Fund (147 cases x \$15,000)	2,205,000	2,205,000
5. Cost of Remarriage	1,610,994 *	1,627,918 **
6. Total Cost (1)+(2)+(3)+(4)+(5)	89,717,639	90,975,413
7. Effect		1.014

* $((0.0964+ \times 356)+(0.0733+ \times 427)) \times 104 \text{ weeks} \times \236.07 (Exh. VII-A)
 $((0.0964+ \times 356)+(0.0733+ \times 427)) \times 104 \text{ weeks} \times \238.55 (Exh. VIII-A)
 + Exhibit III-G.

EXHIBIT III-A

Valuation of Fatal Benefits for Dependents Not Receiving
Social Security Survivorship Benefits, Effective 7-1-88

(1) No. of Cases	(2) Person Receiving Comp.	(3) No. of Depen- dents	(4) Avg. Age Arith.	(5) Annuity Symbol	(6) Annuity Value	(7) Average Weekly Ben.++	(8) Total Cost (1)x(6)x(7)
147	None	None	xx	xxx	xxx	xxx	
356	Widow Alone	1	51	$\bar{a}'51:\overline{9.0000/}$	384.56	236.07	32,318,776
136	Widow with child	1 1	36	$8/\bar{a}'36:\overline{16.0000/}$	372.04	236.07	11,944,538
129	Widow with children	1 2	36	$8/\bar{a}'36:\overline{16.0000/}$	372.04	236.07	11,329,745
82	Widow with Children	1 3	36	$8/\bar{a}'36:\overline{16.0000/}$	372.04	236.07	7,201,854
42	Widow with Children	1 4	36	$8/\bar{a}'36:\overline{16.0000/}$	372.04	236.07	3,688,754
22	Widow with Children	1 5	36	$8/\bar{a}'36:\overline{16.0000/}$	372.04	236.07	1,932,205
16	Widow with children	1 7*	36	$8/\bar{a}'36:\overline{16.0000/}$	372.04	236.07	1,405,240
13	Parent	1	61	$\bar{a} 61:\overline{1.0000/}$	50.74	236.07	155,716
17	Parents	2	49	$a \overline{676/} \approx 1340$ <small>113760</small>	545.37	236.07	2,188,673
1	Brother o Sister	1	23	$\bar{a} 23:\overline{Life/}$	1,226.15	236.07	289,457
2	Other Dependents	1*	21	$\bar{a} 21:\overline{Life/}$	1,242.03	236.07	586,412
							73,041,370

* Average.

+ Exhibit VII-A.



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EXHIBIT III-B

Valuation of Fatal Benefits for Dependents Receiving Social Security Survivorship Benefits, Effective 7-1-88

(1) No. of Cases	(2) Person Receiving Comp.	(3) No. of Depen- dents	(4) Avg. Age Arith.	(5) Annuity Symbol	(6) Annuity Value	(7) Average Weekly Ben.++	(8) Total Cost (1)x(6)x(7)
47	None	None	xx	xxx	xxx	xxx	xxx
56	Widow Alone	1	51	$9/\bar{a}'51:\overline{\text{Life}}$	498.50	53.54	9,501,530
36	Widow with child	1	36	$24/\bar{a}'36:\overline{\text{Life}}/+$	227.12	-	0
		1	10	$a \overline{416/}$	363.80	-	0
29	Widow with children	1	36	$24/\bar{a}'36:\overline{\text{Life}}/+$	227.12	-	0
		2	10	$a \overline{416/}$	363.80	-	0
8	Widow with Children	1	36	$24/\bar{a}'36:\overline{\text{Life}}/+$	227.12	-	0
		3	10	$a \overline{416/}$	363.80	-	0
42	Widow with Children	1	36	$24/\bar{a}'36:\overline{\text{Life}}/+$	227.12	-	0
		4	10	$a \overline{416/}$	363.80	-	0
22	Widow with Children	1	36	$24/\bar{a}'36:\overline{\text{Life}}/+$	227.12	-	0
		5	10	$a \overline{416/}$	363.80	-	0
16	Widow with children	1	36	$24/\bar{a}'36:\overline{\text{Life}}/+$	227.12	-	0
		7*	10	$a \overline{416/}$	363.80	-	0
16	Orphan	1	11	$\bar{a} 11:\overline{7.0000/}$	323.11	112.65	582,373
10	Orphans	2	11	$a \overline{364/}$	323.59	-	0
7	Orphans	3	11	$a \overline{364/}$	323.59	-	0
3	Orphans	4	11	$a \overline{364/}$	323.59	-	0

EXHIBIT III-B (Cont.)

Valuation of Fatal Benefits for Dependents Receiving Social Security Survivorship Benefits, Effective 7-1-88

(1) No. of Cases	(2) Person Receiving Comp.	(3) No. of Dependents	(4) Avg. Age Arith.	(5) Annuity Symbol	(6) Annuity Value	(7) Average Weekly Ben.++	(8) Total Cost (1)x(6)x(7)
1	Orphans (> 4)	5*	11	a $\overline{364/}$	323.59	-	0
13	Parent	1	61	1/ $\overline{a61:Life/}$	638.59	93.52	776,372
17	Parents	2	49	13/ $\overline{a49:Life/**}$	379.26	-	0
							10,860,275

* Average.

+ At age 60 the S.S. Benefit exceeds the W.C. Benefit so there is no cost after age 60.

** At age 62 the S.S. Benefit exceeds the W.C. Benefit so there is no cost after age 62.

→ Exhibit III-E.



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EXHIBIT III-E

Calculation of The Reduced Workers Compensation
Average Weekly Benefit For Dependents Receiving Social
Security Survivorship Benefits, Effective 7-1-88

(A) Type of Dependency	(B) Primary Social Security Benefit**	(C) Initial Social Security Benefit***	(D) Workers Compensation Benefit****	(E) Reduced Workers Comp. Benefit (D)-(C)
Widow Alone	164.56	182.53 +	236.07	53.54
Widow & 1 Child	164.56	246.84	236.07	-
Widow & 2 Children	164.56	297.95 *	236.07	-
Widow & 3 Children	164.56	297.95 *	236.07	-
Widow & 4 Children	164.56	297.95 *	236.07	-
Widow & 5 Children	164.56	297.95 *	236.07	-
Widow & 7 Children	164.56	297.95 *	236.07	-
1 Orphan	164.56	123.42	236.07	112.65
2 Orphans	164.56	246.84	236.07	-
Orphans	164.56	297.95 *	236.07	-
Orphans	164.56	297.95 *	236.07	-
1 Parent	164.56	142.55 ++	236.07	93.52
2 Parents	164.56	297.95 *	236.07	-

+ (B) x Fraction of Primary Payable (Exhibit IX-C) x (1.05)⁹

(164.56 x 0.715) x (1.05) = 182.53

++ (B) x Fraction of Primary Payable (Exhibit IX-C) x 1.05

(164.56 x 0.825) x 1.05 = 142.55

* Maximum Weekly Benefit (Exhibit IX).

** Exhibit IX.

*** (B) x Fraction of Primary Payable (Exhibit IX-C).

**** Exhibit VII-A.

EXHIBIT III-G

Calculation of Remarriage Values

(1) Average Age	(2) No. of Cases		(4) R(x) ----- D(x)	(5) R(x)+8 ----- D(x)	(6) (2)x(4)	(7) (3)x(5)
	Widow Alone	Widow w/children				
17	97	135	0.67189	0.13514	65.17333	18.24390
22	124	462	0.52389	0.13542	64.96236	62.56404
27	81	522	0.38306	0.11420	31.02786	59.61240
32	67	494	0.26647	0.08614	17.85349	42.55316
37	124	534	0.17896	0.06049	22.19104	32.30166
42	253	572	0.11735	0.04034	29.68955	23.07448
47	563	398	0.07548	0.02571	42.49524	10.23258
52	779	233	0.04760	0.01559	37.08040	3.63247
57	806	84	0.02933	0.00887	23.63998	0.74508
62	431	14	0.01755	0.00465	7.56405	0.06510
67	151	5	0.01022	0.00223	1.54322	0.01115
72	68	-	0.00582	0.00099	0.39576	-
77	13	-	0.00331	0.00044	0.04303	-
82	6	-	0.00192	0.00027	0.01152	-
87	1	-	0.00126	0.00034	0.00126	-

Remarriage Values+

		Sum Col. (2) = 3564
Widow Alone:	Sum Col. (6) = 0.0964	Sum Col. (3) = 3453

	Sum Col. (2)	Sum Col. (6) = 343.67209
Widow with Children:	Sum Col. (7) = 0.0733	Sum Col. (7) = 253.03602

	Sum Col. (3)	

Interest rate:1.035 Escalation rate:1.000 Run at 12:08:19 on 02/11/1991

TOTAL POPULATION ANNUITY VALUES

Page 1

Age	L	D	N
0	100,000	100,000.00	2,603,750.12
1	98,740	95,400.97	2,506,049.64
2	98,648	92,088.96	2,412,304.67
3	98,584	88,917.12	2,321,801.63
4	98,535	85,867.56	2,234,409.29
5	98,495	82,930.15	2,150,010.44
6	98,459	80,096.46	2,068,497.13
7	98,426	77,361.95	1,989,767.93
8	98,396	74,723.06	1,913,725.42
9	98,370	72,177.12	1,840,275.33
10	98,347	69,720.04	1,769,326.75
11	98,328	67,349.34	1,700,792.06
12	98,309	65,059.25	1,634,587.77
13	98,285	62,843.84	1,570,636.22
14	98,248	60,695.83	1,508,866.39
15	98,196	58,612.27	1,449,212.34
16	98,129	56,591.57	1,391,610.41
17	98,047	54,632.16	1,335,998.55
18	97,953	52,734.09	1,282,315.42
19	97,851	50,897.75	1,230,499.50
20	97,741	49,121.29	1,180,489.98
21	97,623	47,402.89	1,132,227.90
22	97,499	45,741.72	1,085,655.59
23	97,370	44,136.42	1,040,716.52
24	97,240	42,586.95	997,354.84
25	97,110	41,091.80	955,515.46
26	96,982	39,649.89	915,144.61
27	96,856	38,259.31	876,190.02
28	96,730	36,917.42	838,601.65
29	96,604	35,622.55	802,331.66
30	96,477	34,372.67	767,334.05
31	96,350	33,166.59	733,564.43
32	96,220	32,001.78	700,980.24
33	96,088	30,877.18	669,540.76
34	95,951	29,790.49	639,206.92
35	95,808	28,740.18	609,941.59
36	95,655	27,723.95	581,709.52
37	95,492	26,740.78	554,477.16
38	95,317	25,789.15	528,212.19
39	95,129	24,867.91	502,883.66

Interest rate:1.035 Escalation rate:1.000 Run at 12:08:19 on 02/11/1991

TOTAL POPULATION ANNUITY VALUES

Page 2

Age	L	D	N
40	94,926	23,975.69	478,461.86
41	94,706	23,111.23	454,918.40
42	94,465	22,272.87	432,226.35
43	94,201	21,459.54	410,360.15
44	93,913	20,670.47	389,295.14
45	93,599	19,904.69	369,007.56
46	93,256	19,161.11	349,474.66
47	92,882	18,438.90	330,674.66
48	92,472	17,736.73	312,586.84
49	92,021	17,053.35	295,191.80
50	91,526	16,388.04	278,471.11
51	90,986	15,740.44	262,406.87
52	90,402	15,110.54	246,981.38
53	89,771	14,497.65	232,177.28
54	89,087	13,900.66	217,978.13
55	88,348	13,319.18	204,368.21
56	87,551	12,752.68	191,332.28
57	86,695	12,200.96	178,855.46
58	85,776	11,663.41	166,923.27
59	84,789	11,139.33	155,521.91
60	83,726	10,627.70	144,638.39
61	82,581	10,127.89	134,260.60
62	81,348	9,639.29	124,377.00
63	80,024	9,161.75	114,976.48
64	78,609	8,695.41	106,047.90
65	77,107	8,240.83	97,579.78
66	75,520	7,798.28	89,560.23
67	73,846	7,367.56	81,977.31
68	72,082	6,948.37	74,819.34
69	70,218	6,539.80	68,075.26
70	68,248	6,141.37	61,734.67
71	66,165	5,752.59	55,787.69
72	63,972	5,373.84	50,224.48
73	61,673	5,005.52	45,034.80
74	59,279	4,648.52	40,207.78
75	56,799	4,303.43	35,731.80
76	54,239	3,970.50	31,594.84
77	51,599	3,649.51	27,784.84
78	48,878	3,340.15	24,290.00
79	46,071	3,041.87	21,099.00

Interest rate:1.035

Escalation rate:1.000

Run at 12:08:19 on 02/11/1991

TOTAL POPULATION ANNUITY VALUES

Page 3

Age	L	D	N
80	43,180	2,754.58	18,200.77
81	40,208	2,478.24	15,584.36
82	37,172	2,213.64	13,238.42
83	34,095	1,961.74	11,150.73
84	31,012	1,724.01	9,307.86
85	27,960	1,501.78	7,694.96
86	24,961	1,295.36	6,296.39
87	22,038	1,105.00	5,096.21
88	19,235	931.84	4,077.79
89	16,598	776.90	3,223.42
90	14,154	640.10	2,514.92
91	11,908	520.32	1,934.71
92	9,863	416.39	1,466.35
93	8,032	327.62	1,094.35
94	6,424	253.17	803.96
95	5,043	192.02	581.36
96	3,884	142.89	413.91
97	2,939	104.47	290.23
98	2,185	75.04	200.47
99	1,598	53.03	136.44
100	1,150	36.87	91.49
101	815	25.25	60.43
102	570	17.06	39.27
103	393	11.36	25.06
104	267	7.46	15.65
105	179	4.83	9.50
106	119	3.10	5.54
107	78	1.97	3.01
108	51	1.24	1.40
109	33	0.78	0.39
110	0	0.00	0.00
111	0	0.00	0.00
112	0	0.00	0.00
113	0	0.00	0.00
114	0	0.00	0.00
115	0	0.00	0.00
116	0	0.00	0.00
117	0	0.00	0.00
118	0	0.00	0.00
119	0	0.00	0.00

FEMALE POPULATION ANNUITY VALUES Page 1

Age	L	D	N
0	100,000	100,000.00	2,644,248.04
1	98,880	95,536.23	2,546,479.93
2	98,796	92,227.12	2,452,598.25
3	98,740	89,057.82	2,361,955.78
4	98,699	86,010.48	2,274,421.63
5	98,666	83,074.12	2,189,879.33
6	98,636	80,240.45	2,108,222.05
7	98,609	77,505.78	2,029,348.93
8	98,585	74,866.59	1,953,162.75
9	98,563	72,318.73	1,879,570.09
10	98,544	69,859.70	1,808,480.87
11	98,527	67,485.65	1,739,808.20
12	98,509	65,191.61	1,673,469.57
13	98,489	62,974.28	1,609,386.62
14	98,464	60,829.27	1,547,484.85
15	98,432	58,753.14	1,487,693.64
16	98,392	56,743.25	1,429,945.45
17	98,346	54,798.76	1,374,174.44
18	98,294	52,917.67	1,320,316.23
19	98,240	51,100.10	1,268,307.34
20	98,184	49,343.93	1,218,085.33
21	98,127	47,647.62	1,169,589.55
22	98,068	46,008.66	1,122,761.41
23	98,007	44,425.17	1,077,544.50
24	97,946	42,896.15	1,033,883.84
25	97,883	41,418.90	991,726.31
26	97,820	39,992.50	951,020.61
27	97,755	38,614.42	911,717.15
28	97,689	37,283.43	873,768.23
29	97,621	35,997.56	837,127.73
30	97,551	34,755.32	801,751.29
31	97,477	33,554.54	767,596.36
32	97,400	32,394.24	734,621.97
33	97,319	31,272.75	702,788.48
34	97,233	30,188.52	672,057.84
35	97,140	29,139.75	642,393.71
36	97,039	28,125.08	613,761.29
37	96,928	27,142.90	586,127.30
38	96,807	26,192.29	559,459.71
39	96,675	25,272.05	533,727.54

Interest rate:1.035 Escalation rate:1.000 Run at 12:08:19 on 02/11/1991

FEMALE POPULATION ANNUITY VALUES Page 2

Age	L	D	N
40	96,531	24,381.07	508,900.98
41	96,374	23,518.28	484,951.30
42	96,200	22,681.95	461,851.19
43	96,009	21,871.42	439,574.50
44	95,799	21,085.58	418,096.00
45	95,570	20,323.84	397,391.29
46	95,320	19,585.20	377,436.77
47	95,047	18,868.70	358,209.82
48	94,748	18,173.28	339,688.83
49	94,419	17,497.75	321,853.32
50	94,060	16,841.76	304,683.56
51	93,669	16,204.59	288,160.38
52	93,245	15,585.74	272,265.22
53	92,788	14,984.88	256,979.91
54	92,294	14,401.06	242,286.94
55	91,760	13,833.57	228,169.62
56	91,185	13,282.01	214,611.83
57	90,567	12,745.89	201,597.88
58	89,903	12,224.58	189,112.65
59	89,187	11,717.12	177,141.80
60	88,414	11,222.77	165,671.86
61	87,577	10,740.60	154,690.17
62	86,670	10,269.92	144,184.91
63	85,691	9,810.55	134,144.67
64	84,641	9,362.64	124,558.08
65	83,520	8,926.22	115,413.65
66	82,328	8,501.28	106,699.90
67	81,061	8,087.39	98,405.57
68	79,712	7,683.87	90,519.94
69	78,269	7,289.63	83,033.19
70	76,720	6,903.73	75,936.51
71	75,055	6,525.52	69,221.88
72	73,273	6,155.15	62,881.55
73	71,368	5,792.39	56,907.78
74	69,340	5,437.48	51,292.84
75	67,186	5,090.41	46,028.90
76	64,910	4,751.66	41,107.86
77	62,506	4,420.94	36,521.56
78	59,960	4,097.46	32,262.36
79	57,253	3,780.16	28,323.55

Interest rate:1.035

Escalation rate:1.000

Run at 12:08:19 on 02/11/1991

FEMALE POPULATION ANNUITY VALUES

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Age	L	D	N
80	54,372	3,468.54	24,699.20
81	51,315	3,162.83	21,383.52
82	48,098	2,864.30	18,369.95
83	44,744	2,574.46	15,650.57
84	41,289	2,295.33	13,215.68
85	37,772	2,028.80	11,053.61
86	34,218	1,775.76	9,151.33
87	30,657	1,537.16	7,494.87
88	27,156	1,315.57	6,068.51
89	23,782	1,113.16	4,854.14
90	20,578	930.62	3,832.25
91	17,561	767.32	2,983.28
92	14,747	622.57	2,288.34
93	12,172	496.49	1,728.80
94	9,871	389.02	1,286.05
95	7,862	299.36	941.86
96	6,147	226.15	679.11
97	4,719	167.74	482.16
98	3,560	122.26	337.16
99	2,641	87.63	232.22
100	1,927	61.78	157.51
101	1,384	42.87	105.19
102	979	29.30	69.10
103	683	19.75	44.58
104	470	13.13	28.14
105	320	8.64	17.25
106	215	5.61	10.13
107	143	3.60	5.52
108	94	2.29	2.58
109	61	1.43	0.72
110	0	0.00	0.00
111	0	0.00	0.00
112	0	0.00	0.00
113	0	0.00	0.00
114	0	0.00	0.00
115	0	0.00	0.00
116	0	0.00	0.00
117	0	0.00	0.00
118	0	0.00	0.00
119	0	0.00	0.00

Interest rate:1.035 Escalation rate:1.000 Run at 12:08:19 on 02/11/1991

REMARRIAGE ANNUITY VALUES

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Age[x]	D [x]	D [x+1]	D [x+2]	D [x+3]	D [x+4]	D [x+5]	Age [x+5]
16	100,000.00	90,159.76	73,608.95	59,442.65	49,030.31	41,463.61	21
17	81,036.37	73,542.90	60,982.93	50,046.39	41,852.19	35,791.81	22
18	66,776.39	60,963.33	51,268.90	42,695.32	36,155.42	31,237.70	23
19	55,853.30	51,266.22	43,667.82	36,852.03	31,565.57	27,528.77	24
20	47,331.81	43,656.65	37,618.68	32,132.88	27,811.93	24,463.32	25
21	40,581.50	37,595.06	32,737.09	28,272.30	24,703.65	21,900.30	26
22	35,155.00	32,696.90	28,744.31	25,073.06	22,099.00	19,731.64	27
23	30,741.67	28,695.14	25,444.67	22,397.29	19,896.77	17,881.94	28
24	27,117.51	25,394.20	22,694.67	20,141.88	18,022.30	16,294.22	29
25	24,110.65	22,644.77	20,381.18	18,225.01	16,414.31	14,921.72	30
26	21,592.66	20,333.44	18,419.08	16,582.88	15,024.85	13,726.79	31
27	19,465.73	18,374.33	16,741.65	15,166.43	13,816.17	12,680.16	32
28	17,654.20	16,700.16	15,296.86	13,935.43	12,757.86	11,757.77	33
29	16,098.93	15,258.46	14,043.04	12,858.82	11,825.49	10,939.93	34
30	14,753.77	14,007.72	12,947.92	11,911.18	10,999.08	10,210.55	35
31	13,582.43	12,915.80	11,985.49	11,072.33	10,262.52	9,556.80	36
32	12,555.90	11,956.49	11,134.64	10,325.42	9,602.63	8,967.86	37
33	11,650.83	11,108.55	10,378.12	9,657.14	9,008.61	8,435.01	38
34	10,848.25	10,354.83	9,701.83	9,055.92	8,471.35	7,950.74	39
35	10,132.36	9,680.96	9,093.99	8,512.58	7,983.19	7,508.66	40
36	9,490.22	9,075.28	8,544.98	8,019.11	7,537.64	7,103.45	41
37	8,911.66	8,528.52	8,047.11	7,569.24	7,129.43	6,730.34	42
38	8,387.28	8,032.15	7,593.07	7,157.00	6,753.54	6,385.54	43
39	7,910.32	7,579.78	7,177.60	6,777.82	6,406.34	6,065.73	44
40	7,474.21	7,165.59	6,795.44	6,427.58	6,084.29	5,768.14	45
41	7,074.01	6,784.66	6,442.77	6,102.96	5,784.71	5,490.30	46
42	6,705.09	6,433.03	6,116.00	5,801.09	5,505.11	5,230.10	47
43	6,363.65	6,107.15	5,812.30	5,519.45	5,243.29	4,985.61	48
44	6,046.71	5,804.31	5,529.09	5,255.86	4,997.36	4,755.16	49
45	5,751.62	5,521.91	5,264.20	5,008.48	4,765.69	4,537.53	50
46	5,475.79	5,257.68	5,015.60	4,775.41	4,546.88	4,331.46	51
47	5,217.37	5,009.70	4,781.52	4,555.41	4,339.80	4,136.00	52
48	4,974.43	4,776.25	4,560.74	4,347.34	4,143.43	3,950.27	53
49	4,745.26	4,555.90	4,351.85	4,150.03	3,956.88	3,773.40	54
50	4,528.76	4,347.54	4,153.95	3,962.70	3,779.29	3,604.62	55
51	4,323.78	4,150.09	3,966.12	3,784.46	3,609.91	3,443.35	56
52	4,129.22	3,962.65	3,787.39	3,614.42	3,448.03	3,289.00	57
53	3,944.34	3,784.26	3,616.96	3,452.05	3,293.20	3,141.07	58
54	3,768.26	3,614.23	3,454.30	3,296.77	3,144.83	2,998.97	59
55	3,600.19	3,451.84	3,298.73	3,147.99	3,002.35	2,862.22	60

Interest rate:1.035 Escalation rate:1.000 Run at 12:08:19 on 02/11/1991

REMARRIAGE ANNUITY VALUES

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Age(x)	D[x]	D[x+1]	D[x+2]	D[x+3]	D[x+4]	D[x+5]	Age(x+5)
56	3,439.49	3,296.50	3,149.69	3,005.14	2,865.23	2,730.34	61
57	3,285.74	3,147.76	3,006.66	2,867.74	2,733.06	2,602.94	62
58	3,138.37	3,004.99	2,869.12	2,735.31	2,605.39	2,479.77	63
59	2,996.75	2,867.62	2,736.51	2,607.41	2,481.98	2,360.71	64
60	2,860.45	2,735.23	2,608.48	2,483.78	2,362.70	2,245.61	65
61	2,728.95	2,607.35	2,484.75	2,364.31	2,247.39	2,134.32	66
62	2,601.92	2,483.80	2,365.19	2,248.85	2,135.94	2,026.63	67
63	2,479.06	2,364.38	2,249.67	2,137.28	2,028.12	1,922.28	68
64	2,360.34	2,249.03	2,138.04	2,029.34	1,923.63	1,820.88	69
65	2,245.54	2,137.53	2,030.07	1,924.76	1,822.14	1,722.14	70
66	2,134.51	2,029.64	1,925.42	1,823.14	1,723.26	1,625.79	71
67	2,027.08	1,925.11	1,823.78	1,724.21	1,626.83	1,531.83	72
68	1,922.92	1,823.55	1,724.80	1,627.70	1,532.78	1,440.14	73
69	1,821.68	1,724.64	1,628.25	1,533.58	1,441.00	1,350.72	74
70	1,723.06	1,628.14	1,534.09	1,441.73	1,351.51	1,263.52	75
71	1,626.80	1,534.02	1,442.20	1,352.15	1,264.23	1,178.62	76
72	1,532.87	1,442.16	1,352.59	1,264.82	1,179.26	1,095.92	77
73	1,441.22	1,352.59	1,265.21	1,179.79	1,096.49	1,015.18	78
74	1,351.80	1,265.24	1,180.15	1,096.97	1,015.69	936.12	79
75	1,264.58	1,180.19	1,097.30	1,016.12	936.57	858.59	80
76	1,179.64	1,097.34	1,016.41	936.95	858.99	782.63	81
77	1,096.88	1,016.46	937.22	859.32	782.97	708.52	82
78	1,016.09	937.27	859.56	783.26	708.83	636.65	83
79	936.96	859.61	783.47	709.08	636.90	567.48	84
80	859.35	783.51	709.25	637.11	567.69	501.47	85
81	783.31	709.29	637.26	567.87	501.65	438.84	86
82	709.12	637.30	567.99	501.80	438.99	379.81	87
83	637.19	568.05	501.92	439.12	379.94	325.02	88
84	567.93	501.95	439.21	380.04	325.11	274.97	89
85	501.88	439.24	380.12	325.20	275.06	229.86	90
86	439.19	380.15	325.27	275.13	229.93	189.51	91
87	380.11	325.29	275.18	229.98	189.56	153.75	92
88	325.25	275.19	230.01	189.60	153.78	122.60	93
89	275.18	230.04	189.64	153.82	122.63	96.06	94
90	230.03	189.65	153.85	122.66	96.08	73.92	95
91	189.61	153.84	122.66	96.09	73.92	55.83	96
92	153.83	122.67	96.10	73.94	55.84	41.41	97
93	122.65	96.10	73.94	55.85	41.41	30.18	98
94	96.09	73.94	55.85	41.42	30.18	21.63	99
95	73.95	55.86	41.43	30.19	21.64	15.25	100

Interest rate:1.035 Escalation rate:1.000 Run at 12:08:19 on 02/11/1991

REMARRIAGE ANNUITY VALUES

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Age[x]	N[x]	N[x+1]	N[x+2]	N[x+3]	N[x+4]	N[x+5]	Age[x+5]
16	807,791.91	712,712.03	630,827.68	564,301.88	510,065.40	464,818.44	21
17	711,029.23	633,739.59	566,476.67	510,962.02	465,012.73	426,190.73	22
18	632,765.98	568,896.13	512,780.01	465,797.90	426,372.53	392,675.97	23
19	568,335.41	514,775.65	467,308.63	427,048.71	392,839.91	363,292.74	24
20	514,414.40	468,920.17	428,282.50	393,406.72	363,434.32	337,296.69	25
21	468,663.88	429,575.60	394,409.53	363,904.83	337,416.86	314,114.88	26
22	429,355.50	395,429.55	364,708.95	337,800.26	314,214.23	293,298.91	27
23	395,237.80	365,519.39	338,449.49	314,528.51	293,381.47	274,492.12	28
24	365,362.95	339,107.10	315,062.66	293,644.39	274,562.30	257,404.04	29
25	338,977.53	315,599.82	294,086.84	274,783.75	257,464.09	241,796.07	30
26	315,491.79	294,528.74	275,152.48	257,651.50	241,847.63	227,471.81	31
27	294,439.87	275,519.83	257,961.85	242,007.81	227,516.50	214,268.34	32
28	275,445.67	258,268.49	242,269.98	227,653.84	214,307.19	202,049.38	33
29	258,205.77	242,527.07	227,876.32	214,425.39	202,083.24	190,700.53	34
30	242,473.35	228,092.60	214,614.78	202,185.23	190,730.10	180,125.29	35
31	228,047.36	214,798.25	202,347.61	190,818.70	180,151.27	170,241.61	36
32	214,760.34	202,504.15	190,958.58	180,228.55	170,264.53	160,979.28	37
33	202,473.19	191,093.50	180,350.16	170,332.53	160,999.66	152,277.85	38
34	191,068.40	180,466.86	170,438.53	161,059.65	152,296.02	144,084.97	39
35	180,446.50	170,539.84	161,152.37	152,349.08	144,101.20	136,355.27	40
36	170,523.06	161,240.31	152,430.18	144,148.14	136,369.76	129,049.22	41
37	161,227.62	152,507.53	144,219.72	136,411.54	129,062.21	122,132.32	42
38	152,496.55	144,286.84	136,474.23	129,099.19	122,143.92	115,574.38	43
39	144,278.31	136,533.26	129,154.57	122,176.86	115,584.78	109,348.75	44
40	136,525.89	129,205.99	122,225.47	115,613.96	109,358.03	103,431.81	45
41	129,199.85	122,270.51	115,656.80	109,383.93	103,440.10	97,802.59	46
42	122,265.22	115,696.16	109,421.64	103,463.10	97,810.00	92,442.39	47
43	115,691.36	109,455.96	103,496.23	97,830.36	92,448.99	87,334.54	48
44	109,451.71	103,526.20	97,859.50	92,467.02	87,340.41	82,464.15	49
45	103,522.66	97,885.90	92,492.84	87,356.50	82,469.42	77,817.81	50
46	97,882.51	92,515.77	87,379.13	82,483.63	77,822.48	73,383.31	51
47	92,512.70	87,399.16	82,503.55	77,835.09	73,387.48	69,149.58	52
48	87,396.56	82,521.22	77,852.72	73,398.68	69,153.30	65,106.45	53
49	82,518.60	77,868.02	73,414.15	69,163.21	65,109.75	61,244.61	54
50	77,865.77	73,427.62	69,176.88	65,118.55	61,247.56	57,555.60	55
51	73,425.76	69,188.83	65,130.72	61,255.43	57,558.25	54,031.62	56
52	69,187.04	65,141.11	61,266.09	57,565.18	54,033.96	50,665.44	57
53	65,139.58	61,275.28	57,574.67	54,040.17	50,667.54	47,450.41	58
54	61,274.13	57,582.89	54,048.62	50,673.09	47,452.29	44,380.39	59
55	57,581.91	54,055.89	50,680.61	47,457.25	44,382.08	41,449.79	60

Interest rate:1.035 Escalation rate:1.000 Run at 12:08:19 on 02/11/1991

REMARRIAGE ANNUITY VALUES

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Age[x]	N[x]	N[x+1]	N[x+2]	N[x+3]	N[x+4]	N[x+5]	Age[x+5]
56	54,054.99	50,686.99	47,463.90	44,386.48	41,451.30	38,653.51	61
57	50,686.43	47,469.68	44,392.47	41,455.27	38,654.87	35,986.87	62
58	47,469.40	44,397.72	41,460.66	38,658.45	35,988.10	33,445.52	63
59	44,397.53	41,465.34	38,663.28	35,991.32	33,446.62	31,025.28	64
60	41,465.34	38,667.50	35,995.64	33,449.51	31,026.27	28,722.12	65
61	38,667.59	35,999.44	33,453.39	31,028.86	28,723.01	26,532.15	66
62	35,999.73	33,456.87	31,032.38	28,725.36	26,532.96	24,451.68	67
63	33,457.34	31,035.62	28,728.59	26,535.12	24,452.42	22,477.22	68
64	31,036.29	28,731.61	26,538.07	24,454.38	22,477.90	20,605.64	69
65	28,732.47	26,540.94	24,457.14	22,479.72	20,606.27	18,834.13	70
66	26,541.78	24,459.70	22,482.17	20,607.89	18,834.69	17,160.17	71
67	24,460.74	22,484.64	20,610.20	18,836.20	17,160.69	15,581.36	72
68	22,485.73	20,612.50	18,838.32	17,162.07	15,581.83	14,095.37	73
69	20,613.61	18,840.45	17,164.01	15,583.09	14,095.80	12,699.94	74
70	18,841.58	17,165.98	15,584.87	14,096.96	12,700.34	11,392.82	75
71	17,167.06	15,586.65	14,098.54	12,701.37	11,393.18	10,171.75	76
72	15,587.71	14,100.19	12,702.82	11,394.11	10,172.07	9,034.48	77
73	14,101.21	12,704.30	11,395.41	10,172.91	9,034.77	7,978.93	78
74	12,705.29	11,396.77	10,174.08	9,035.52	7,979.19	7,003.28	79
75	11,397.69	10,175.30	9,036.56	7,979.85	7,003.51	6,105.93	80
76	10,176.14	9,037.65	7,980.78	7,004.10	6,106.13	5,285.32	81
77	9,038.41	7,981.74	7,004.90	6,106.63	5,285.49	4,539.74	82
78	7,982.45	7,005.77	6,107.35	5,285.94	4,539.90	3,867.16	83
79	7,006.37	6,108.09	5,286.55	4,540.27	3,867.28	3,265.09	84
80	6,108.59	5,287.16	4,540.78	3,867.60	3,265.20	2,730.62	85
81	5,287.61	4,541.31	3,868.03	3,265.47	2,730.71	2,260.46	86
82	4,541.68	3,868.47	3,265.83	2,730.93	2,260.54	1,851.14	87
83	3,868.86	3,266.24	2,731.25	2,260.73	1,851.20	1,498.72	88
84	3,266.49	2,731.55	2,260.97	1,851.34	1,498.77	1,198.72	89
85	2,731.80	2,261.24	1,851.56	1,498.90	1,198.77	946.31	90
86	2,261.46	1,851.79	1,499.08	1,198.88	946.35	736.63	91
87	1,851.94	1,499.24	1,199.00	946.42	736.65	565.00	92
88	1,499.33	1,199.11	946.51	736.70	565.01	426.82	93
89	1,199.24	946.63	736.79	565.06	426.84	317.49	94
90	946.72	736.88	565.13	426.87	317.50	232.50	95
91	736.86	565.13	426.88	317.51	232.50	167.63	96
92	565.18	426.93	317.54	232.52	167.63	119.01	97
93	426.93	317.55	232.53	167.64	119.01	83.21	98
94	317.56	232.54	167.65	119.01	83.21	57.31	99
95	232.59	167.68	119.04	83.23	57.31	38.87	100

REMARRIAGE ANNUITY VALUES

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Age [x]	R [x]	R [x+1]	R [x+2]	R [x+3]	R [x+4]	R [x+5]	Age [x+5]
16	70,036.10	63,511.38	49,822.04	37,982.06	29,467.38	23,484.16	21
17	54,447.64	49,654.16	39,446.08	30,451.95	23,865.88	19,164.92	22
18	42,922.39	39,341.84	31,610.68	24,681.40	19,522.10	15,785.02	23
19	34,252.01	31,538.14	25,600.87	20,194.93	16,107.10	13,105.52	24
20	27,616.84	25,533.26	20,918.25	16,654.47	13,383.66	10,951.35	25
21	22,467.50	20,849.35	17,223.45	13,827.47	11,187.43	9,200.95	26
22	18,417.35	17,147.53	14,271.23	11,543.34	9,396.12	7,762.39	27
23	15,199.29	14,193.67	11,892.13	9,683.35	7,924.60	6,572.52	28
24	12,621.75	11,818.61	9,961.93	8,160.44	6,710.39	5,584.67	29
25	10,539.80	9,893.21	8,384.18	6,905.29	5,702.64	4,760.41	30
26	8,845.04	8,320.93	7,086.37	5,864.59	4,861.70	4,069.22	31
27	7,456.47	7,028.73	6,012.41	4,997.62	4,157.01	3,487.33	32
28	6,311.31	5,960.15	5,118.80	4,271.40	3,563.64	2,995.53	33
29	5,361.21	5,071.35	4,371.15	3,660.41	3,062.04	2,578.21	34
30	4,568.63	4,328.22	3,742.81	3,144.10	2,636.30	2,222.82	35
31	3,904.58	3,704.20	3,212.65	2,706.38	2,273.84	1,919.42	36
32	3,345.70	3,178.10	2,763.71	2,333.98	1,964.41	1,659.78	37
33	2,873.59	2,732.85	2,382.34	2,016.49	1,699.79	1,437.20	38
34	2,473.47	2,354.89	2,057.38	1,744.93	1,472.87	1,246.01	39
35	2,133.19	2,032.90	1,779.67	1,512.18	1,277.86	1,081.42	40
36	1,842.80	1,757.81	1,541.65	1,312.06	1,109.85	939.48	41
37	1,594.69	1,522.41	1,337.47	1,139.92	964.97	816.86	42
38	1,381.61	1,320.10	1,161.47	991.18	839.62	710.74	43
39	1,198.62	1,146.04	1,009.75	862.68	731.14	618.77	44
40	1,040.78	995.88	878.51	751.30	636.97	538.92	45
41	904.55	866.08	764.89	654.66	555.17	469.50	46
42	786.75	753.71	666.30	570.67	484.02	409.09	47
43	684.53	656.18	580.63	497.57	422.02	356.42	48
44	595.92	571.53	506.12	433.90	367.94	310.47	49
45	519.00	497.94	441.24	378.42	320.78	270.38	50
46	451.97	433.86	384.67	329.95	279.53	235.33	51
47	393.69	378.02	335.28	287.57	243.50	204.72	52
48	342.86	329.33	292.20	250.58	211.98	177.92	53
49	298.46	286.77	254.48	218.18	184.39	154.49	54
50	259.73	249.64	221.56	189.85	160.26	134.00	55
51	225.97	217.23	192.78	165.11	139.19	116.09	56
52	196.43	188.89	167.60	143.40	120.67	100.40	57
53	170.65	164.10	145.55	124.43	104.51	86.69	58
54	148.15	142.49	126.33	107.85	90.37	74.71	59
55	128.47	123.56	109.48	93.32	78.02	64.25	60

REMARRIAGE ANNUITY VALUES

Age[x]	R[x]	R[x+1]	R[x+2]	R[x+3]	R[x+4]	R[x+5]	Age[x+5]
56	111.24	106.99	94.74	80.63	67.20	55.13	61
57	96.24	92.56	81.88	69.53	57.78	47.17	62
58	83.16	79.98	70.67	59.87	49.58	40.25	63
59	71.73	68.96	60.86	51.44	42.42	34.25	64
60	61.76	59.37	52.32	44.08	36.19	29.04	65
61	53.08	51.01	44.87	37.69	30.78	24.52	66
62	45.55	43.76	38.39	32.13	26.11	20.62	67
63	38.96	37.43	32.79	27.34	22.08	17.28	68
64	33.32	32.00	27.96	23.20	18.60	14.41	69
65	28.44	27.30	23.79	19.65	15.65	11.98	70
66	24.21	23.23	20.18	16.57	13.08	9.90	71
67	20.59	19.73	17.08	13.95	10.92	8.15	72
68	17.45	16.71	14.42	11.71	9.08	6.67	73
69	14.77	14.14	12.16	9.81	7.52	5.44	74
70	12.46	11.92	10.21	8.18	6.21	4.41	75
71	10.50	10.03	8.56	6.80	5.10	3.55	76
72	8.79	8.40	7.14	5.64	4.18	2.84	77
73	7.38	7.04	5.95	4.66	3.40	2.26	78
74	6.16	5.87	4.94	3.84	2.76	1.78	79
75	5.13	4.88	4.09	3.14	2.23	1.40	80
76	4.25	4.04	3.36	2.56	1.79	1.09	81
77	3.51	3.33	2.76	2.08	1.42	0.83	82
78	2.88	2.73	2.25	1.68	1.13	0.64	83
79	2.35	2.23	1.82	1.35	0.89	0.48	84
80	1.91	1.81	1.47	1.07	0.69	0.36	85
81	1.54	1.46	1.18	0.85	0.54	0.26	86
82	1.23	1.16	0.93	0.66	0.41	0.19	87
83	0.98	0.92	0.73	0.52	0.31	0.14	88
84	0.77	0.73	0.58	0.40	0.23	0.10	89
85	0.60	0.56	0.44	0.30	0.18	0.07	90
86	0.47	0.44	0.34	0.23	0.13	0.05	91
87	0.36	0.34	0.26	0.17	0.10	0.03	92
88	0.27	0.25	0.19	0.13	0.07	0.02	93
89	0.20	0.19	0.14	0.09	0.05	0.01	94
90	0.15	0.14	0.11	0.07	0.03	0.01	95
91	0.11	0.10	0.07	0.05	0.02	0.01	96
92	0.08	0.07	0.05	0.03	0.02	0.00	97
93	0.05	0.05	0.04	0.02	0.01	0.00	98
94	0.04	0.03	0.02	0.01	0.01	0.00	99
95	0.03	0.02	0.02	0.01	0.00	0.00	100

**LAW AMENDMENTS:
TECHNICAL APPENDIX C**

PERMANENT TOTAL INJURIES

The purpose of this Appendix is to describe the details of the methodology employed by NCCI in pricing permanent total (PT) disability benefits.

Exhibit C1, Sheets 1-2 display NCCI's summary of the benefit provisions and the law amendment change including a summary of social security benefits for PT disability cases for a sample benefit revision. For this revision, the only change is an increase in the maximum weekly benefit from \$354.69 to \$371.21.

Exhibit C2 summarizes the calculation of the effect of the law amendment change on permanent total disability benefits. Lines 1-4 represent four distinct subgroups of the permanent total disability benefit which NCCI prices. These four subgroups represent different combinations of dependency; (1) worker alone, (2) worker with wife (and no children), (3) worker with children (and no wife), and (4) worker with wife and children.

The cost in dollars, both pre and post-law amendment, is estimated for each subgroup. The total PT cost is shown in line 5. Line 6 is the overall effect of the law change, that is, the total cost in dollars based on the new law divided by the total cost in dollars based on the old law.

Exhibit C3 is an example of the NCCI calculation of PT benefits for the first subgroup, injured worker alone, using the pre-law benefits. The calculations of the post-law benefits use the same methodology and, thus, are not included.

Column (1) is the year(s) in which the annuity benefit applies. This time line corresponds to changes in the workers compensation benefits, due to changes in the social security benefits or changes in the status of dependent child(ren), if applicable. On this exhibit, the full workers compensation benefit applies for 5 months, followed by a reduced benefit (based on a social security offset) for life. The worker is immediately eligible for the permanent total workers compensation benefit, but there is a 5 month waiting period until the social security total disability benefits apply.

LAW AMENDMENTS: TECHNICAL APPENDIX C

Column (2) displays the type of annuity in effect during the year(s) indicated in column (1). (Note that the average age of the injured worker and dependents for each subgroup are derived from data underlying the Workmen's Compensation Injury Table.) The benefit costs for a worker alone, assuming an average age of 46, are defined by a 5 month term life annuity (5 months equals .4167 years) for a person age 46 (when the worker receives only the workers compensation benefits) and a 5 month deferred life annuity for this same person (when the worker receives social security benefits and a reduced workers compensation benefit).

Note that NCCI calculates a single annuity for a person of average age (46 years old, in this case.) However, there is actually a distribution of ages around this average. The average of annuities for people of various ages differs from the annuity of a single person of average age.

In cases where a life annuity is used, NCCI makes an adjustment to the average age to help counteract this potential distortion. In these cases, NCCI uses a "pension" average age instead of an arithmetic average age.

For example, on Exhibit 8, Sheet 4 in the main report, NCCI calculates four average ages for PT cases.

Arithmetic	46
Pension	47
Pension 5% Escalation	44
Pension 6% Escalation	43

Column (3) contains the present value of an annuity of a unit benefit based on a 3.5% interest rate and the NCCI mortality table (United States, 1979-81 Life Table for the Total Population). The interest rate and mortality table are not displayed in a typical filing.

Column (4) is the amount of the average weekly social security benefit. This has been calculated based on NCCI's interpretation of the social security benefit structure. (Exhibit C5).

LAW AMENDMENTS: TECHNICAL APPENDIX C

Column (5) calculates the weekly benefit during each of the annuity intervals. The full benefit of \$234.87 is based on the statewide average weekly wage (SAWW), the minimum and maximum weekly benefits, and the wage table. Its derivation is not shown here. (Sample calculations of average weekly benefits using NCCI's formulas appear in Appendix E.) The reduced workers compensation benefit in Line 2 is based on the full workers compensation benefit reduced by half of the social security benefit (The 50% reduction appears on Exhibit C1, Sheet 1.)

Column (6) is the PT benefit cost associated with each annuity period computed by multiplying columns (3) and (5).

Line 7 is the total PT cost per case for this subgroup, injured workers alone.

Line 8 is the average number of cases out of every 1,000 cases with workers alone. (This is based on the Workmen's Compensation Injury Table.)

Line 9 is the total cost in dollars for this subgroup.

Exhibit C4 is an example of the NCCI calculation of PT benefits for the second subgroup, injured worker with wife, using the pre-law benefits. Again, the post-law benefit calculation is similar. Column (1) through line 9 have the same definition as in Exhibit C3 for the injured worker alone. The worker is assumed to be 54 years old.

A description of the various annuities shown in column (2) corresponding to each year in column (1) follows. The first annuity is an annuity certain for 21.67 weeks corresponding to the 5 month waiting period required by social security. In other words, during this time period, the worker receives full workers compensation benefits.

The second annuity is a 21.67 week deferred annuity certain for 446.88 weeks. The statute requires that 6 years of workers compensation benefits be paid. After 5 months the workers compensation benefit is reduced by half of the social security benefit. NCCI calculates that 9.0106 years of total workers compensation benefits consisting of full benefits (for 5 months) and reduced benefits (for the remaining

LAW AMENDMENTS: TECHNICAL APPENDIX C

period) is equivalent to 6 years of full benefits. The derivation of the 9.0106 years appears in the notes to this exhibit.

The third annuity is a deferred life annuity for a period of 1.9894 years. (At which point in time, we are 11 years past the date of injury, $11 = 1.9894 + 9.0106$). The annuity has converted to a life annuity, as opposed to an annuity certain, but the social security benefit is the same as in the previous line.

The last annuity is an 11 year deferred life annuity for the remainder of the injured worker's life. At this point, the worker's wife has reached age 62, and the social security benefit increases by 37.5% from 164.56 per week to 226.27 per week.

Exhibit C5 is an example of NCCI's determination of the average social security weekly benefits for disability cases. Line A is the effective average annual indexed wage based on NCCI's history of statewide average weekly wages over a 24 year period. The social security law provides for the elimination of the five lowest annual wages. Line B is the effective average indexed monthly wage (AIMW), that is line A divide by 12. Line C is the primary insurance amount (PIA) derived as the sum of 90% of the first \$339 of AIMW, 32% of the next \$1,705 of AIMW and 15% of any remaining AIMW over \$2,044. Line D is the maximum monthly family benefit derived using various percentages of the AIMW and the PIA. The exact formula is shown in the exhibit. Line E is the primary weekly benefit, that is the primary monthly benefit in line C converted to a weekly benefit. Line F is the maximum weekly family benefit, that is, the maximum monthly family benefit from line D converted to a weekly benefit.

EXHIBIT I

Summary of Principal Benefit Changes Due to the Annual
Maximum Weekly Benefit Change, Effective 7-1-89

Fatal	7-1-88	7-1-89
% Rate of Compensation		66 2/3%
Min./Max. Weekly Benefit	\$88.67*/\$354.69+	\$92.80*/\$371.21+
Duration: Widow, Child(ren)		Life or Remarriage To age 18, or 21 if a student
Others		Life
Burial Allowance		\$2,000
Subsequent Injury Fund (non-dependency cases)		\$15,000
Remarriage Award (if no dep. children)		Two year lump sum
Social Security Benefit Offset		W.C. Benefit reduced by 100% Initial S.S. Benefit
Total Disability		
% Rate of Compensation		66 2/3%
Min./Max. Weekly Benefit	\$354.69+	\$371.21+
Duration		Period of disability
Social Security Benefit Offset		W.C. Benefit reduced by 50% Initial S.S. Benefit
Waiting Period/Retroactive after, days		3/14
Minimum Payable (in dep. cases)		6 years of W.C. Benefits
Permanent Partial Disability		
Weekly Benefit: Schedule		Fixed at \$150.00
Non-Schedule		Fixed at \$120.00
Healing Period		Same as Temp. Total
Duration: Schedule		As per Schedule
Non-Schedule		Life Expectancy x % Disability
Maximum Amount Payable: Schedule		\$150.00 x Schedule
Non-Schedule		\$37,560
Minimum Payable		Amount determined due

EXHIBIT IX-C

Summary of Social Security Benefits
for Fatal and Permanent Total Disability Cases

A. FATAL

(1) Dependency	(2) Payee	(3) Fraction of Primary Payable*	(4) Conditions of Payment
Widow Alone	Widow	100%	Age 65
Widow Alone	Widow	82.9	Age 62
Widow Alone	Widow	71.5	Age 60
Widow and Children	Widow	75	While caring for child under age 18
	Each Child	75	Until age 18, or 19 if a student
Orphans	Each Child	75	Until age 18, or 19 if a student
One Parent	Parent	82.5	Age 62
Two Parents	Parents	150	Age 62

B. PERMANENT TOTAL DISABILITY +

Worker Alone	Worker	100	After a five month waiting period**
Worker and Wife	Worker	100	After a five month waiting period**
	Wife	50	Age 65
	Wife	37.5	Age 62
Worker, Wife and Children	Worker	100	After a five month waiting period**
	Wife	50	While caring for child, under 18
	Each Child	50	19 if a student
	Each Child	50	Until age 18, or 19 if a student
Worker and Children	Worker	100	After a five month waiting period**
	Each Child	50	Until age 18, or 19 if a student

- * All aggregate benefits are limited to the family maximum benefit.
- * The five month waiting period also applies to members of the worker's family.
- At age 65 the disability benefit becomes a retirement benefit.

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EXHIBIT IVCalculation of the Effect of the Annual Maximum Weekly Benefit
Change on Permanent Total Disability Costs, Effective 7-1-89

	<u>7-1-88</u>	<u>7-1-89</u>
. Cost of Worker Alone (Exh. IV-A, E)	26,364,362	26,760,424
. Cost of Worker with Wife (Exh. IV-B, F)	41,859,035	42,538,034
. Cost of Worker with Child(ren) (Exh. IV-C, G)	4,990,066	5,071,931
. Cost of Worker with Wife and Child(ren) (Exh. IV-D, H)	<u>63,734,981</u>	<u>64,775,341</u>
. Total Cost (1) + (2) + (3) + (4)	136,948,444	139,145,730
. Effect		1.016

EXHIBIT IV-A

Calculation of Cost of Worker Alone, Effective 7-1-88

(1)	(2)	(3)	(4)	(5)	(6)
n	Annuity Symbol	Annuity Value	S.S. Benefit 164.56+	Reduced W.C. Benefit 234.87* - 1/2(4)	Cost (3)x(5)
-	$\bar{a} 46:0.4167/$	21.26	-	234.87	4,993.34
0	$0.4167/\bar{a}46:Life/$	927.16	164.56	152.59	141,475.34
7. Cost Per Case (Sum Col. (6))					146,468.68
8. Number of Cases					180
9. Total Cost (7) x (8)					26,364,362

+ Exhibit IX.
* Exhibit VII.

EXHIBIT IV-B

Calculation of Cost of Worker with Wife, Effective 7-1-88

(1)	(2)	(3)	(4)	(5)	(6)
n	Annuity Symbol	Annuity Value	Social Security Ben.++	Reduced W.C. Benefit 234.87* - 1/2(4)	Cost (3)x(5)
0	a $\overline{21.67/}$	21.52	-	234.87	5,054.40
0-8	21.67/a $\overline{446.88/**}$	381.53	164.56	152.59	58,217.66
8-11	9.0106/ $\overline{a54:1.9894/}$	64.72	164.56	152.59	9,875.62
>=11	11.0000/ $\overline{a 54:Life/}$	365.02	226.27	121.73	44,433.88
7. Cost Per Case (Sum Col. (6))					117,581.56
8. Number of Cases					356
Total Cost (7) x (8)					41,859,035

+ Exhibit IX.

* Exhibit VII.

** Minimum Payable: $6 \times 52 \times 234.87 = 73,279$ When n = 9.0106 years
73,279 has been paid.

$(21.67 \times 234.87) + (446.88 \times 152.59) = 73,279$

++ n = 0-11: (164.56+)

n = 11: (164.56+ x 1.375)

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EXHIBIT IX

Determination of the Average Social Security Weekly Benefits

	<u>Disability</u>	<u>Survivorship or Retirement</u>
A. Effective Average Indexed Annual Wage*	19,379.95	19,379.95
B. Effective Average Indexed Monthly Wage = (A)/12**	1,614.00	1,614.00
C. Primary Insurance Amount for 07/01/89***	713.10	713.10
D. Maximum Monthly Family Benefit for 07/01/89****	1,069.65	1,291.10
E. Primary Weekly Benefit = [(C)x12]/52	164.56	164.56
F. Maximum Weekly Family Benefit = [(D)x12]/52	246.84	297.95

* The sum of the 19 greatest "Effective Annual Indexed Wages" (from Exhibit IX-A), divided by 19.

** Any fraction of a dollar is dropped.

*** The Primary Insurance Amount for workers becoming eligible after 07/01/89 is derived as the sum of the following:

90% of the first \$339 of the Average Indexed Monthly Wage	305.10
32% of the next \$1,705 of the Average Indexed Monthly Wage	408.00
15% of any amount over \$2,044 of the A.I.M.W.	<u>0.00</u>

Any fraction of a dime is dropped from the total. 713.10

*** The Maximum Family Benefit for disabled workers is derived as the lesser of:

- (1) 85% of the A.I.M.W. (\$1,371.90) or 100% of the P.I.A. (\$713.10), whichever is greater, and:
- (2) 150% of the P.I.A. (\$1,069.65).

The Maximum Family Benefit for retired workers is derived as the sum of the following:

150% of the P.I.A. less than \$433	649.50
272% of the P.I.A. greater than \$433 and less than \$626	524.96
134% of the P.I.A. greater than \$626 and less than \$816	116.71
175% of the P.I.A. greater than \$816	<u>0.00</u>

Any fraction of a dime is dropped from the total. 1,291.10

**LAW AMENDMENTS:
TECHNICAL APPENDIX D**

TEMPORARY TOTAL INJURIES

This Appendix describes the detailed calculations underlying a sample NCCI benefit pricing for temporary total (TT) disability.

Exhibit D1, Sheet 1 displays NCCI's summary of the benefit provisions and the law amendment change for TT disability cases. The only change in the benefit structure is an increase in the maximum weekly benefit from \$354.69 per week to \$371.21 per week.

Exhibit D2, Sheets 1-2 show the distribution of durations for these claims based on the injury table.

For purposes of this Appendix we will assume that the calculation of the average weekly workers compensation benefits have been computed elsewhere in accordance with the statutory provisions and NCCI's estimate of the state average weekly wage (SAWW). Sample calculations of average weekly benefits using NCCI's formulas appear in Appendix E.

Exhibit D3 is NCCI's exhibit for the calculation of the effect of the law amendment change on temporary total disability benefits. Line 1 is the statutory waiting period, that is, the required number of days lost before TT benefits become available, based on pre and post-law amendment. In this exhibit there is no change in the waiting period. Line 2 is the retroactive period, that is, the minimum number of days lost after which the injured worker can recoup the TT benefits for the waiting period.

Line 3 is the total days of disability based on the cases which exceed the waiting period from line 1. This represents the average number of days for which TT benefits will be paid. This number is the entry in column (4) from Exhibit D2, Sheet 1 corresponding to the disability period lasting 4 days or longer.

Line 4 of Exhibit D3 is the total number of cases which exceed the retroactive period and, therefore, can recoup TT benefits for the waiting period. This number is the entry in column (3) from Exhibit D2, Sheet 1 corresponding to the disability period lasting 15 days or longer. Given 39,245 cases that exceed the retroactive period, then

**LAW AMENDMENTS:
TECHNICAL APPENDIX D**

the additional number of benefit days is the length of the waiting period (3) times the number of cases (39,245). This is the calculation that appears in Line 5.

Line 6 is the total days of TT benefits payable, that is, the sum of line 3 and line 5. That is, the total number of benefit days for all cases that exceed three days in duration, plus the additional days of benefits for the cases that exceed the retroactive period.

Line 7 is line 6 divided by 7, that is the total weeks of TT benefits payable. Line 8 is the average weekly temporary total benefit. This has been calculated based on the statewide average weekly wage (SAWW), the minimum and maximum weekly benefits, and the wage table. Its derivation is not shown here. (Sample calculations of average weekly benefits using NCCI's formulas appear in Appendix E.) Note that the average weekly benefit changes from the old law to the new law, while all the duration statistics are identical under the old law and the new law.

Line 9 is the total cost in dollars for TT benefits, that is, the product of line 7 and line 8. Line 10 is the overall effect of the law change on temporary total disability costs, that is, the total cost in dollars based on the new law divided by the total cost in dollars based on the old law.



COLORADO LAW MEMO

EXHIBIT I

Summary of Principal Benefit Changes Due to the Annual
Maximum Weekly Benefit Change, Effective 7-1-89

Fatal	7-1-88	7-1-89
% Rate of Compensation		66 2/3%
Min./Max. Weekly Benefit	\$88.67*/\$354.69+	\$92.80*/\$371.21+
Duration: Widow, Child(ren)		Life or Remarriage To age 18, or 21 if a student
Others		Life
Burial Allowance		\$2,000
Subsequent Injury Fund (non-dependency cases)		\$15,000
Remarriage Award (if no dep. children)		Two year lump sum
Social Security Benefit Offset		W.C. Benefit reduced by 100% Initial S.S. Benefit

Total Disability

% Rate of Compensation		66 2/3%
Min./Max. Weekly Benefit	\$354.69+	\$371.21+
Duration		Period of disability
Social Security Benefit Offset		W.C. Benefit reduced by 50% Initial S.S. Benefit
Waiting Period/Retroactive after, days		3/14
Minimum Payable (in dep. cases)		6 years of W.C. Benefits

Permanent Partial Disability

Weekly Benefit: Schedule		Fixed at \$150.00
Non-Schedule		Fixed at \$120.00
Healing Period		Same as Temp. Total
Duration: Schedule		As per Schedule
Non-Schedule		Life Expectancy x % Disability
Maximum Amount Payable: Schedule		\$150.00 x Schedule
Non-Schedule		\$37,560
Minimum Payable		Amount determined due

EXHIBIT VI-A

SPECIAL CALL FOR ACCIDENT STATISTICS DISTRIBUTION OF DURATIONS

Temporary Total Accident Distribution According to Duration of Disability

(1) Disability Period (Days)	(2) Total Cases	(3) Summation of Col. 2 Upward	(4) Days Disability Lasting Col. 1 and Over
1	8,973	103,371	3,060,329
2	8,198	94,398	2,956,958
3	6,236	86,200	2,862,560
4	7,077	79,964	2,776,360
5	6,437	72,887	2,696,396
6	5,156	66,450	2,623,509
7	4,854	61,294	2,557,059
8	2,351	56,440	2,495,765
9	2,407	54,089	2,439,325
10	2,865	51,682	2,385,236
11	2,665	48,817	2,333,554
12	2,156	46,152	2,284,737
13	1,891	43,996	2,238,585
14	2,860	42,105	2,194,589
15	1,563	39,245	2,152,484
16	1,621	37,682	2,113,239
17	1,703	36,061	2,075,557
18	1,486	34,358	2,039,496
19	1,096	32,872	2,005,138
20	888	31,776	1,972,266
21	2,009	30,888	1,940,490
22	854	28,879	1,909,602
23	910	28,025	1,880,723
24	961	27,115	1,852,698
25	762	26,154	1,825,583
26	590	25,392	1,799,429
27	467	24,802	1,774,037
28	1,480	24,335	1,749,235
29	532	22,855	1,724,900
30	604	22,323	1,702,045
31	655	21,719	1,679,722
32	603	21,064	1,658,003
33	437	20,461	1,636,939
34	376	20,024	1,616,478
35	894	19,648	1,596,454
36	389	18,754	1,576,806
37	390	18,365	1,558,052
38	442	17,975	1,539,687
39	424	17,533	1,521,712
40	287	17,109	1,504,179
41	274	16,822	1,487,070
42	1,160	16,548	1,470,248
43 - 49	2,692	15,388	1,453,700 - 1,366,629

EXHIBIT VI-A (Cont.)

SPECIAL CALL FOR ACCIDENT STATISTICS DISTRIBUTION OF DURATIONS

Temporary Total Accident Distribution According
to Duration of Disability

(1) Disability Period (Days)	(2) Total Cases	(3) Summation of Col. 2 Upward	(4) Days Disability Lasting Col. 1 and Over
50 - 56	2,155	12,696	1,353,205 - 1,281,192
57 - 63	1,725	10,541	1,270,007 - 1,210,298
64 - 70	1,258	8,816	1,201,053 - 1,150,461
71 - 77	987	7,558	1,142,491 - 1,099,160
78 - 84	807	6,571	1,092,325 - 1,054,427
85 - 91	626	5,764	1,048,409 - 1,015,082
92 - 98	544	5,138	1,009,770 - 979,894
99 - 105	423	4,594	975,102 - 948,240
106 - 112	342	4,171	943,909 - 919,548
113 - 119	273	3,829	915,620 - 893,144
120 - 126	271	3,556	889,496 - 868,653
127 - 133	231	3,285	865,275 - 846,026
134 - 140	217	3,054	842,900 - 824,849
141 - 147	196	2,837	821,900 - 805,306
148 - 154	167	2,641	802,615 - 787,062
155 - 161	137	2,474	784,524 - 769,952
162 - 168	130	2,337	767,578 - 753,784
169 - 175	116	2,207	751,530 - 738,480
176 - 182	129	2,091	736,343 - 723,948
183 - 189	86	1,962	721,921 - 710,316
190 - 196	92	1,876	708,412 - 697,317
197 - 203	62	1,784	695,503 - 684,914
204 - 210	74	1,722	683,169 - 672,957
211 - 217	73	1,648	671,280 - 661,521
218 - 224	55	1,575	659,919 - 650,588
225 - 231	63	1,520	649,050 - 640,049
232 - 266	220	1,457	638,570 - 592,396
267 - 301	203	1,237	591,139 - 552,653
302 - 336	95	1,034	551,611 - 518,088
337 - 371	104	939	517,143 - 486,802
372 - 406	80	835	485,961 - 458,672
407 - 441	67	755	457,909 - 433,213
442 - 476	64	688	432,519 - 410,069
477 - 511	58	624	409,434 - 389,141
512 - 581	80	566	388,570 - 352,003
582 - 651	65	486	351,514 - 320,191
582 and Over	-	421	319,770 - xxx

EXHIBIT VI

Calculation of the Effect of the Annual Maximum Weekly Benefit
Change on Temporary Total Disability Costs, Effective 7-1-89

	<u>7-1-88</u>	<u>7-1-89</u>
1. Waiting Period (days)	3	3
2. Retroactive After (days)	14	14
3. Days Disability Based on (1)	2,776,360	2,776,360
4. Total Cases based on (2)	39,245	39,245
5. Additional days of disability based on (2) ((4) x (1))	117,735	117,735
6. Cost in days ((3) + (5))	2,894,095	2,894,095
7. Cost in Weeks	413,442	413,442
8. Average Weekly Benefit (Exh. VII-B ,VIII-B)	234.87	237.19
9. Monetary Cost (7) x (8)	97,105,122.54	98,064,307.98
0. Effect		1.010

**LAW AMENDMENTS:
TECHNICAL APPENDIX E**

PERMANENT PARTIAL INJURIES

This Appendix describes the detailed calculations underlying a sample NCCI benefit pricing for major permanent partial claims. It is divided into six sections:

- A. Scheduled Injuries
- B. Non-Scheduled Injuries
- C. Healing Period
- D. Summary
- E. Lump Sums
- F. Comparison of Model Pricing to Other Data

A. Scheduled Injury Benefit Calculation Details

This part illustrates the NCCI detailed calculations for a sample state.

Exhibit E1 summarizes a typical NCCI calculation of a permanent partial benefit change pricing. Lines 1, 3, 5, and 11 (E1, Sheet 1 for major permanent partial E1, Sheet 2 for minor permanent partial) are derived from Exhibit E2 (Sheet 1 for major, Sheets 2-3 for minor) and are the estimated number of weeks of benefits for various components of the permanent partial benefit package.

Exhibit E2, Sheet 1 summarizes a typical NCCI calculation of their evaluation of permanent partial law changes. This exhibit displays the derivation of the number of weeks of benefits for scheduled permanent partial and healing period benefits. Columns 2, 3, and 8 of Exhibit E2 are based on the NCCI injury tables.

Column (1) of Exhibit E2, Sheet 1 lists the types of scheduled injuries that are contained in many workers compensation statutes. For states, that have a less exhaustive list of scheduled injuries, this table is collapsed into a smaller table. Conversely, for states, that have a more comprehensive list of scheduled injuries, this table is expanded into a larger table. For example, in a state in which back injuries are scheduled injuries, this item would be included part A of Exhibit E2, Sheet 1 and the part B, other major injuries, total would be decreased.

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Column (2) of Exhibit E2, case frequency, gives a frequency of the injuries. For example, from this table we see that for state X, 50.3% (503 / 1,000) of major permanent partial injuries are scheduled injuries. Also, 0.05% (5 / 1,000) of major permanent partial injuries are due to the dismemberment of a hand. The distribution of frequency by injury type is derived from the injury table.

Column (3) of Exhibit E2, average percentage loss, is derived from the NCCI injury tables. The percentage loss refers to the percentage loss for that particular member or organ. Therefore, amputation results in 100% loss. For loss of use, the percentage loss of use of that member is also based on the NCCI injury table. The figures in column (4), schedule at 100%, are based on the state statute. For example, some state statutes indicate that for the partial loss of use of an arm, hand, thumb, finger, leg, foot, toe or phalanges, compensation shall be paid for the proportionate loss of the use of such arm, hand, thumb, finger, leg foot, toe or phalanges. Other states may define a specific benefit for partial loss of use. For example, in our sample state X, we see that the figures in column (4) for partial loss of use are 50% of the figure for total loss of use. This relationship is based on the terms of the statute. The NCCI does not typically provide the details underlying their calculations.

Column (5) is the product of columns (3) and (4). That is, it represents the total number of weeks of permanent partial benefits payable based on the injury schedule, for both total loss of use of various members and partial loss of use.

Column (6) is column (5) discounted for interest only for durations that are longer than 52 weeks, while shorter durations are undiscounted.

The figures in column (7), weeks payable for schedule, is the product of column (2) times column (6). This product for a particular injury represents the discounted number of weeks that would have to be paid in permanent partial benefits for this group of 1,000 permanent partial injuries. For example, from Exhibit E2, Sheet 1, we see that for State X, on average out of every 1,000 major permanent partial injuries 5 will be for dismembered hands. For state X, a worker who has sustained such a hand injury will receive 195 weeks of permanent partial benefits or on a commuted basis, 182.98 weeks. Therefore, out of every 1,000 major permanent partial injuries, 915

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commuted weeks of benefits will be due to dismembered hand injuries ($915 = 5 \times 183$). Also, from this exhibit we see that on the average out of every 1,000 major permanent partial injuries, a grand total of 51,984 commuted weeks of benefits will be paid for scheduled injuries.

Column (8), average healing period, indicates, for each type of injury, the healing period associated with the injury. This distribution is based on the Injury Table. Finally, column (9), weeks payable for healing period, gives an estimate of the number of weeks that benefits must be paid for the healing period. For example, for dismembered hands, out of every 1,000 major permanent partial injuries, the employers of state X would be liable for 145 weeks of healing period benefits, i.e., 145 weeks of temporary total benefits. In some states healing period benefits are an add on to the permanent partial scheduled benefits, as is the case for our sample state. In other states they may be subtracted from the duration of permanent partial benefits. Other combinations are also possible. For example, some states limit the combined duration of healing period and permanent partial benefits. Any of these combinations could be reflected on this exhibit. However, in case of a limit on the combined duration of healing period and permanent partial benefits, care must be taken to properly calculate the effect. For example, if there is a limitation of 250 weeks on the combined benefits, the average limited benefit is not the sum of the limited sum of the component parts.

Finally, from the summary of part A on Exhibit E2, Sheet 1, we see that NCCI estimates that out of every 1,000 major permanent partial injuries, 503 will be scheduled injuries producing on the average 103.35 ($103.35 = 51,984 / 503$) weeks of scheduled benefits and on average 25.76 ($25.76 = 12,956 / 503$) weeks for healing period.

B. Permanent Partial Non-Scheduled Injuries

Part B of this exhibit displays the information on permanent partial non-scheduled injuries. For this sample state, we see that out of every 1,000 major permanent partial injuries, 497 are estimated to be non-scheduled injuries producing on the average 36 weeks of healing period. (Note that this average healing period is greater than the

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average healing period for scheduled injuries.) Also, NCCI will assume that for the major permanent partial non-scheduled injuries these injuries will produce, on the average, a 40% wage loss. These amounts are also derived from the injury table. For this sample state, the duration of permanent partial benefits for non-scheduled injuries are calculated on another exhibit, using annuity functions. Possible approaches we have seen in other states include a 40% wage loss for the maximum duration of permanent partial benefits, or the use of external data sources to estimate durations.

The average weekly benefit is calculated in a similar manner throughout the NCCI benefit pricing structure. That is, the following elements are used:

- a. Compensation Rate (typically 66 2/3%, but for this sample state it will be 50%, 55%, 67%, or 75% depending on the type of benefit)
- b. Statewide Average Weekly Wage
- c. Minimum and Maximum Benefits
- d. Wage Table

We will now review Exhibit E3, which calculates average weekly benefits in more detail. Lines 2 and 3 give the date of the law change and the percentage rate of compensation for this type of injury. In this case, it is 55% of the injured employee's average weekly wage. The percentage is set by statute. Also, lines 4 and 5 are set by statute. For state X, as of 10/1/88, the maximum weekly benefit payable will be \$380.77 and the minimum benefit will be \$0.00.

Line 9 is calculated by NCCI from the Current Population Survey. (See Section III, Subsection B of the main report.) Lines 10 through line 13 are self explanatory. Lines 14, 15, 17, and 18 are derived from the wage table. Line 22 which is the sum of lines 16, 20, and 21, displays the limit factor. This factor indicates that because state X will limit the injured employee's wage to no more than \$380.77 in the calculation of his workers compensation benefit, the state's average weekly wage should be modified by the factor 0.8556. Then finally in line 24, an estimate of the average weekly benefit is calculated as the effective average weekly wage (\$353.07) times the rate of

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compensation (55%). The effective average weekly wage is the actual average weekly wages times the limit factor.

Repeating the above calculations for the different rates of compensation for the scheduled major permanent partial injuries, we are able to complete part A of Exhibit E1. In line 7 of Exhibit E1, Sheet 1, we see that under the old law, an estimate of the benefit costs for the 1,000 the scheduled major permanent partial injuries would be \$8,642,589 and under the new law the cost for these same injuries would be \$8,949,497. One must be careful, how one interprets this number. The NCCI is not suggesting that the total cost to state X for these benefits is \$8.6 million under the old law and \$8.9 million under the new law. Rather, the NCCI is constructing a model of the benefit structure. The proper interpretation is that for the 503 injuries that comprise the table of scheduled injuries, the total cost under the old system would be approximately \$8.6 million and under the new law the cost would be \$8.9 million. Another possible way to interpret these numbers is to say that under the old system an estimate of the average cost per scheduled injury would be \$17,182 ($8,642,589 / 503$) and an estimate of the average cost per scheduled injury under the new law would be \$17,792 ($8,949,497 / 503$).

Returning to Exhibit E1, Sheet 1, line 10 is the product of line 8 times line 9. Line 10 should be interpreted as follows: On average, out of every 1,000 major permanent partial injuries, \$23,580,246 will be paid for non-scheduled injuries benefits under the old law and on average, out of every 1,000 major permanent partial injuries, \$23,601,596 will be paid for non-scheduled injuries under the new law, (i.e., average costs of \$47,445 ($23,580,246/497$) under the old law and \$47,488 ($23,601,596/497$) under the new law).

For the sample state, non-scheduled permanent partial injuries are compensated based on wage loss. Since there is an assumed 40% wage loss for major injuries (based on the injury table), and by statute, the injured employee is entitled to a lifetime weekly benefit equal to 55% of his wage loss, the calculated benefit is 22% ($.22 = .55 \times .40$) of his average weekly wage. (The lifetime benefit is not readily apparent from the NCCI summary of benefits.) The 40% wage loss assumption is probably not critical in this situation since the same percentage is used in the pre and post law change calculations. (The exact size of the wage loss assumption will usually

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only affect the weights attributable to non-scheduled as compared to scheduled injuries. In this sample state, approximately 60% of the major permanent partial benefits are considered to be non-scheduled and the estimated change in the cost of non-scheduled benefits is +0.1%. Meanwhile the scheduled benefits and the healing period benefits comprise approximately 40% of the total costs and are estimated to increase by +3.6%.) In a situation where there would be a change in the method of compensating non-scheduled benefits, we would consider this a non-formula change. However, NCCI may still include this variation as a formula change.

From Exhibit E2, Sheet 1, we see that out of every 1,000 major permanent partial injuries, 497 of the injuries are estimated to be non-scheduled injuries. For these, non-scheduled injuries the average healing period will be 36 weeks. So after the 36 weeks, the employee will be entitled to permanent partial benefits for life. Therefore, under this scenario, NCCI needs to estimate the average number of weeks of benefits that will be paid. To make this estimation, NCCI assumes that the average age when injured of an employee with a major permanent partial non-scheduled injury is 37 years old. This average age is from an analysis by NCCI of its injury tables. NCCI then calculates that the average life expectancy of a 37 year old is 2,057.14 weeks (approximately 40 years). The life expectancy is derived from the 1979 Total Population Life Tables.

Next, NCCI calculates a duration of benefits of 15.5472 years using the following formula:

$$15.5472 = [(2,057.14 - 36) \times .40 / 52]$$

where:

the 2,057.14 is the life expectancy in weeks,

the 36 refers to the average healing period for non-scheduled major permanent partial in weeks,

the .40 represents the average duration of loss of earning capacity benefits as a percent of the maximum possible duration, and

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the 52 divisor converts weeks to years.

According to NCCI, the .40 factor to adjust durations was based on a special countrywide call for wage loss data that compared the average duration of wage loss claims to the average statutory maximum. Coincidentally, the .40 is also the factor that represents the average wage loss for major permanent partial claims. In addition, for permanent partial minor claims, a .25 factor is used for both the average wage loss and the average duration adjustment. Based on the NCCI formula, the annuity formula for a permanent partial major non-scheduled injury stream of benefits would be Y , where Y is defined as an annuity for a person age 37 continuous for 15.5472 years. Finally, we see that out of 1,000 major permanent partial injuries on the average, 305,009 ($305,009 = 497 \times Y \times 52$) weeks of benefits will be payable for non-scheduled injuries. This is the number appearing on line 8, of Exhibit E1, Sheet 1. The annuity tables used to calculate Y are the 1979 Total Population Annuity Value Tables with interest rate of 3.5% and an escalation rate of 0.00% per annum. The interest rate used is a standard value for benefit evaluations and the escalation rates are based on the statutory provision for escalation of workers compensation benefits.

The calculation of the average weekly benefit for non-scheduled injuries, (Exhibit E1, Sheet 1, line 9), is similar to the calculation for scheduled injuries except for one departure. As mentioned above, by statute the benefits for non-scheduled injuries is 55% of wage loss, NCCI uses the number 22% ($.22 = .55 \times .40$) for the nominal rate of compensation. This is based on the assumption of a 40% wage loss for major permanent partial injuries. So for state X, this results in an average weekly benefit pre-law change of \$77.31. Post-law change the average weekly benefit is estimated to be \$77.38 (Exhibit E1, Sheet 1, line 9).

NCCI is not calculating the average benefit based on a 40% wage loss and a benefit percentage of 55% times actual wage loss. Instead, NCCI is calculating the average benefit for a worker who receives a 22% ($40\% \times 55\%$) benefit times their full wage rate. There are two complications with the NCCI conversion both related to how the wage table operates. First of all, by calculating a low benefit rate (22% for major and 13.75% for minor permanent partial), a worker must be very highly paid for the maximum benefit limit to apply. Secondly, the 40% wage loss is assumed to apply

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exactly to all workers. However, it is more likely that the wage loss will vary around 40% with some workers having a lower percentage of wage loss and some workers having a higher percentage of wage loss. The NCCI method understates the impact of the maximum weekly benefit increase.

A simplified example may help to clarify the situation. Assume that two workers are each earning 150% of the statewide average weekly wage. Also assume that the benefit percentage is 70% of the workers actual wage loss subject to a maximum benefit of 50% of the statewide average weekly wage.

When both workers suffer a major permanent partial non-scheduled injury, the average benefit depends on the distribution of the wage loss. In Scenario 1, the NCCI method, both workers suffer a 40% wage loss. Both workers have a wage loss of 60% of the SAWW [40% of 150%], and a benefit of 42% of the SAWW [70% of 60%] and the maximum benefit has no effect. In Scenario 2, one worker suffers a 10% wage loss and one worker suffers a 70% wage loss (for an average wage loss of 40%). Worker #1 has a wage loss of 15% of the SAWW (10% of 150%) and worker #2 has a wage loss of 105% (70% of 150%) of the SAWW. Their respective benefits are 10.5% and 73.5%. Therefore, worker #2 should be subject to the wage cap. It appears that the NCCI methodology underestimates the impact of the maximum weekly benefit, which in turn leads to an underestimate of the impact of the law change. While not a difficult problem in the formula area, the lack of data and information on wage loss is a serious problem when trying to price non-formula benefit changes.

The calculations for minor permanent partial non-scheduled injuries are similar to those for major. A key difference is that a 25% wage loss assumption is used instead of the 40% figure used for major.

C. Healing Period Benefits

NCCI first estimates the number of weeks of healing period for their 1,000 typical major permanent partial injuries. See Exhibit E2, Sheet 1, column 9. From this exhibit, we see that for every 1,000 major permanent partial injuries, on the average,

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there will be 30,848 weeks payable for healing period. This is the number that appears on line 11 of Exhibit E1, Sheet 1.

The calculation of the average weekly benefit for healing period is similar to the calculation of average weekly benefit for permanent partial scheduled injuries. See Exhibit E11 (old law) and E12 (new law) for these calculations. One must be aware of the fact that the healing period is governed by the temporary total benefit structure and therefore in state X the nominal rate of compensation for the healing period will be 67% of the injured employee's average weekly wage.

So for state X, we can conclude from Exhibit E1, Sheet 1, that, on the average, out of every 1,000 major permanent partial injuries, \$6,212,787 will be paid for healing period benefits under the old law, and, under the new law, on the average, out of every 1,000 major permanent partial injuries, \$6,433,659 will be paid for healing period benefits.

The table below indicates which exhibits display the calculation of the average weekly benefit for each part of the permanent partial package:

<u>Exhibit</u>	<u>Purpose</u>	<u>Compensation Rate</u>
E3	Dismemberment, 100% Loss of Use, Old Law	55%
E4	Dismemberment, 100% Loss of Use, New Law	55%
E5	Partial Loss Of Use, Old Law	50%
E6	Partial Loss Of Use, New Law	50%
E7	Scheduled Permanent Partial, Old Law	75%
E8	Scheduled Permanent Partial, New Law	75%
E9	Non-Scheduled, Major, Old Law	22%
E10	Non-Scheduled, Major, New Law	22%
E11	Total Disability, Healing, Old Law	67%
E12	Total Disability, Healing, New Law	67%
E13	Non-Scheduled, Minor, Old Law	13.75%
E14	Non-Scheduled, Minor, New Law	13.75%

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D. Summary

In Exhibit E1, Sheet 1, the sum of lines 7, 10, and 13, yields line 14. Line 14, therefore, represents the total benefits payable for the 1,000 major permanent partial injuries. Hence, on average out of every 1,000 major permanent partial injuries \$38,435,622 of benefits will be paid under the old law and, on the average, \$38,984,752 under the new law. Another way of stating this conclusion is as follows: An estimate of the average cost of benefits under the old law is \$38,435.62 ($38,435.62 = 38,435,622 / 1,000$) and is \$38,984.75 under the new law. Therefore, an estimate of the change in the average benefit costs would be 1.014 ($1.014 = 38,984.75 / 38,435.62$).

E. Lump Sums

NCCI's benefit pricing model attempts to estimate the average cost of benefits based on the statutory structure of the law. They reflect lump summing of claims to a limited extent in that scheduled permanent partial claims greater than 52 weeks in duration are assumed to be commuted. However, in many states, the lump summing of claims is an important issue and states sometimes adjust their systems to make the lump summing of claims more difficult or easier, depending on the perceived problems in the state. The NCCI formula pricing methodology does not give recognition to the prevailing lump summing approach in the state, and it does not reflect the impact of changes in lump summing.

Lump sums are an important component of how workers compensation claims are settled. Depending on other factors in the environment, states may consider that too many cases are being lump summed, and that the use of lump sums should be discouraged. In other circumstances, states may wish to encourage the use of lump sum settlements, for example when there is a large backlog in the administrative inventory of claims awaiting processing.

Therefore, legislation often addresses the use of lump sum settlements.

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Insurers utilize lump sum settlements for a variety of reasons. In some states they may be the only way to be reasonably sure of terminating benefits. In other states, the use of lump sum settlements may be advantageous to the company to release themselves from future liability on the claim and avoid the risk of an adverse outcome, (similar to the settlement of a liability claim). A discussion of all the reasons for and cost impacts of lump sum settlements is beyond the scope of our assignment. However, in this section we will point out some of the impacts that lump sums have on the benefit evaluation process.

1. Where are lump sums currently reflected in the benefit evaluation formulas?

In the current benefit pricing formulas lump sum values are not generally used. However, certain benefit components are evaluated by the use of annuities, which are discounted at a 3.5% interest rate. In addition, scheduled permanent partial benefits over 52 weeks in duration are "commuted". That is, they are discounted for interest at a 3.5% rate.

The choice of a 3.5% interest rate derives from statutory reserving requirements and is not intended to reflect market interest rates. When an insurer is evaluating the merits of a lump sum settlement they are likely to select an interest rate based on their evaluation of current and future interest rates. For an individual case, the present value at a 3.5% rate compared to the present value at a 6.0% rate may be substantially different. This should have only a small impact on the formula benefit calculation, where the interest rate will only affect the weights assigned in the pricing calculation. However, in a non-formula situation the impact may be more substantial.

2. What are some of the areas where lump sums may affect data reported to NCCI?

As noted above, an insurer may use a lump sum settlement to release themselves from future liability on the claim and avoid the risk of an adverse outcome. When the insurer reports this loss experience to NCCI, the claim will have a reduced value based on the interest discount and the probability value reflecting the chance of an adverse outcome. In most cases, the lump sum will be reported as a permanent partial. This indicates that, absent lump sums, some fraction of the permanent partial

**LAW AMENDMENTS:
TECHNICAL APPENDIX E**

claims would have been permanent total claims. This, in turn, indicates that the benefit structure for permanent total claims will impact on the settlement value of permanent partial claims.

F. Comparison of Model Pricing to Other Data

As noted above, the average benefit cost estimated by NCCI is a model of what the statutory benefit structure is expected to pay for a major permanent partial injury. For the sample state under review, this average is \$38,436 under the old benefit structure. In addition, NCCI gathers WCSP data on the actual cost of major permanent partial injuries. NCCI also has loss development techniques to develop the immature WCSP data to an ultimate value. Therefore, it is possible to compare the estimated benefit cost of an injury based on the formula pricing model to actual data obtained from the WCSP. Such a comparison may be useful in evaluating the performance of the pricing models.

STATE X LAW MEMO

Calculation of the Monetary Cost and Effect
of Amendments on Permanent Partial Benefits

	Major Perm. Partial Law Effective	
	10-1-88	7-1-89
A. PERMANENT PARTIAL SCHEDULE INJURIES		
1. Costs in Units of Wks. Wages (a)	50,560	50,560
2. Average Weekly Benefit (Exh. E3, E4)	166.15	172.05
3. Costs in Units of Wks. Wages (b)	1,067	1,067
4. Average Weekly Benefit (Exh. E5, E6)	151.04	156.41
5. Costs in Units of Wks. Wages (c)	357	357
6. Average Weekly Benefit (Exh. E7, E8)	226.57	234.62
7. Cost of Schedule Injuries (1)x(2)+(3)x(4)+(5)x(6)	8,642,589	8,949,497
B. PERMANENT PARTIAL NON-SCHEDULE INJURIES		
8. Costs in Units of Wks. Wages	305,009 *	305,009 *
9. Average Weekly Benefit (Exh. E9, E10)	77.31	77.38
10. Cost of Non-Schedule Injuries (8)x(9)	23,580,246	23,601,596
C. PARTIAL DIABILITIES - HEALING PERIOD		
11. Cost in Units of Wks. Wages (Exh E2, Sheet 1)	30,848	30,848
12. Average Weekly Benefit (Exh E11, E12)	201.40	208.56
13. Cost of Healing Period (11)x(12)	6,212,787	6,433,659
D. TOTAL MONETARY COST & EFFECT		
14. Total Cost of Partial Disability Benefit (7)+(10)+(13)	38,435,622	38,984,752
15. Effect		1.014

Notes: (a) Exh. E2, Sheet 1, Column (7), the summation of the A's.
 (b) Exh. E2, Sheet 1, Column (7), the summation of the B's.
 (c) Exh. E2, Sheet 1, Column (7), the summation of the C's.
 (*) Life Expectancy of a 37 yr old = 2,057.14
 $[(2,057.14 - 36) \times .40] / 52 = 15.5472$, 36 is the average H. P.
 from Exhibit E2, Sheet 1, Section B

$$\overline{a}_{37:15.5472} \times 497 \times 52 = 305,009$$

STATE X LAW MEMO

Calculation of the Monetary Cost and Effect
of Amendments on Permanent Partial Benefits

	Minor Perm. Partial Law Effective	
	10-1-88	7-1-89
A. PERMANENT PARTIAL SCHEDULE INJURIES		
1. Costs in Units of Wks. Wages (a)	46,732	46,732
2. Average Weekly Benefit (Exh. E3, E4)	166.15	172.05
3. Costs in Units of Wks. Wages (b)	767	767
4. Average Weekly Benefit (Exh. E5, E6)	151.04	156.41
5. Costs in Units of Wks. Wages (c)	103	103
6. Average Weekly Benefit (Exh. E7, E8)	226.57	234.62
7. Cost of Schedule Injuries (1)x(2)+(3)x(4)+(5)x(6)	7,903,706	8,184,373
B. PERMANENT PARTIAL NON-SCHEDULE INJURIES		
8. Costs in Units of Wks. Wage	480,166 *	480,166 *
9. Average Weekly Benefit (Exh. E13, E14)	48.49	48.50
10. Cost of Non-Schedule Injuries (8)x(9)	23,283,249	23,288,051
C. PARTIAL DIABILITIES - HEALING PERIOD		
11. Cost in Units of Wks. Wages (Exh E2, Sheet 3)	31,717	31,717
12. Average Weekly Benefit (Exh E11, E12)	201.40	208.56
13. Cost of Healing Period (11)x(12)	6,387,804	6,614,898
D. TOTAL MONETARY COST & EFFECT		
14. Total Cost of Partial Disability Benefit (7)+(10)+(13)	37,574,759	38,087,322
15. Effect		1.014

Notes: (a) Exh. E2, Sheets 2 and 3, Column (7), the summation of the A's.
 (b) Exh. E2, Sheets 2 and 3, Column (7), the summation of the B's.
 (c) Exh. E2, Sheets 2 and 3, Column (7), the summation of the C's.
 (*) Life Expectancy of a 37 yr old = 2,057.14
 $[(2,057.14 - 14) \times .25] / 52 = 9.8228$, 14 is the average H. P.
 from Exhibit E2, Sheet 3, Section B

$$\frac{1}{a} \times 37,982,281 \times 1,120 \times 52 = 480,166$$

STATE X LAW MEMO

Valuation of Major Permanent Partial									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
LAW EFFECTIVE 10-1-88 and 7-1-89			Weeks Duration			Weeks Payable For		Weeks Payable For	
Type of Benefit	Case Freq.	Ave. % Loss	Sched. At 100%	Payable (3)x(4)	Com- muted**	Sched. (2)x(6)	Avg. H.P. (Wks)	H.P. (2)x(8)	
A. SCHEDULE INJURIES									
Arm:									
Dism. at or above elbow	4	100%	238.33	238.33	220.54	882	A	33	132
Dism. below elbow	3	100%	238.33	238.33	220.54	662	A	18	54
Loss of use	62	64%	238.33	152.53	145.11	8,997	A	27	1,674
Loss of use - part.	14	13%	119.17	15.49	15.49	217	B	27	378
Loss of use - part.	5	13%	119.17	15.49	15.49	77	C	27	135
Hand:									
Dismemberment	5	100%	195.00	195.00	182.98	915	A	29	145
Loss of use	108	65%	195.00	126.75	121.60	13,133	A	20	2,160
Loss of use - part.	23	13%	97.50	12.68	12.68	292	B	20	460
Loss of use - part.	8	13%	97.50	12.68	12.68	101	C	20	160
Leg:									
Dism. above knee	6	100%	216.67	216.67	201.90	1,211	A	34	204
Dism. below knee	3	100%	216.67	216.67	201.90	606	A	39	117
Loss of use	110	64%	216.67	138.67	132.52	14,577	A	34	3,740
Loss of use - part.	26	13%	108.34	14.08	14.08	366	B	34	884
Loss of use - part.	9	13%	108.34	14.08	14.08	127	C	34	306
Foot:									
Dismemberment	3	100%	173.33	173.33	163.79	491	A	26	78
Loss of use	52	63%	173.33	109.20	105.36	5,479	A	25	1,300
Loss of use - part.	13	13%	86.67	11.27	11.27	147	B	25	325
Loss of use - part.	4	13%	86.67	11.27	11.27	45	C	25	100
Eye:									
Enucleation	3	100%	130.00	130.00	124.58	374	A	20	60
Loss of use	33	79%	108.33	85.58	83.21	2,746	A	14	462
Loss of use - part.	4	13%	54.17	7.04	7.04	28	B	14	56
Loss of use - part.	1	13%	54.17	7.04	7.04	7	C	14	14
Hearing:									
Both ears	3	66%	260.00	171.60	162.24	487	A	3	9
Loss of use - part.	1	13%	130.00	16.90	16.90	17	B	3	3
Loss of use - part.	0	13%	130.00	16.90	16.90	0	C	3	0
Total Schedule Injuries	503					51,984			12,956
B. Other Major Injuries									
	497							36	17,892
TOTAL	1,000								30,848

Notes: ** Commuted if over 52 weeks.

A = % Rate of Compensation is 55% of State Average Weekly Wage.

B = % Rate of Compensation is 50% of State Average Weekly Wage.

C = % Rate of Compensation is 75% of State Average Weekly Wage.

STATE X LAW MEMO

Valuation of Minor Permanent Partial									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
LAW EFFECTIVE 10-1-88 and 7-1-89									
Type of Benefit	Case Freq.	Weeks Duration				Weeks Payable For	Avg. H.P. (Wks)	Weeks Payable For	
		Ave. % Loss	Sched. At 100%	Payable (3)x(4)	Com-muted**	Sched. (2)x(6)		H.P. (2)x(8)	
A. SCHEDULE INJURIES									
Thumb:									
Dism. 1 phalange	23	100%	32.50	32.50	32.50	748	A	6	138
Dism. 2 or more	5	100%	65.00	65.00	63.63	318	A	6	30
Loss of use	82	63%	65.00	40.95	40.95	3,358	A	4	328
Loss of use part.	62	13%	32.50	4.23	4.23	262	B	4	248
Loss of use-part.	20	13%	32.50	4.23	4.23	85	C	4	80
Index Finger:									
Dism. 1 phalange	48	100%	19.50	19.50	19.50	936	A	5	240
Dism. 2 or more	18	100%	39.00	39.00	39.00	702	A	8	144
Loss of use	129	61%	39.00	23.79	23.79	3,069	A	4	516
Loss of use part.	87	13%	19.50	2.54	2.54	221	B	4	348
Middle Finger:									
Dism. 1 phalange	32	100%	15.17	15.17	15.17	485	A	3	96
Dism. 2 or more	11	100%	30.33	30.33	30.33	334	A	7	77
Loss of use	84	61%	30.33	18.50	18.50	1,554	A	3	252
Loss of use part.	68	13%	15.17	1.97	1.97	134	B	3	204
Ring Finger:									
Dism. 1 phalange	19	100%	10.84	10.84	10.84	206	A	4	76
Dism. 2 or more	8	100%	21.67	21.67	21.67	173	A	4	32
Loss of use	57	61%	21.67	13.22	13.22	754	A	3	171
Loss of use part.	41	13%	10.84	1.41	1.41	58	B	3	123
Little Finger:									
Dism. 1 phalange	15	100%	8.67	8.67	8.67	130	A	2	30
Dism. 2 or more	8	100%	17.33	17.33	17.33	139	A	5	40
Loss of use	61	60%	17.33	10.40	10.40	634	A	3	183
Loss of use part.	34	13%	8.67	1.13	1.13	38	B	3	102
Great Toe:									
Dism. 1 phalange	2	100%	15.17	15.17	15.17	30	A	6	12
Dism. 2 or more	1	100%	30.33	30.33	30.33	30	A	12	12
Loss of use	25	64%	30.33	19.41	19.41	485	A	4	100
Loss of use part.	19	13%	15.17	1.97	1.97	37	B	4	76
Loss of use-part.	6	13%	15.17	1.97	1.97	12	C	4	24
Other Toes:									
Dismemberment	4	100%	10.83	10.83	10.83	43	A	9	36
Loss of use	12	59%	10.83	6.39	6.39	77	A	2	24
Loss of use part.	9	13%	5.42	0.70	0.70	6	B	2	18
Hearing: One Ear									
Partial	7	58%	86.67	50.27	50.27	352	A	3	21
Partial	2	13%	43.34	5.63	5.63	11	B	3	6
Partial	1	13%	43.34	5.63	5.63	6	C	3	3

STATE X LAW MEMO

Valuation of Minor Permanent Partial									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
LAW EFFECTIVE 10-1-88 and 7-1-89									
		Weeks Duration				Weeks Payable For		Weeks Payable For	
Type of Benefit	Case Freq.	Ave. % Loss	Sched. At 100%	Payable (3)x(4)	Com- muted**	Sched. (2)x(6)	Avg. H.P. (Wks)	H.P. (2)x(8)	
A. SCHEDULE INJURIES									
			Major Members						
Arm	259	13%	238.33	30.98	30.98	8,024	A	10	2,590
Hand	308	13%	195.00	25.35	25.35	7,808	A	8	2,464
Leg	386	13%	216.67	28.17	28.17	10,874	A	13	5,018
Foot	202	13%	173.33	22.53	22.53	4,551	A	10	2,020
Eye	32	15%	108.33	16.25	16.25	520	A	4	128
Hearing (2 Ears)	9	17%	260.00	44.20	44.20	398	A	3	27
Total Schedule Injuries	2,196					47,602			16,037
B. Other Minor Injuries									
	1,120							14	15,680
Total	3,316								31,717

Notes: ** Commuted if over 52 weeks.

A = % Rate of Compensation is 55% of State Average Weekly Wage.

B = % Rate of Compensation is 50% of State Average Weekly Wage.

C = % Rate of Compensation is 75% of State Average Weekly Wage.

STATE X LAW MEMO
-----Calculation of Average Weekly Benefit

1. Class of Injury: Schedule Permanent Partial - Dismemberment, Loss of Use	
2. Effective Date of Compensation Law	10-1-88
3. Nominal Rate of Compensation	55%
4. Minimum Weekly Compensation	0.00
5. Maximum Weekly Compensation	209.42
6. Effective Weekly Wage for Min. Benefits (4)/(3)	0.00
7. Effective Weekly Wage for Max. Benefits (5)/(3)	380.77
8. Average Weekly Wage Based on the 12 Months Ending	12-31-87
9. Average Weekly Wage	353.07
10. Ratio to the Average Weekly Wage (Min.) (6)/(9)	0.00
11. Ratio to the Average Weekly Wage (Max.) (7)/(9)	1.078
12. Line (10) adjusted to the nearest 0.05	0.00
13. Line (11) adjusted to the nearest 0.05	1.10
14. (B) for (12) from Wage Distribution	0.0000
15. (B) for (13) from Wage Distribution	50.1850
16. Difference (15) - (14)	50.19
17. (A) for (12) from Wage Distribution	0.0000
18. (A) for (13) from Wage Distribution	67.1858
19. Difference 100.00 - (18)	32.8142
20. Product (10) x (17)	0.00
21. Product (11) x (19)	35.37
22. Limit Factor [(16)+(20)+(21)] as a %	85.56%
23. Eff. Average Weekly Wage (9) x (22)	302.09
24. Average Weekly Benefit (23) x (3)	166.15

STATE X LAW MEMO
-----Calculation of Average Weekly Benefit

1. Class of Injury: Schedule Permanent Partial - Dismemberment, Loss of Use	
2. Effective Date of Compensation Law	7-1-89
3. Nominal Rate of Compensation	55%
4. Minimum Weekly Compensation	0.00
5. Maximum Weekly Compensation	228.46
6. Effective Weekly Wage for Min. Benefits (4)/(3)	0.00
7. Effective Weekly Wage for Max. Benefits (5)/(3)	415.38
8. Average Weekly Wage Based on the 12 Months Ending	12-31-87
9. Average Weekly Wage	353.07
10. Ratio to the Average Weekly Wage (Min.) (6)/(9)	0.00
11. Ratio to the Average Weekly Wage (Max.) (7)/(9)	1.176
12. Line (10) adjusted to the nearest 0.05	0.00
13. Line (11) adjusted to the nearest 0.05	1.20
14. (B) for (12) from Wage Distribution	0.0000
15. (B) for (13) from Wage Distribution	58.1398
16. Difference (15) - (14)	58.14
17. (A) for (12) from Wage Distribution	0.0000
18. (A) for (13) from Wage Distribution	74.0989
19. Difference 100.00 - (18)	25.9011
20. Product (10) x (17)	0.00
21. Product (11) x (19)	30.46
22. Limit Factor [(16)+(20)+(21)] as a %	88.60%
23. Eff. Average Weekly Wage (9) x (22)	312.82
24. Average Weekly Benefit (23) x (3)	172.05

STATE X LAW MEMO
-----Calculation of Average Weekly Benefit

1. Class of Injury:	Schedule Permanent Partial - Partial Loss of Use	
2. Effective Date of Compensation Law		10-1-88
3. Nominal Rate of Compensation		50%
4. Minimum Weekly Compensation		0.00
5. Maximum Weekly Compensation		190.39
6. Effective Weekly Wage for Min. Benefits (4)/(3)		0.00
7. Effective Weekly Wage for Max. Benefits (5)/(3)		380.77
8. Average Weekly Wage Based on the 12 Months Ending	12-31-87	
9. Average Weekly Wage		353.07
10. Ratio to the Average Weekly Wage (Min.) (6)/(9)		0.00
11. Ratio to the Average Weekly Wage (Max.) (7)/(9)		1.078
12. Line (10) adjusted to the nearest 0.05		0.00
13. Line (11) adjusted to the nearest 0.05		1.10
14. (B) for (12) from Wage Distribution		0.0000
15. (B) for (13) from Wage Distribution		50.1850
16. Difference (15) - (14)		50.19
17. (A) for (12) from Wage Distribution		0.0000
18. (A) for (13) from Wage Distribution		67.1858
19. Difference 100.00 - (18)		32.8142
20. Product (10) x (17)		0.00
21. Product (11) x (19)		35.37
22. Limit Factor [(16)+(20)+(21)] as a %		85.56%
23. Eff. Average Weekly Wage (9) x (22)		302.09
24. Average Weekly Benefit (23) x (3)		151.04

STATE X LAW MEMO

Calculation of Average Weekly Benefit

1. Class of Injury:	Schedule Permanent Partial - Partial Loss of Use
2. Effective Date of Compensation Law	7-1-89
3. Nominal Rate of Compensation	50%
4. Minimum Weekly Compensation	0.00
5. Maximum Weekly Compensation	207.69
6. Effective Weekly Wage for Min. Benefits (4)/(3)	0.00
7. Effective Weekly Wage for Max. Benefits (5)/(3)	415.38
8. Average Weekly Wage Based on the 12 Months Ending	12-31-87
9. Average Weekly Wage	353.07
10. Ratio to the Average Weekly Wage (Min.) (6)/(9)	0.00
11. Ratio to the Average Weekly Wage (Max.) (7)/(9)	1.176
12. Line (10) adjusted to the nearest 0.05	0.00
13. Line (11) adjusted to the nearest 0.05	1.20
14. (B) for (12) from Wage Distribution	0.0000
15. (B) for (13) from Wage Distribution	58.1398
16. Difference (15) - (14)	58.14
17. (A) for (12) from Wage Distribution	0.0000
18. (A) for (13) from Wage Distribution	74.0989
19. Difference 100.00 - (18)	25.9011
20. Product (10) x (17)	0.00
21. Product (11) x (19)	30.46
22. Limit Factor [(16)+(20)+(21)] as a %	88.60%
23. Eff. Average Weekly Wage (9) x (22)	312.82
24. Average Weekly Benefit (23) x (3)	156.41

STATE X LAW MEMO

Calculation of Average Weekly Benefit

1. Class of Injury:	Schedule Permanent Partial
2. Effective Date of Compensation Law	10-1-88
3. Nominal Rate of Compensation	75%
4. Minimum Weekly Compensation	0.00
5. Maximum Weekly Compensation	285.58
6. Effective Weekly Wage for Min. Benefits (4)/(3)	0.00
7. Effective Weekly Wage for Max. Benefits (5)/(3)	380.77
8. Average Weekly Wage Based on the 12 Months Ending	12-31-87
9. Average Weekly Wage	353.07
10. Ratio to the Average Weekly Wage (Min.) (6)/(9)	0.00
11. Ratio to the Average Weekly Wage (Max.) (7)/(9)	1.078
12. Line (10) adjusted to the nearest 0.05	0.00
13. Line (11) adjusted to the nearest 0.05	1.10
14. (B) for (12) from Wage Distribution	0.0000
15. (B) for (13) from Wage Distribution	50.1850
16. Difference (15) - (14)	50.19
17. (A) for (12) from Wage Distribution	0.0000
18. (A) for (13) from Wage Distribution	67.1858
19. Difference 100.00 - (18)	32.8142
20. Product (10) x (17)	0.00
21. Product (11) x (19)	35.37
22. Limit Factor [(16)+(20)+(21)] as a %	85.56%
23. Eff. Average Weekly Wage (9) x (22)	302.09
24. Average Weekly Benefit (23) x (3)	226.57

STATE X LAW MEMO
-----Calculation of Average Weekly Benefit

1. Class of Injury:	Schedule Permanent Partial
2. Effective Date of Compensation Law	7-1-89
3. Nominal Rate of Compensation	75%
4. Minimum Weekly Compensation	0.00
5. Maximum Weekly Compensation	311.54
6. Effective Weekly Wage for Min. Benefits (4)/(3)	0.00
7. Effective Weekly Wage for Max. Benefits (5)/(3)	415.38
8. Average Weekly Wage Based on the 12 Months Ending	12-31-87
9. Average Weekly Wage	353.07
10. Ratio to the Average Weekly Wage (Min.) (6)/(9)	0.00
11. Ratio to the Average Weekly Wage (Max.) (7)/(9)	1.176
12. Line (10) adjusted to the nearest 0.05	0.00
13. Line (11) adjusted to the nearest 0.05	1.20
14. (B) for (12) from Wage Distribution	0.0000
15. (B) for (13) from Wage Distribution	58.1398
16. Difference (15) - (14)	58.14
17. (A) for (12) from Wage Distribution	0.0000
18. (A) for (13) from Wage Distribution	74.0989
19. Difference 100.00 - (18)	25.9011
20. Product (10) x (17)	0.00
21. Product (11) x (19)	30.46
22. Limit Factor [(16)+(20)+(21)] as a %	88.60%
23. Eff. Average Weekly Wage (9) x (22)	312.82
24. Average Weekly Benefit (23) x (3)	234.62

STATE X LAW MEMO
-----Calculation of Average Weekly Benefit

1. Class of Injury:	Non-Schedule Major Permanent Partial	
2. Effective Date of Compensation Law		10-1-88
3. Nominal Rate of Compensation	[.55 x .40]	22%
4. Minimum Weekly Compensation		0.00
5. Maximum Weekly Compensation	[.55 x 380.77]	209.42
6. Effective Weekly Wage for Min. Benefits (4)/(3)		0.00
7. Effective Weekly Wage for Max. Benefits (5)/(3) [380.77/.40]		951.91
8. Average Weekly Wage Based on the 12 Months Ending		12-31-87
9. Average Weekly Wage		353.07
10. Ratio to the Average Weekly Wage (Min.) (6)/(9)		0.00
11. Ratio to the Average Weekly Wage (Max.) (7)/(9)		2.696
12. Line (10) adjusted to the nearest 0.05		0.00
13. Line (11) adjusted to the nearest 0.05		2.70
14. (B) for (12) from Wage Distribution		0.0000
15. (B) for (13) from Wage Distribution		98.0372
16. Difference (15) - (14)		98.04
17. (A) for (12) from Wage Distribution		0.0000
18. (A) for (13) from Wage Distribution		99.4464
19. Difference 100.00 - (18)		0.5536
20. Product (10) x (17)		0.00
21. Product (11) x (19)		1.49
22. Limit Factor [(16)+(20)+(21)] as a %		99.53%
23. Eff. Average Weekly Wage (9) x (22)		351.41
24. Average Weekly Benefit (23) x (3)		77.31

STATE X LAW MEMO
-----Calculation of Average Weekly Benefit

1. Class of Injury:	Non-Schedule Major Permanent Partial
2. Effective Date of Compensation Law	7-1-89
3. Nominal Rate of Compensation	22%
4. Minimum Weekly Compensation	0.00
5. Maximum Weekly Compensation	228.46
6. Effective Weekly Wage for Min. Benefits (4)/(3)	0.00
7. Effective Weekly Wage for Max. Benefits (5)/(3)	1,038.45
8. Average Weekly Wage Based on the 12 Months Ending	12-31-87
9. Average Weekly Wage	353.07
10. Ratio to the Average Weekly Wage (Min.) (6)/(9)	0.00
11. Ratio to the Average Weekly Wage (Max.) (7)/(9)	2.941
12. Line (10) adjusted to the nearest 0.05	0.00
13. Line (11) adjusted to the nearest 0.05	2.95
14. (B) for (12) from Wage Distribution	0.0000
15. (B) for (13) from Wage Distribution	98.6021
16. Difference (15) - (14)	98.60
17. (A) for (12) from Wage Distribution	0.0000
18. (A) for (13) from Wage Distribution	99.6515
19. Difference 100.00 - (18)	0.3485
20. Product (10) x (17)	0.00
21. Product (11) x (19)	1.02
22. Limit Factor [(16)+(20)+(21)] as a %	99.62%
23. Eff. Average Weekly Wage (9) x (22)	351.73
24. Average Weekly Benefit (23) x (3)	77.38

STATE X LAW MEMO

Calculation of Average Weekly Benefit

1. Class of Injury:	Total Disabilities
2. Effective Date of Compensation Law	10-1-88
3. Nominal Rate of Compensation	67%
4. Minimum Weekly Compensation	0.00
5. Maximum Weekly Compensation	253.86
6. Effective Weekly Wage for Min. Benefits (4)/(3)	0.00
7. Effective Weekly Wage for Max. Benefits (5)/(3)	380.77
8. Average Weekly Wage Based on the 12 Months Ending	12-31-87
9. Average Weekly Wage	353.07
10. Ratio to the Average Weekly Wage (Min.) (6)/(9)	0.00
11. Ratio to the Average Weekly Wage (Max.) (7)/(9)	1.078
12. Line (10) adjusted to the nearest 0.05	0.00
13. Line (11) adjusted to the nearest 0.05	1.10
14. (B) for (12) from Wage Distribution	0.0000
15. (B) for (13) from Wage Distribution	50.1850
16. Difference (15) - (14)	50.19
17. (A) for (12) from Wage Distribution	0.0000
18. (A) for (13) from Wage Distribution	67.1858
19. Difference 100.00 - (18)	32.8142
20. Product (10) x (17)	0.00
21. Product (11) x (19)	35.37
22. Limit Factor [(16)+(20)+(21)] as a %	85.56%
23. Eff. Average Weekly Wage (9) x (22)	302.09
24. Average Weekly Benefit (23) x (3)	201.40

STATE X LAW MEMO

Calculation of Average Weekly Benefit

1. Class of Injury:	Total Disabilities
2. Effective Date of Compensation Law	7-1-89
3. Nominal Rate of Compensation	67%
4. Minimum Weekly Compensation	0.00
5. Maximum Weekly Compensation	276.93
6. Effective Weekly Wage for Min. Benefits (4)/(3)	0.00
7. Effective Weekly Wage for Max. Benefits (5)/(3)	415.38
8. Average Weekly Wage Based on the 12 Months Ending	12-31-87
9. Average Weekly Wage	353.07
10. Ratio to the Average Weekly Wage (Min.) (6)/(9)	0.00
11. Ratio to the Average Weekly Wage (Max.) (7)/(9)	1.176
12. Line (10) adjusted to the nearest 0.05	0.00
13. Line (11) adjusted to the nearest 0.05	1.20
14. (B) for (12) from Wage Distribution	0.0000
15. (B) for (13) from Wage Distribution	58.1398
16. Difference (15) - (14)	58.14
17. (A) for (12) from Wage Distribution	0.0000
18. (A) for (13) from Wage Distribution	74.0989
19. Difference 100.00 - (18)	25.9011
20. Product (10) x (17)	0.00
21. Product (11) x (19)	30.46
22. Limit Factor [(16)+(20)+(21)] as a %	88.60%
23. Eff. Average Weekly Wage (9) x (22)	312.82
24. Average Weekly Benefit (23) x (3)	208.56

STATE X LAW MEMO
-----Calculation of Average Weekly Benefit

1. Class of Injury:	Non-Schedule Minor Permanent Partial
2. Effective Date of Compensation Law	10-1-88
3. Nominal Rate of Compensation	13.75%
4. Minimum Weekly Compensation	0.00
5. Maximum Weekly Compensation	209.42
6. Effective Weekly Wage for Min. Benefits (4)/(3)	0.00
7. Effective Weekly Wage for Max. Benefits (5)/(3)	1,523.05
8. Average Weekly Wage Based on the 12 Months Ending	12-31-87
9. Average Weekly Wage	353.07
10. Ratio to the Average Weekly Wage (Min.) (6)/(9)	0.00
11. Ratio to the Average Weekly Wage (Max.) (7)/(9)	4.314
12. Line (10) adjusted to the nearest 0.05	0.00
13. Line (11) adjusted to the nearest 0.05	4.30
14. (B) for (12) from Wage Distribution	0.0000
15. (B) for (13) from Wage Distribution	99.4574
16. Difference (15) - (14)	99.46
17. (A) for (12) from Wage Distribution	0.0000
18. (A) for (13) from Wage Distribution	99.9033
19. Difference 100.00 - (18)	0.0967
20. Product (10) x (17)	0.00
21. Product (11) x (19)	0.42
22. Limit Factor [(16)+(20)+(21)] as a %	99.88%
23. Eff. Average Weekly Wage (9) x (22)	352.65
24. Average Weekly Benefit (23) x (3)	48.49

STATE X LAW MEMO
-----Calculation of Average Weekly Benefit

1. Class of Injury:	Non-Schedule Minor Permanent Partial
2. Effective Date of Compensation Law	7-1-89
3. Nominal Rate of Compensation	13.75%
4. Minimum Weekly Compensation	0.00
5. Maximum Weekly Compensation	228.46
6. Effective Weekly Wage for Min. Benefits (4)/(3)	0.00
7. Effective Weekly Wage for Max. Benefits (5)/(3)	1,661.53
8. Average Weekly Wage Based on the 12 Months Ending	12-31-87
9. Average Weekly Wage	353.07
10. Ratio to the Average Weekly Wage (Min.) (6)/(9)	0.00
11. Ratio to the Average Weekly Wage (Max.) (7)/(9)	4.706
12. Line (10) adjusted to the nearest 0.05	0.00
13. Line (11) adjusted to the nearest 0.05	4.70
14. (B) for (12) from Wage Distribution	0.0000
15. (B) for (13) from Wage Distribution	99.5309
16. Difference (15) - (14)	99.53
17. (A) for (12) from Wage Distribution	0.0000
18. (A) for (13) from Wage Distribution	99.9197
19. Difference 100.00 - (18)	0.0803
20. Product (10) x (17)	0.00
21. Product (11) x (19)	0.38
22. Limit Factor [(16)+(20)+(21)] as a %	99.91%
23. Eff. Average Weekly Wage (9) x (22)	352.75
24. Average Weekly Benefit (23) x (3)	48.50

**LAW AMENDMENTS:
TECHNICAL APPENDIX F**

TREND AND BENEFIT ON-LEVEL FACTORS

This appendix will present two alternate trend calculations in a simplified example.

The assumptions underlying both methods are as follows:

- The benefit percentages remain constant through the experience period.
- Average wages increase by 5% per year.
- The 5% average wage increase results in a 5% per year average benefit increase.
- Rate levels are constant.

Set forth below are trend calculations done in year 4 for two methods, based on loss experience through year 3.

Method 1

Year	(1) Payroll	(2) Rate	(3) Premium (1)x(2)/100	(4) Losses	(5) Benefit on Level Factor	(6) On Level Loss Ratio (4)x(5)/(3)
1	100	100	100	50.00	1.158	.579
2	105	100	105	52.50	1.103	.552
3	110.25	100	110.25	55.13	1.05	.525

This method produces a downward trend (of 1/1.05 per year).

Method 2 produces the following table

Year	(1) Payroll	(2) Rate	(3) Premium (1)x(2)/100	(4) Losses	(5) Benefit on Level Factor	(6) On Level Loss Ratio (4)x(5)/(3)
1	100	100	100	50.00	1.0	.500
2	105	100	105	52.50	1.0	.500
3	110.25	100	110.25	55.13	1.0	.500

This method produces no trend and the zero trend is applied to a lower on-level loss ratio.

The projected loss ratio for year 4 in Method 1 is $.500 = (.525 \times (1/1.05))$. For Method 2, the projected on-level loss ratio is also $.500 = (.500 \times (1/1.00))$.

**LAW AMENDMENTS:
TECHNICAL APPENDIX F**

Thus, for year 4, where the benefit change is already in effect, both methods produce identical results. (These calculations are assuming an exponential trend, rather than a linear trend).

However, for year 5, Method 1 projects a loss ratio of $.476 = (5.25 \times 1/1.05^2)$ while Method 2 still projects a loss ratio of .500.

**RATEMAKING PROCEDURES
EVALUATION OF RATEMAKING METHODOLOGIES**

**NCCI EXAMINATION
VOLUME VIII - SECTION IIB - PART 6
ALTERNATIVE EXPOSURE BASES**

December 6, 1991

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ALTERNATIVE EXPOSURE BASES

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ALTERNATIVE EXPOSURE BASES

I. INTRODUCTION

The exposure base is the fundamental measurement of an insured's exposure to loss. The exposure base is multiplied by the rate specified by the rating manual to derive the manual premium for the insured. The total premium collected during the policy term is the manual premium adjusted for experience rating modifications, premium discount, expense constant and minimum premium considerations, and other rating variables (e.g., schedule and retrospective rating) that may apply.

In most jurisdictions and for most classifications, the current exposure base for workers compensation insurance is unlimited payroll. However, the use of unlimited payroll as the fundamental rating element for workers compensation has been a controversial topic almost from the inception date of this line of insurance. At various times, limited payroll; hours worked; number of employees and several combinations thereof have been espoused as preferred alternatives to unlimited payroll.

Currently the discussion on exposure bases centers on whether or not equity in rating can be enhanced by recognizing wage rate differences among insureds within the same classification. The question becomes more acute when considering employers who may be engaged in the exact same activity in the same work location but who pay significantly different hourly wages to their employees.

As an integral part of its comprehensive examination of the NCCI ratemaking procedures, M&R was engaged to respond to the following two questions:

1. What improvement in rate equity could be expected from a system recognizing wage rates (if available) in addition to unlimited payroll?
2. What additional expenses would be expected from administration of a system using wage rates?

The remainder of this chapter details our analysis, conclusions and recommendations concerning these two issues.

ALTERNATIVE EXPOSURE BASES

ALTERNATIVE EXPOSURE BASES

II. CONCLUSIONS AND RECOMMENDATIONS

This section summarizes our conclusions regarding the two objectives of the alternative exposure base review. Following our conclusions is a summary of recommendations for further consideration by the NAIC.

A. Wage Rate(s) - Equity Impact

A comprehensive review of available research on the issue leads to two conclusions:

- No single exposure base for workers compensation (or any other line of insurance) is ideal for all circumstances.
- A usable exposure base must balance theoretical and practical considerations.

Accepting these two initial findings as principles, we then pursued additional areas of analysis. These included reviewing intuitive exposure base/loss cost correlations, evaluating empirical data compiled for the 1985 M&R study for the State of Oregon and testing the rating system for a number of theoretical insureds. From this supplemental analysis, we conclude the following:

- Unlimited payroll appears to provide the most reasonable compromise between theoretical and practical considerations for most insureds.
- The introduction of the Revised Experience Rating Plan (RERP) will mitigate the premium basis inequities inherent in the current rating system for many insureds.
- A further analysis of insured characteristics indicates that, despite the combined application of unlimited payroll and RERP, theoretical inequities in the rating system can remain. For purposes of this report, we refer to any "unidentifiable" premium disparity remaining after application of all aspects of the rating structure, including experience rating, as residual inequity. By testing the impact of the rating system in various hypothetical situations, we conclude

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that this residual inequity is most likely to exist for insureds with the following joint characteristics:

They are concentrated in classes with a wide range of verifiable average hourly wages.

The wage variation has no logical relationship to occupational hazard specific to a given type and locale of activity.

The insureds are either too small to qualify for or have low credibility under RERP.

- The residual inequity can be further mitigated through a wage rate recognition plan limited to those classes with a demonstrated problem and with hours worked data readily available and verifiable.

Overall, we do not conclude that recognition of wage rates within the rating structure for all classes of insureds would ultimately improve the equity of the system. It is impossible to identify all who benefit (and all who do not) from such a universal change. However, it is clear that such a universal change would provoke a largely unnecessary disturbance in the workers compensation system with regard to rates and procedures.

B. Wage Rate(s) - Expense Impact

At this time, hours worked or average hourly wages are not collected under the NCCI's Workers Compensation Statistical Plan (WCSP). Additionally, there is no procedure in place for all insureds to internally compile and maintain hours worked records for workers compensation rating purposes. Therefore, any attempt to universally collect such data will affect the record-keeping, data collection and processing, and auditing functions of the insureds, insurers, and NCCI. With this perspective, we offer the following observations:

- The availability, quality, and verifiability of hours worked varies greatly by jurisdiction and type of employment.
-

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- There is no guarantee that such data would be available or meaningful at any cost for all insureds. The types of employment offering the least likelihood of success are:

Those with a high percentage of salaried employees.

Those with a significant number of employees compensated on commission, piecework, or payment-in-kind bases.

Those involving multi-employer and part-time work situations.

- Hours worked or average hourly wages are most likely to be available and verifiable for employments with a high concentration of unionized workers or situations involving governmental monitoring.
- The incorporation of hours worked or average hourly wage in the WCSP will increase data processing costs at least in the short-term. Three different categories of programs would have to be changed:

Insurance carrier programs for those companies capturing WCSP data on an automated basis.

NCCI data base programs for compiling and maintaining WCSP data.

NCCI ratemaking programs for accessing the WCSP data base.

- Estimates of the additional insured record-keeping and insurer audit costs inherent in capturing hours worked range from +26% to +250% for the affected classes. This does not include the programming costs discussed above.

Overall, we believe that the costs associated with universal collection of hours worked or average hourly wage could be as much as 0.4% to 0.7% of collected premium. Even at that cost, there is no guarantee that the data collected will be accurate and usable. Furthermore, these additional expenses could be concentrated in those

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employments least likely to realize an equity enhancement through wage rate recognition.

C. Wage Rate(s) - Recommendations

We do recommend judicious use of wage rate recognition plans only for those states and classes of employment identified as having residual inequities after application of RERP to the unlimited payroll exposure base. This recommendation follows the precedent set by the construction class premium adjustment plans filed for use in several states. Specifically, the Massachusetts plan (see Exhibit 4) has, in our opinion, the most desirable characteristics. From our perspective, the wage rate plans should have the following characteristics:

1. The state plans should provide a multi-tiered discount schedule for average hourly wages exceeding a specified level.
2. Initially, it may be necessary to survey employers to determine both reasonable discount schedules and class rate offsets. It may also be necessary to update the surveys while discount class data is being compiled.
3. Ideally, the discount class designation would be captured within the WCSP to permit updating of the discounts and offsets as a part of the ratemaking process.
4. The plan should include a mechanism for indexing the discount thresholds on the basis of wage rate changes for the effected classes.
5. As an absolute qualification standard for the plan, the insured should be responsible for collecting hours worked and average hourly wage in a format that is readily verifiable during the normal course of the payroll audit.
6. Experience modifications should be adjusted to reflect the applicable average hourly wage discount.

Overall, the intent of this recommendation is to introduce wage rate differentials as a refinement of the classification system without creating new inequities or extraordinary

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expenses. Furthermore, it is intended to limit application of wage rate credits to employers where an identifiable problem may exist; e.g., the construction industry. This industry group has a high population of both union and non-union workers; the situation most likely to result in a residual inequity through use of unlimited payroll. We refer to pages 37 through 40 of this report for a more complete discussion of the recommended procedure for introducing wage rate differentials.

As with any change in a premium allocation procedure, certain insureds will benefit while others will not. Those most likely to benefit will be small high-wage paying employers who can compile hours worked. Those most likely to suffer a premium increase are small low-wage paying employers and small high-wage paying employers who cannot compile hours worked; i.e., those who do not qualify for wage credits or have low credibility under RERP.

The impact on this latter group illustrates a problem that transcends actuarial considerations but has been a point of contention in past discussions of alternative exposure bases. A fundamental societal dilemma is created: should small employers be required to pay more for workers compensation insurance? Although the actuarial justification for such a result may exist, this category of insureds may be the least able to afford the increase. Furthermore, the small employers have relatively limited bargaining power with which to achieve more favorable prices or terms. The unresolved question is whether societal concerns outweigh actuarial equity.

By intent of the NAIC, this study did not entail the compilation and analysis of new empirical data. Instead, we were to rely on data from past studies of exposure bases; the most complete of which were conducted in 1984 and 1985. Given the sensitivity of this issue and the lack of up-to-date, relevant data, the NAIC may want to consider follow-up research on the topic of exposure bases.

We foresee two possible avenues of additional research:

1. Initiation of a comprehensive study such as that undertaken by NCCI in Oregon in 1984. This analysis involved both a compilation of wage data through an employer survey and a review of the NCCI loss experience for the same employers.

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2. Compilation and review of the actual premium and loss data that has emerged under Florida's Contracting Classification Premium Adjustment Program (CCPAP). This program has been in effect since January 1, 1984.

At this time, we suggest that the latter research alternative be pursued. Concentrating on the premium and loss experience developed under Florida's CCPAP will permit an evaluation of the impact of wage rate recognition under actual market conditions. Although the data may be have limited credibility at this time, we believe that this is a logical starting point for additional work.

Section VI of this report provides a more comprehensive discussion of our recommendations. This section also includes our suggested guidelines for identifying classes for which a wage rate recognition plan may be appropriate. We encourage readers of this report to review Section VI in detail.

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III. OVERVIEW OF EXPOSURE BASES

A discussion of the evolution of workers compensation exposure bases requires an understanding of the function of the exposure or premium base. An overview of exposure bases is provided in the following excerpt from "Notes on Exposure and Premium Bases," an article by Paul Dorweiler, published in the 1929 Proceedings of the Casualty Actuarial Society:

"The medium most desirable as a premium basis is the one possessing a combination of these two qualifications in the largest degree:

1. Magnitude of Medium should vary with hazard.

It is desirable to have for premium basis an exposure medium whose magnitude varies approximately directly with the hazard when this is measured by the losses. By using a medium which varies directly with the hazard, the total premium may be obtained by multiplying the exposure expressed in units of the premium basis by the rate.

2. The Medium should be practical and preferably already in use.

For measuring the exposure it is desirable to have a medium whose magnitude is readily ascertained and which is already used by the assured for other than insurance purposes. The use of a medium possessing these qualities promotes efficiency, as no additional records are necessary for measuring exposure, and enhances accuracy, as various existing records may be used as a check.

When one considers the many diverse factors which enter into a hazard and the additional factors which enter into the evaluation of a hazard in terms of losses, one might expect that generally it would be impossible to find a medium whose magnitude varies directly with the losses."

Significantly, the 62 year old reference still provides a very accurate description of the role of an exposure base and the problems inherent in selecting the optimal base. In an article titled "Exposure Bases Revisited" that appeared in the 1989 Proceedings of

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the Casualty Actuarial Society, Amy Bouska was able to further clarify the role of an exposure base:

"It is important to make note of two things that exposure bases are not. First, the exposure base is not the true exposure. The exposure base is a proxy for the true exposure, which we are unable to know both because it is constantly changing and because it is generally a function of a large number of variables...

Second, the exposure base is not a rating variable, although the dividing line between the two is somewhat arbitrary at times. In order to determine the correct manual premium for a risk, it is first necessary to classify the risk, based on whatever the rating variables are for the risk under consideration."

This latter point is very significant for workers compensation since the issues of exposure base and classification refinement have become intertwined and confused.

The actual premium charged for workers compensation can best be illustrated as a function with three key variables (for simplicity we are ignoring expense constants, premium discounts, schedule rating, etc.):

$$\begin{array}{ccccc} \text{number of} & & \text{class rate} & & \text{individual risk} \\ \text{exposure} & \times & \text{per exposure} & \times & \text{experience} \\ \text{base units} & & \text{base unit} & & \text{modifier} \end{array}$$

In this equation, the exposure base approximates the hazard to be insured. The class rate translates this hazard into expected losses for the general category of employment. The experience modifier refines the expected losses to better reflect the characteristics of the specific risk to be insured.

In the 1970's, unlimited payroll was adopted by NCCI as the best available proxy for true hazard for all jurisdictions and most classes. With the exception of two states, unlimited payroll is in use countrywide. The two exception states (i.e., Nevada, which uses limited payroll, and Washington, which uses cents-per-hour) have exclusive state funds.

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The near universal adoption of unlimited payroll does not indicate universal acceptance of the exposure base by all facets of the workers compensation system. At various times, labor and management groups have suggested alternative premium bases that, from their perspective, provide better hazard measurement. Between 1983 and 1985, these groups prompted a series of analyses that provided further insight into the strengths and weaknesses of unlimited payroll and other possible exposure bases. The most prominent of these studies included the following:

1. NCCI's "Study of Premium Equity by Employer Group" (1984)
2. Future Cost Analysts, Inc.'s "An Equitable Basis for Workers Compensation Premiums" (January 1985)
3. M&R's "Review of Alternative Premium Bases for Oregon Workers Compensation Insurance" (March 1985)

As a result of these studies, several states determined that an inequity in the premiums existed between certain categories of low and high average wage construction industry employers. Three different plans to address this problem were implemented:

1. In Florida, a Contracting Classification Premium Adjustment Program (CCPAP) was implemented in January 1984. This program provides for credits from manual premium for average hourly wage rates above \$9.99. A qualifying contracting employer can receive a maximum credit of 25%. The average hourly wage rate thresholds have not changed since implementation.
2. In Maryland, Oregon, Illinois, and Nebraska a Loss Ratio Adjustment Program (LRAP) was implemented effective July 1985. This program provided for an increase in the sensitivity of the experience rating modification to the actual experience of construction insureds. The program only applied to experience rated risks.
3. In California, several construction classes were split into two groups based on an average hourly wage threshold. This plan is commonly referred to as a two-tier plan.

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Since 1985, there have been several new developments pertaining to exposure bases:

1. LRAP was replaced by RERP in Nebraska (November 1989), Maryland (July 1990), Illinois (September 1990), and Oregon (March 1991). This change was consistent with NCCI's original concept of LRAP as an interim measure for contractors that would be superseded by a more responsive experience rating plan for all classes of insureds.
2. Variations on CCPAP were filed in 1990 and 1991 in Delaware, Massachusetts, Missouri, Oregon, and Pennsylvania. Again, only contractors were affected.
3. A review of alternatives to unlimited payroll was initiated in New Mexico in 1990. A new effort was also undertaken in Oregon, site of the most complete analysis done in recent years. At this time, we understand that neither review has been completed.

To date, no definitive information regarding the success or failure of the wage plans implemented in the 1980's has been compiled. However, based on conversations with individuals most familiar with the Florida experience, we draw the following observations concerning the CCPAP approach:

- The proportion of risks receiving discounts has not increased significantly over time despite the fact that the wage thresholds have not been indexed,
- Although the class rate offsets caused by the CCPAP have been monitored and adjusted, no test of the adequacy or equity of discounts has been conducted, and
- The program appears to have addressed the primary equity concerns of the construction industry without requiring a massive change in the Florida workers compensation rating system.

Given the most recent level of activity and interest in this area, it is clear that many questions regarding the optimal exposure base for workers compensation remain unresolved.

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IV. EVALUATION OF WAGE RATE(S) RECOGNITION (OBJECTIVE 6a)

The objective of this aspect of the examination was to evaluate the improvement, if any, in rate equity that could be realized through recognition of wage rates (when available) as a supplement to the unlimited payroll premium base. The scope of the assignment did not involve collection and compilation of original data. Instead, we relied on data compiled from past studies of alternative exposure bases.

A. Data Sources

Our research indicates that the most comprehensive data base pertaining to workers compensation exposure bases was compiled during the 1983 through 1985 period in conjunction with studies done for Florida and Oregon. Of particular value was information collected for the 1984 NCCI "Study of Premium Equity by Employer Group." This included actual Oregon premium and loss data by employer for 42 construction classifications. The data were compiled for 1983 Oregon employers surveyed by the research firm of Bardsley & Haslacher, Inc. The survey was necessary to determine employer characteristics not captured in NCCI statistics. The key characteristics included average weekly wages, number of employees and union/non-union status.

Subsequent to release of the 1984 NCCI study, M&R was retained by the Oregon Workers Compensation Department to conduct a follow-up analysis. This latter study, titled "Review of Alternative Premium Bases for Oregon Workers Compensation Insurance" (March 1985), involved review of NCCI findings and analysis of supplemental data compiled from the NCCI records. This supplemental information provided the primary data base for the current M&R review.

In addition to the two studies mentioned (copies of both can be found in the Technical Supplement), we drew upon the analyses and observations derived from the following studies:

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1. Future Cost Analysts, Inc.'s "An Equitable Basis for Workers Compensation Premiums" (January 1985)
2. Future Cost Analysts, Inc.'s "A Response to: 'Study of Premium Equity by Employer Groups'"
3. NCCI's "Workers Compensation Premium: Finding the Perfect Fit" (1985)
4. NCCI's "The Basis of Premium for Workers Compensation Insurance"
5. NCCI's "Understanding the Changes Introduced by the Revised Workers Compensation Experience Rating Plan" (November 1989)

In addition, NCCI provided to us several rate filings and compilations from the Detailed Claims Information (DCI) data base.

B. Analysis

Many different exposure bases for workers compensation have been considered and proposed over time. Although a full analysis of all such alternatives is beyond the scope of this assignment, a brief review of these options and their perceived strengths and weaknesses will facilitate putting the wage rate(s) issue into perspective. The following grid is offered as a means of considering alternative exposure bases and their correlation with the components of workers compensation costs. Included within the table is our judgmental evaluation of each exposure medium as it relates to each cost component.

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EXPOSURE BASE/COST COMPONENT MATRIX

<u>Exposure Base</u>	<u>Number of Claims</u>	<u>Medical Costs</u>		<u>Indemnity Costs</u>		<u>Vocational Rehabilitation</u>
		<u>Per Visit</u>	<u>Duration & Utilization</u>	<u>Average Benefit</u>	<u>Duration & Utilization</u>	
Unlimited Payroll	L	L	L	S	S	L
Limited ¹ Payroll	S	S	S	L	S	S
Hours Worked	V	S	S	U	U	U
Average Wage Per Hour	U	L	V	V	S	S
Head Count (F.T.E.)	V	U	U	U	U	U

NOTES:

- V = Very likely correlated.
- L = Likely correlated.
- S = Some correlation.
- U = Unknown correlation.

Several observations can be made using the table above:

- No single exposure base is well correlated with all six of the claim cost components identified.
- "Unlimited payroll" appears to provide the best mix of claim frequency and severity correlations from among the five candidates.

1 Payroll limited to that wage generating maximum indemnity benefits.

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- A medium that separately measures "hours worked" and "average wage" offers promise of better correlation with claim cost than do any of the five candidates considered on their own.

In an attempt to quantify the correlation of unlimited payroll with workers compensation costs, we asked NCCI to produce a comparison of average claim costs with pre-injury average weekly wages for contracting classes. The contracting classes were chosen based on the potential wide variation in wage levels within this employer category. The source of the information is the DCI 1980 through 1987 accident year data base for 12 states. Exhibit 8 of this report is a memorandum with charts, prepared by NCCI, that describes this data in detail. The memorandum also includes the NCCI's own conclusions regarding this material.

Graphs I through IV highlight what we believe to be the key observations to be drawn from this data. Rather than presenting the claim cost/wage comparison in absolute terms, we relied on ratios to average claim costs and average wages. This was done to recognize claim cost and wage differences across classes and regions.

Graph I shows total claim costs relative to wages. For each wage category, two bars are shown. One, designated as "actual," provides the DCI generated actual experience. The other, designated as "one-to-one," provides a purely theoretical benchmark in which total claim costs vary identically with wages. In the latter situation, unlimited payroll would provide an ideal medium for measuring average claim costs, if we assume that claim frequency is independent of average wage levels.

This graph indicates that total average claim costs do continue to increase significantly as average wages rise. However, the rate of increase in claim costs does not match that of wages.

Graphs II and III provide similar relativities by wage separately for indemnity and medical costs, respectively. As expected, indemnity and wage changes are positively correlated. However, a positive correlation between medical costs and wage increases also exists. Both graphs indicate that the proportionality of claim cost to wage increases decreases at higher wage levels.

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Graph IV shows average benefit duration in weeks by wage size. Of particular significance on this graph are the relatively long benefit durations at the lowest and highest wage categories. The experience at the lowest wage category is not unexpected given the interaction of actual wages and minimal benefits. However, the experience at the highest wage category is counter intuitive in that we would expect a faster return-to-work rate for higher paid employees.

In summary, Graphs I through IV indicate to us that unlimited payroll is reasonably correlated with average claim costs for employment categories with wide wage variation potential. However, Graphs I through III, in particular, suggest that the proportionality of claim costs and wage increases tend to diminish at the higher average wage categories.

We emphasize that these observations are made without regard to the availability of the exposure medium. However, as the literature cited in Section III makes clear, issues of practicality and theory cannot be divorced when considering the merits of an exposure base. The following grid shows the predominant compensation methods and the exposure bases under consideration, and our judgmental evaluation of the availability of each base without resorting to presumptive rules:

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COMPENSATION METHOD/EXPOSURE BASE MATRIX

<u>Employment Compensation Method</u>	<u>Unlimited Payroll</u>	<u>Limited² Payroll</u>	<u>Hours Worked</u>	<u>Average Wage</u>	<u>Head Count (F.T.E.)</u>
Hourly Wage	D	D	D	D	D
Salary	D	P	U	U	D
Commissions & Other Compensation Methods	P	P	U	U	D
Profit (Ownership)	U	U	U	U	D
None (Volunteer)	U	U	U	U	D

NOTES:

D = Definitely available.
P = Possibly available.
U = Unknown availability.

Three observations are drawn from the table above:

- "Head count" is the most available and verifiable exposure base. Unfortunately, it is poorly correlated with workers compensation costs.
- "Unlimited payroll" is the second most available and verifiable medium among the five compensation methods.
- A combination of "hours worked" and "average wage" is most feasible for employments actually compensated on an hourly wage basis.

2 Payroll limited to that wage generating maximum indemnity benefits.

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Combining the loss correlation and feasibility observations, we first arrive at the conclusion that no single exposure base is perfect for workers compensation insurance. Secondly, "unlimited payroll" appears to provide the optimal combination of theoretical accuracy and practicality for most situations.

Third, a combination of "hours worked" and "average wage" offers promise of an improved exposure base for those employments actually compensated on an hourly basis.

Before leaving this discussion, it is important to recognize the impact of experience rating. As discussed earlier, experience rating is intended to modify premiums to better reflect individual risk characteristics. In other words, it is designed to partially correct for the theoretical deficiencies inherent in any exposure base. For workers compensation, the corrective powers of experience rating improve with the "credibility" assigned to a risk's own experience (i.e., the larger the risk, the greater the reliance on individual experience).

We can then further conclude that the loss correlation improvement to be gained through a combination of "hours worked" and "average wage" is already realized through experience rating for the larger risks (i.e., those approaching maximum credibility). The combination of "hours worked" and "average wage" is therefore most likely to improve risk assessment for the smaller employers who pay employees on an hourly basis.

In order to test these conclusions against empirical data, we refer to the NCCI data compiled for the 1985 M&R Oregon premium equity study. For comparison purposes, we are assuming that the construction employers that were the focus of the Oregon study compensate their employees strictly on an hourly basis.

The table below segregates the construction employer loss experience into high and low wage payer categories. The experience indices shown indicate relative premium redundancies (+) and deficiencies (-). Ideally, the indices for all cells would equal 0.

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OREGON CONSTRUCTION EMPLOYERS (THREE YEAR LOSS EXPERIENCE)

	<u>Non-Experience³</u> <u>Rated Risks</u>		<u>Experience⁴</u> <u>Rated Risks</u>	
	<u>Distribution</u> <u>of Premium</u>	<u>Premium</u> <u>Index</u>	<u>Distribution</u> <u>of Premium</u>	<u>Premium</u> <u>Index</u>
High ⁵ Average Wage	16.6%	- 5%	35.8%	+7%
Low Average Wage	<u>83.4</u>	+1	<u>64.2</u>	- 4
Overall	100.0%	0%	100.0%	0%

For experience rated risks, this table supports the contention that "high wage" employers paid a disproportion premium by virtue of the 11 point difference in indices. For non-experience rated risks, the results were counter to the findings above, but were not as credible given the small volume of data.

A simplistic evaluation of the Oregon results would suggest that rates per \$100 of payroll should not be constant for all wage levels. This makes intuitive sense when considering the same type of work activity in the same work location. However, it is equally intuitive that wages will vary directly with employment hazard and location cost differences. In an attempt to filter out these influences from the results shown above, we did further segregate the Oregon data for union and nonunion employers. This was done under the assumption that a union/non-union analysis is more likely to reveal wage and workers compensation loss correlations in a constant work environment.

3 Reflects only one year of data and an extremely small volume of data (i.e., 2.2% of construction industry premium, or \$434,000 for 1983).

4 Reflects 1983 experience rating plan.

5 "High wage" defined as greater than \$500 per week per employee.

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OREGON CONSTRUCTION EMPLOYERS EXPERIENCE RATED RISKS⁶ (THREE YEAR LOSS EXPERIENCE)

	<u>Union Employers</u>		<u>Non-Union Employers</u>		<u>Total</u>	
	<u>Premium</u>	<u>Index</u>	<u>Premium</u>	<u>Index</u>	<u>Premium</u>	<u>Index</u>
	<u>Distribution</u>		<u>Distribution</u>		<u>Distribution</u>	
High ⁷ Avg Wage	26.0%	+19%	9.8%	-26%	35.8%	+7%
Low Avg Wage	<u>27.3</u>	+ 2	<u>36.9%</u>	- 8	<u>64.2</u>	- 4
Overall	53.3%	+10%	46.7%	-12%	100.0%	0%

This additional table provides evidence that within the union employer group, wage rate recognition can improve rate equity. High wage paying union employers had a 17 point greater relative premium redundancy to the low wage payers.

The results for the non-union employer group were counter to those of the union group. The high wage payers actually had an 18 point greater relative premium deficiency than did the low wage paying group. However, it should be realized that the high wage paying non-union employers represent the smallest and, therefore, least credible experience group.

To provide further insight regarding union and non-union employer characteristics, we also calculated the average weekly wage per Oregon employee within the high and low wage categories. As the following table indicates, the union wage in each category is slightly higher:

6 Reflects 1983 experience rating plan.
7 "High wage" defined as greater than \$500 per week per employee.

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OREGON CONSTRUCTION EMPLOYERS EXPERIENCE RATED RISKS

Average Weekly Wage

	<u>Union</u>	<u>Non-Union</u>	<u>Union Differential</u>
High Avg Wage	\$655	\$614	+ 7%
Low Avg Wage	379	338	+12
Overall	\$535	\$386	+39%

Of greater significance than the differences within category is the difference on an overall basis. The union employers have a much higher proportion of employees (57%) in the "high" category than do non-union employers (17%). As a result, Oregon union employees have an average wage that exceeds non-union employee wages by 39%. This suggests that the issues pertaining to union versus non-union and high versus low wage characteristics are substantially the same.

Overall, we made the following observations from this data:

- there is a wide disparity between high and low average weekly wage employers, and
- there is also a wide disparity between the results of union and non-union employers.

To the extent that these disparities can be addressed through further refinement of compensation characteristics, premium equity could be improved through wage rate recognition.

As indicated earlier, this problem was recognized and addressed by NCCI through the LRAP program. The intent of LRAP was to assign greater weight to construction employer experience modification through a judgmental 5 point "D ratio" increase. Obviously, this would only effect experience rated risks. The following table shows how the experience indices were projected to change under this plan:

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OREGON CONSTRUCTION EMPLOYERS EXPERIENCE RATED RISKS⁸ (THREE YEAR LOSS EXPERIENCE)

	<u>Union</u> <u>Employers</u>		<u>Non-Union</u> <u>Employers</u>	
	<u>Pre-LRAP</u>	<u>LRAP⁹</u>	<u>Pre-LRAP</u>	<u>LRAP</u>
High ¹⁰ Average Wage	+19%	+18%	-26%	-2%
Low Average Wage	+ 2	- 8	- 8	-6
Overall	+10%	+ 5%	-12%	-5%

The projected impact of LRAP was to reduce the equity disparity in three of the four cells; the "low wage" union cell being the one exception.

At the time of the Oregon study, the Florida CCPAP was also being considered. Using the Oregon survey data, we were also able to evaluate this program's impact on rate equity in Oregon. The following table appends the CCPAP program to the previous findings:

-
- 8 Reflects 1983 experience rating plan.
 - 9 LPAP effective July 1, 1985.
 - 10 "High wage" defined as greater than \$500 per week per employee.
-

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OREGON CONSTRUCTION EMPLOYERS
EXPERIENCE RATED RISKS¹¹
(THREE YEAR LOSS EXPERIENCE)

	<u>Union</u> <u>Employers</u>			<u>Non-Union</u> <u>Employers</u>		
	<u>Pre-</u> <u>LRAP</u>	<u>LRAP¹²</u>	<u>CCPAP¹³</u>	<u>Pre-</u> <u>LRAP</u>	<u>LRAP</u>	<u>CCPAP</u>
High ¹⁴ Average Wage	+19%	+18%	+11%	-26%	-2%	-34%
Low Average Wage	+ 2	- 8	+ 7	- 8	-6	- 4
Overall	+10%	+5%	+10%	-12%	-5%	-10%

The projected impact of CCPAP, if implemented independent of experience rating, was to reduce the premium disparity for two cells while plan exacerbating the disparity for two groups.

In summary, the NCCI's LRAP program appeared to be a reasonable yet indirect response to the wage differential equity problem for most classes studied: construction employers with significant union and non-union populations. In fact, the LRAP program appeared to be more effective than the more direct CCPAP approach for experience rated risks. However, the issues of rate equity for non-experience rated risks and the transportability of the Oregon findings were not resolved.

Beginning in 1989, LRAP (which affected only construction classes) was replaced by the more universal RERP. As of this date, we cannot determine how the LRAP modifications would compare with the RERP modifications for construction employers. However, it is reasonable to assume that LRAP and RERP would have the same impact on smaller insureds given that both plans are intended to increase the experience rating credibility for this population. Furthermore, it is reasonable to

11 Reflects 1983 experience rating plan.

12 LRAP effective July 1, 1985.

13 CCPAP effective January 1, 1983.

14 "High wage" defined as greater than \$500 per week per employee.

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assume that RERP will result in tempered debits and credits for larger insureds, since this is a stated objective of the new plan. This could serve to unwind the rate equity introduced by LRAP for high wage paying, larger construction employers.

In retrospect, one of the key drawbacks to CCPAP when originally implemented in Florida was its independence from the experience rating modification. We believe that this is one of the primary reasons the LRAP appeared to be a superior solution to the wage differential equity problem. Effectively, CCPAP in Florida provided discounts to insureds that were inconsistent with individual risk characteristics as expressed by the experience modifiers.

To test the effect of applying a CCPAP plan with RERP, we developed rates for 20 hypothetical risks with two sets of identical theoretical costs, but with varying wage characteristics. The details of the calculation are provided in Exhibit 1. As shown below, the results of that exercise indicate that the combination of CCPAP and adjustment of RERP for CCPAP can potentially improve rate equity for the problem classes under both cost scenarios.

VARIANCE OF PREMIUM FROM THEORETICAL COST

	<u>Unlimited Payroll with RERP Cost Scenario</u>		<u>Unlimited Payroll with CCPAP and Adjusted RERP Cost Scenario</u>	
	<u>#1</u>	<u>#2</u>	<u>#1</u>	<u>#2</u>
	<u>Average Contractor</u>			
Maximum Overcharge	+27%	+22%	+13%	+4%
Maximum Undercharge	- 26	- 27	- 13	- 4
<u>Large Contractor</u>				
Maximum Overcharge	+22%	+17%	+12%	+4%
Maximum Undercharge	- 19	- 20	- 9	- 2

It is significant that the CCPAP plans recently filed in Missouri and Massachusetts recognize that CCPAP should not be independent of experience rating. The Missouri plan required an experience modifier of 1.05 or lower to qualify for CCPAP. The

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Massachusetts and Pennsylvania plans adjust the experience rating expected losses for the CCPAP credit.

Included as Exhibits 2, 3, and 4, respectively, are the Florida, Missouri, and Massachusetts CCPAP plans referred to above. We have also included the recently replaced Oregon LRAP plan as Exhibit 5.

C. Conclusion

Our analysis indicates that unlimited payroll combined with RERP still results in a reasonable premium basis for most classes of insureds. However, a review of the theoretical issues, an analysis of the limited empirical data and a test of hypothetical risk situations (see Exhibit 1) indicates that equity problems attributable to wage differences may exist for certain classes of employers:

1. those involved in activity for which average hourly wages can vary greatly for the same type and locale of activity, and
2. those who do not qualify for RERP or have low credibility under the plan.

It appears that this problem is most likely isolated to those locations and employer groups that have a high concentration of both union and non-union employees. Therefore, any change in the rating system addressing this issue should be limited to those problem classes to avoid unnecessary premium instability.

One possible course of action would be to extend use of the CCPAP to other states and classes. In that case, we believe that the experience rating plan calculations for such risks should be adjusted to reflect the implementation of CCPAP. The Massachusetts plan included as Exhibit 4 provides a reasonable model from which a more permanent and transportable rating procedure could be developed. Two specific features of this plan deserve close review and reconsideration:

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1. it only applies to experience rated risks, and
2. its application is not dependent on a qualification standard as to the direction and magnitude of the experience modifier.

These two features may be at odds with the equity enhancement goal of the CCPAP.

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V. EVALUATION OF WAGE(S) RATE EXPENSES (OBJECTIVE 6b)

The objective of this aspect of the examination was to evaluate what additional expenses would be involved in recognizing wage(s) rates as a supplement to the unlimited payroll exposure base. The additional expenses considered are those immediately absorbed by insureds, insurers, and NCCI. Ultimately, all additional costs would be passed on to the insureds through the premium paid.

This part of the review of alternative exposure bases represents the joint efforts of M&R and Arthur Andersen & Co., a subcontractor to M&R in the examination.

A. Data Sources

Data specific to this assignment are not readily available. Therefore, we relied heavily on special cost data compiled by NCCI and on information compiled from a telephone survey of insurers of various sizes and operational characteristics. Furthermore, we were provided copies of historical correspondence on the topic by NCCI. These included memoranda concerning Texas (1982), Oregon (1979), Washington (1979 and 1988), and New York (1989).

B. Analysis of Cost

In order to recognize wage rate(s) within the rating structure, one new statistical element would have to be captured for each insured: number of hours worked. Our investigation suggests that it would be difficult and/or expensive to compile this information for all insureds.

At this time, hours worked are used in rating all risks in only one state: Washington. This state, where workers compensation coverage is provided by an exclusive state fund, converted from a payroll exposure base to an hours worked base in the 1930's to offset the payroll deflation of the depression. Subsequent attempts to change back to a payroll base have been unsuccessful largely due to resulting premium disruptions.

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Hours worked are used in rating construction employers in the six CCPAP states: Delaware, Florida, Missouri, Massachusetts, Oregon, and Pennsylvania. Furthermore, they are used in California and Nevada to administer two-tiered classification structures for construction employments. However, in all eight cases the onus is on the employer to compile verifiable hours worked data. Failure to do so results in use of the highest applicable manual rate. In none of the states are hours worked captured as a separate element of the statistical plan, nor are they explicitly used in the ratemaking process.

We have identified seven areas of potential additional cost due to capturing and explicitly using hours worked in the rating and ratemaking processes:

1. insured record-keeping to the extent that hours worked are collected for employees not compensated on an hourly basis,
2. insurer collection of this additional data,
3. insurer and NCCI verification of hours worked,
4. insurer reporting of hours worked to NCCI,
5. NCCI acceptance of the expanded insurer reports,
6. NCCI usage of hours worked for ratemaking, and
7. NCCI usage of hours worked for experience rating.

In order to evaluate the potential cost impact of the first four items listed above, Arthur Andersen and M&R surveyed several insurers for their insights. We supplemented the insurer responses with a review of past discussions on this topic among NCCI, the American Insurance Association, and various states.

We generally received pessimistic responses with regard to the essential feasibility and potential cost of compiling hours worked. This was not surprising since the insurers were being asked to opine on a process that would inevitably complicate the administration of workers compensation insurance no matter how it is done.

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Furthermore, the survey was not able to elicit any detailed analysis of potential costs. Again, this is not surprising since the insurers have no benchmark from which to measure the impact of collecting hours worked.

Despite these drawbacks, the survey identified a consensus on the following issues:

1. Most insurers believed that insureds who actually pay employees on a hourly basis, specifically subsets of the contracting and manufacturing industries, have verifiable records readily available.
2. Any attempt to have insureds begin to collect hours worked just for workers compensation purposes would be problematical.
3. Even limiting the process to insureds with verifiable records of hours worked will significantly complicate the audit function. This is due to the lack of uniformity among employers in hours worked record-keeping.
4. The estimated cost impact of collecting and verifying hours worked ranged from a "nominal increase" to "at least doubling."
5. The collection of additional exposure data would affect existing underwriting procedures and systems. This would increase the expense of underwriting a policy and could introduce delays in binding coverage.

In an effort to translate the survey findings into a reasonable cost estimate, we researched historical expense information to establish a framework to project expenses. At this time, approximately 6% of the nationwide premium dollar is earmarked for general expense (i.e., basic policy maintenance costs). However, we are not aware of any data source that definitively segregates the general expenses into various functions (e.g., payroll audit).

Going to a different data source (data compiled by the California Department of Insurance), we find that payroll audit expenses range between 0.6%, and 1% of the premium dollar. Noting that the organizations represented in this data compilation place a higher emphasis on the audit function than many other types of insurers in

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other jurisdictions, it is reasonable to assume that a more representative estimate of payroll audit expense is at the lower end of the range (0.6%).

One study, produced by the New York Compensation Insurance Rating Board (Exhibit 6), suggests that audit expenses will increase by 26% for the effected classes. It is important to note that this study was limited to contractor employers, a group for which hourly records are probably more complete than for the average employer.

Another study completed in the state of Washington (in 1989), indicates that an average audit in the "hours worked" state takes 13.9 hours to complete. This is approximately ten hours (or 250%) more than the four hours estimated by NCCI for a payroll based audit. It is important to realize that the Washington audits do encompass classes for which hourly records may not be kept for non-insurance reasons. Also, it is not clear that the additional time translates into additional costs on a proportional basis.

These two sources indicate that audit costs will increase in the range of 26% to 250% due to hours worked, with the lower end of the range having a higher probability. Therefore, it is reasonable to expect the 0.6% audit cost provision to increase by 0.2 to 0.4 points due to introduction of hours worked for affected classes.

Use of hours worked will also increase the internal administrative costs of insureds who do not normally compensate employees on an hourly basis. We are not able to estimate the level of these costs; however, they may be significant for insureds who would be required to implement a new record-keeping system for this purpose.

Through Arthur Andersen, NCCI has provided estimates (Exhibit 7) of the additional costs that reporting and using hours worked would entail if this exposure element were fully integrated into the rating system. The Council has provided the estimates under two scenarios:

1. hours worked are integrated on a stand alone basis, and
2. hours worked are integrated as part of a more extensive rewrite of the statistical plan and policy information system currently under review.

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The following table summarizes the NCCI cost estimates:

HOURS WORKED IMPLEMENTATION COSTS

<u>Function</u>	<u>Initial Costs</u>		<u>Ongoing Costs</u>
	<u>Stand Alone</u>	<u>Part of Rewrite</u>	
Reporting	\$150,000	\$ 0	\$20,000
Ratemaking	375,000	75,000	0
Experience Rating	<u>450,000</u>	<u>75,000</u>	<u>0</u>
Total	\$975,000	\$150,000	\$20,000

Although implementation costs in the \$150,000 to \$975,000 range are not insignificant, the expense as a percentage of nationwide premium is negligible. However, there would be indirect costs that defy estimation. For example, NCCI indicated that the magnitude of this project could impede their ability to proceed with other system development efforts at the same time. The inherent delays could have some cost impact. As the discussion above illustrates, it is extremely difficult, if not impossible, to derive an accurate total cost estimate for capturing and using hours worked. To a large extent, this is dependent on exactly how the new exposure base is integrated into the rating system. However, we do believe that sufficient information does exist to permit a rough estimate as summarized below:

HOURS WORKED IMPLEMENTATION COSTS ESTIMATED AS A PERCENTAGE OF PREMIUM

Insurer/NCCI Audits	0.2% to 0.4%
Insured/Agent Record-Keeping ¹⁵	0.1% to 0.2%
NCCI Costs ¹⁶	<u>0.1% to 0.1%</u>
Total	0.4% to 0.7%

15 Estimated as 50% of the insurer/NCCI audit costs.

16 Reflects the Arthur Andersen findings and the uncertainty inherent in the estimates contained therein.

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In total, this data implies that universal introduction of hours worked into workers compensation rating for all insureds would add approximately 0.4% to 0.7% to the total system costs. Of course, this analysis is premised on the assumption that hours worked data is available. As discussed below, this assumption cannot be verified for all categories of insureds.

C. Analysis of Feasibility

As indicated above, the cost of compiling hours worked for purposes of a workers compensation premium base may be manageable. However, the ability to compile hours worked at a reasonable cost does not guarantee that the resulting data is suitable for determining premiums, even if there is a strong theoretical argument in favor of its use. Our foundation for this statement is Dorweiler's comment on practicality and the following quote from Insurance Company Operations, Volume II, Webb et al.:

"Second, it [a good exposure base] should be easy for the insurer to determine. Finally, it should be difficult for the insured to manipulate."

The following paragraphs provide a review of the practical problems inherent in hours worked compilation that are not directly related to the costs of the process. This discussion is included under the expense evaluation heading because these problems do result in indirect expenses that may be borne by the insurers and ultimately will be borne by some segment of the insured population.

Based on our review of historical information supplemented with our survey results, the key drawback to use of hours worked is that not all employers currently collect this data. There does not appear to be a universal requirement to collect this data, for reasons unrelated to workers compensation insurance. Even in those jurisdictions where this information is compiled (e.g., Washington), there is reliance on presumptive rules for approximating hours worked in those situations where compensation is not directly related to time worked.

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Conceivably, use of the same presumptive rules could be extended to workers compensation as well. However, this would introduce an arbitrary aspect to workers compensation rating that does not exist under the payroll based system.

This action would neither enhance quantification of inherent hazard nor improve the accuracy of the exposure medium. Therefore, introduction of hours worked would have minimal, if any, benefit from an equity standpoint for most classes of employment that are not predominantly populated by employees compensated on an hourly basis.

Assuming that hours worked was used as a supplemental exposure medium for only the employers who compensate employees on an hourly basis, the task of identifying such employer groups remains. The data compiled for this study suggests that this is not a simple undertaking. For example, a study (Exhibit 6) of New York construction employers, conducted by the New York Compensation Insurance Rating Board, indicated that only 53% of the employers audited had some form of hourly records. Furthermore, none of the employers who maintained hourly records maintained them by category of work activity that would approximate the current workers compensation classification system.

Thus, even with a group of employers (e.g., contractors) that are predominantly in an hourly wage industry, the type of records needed to use hours worked as an exposure base apparently are not now maintained in a format consistent with payroll. This situation leads to the following choices:

1. create and impose a new record-keeping requirement just for workers compensation, or
2. allow those who do maintain hours worked to access a special rating plan for workers compensation.

The first approach would be a violation of the "already used...for other than insurance purposes" tenet. The second approach would create an opportunity for adverse selection that could jeopardize the financial soundness of the rating plan.

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We anticipate that the availability and comparability of hours worked records will vary greatly by jurisdiction and by employer group. However, it is not clear, based on the current state of records maintained, that hours worked are as readily verifiable as payroll data. Successful introduction of hours worked as a supplemental exposure base may require a re-orientation of record-keeping among insureds that is not just a matter of cost.

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VI. RECOMMENDATIONS

As indicated in prior sections of this report, we do believe that wage recognition can improve rate equity for certain groups of insureds. Furthermore, the cost of compiling and using hours worked as an exposure base supplement for employers who pay the employees on this basis appears to be manageable. However, universal implementation of an hours worked or wage differentiation plan would be counterproductive from an equity standpoint.

In response to these findings, we recommend continued judicious use of wage recognition plans only for those states and those classes of employment identified as having residual inequities after application of RERP to the unlimited payroll exposure base. Even for those classes, equity will not be served by substituting hours worked for unlimited payroll. Rather, we suggest a plan that combines wage rates with unlimited payroll.

At this time, we are aware of two categories of wage differentiation plans in use. The first category, which is referred to as the California plan, segregates the construction class employees into two tiers based on an hourly wage threshold. A higher rate per \$100 of unlimited payroll is applicable to employees classified below the threshold. The second category of plans (i.e., the CCPAP plans), provide discounts for average hourly payrolls above a specified level. The result is a multi-tiered discount schedule ranging from 0% to 20% or 25%.

In our opinion, the CCPAP approach is preferable. This plan, which provides for a graduated scale of discounts based on wage differentials, would appear to enhance rate equity more than a two-tiered system. Additionally, the incentive to manipulate data at or near the two-tier wage boundary would be diminished.

There are variations in the treatment of experience rating modifiers among the CCPAP plans in use. Under the original Florida plan, the CCPAP discount and experience rating modifier are independent and unrelated rating steps. Under the Missouri and Oregon plans, insureds qualify for CCPAP only if their experience modification is no greater than 1.05 and 1.00, respectively. Under the Massachusetts plan, only experience rated risks are eligible and the expected losses for the experience rating calculation are adjusted for the applicable CCPAP discount.

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Particularly with the introduction of RERP, we believe that independent application of CCPAP and experience rating modifications will over-compensate for inequities caused by wage differentials. The Missouri and Oregon plans partially address this issue through qualifications standards based on the magnitude of the experience rating factor. The Massachusetts plan (see Exhibit 4) more formally integrates the CCPAP credits with experience rating and, in our opinion, is the best available prototype for future use. However, even this plan has certain features (e.g., application only to experience rate risks without an experience modifier qualification criterion) that deserve further review.

A key characteristic of all CCPAP plans is that the insured is responsible for collecting the hours worked and average hourly wage data in a readily verifiable format. Given that the plans offer only discounts, there is no disincentive to compile the necessary wage data. With the uncertainty surrounding the availability of hours worked for all employers within a targeted class, we believe that these are absolutely essential features of CCPAP.

Two potentially negative attributes concerning CCPAP should be considered. First, those insureds who do not qualify for wage discounts will pay more as the class base rates are increased to offset applicable credits. This is not necessarily unfair, given the results of the Oregon study for low average wage paying employers. Second, those insureds who would qualify for discounts but have not compiled the necessary wage records will also pay more. To avoid such an increase in workers compensation premiums, these insureds will have to assume a new record-keeping burden and the attendant costs.

The average hourly wage thresholds and the corresponding discounts under CCPAP have historically been a matter of judgment. Given the lack of empirical data, this is understandable. However, if CCPAP is to be expanded to other jurisdictions or classes, it would be advisable to establish more formal guidelines for developing wage rate discount schedules. The following are our recommendations:

1. Only those classes that have a verifiably wide range of wages for the same type and locale of work activity should be subject to the schedules. Wage differentials attributable to variances in economic conditions by region or job safety characteristics

ALTERNATIVE EXPOSURE BASES

would not be a motivating factor for a discount plan. Due to variations by jurisdiction, we are reluctant to define a "verifiably wide range." However, we understand that this situation is likely to occur when two or more distinct wage scales are applicable. This would appear to be common for classes with a significant population of both union and non-union employees.

2. Discounts should only be applicable for insureds with an average hourly wage that exceeds the average hourly wage for all the subject CCPAP plan classes combined. This approach specifically limits application of discounts to classes with "higher than average" wages; i.e., those most likely to experience a residual inequity.
3. The maximum discount should only be applicable at an average wage generating at least the maximum indemnity benefits in the jurisdiction.
4. The actual scaling of the discounts by average wage category would be dependent on two factors. The first is the actual benefit structure in the jurisdiction. The second is the actual dispersion of wages for the subject classes.
5. A formal survey procedure for determining average wages and the variances about the average should be instituted. This will facilitate development of reasonable discounts and estimation of resulting offsets.
6. The survey should be updated annually or bi-annually until such time as empirical data is compiled.

A major drawback to the CCPAP plans is that there does not presently exist a mechanism to test the appropriateness of the discounts. NCCI has developed a procedure to monitor the offsets by class that the discount schedule creates. However, no procedure for regularly comparing the loss experience of insureds falling into the various discount categories has been established. As a result, no empirical data on which to base adjustments to the CCPAP discount schedule is readily or routinely captured.

One of the primary reasons for not capturing premium and loss data by CCPAP discount category is that this information is not included in the Workers Compensation Statistical Plan (WCSP). This is understandable since the CCPAP plans

ALTERNATIVE EXPOSURE BASES

were not considered permanent by NCCI and, therefore, did not warrant a change in the WCSP structure. However, we recommend that the WCSP be modified to capture the CCPAP discount class data if this rating approach is extended to other jurisdictions. At this time, the CCPAP plan appears to warrant a more permanent position in NCCI's ratemaking efforts.

From an analytical standpoint, the ideal modification to the WCSP would be to actually record the average hourly wage by class. However, this approach would substantially complicate the WCSP coding process and would consume valuable unit report space. A practical alternative would be to assign a one or two digit sub-class code for insureds participating in the CCPAP based on the magnitude of the discount by class.

One problem with the CCPAP's as they now exist, is that the average hourly wage thresholds are static. There is not an automatic mechanism for adjusting the thresholds for changes in wage levels that occur as the result of general inflation or collective bargaining agreements. If no adjustments are made, the number of insureds receiving discounts will increase without justification. Ultimately, the original value of wage rate differentiation will be diminished. Therefore, we recommend that the wage thresholds inherent in the CCPAP plans be indexed to average statewide wage changes or a similar indicator. At a minimum, the wage thresholds should be subject to regular review on an annual or bi-annual basis.

As a final recommendation, we do suggest that the NAIC consider additional research regarding the CCPAP plans. The objectives of this research would be two-fold:

- to update the 1984-1985 Oregon empirical data with a compilation and review of actual premium and loss experience under the Florida CCPAP plan, and
- to further evaluate the attributes of the Massachusetts CCPAP for incorporation into a universal prototype plan.

ALTERNATIVE EXPOSURE BASES

VII. EXHIBITS AND GRAPHS

<u>Graph Number</u>	<u>Title</u>
I	Total Claim Cost Relativity by Wage
II	Indemnity Claim Cost Relativity by Wage
III	Medical Claim Cost Relativity by Wage
IV	Average Duration by Wage

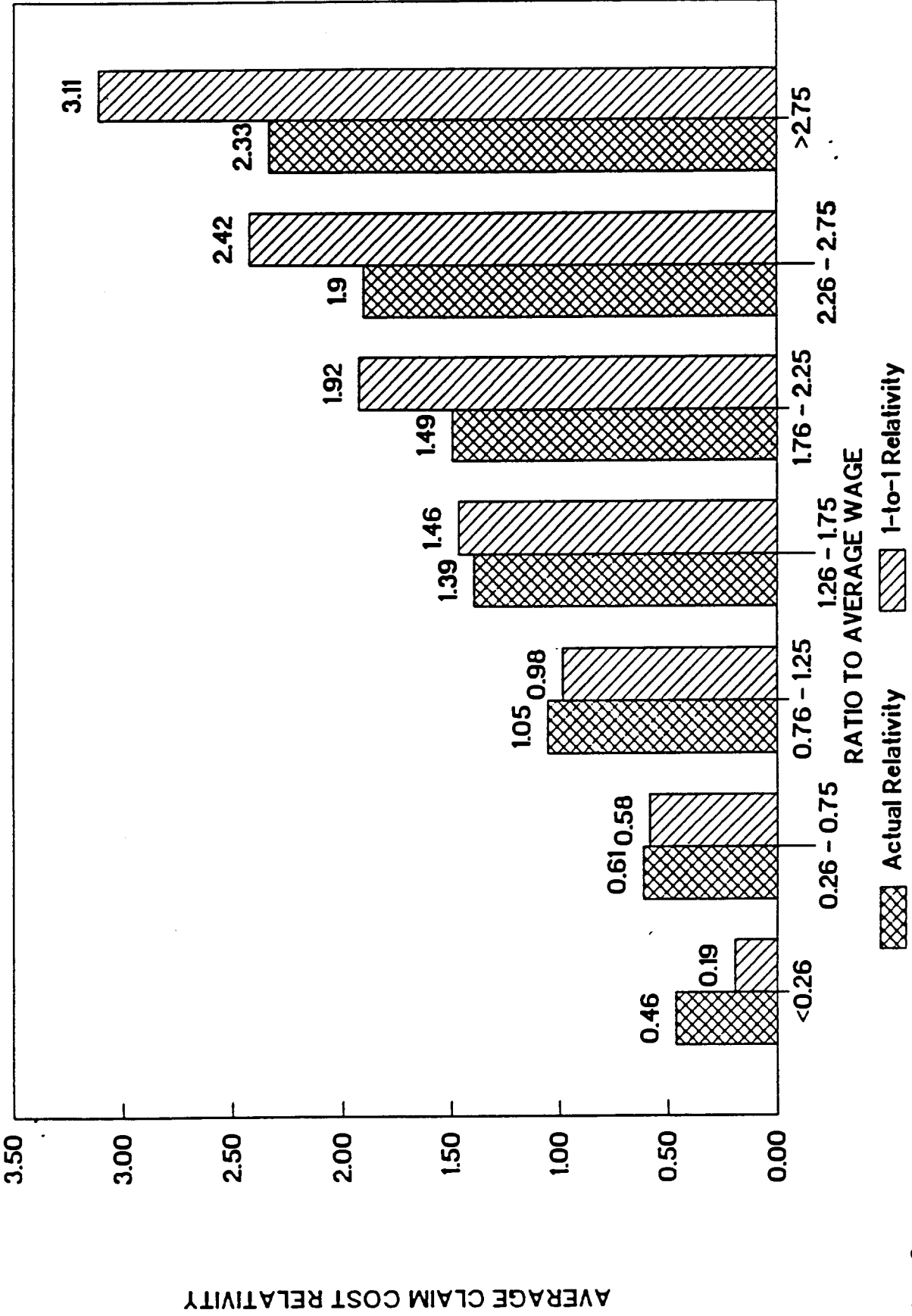
<u>Exhibit Number</u>	<u>Title</u>
1	Comparison of Revised Experience Rating Plan and Construction Classification Premium Adjustment Plan
2	Florida Contracting Classification Premium Adjustment Plan
3	Missouri Contracting Classification Premium Adjustment Plan
4	Massachusetts Construction Classification Premium Adjustment Plan
5	Oregon Loss Ratio Adjustment Program
6	New York Compensation Insurance Rating Board Contractor Class Study
7	NCCI Alternative Exposure Base Cost Estimates
8	NCCI Correspondence Concerning Cost/Wage Relativity Graphs

ALTERNATIVE EXPOSURE BASES

TOTAL CLAIM COST RELATIVITY BY WAGE

GRAPH I

CONTRACTING CLASSES

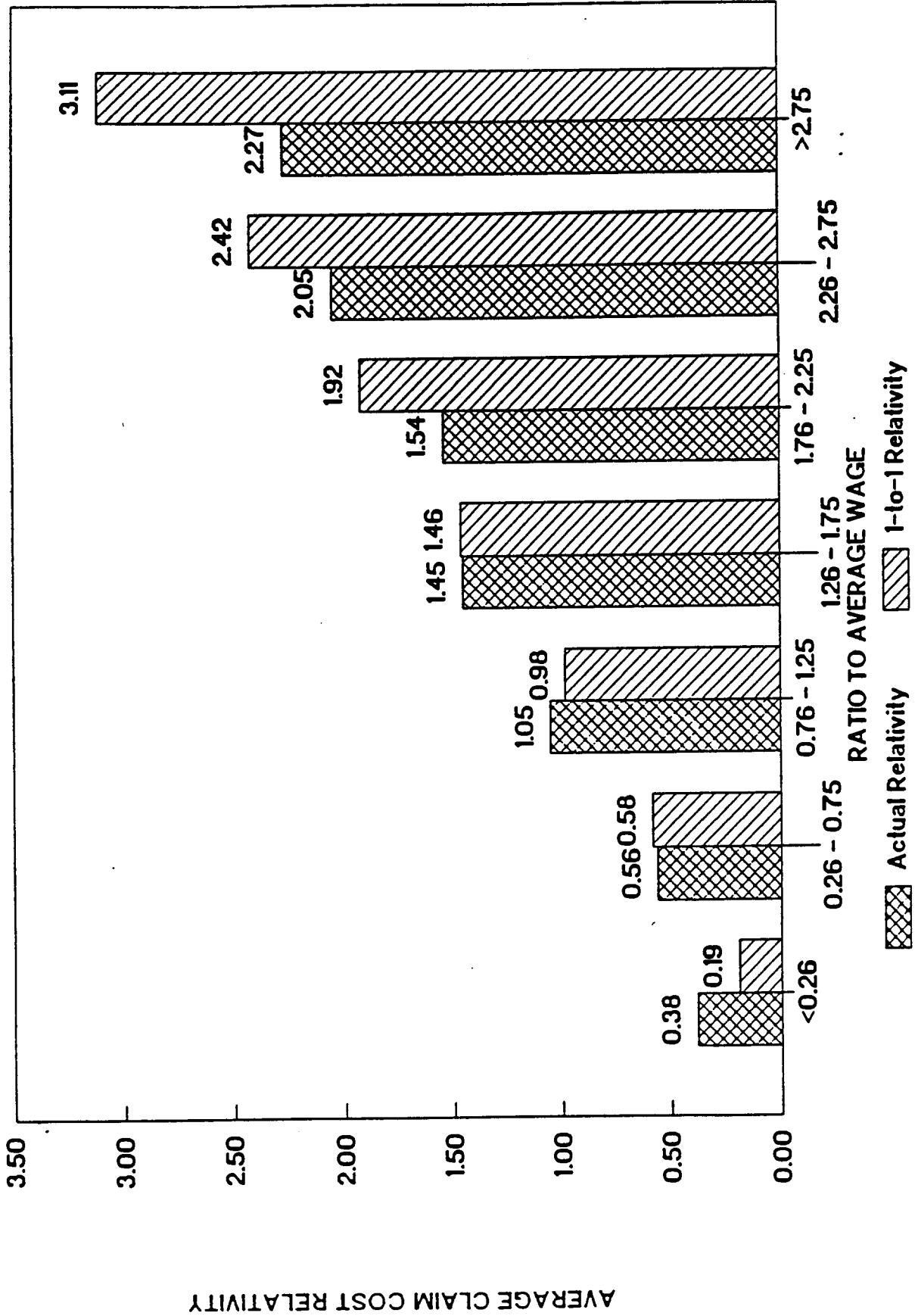


Data Source:
Detailed Claim Information
NATIONAL COUNCIL ON COMPENSATION INSURANCE

INDEMNITY CLAIM COST RELATIVITY BY WAGE

GRAPH II

CONTRACTING CLASSES

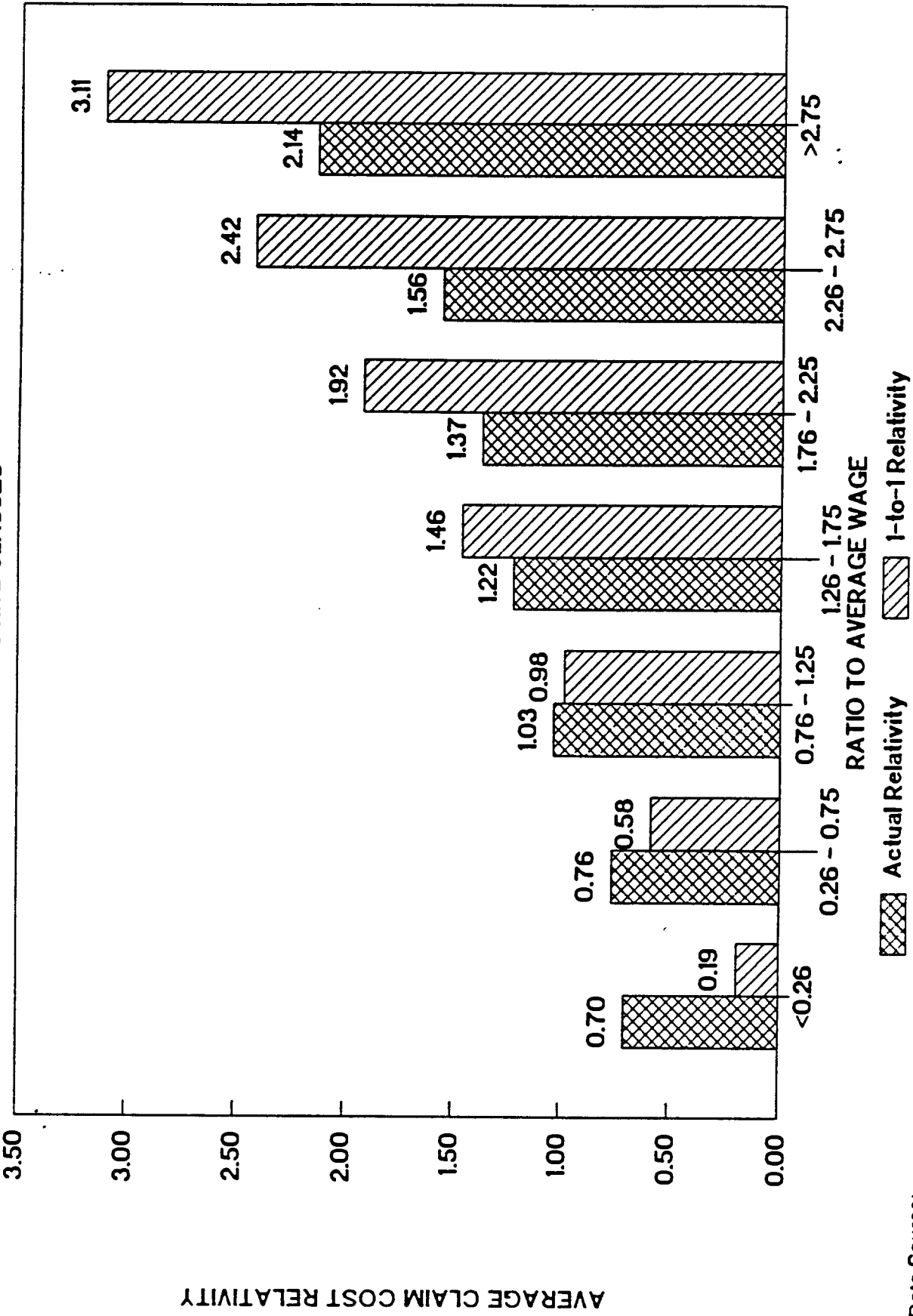


Data Source:
 Detailed Claim Information
 NATIONAL COUNCIL ON COMPENSATION INSURANCE

MEDICAL CLAIM COST RELATIVITY BY WAGE

GRAPH III

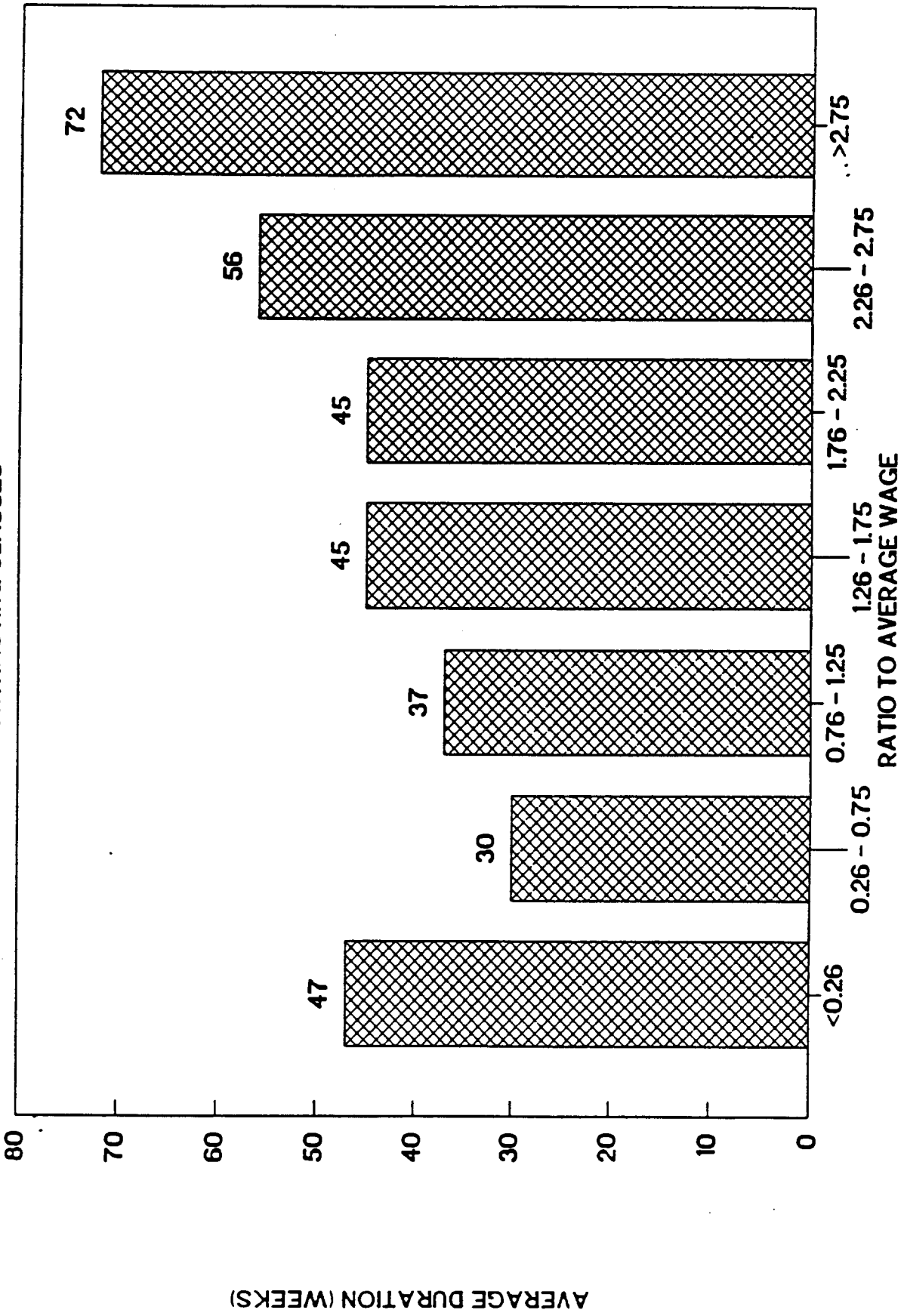
CONTRACTING CLASSES



Data Source:
Detailed Claim Information
NATIONAL COUNCIL ON COMPENSATION INSURANCE

AVERAGE DURATION BY WAGE

CONTRACTING CLASSES



Data Source:
Detailed Claim Information
NATIONAL COUNCIL ON COMPENSATION INSURANCE

ALTERNATIVE EXPOSURE BASES

EXHIBIT 1

**COMPARISON OF REVISED EXPERIENCE RATING
PLAN AND CONSTRUCTION CLASSIFICATION PREMIUM
ADJUSTMENT PLAN**

ALTERNATIVE EXPOSURE BASES

COMPARISON OF REVISED EXPERIENCE RATING PLAN AND
CONSTRUCTION CLASSIFICATION PREMIUM ADJUSTMENT PLAN

SCENARIO #1

I. Average Contractor

<u>Employer Number</u>	<u>Theoretical Cost</u>	<u>RERP Premium</u>	<u>Variance From Cost</u>	<u>CCPAP Premium</u>	<u>Variance From Cost</u>
1	\$ 20,000	\$ 19,587	-2.1%	\$ 19,832	-0.8%
2	20,000	22,460	12.3	20,133	0.7
3	20,000	15,590	-22.1	18,602	-7.0
4	20,000	19,871	-0.6	20,123	0.6
5	20,000	25,394	27.0	22,608	13.0
6	20,000	17,571	-12.1	21,158	5.8
7	20,000	22,460	12.3	20,133	0.7
8	20,000	22,197	11.0	19,914	-0.4
9	20,000	14,734	-26.3	17,477	-12.6
10	<u>20,000</u>	<u>20,136</u>	0.7	<u>20,021</u>	0.1
Total	\$200,000	\$200,000	0.0%	\$200,000	0.0%

II. Large Contractor (Ten Times Average Contractor)

<u>Employer Number</u>	<u>Theoretical Cost</u>	<u>RERP Premium</u>	<u>Variance From Cost</u>	<u>CCPAP Premium</u>	<u>Variance From Cost</u>
1	\$ 200,000	\$ 194,566	-2.7%	\$ 195,930	-2.0%
2	200,000	213,164	6.6	195,862	-2.1
3	200,000	173,061	-13.5	195,866	-2.1
4	200,000	198,753	-0.6	200,161	0.1
5	200,000	243,066	21.5	223,007	11.5
6	200,000	195,079	-2.5	221,395	10.7
7	200,000	213,164	6.6	195,862	-2.1
8	200,000	210,141	5.1	193,114	-3.4
9	200,000	161,899	-19.1	182,969	-8.5
10	<u>200,000</u>	<u>197,107</u>	-1.4	<u>195,812</u>	-2.1
Total	\$2,000,000	\$2,000,000	0.0%	\$2,000,000	0.0%

COMPARISON OF REVISED EXPERIENCE RATING PLAN AND
CONSTRUCTION CLASSIFICATION PREMIUM ADJUSTMENT PLAN

SCENARIO #2

I. Average Contractor

<u>Employer Number</u>	<u>Theoretical Cost</u>	<u>RERP Premium</u>	<u>Variance From Cost</u>	<u>CCPAP Premium</u>	<u>Variance From Cost</u>
1	\$ 20,000	\$ 20,125	0.6%	\$ 19,983	-0.1%
2	20,000	23,391	17.0	20,123	0.6
3	20,000	14,814	-25.9	19,613	-1.9
4	20,000	20,177	0.9	19,925	-0.4
5	20,000	24,327	21.6	20,861	4.3
6	20,000	15,131	-24.3	20,118	0.6
7	20,000	23,391	17.0	20,123	0.6
8	20,000	23,097	15.5	19,893	-0.5
9	20,000	14,626	-26.9	19,310	-3.5
10	<u>20,000</u>	<u>20,921</u>	4.6	<u>20,050</u>	0.3
Total	\$200,000	\$200,000	0.0%	\$200,000	0.0%

II. Large Contractor (Ten Times Average Contractor)

<u>Employer Number</u>	<u>Theoretical Cost</u>	<u>RERP Premium</u>	<u>Variance From Cost</u>	<u>CCPAP Premium</u>	<u>Variance From Cost</u>
1	\$ 200,000	\$ 200,996	0.5%	\$ 199,221	-0.4%
2	200,000	223,707	11.9	199,161	-0.4
3	200,000	162,552	-18.7	199,244	-0.4
4	200,000	201,770	0.9	199,181	-0.4
5	200,000	233,608	16.8	207,835	3.9
6	200,000	167,903	-16.5	205,018	2.5
7	200,000	223,707	11.9	199,161	-0.4
8	200,000	220,443	10.2	196,300	-1.9
9	200,000	159,712	-20.1	195,633	-2.2
10	<u>200,000</u>	<u>206,410</u>	3.2	<u>199,246</u>	-0.4
Total	\$2,000,000	\$2,000,000	0.0%	\$2,000,000	0.0%

ASSUMPTIONS

1a. SCENARIO #1 - Cost/Benefit Structures:

- a. 40% of cost for medical benefits.
- b. 10% of cost for low maximum compensation (e.g., "permanent partial" benefits).
- c. 50% of cost for high maximum compensation (e.g., "temporary total" benefits).
- d. \$600 weekly wages qualifies for maximum compensation.
- e. Frequency related to hours worked.
- f. Medical costs increase 20% for doubling of weekly wages.
- g. Indemnity severity varies due to weekly wages.

1b. SCENARIO #2 - Cost/Benefit Structures:

- a. 40% of cost for medical benefits.
- b. 50% of cost for low maximum compensation (e.g., "permanent partial" benefits).
- c. 10% of cost for high maximum compensation (e.g., "temporary total" benefits).
- d. \$600 weekly wages qualifies for maximum compensation.
- e. Frequency related to hours worked.
- f. Medical costs increase 20% for doubling of weekly wages.
- g. Indemnity severity varies due to weekly wages.

2. Average worker works 35 hours per week, 45 weeks per year, at \$16 per hour.

3. RERP structure:

- a. Average claim size \$2750.
- b. D-ratio 30%.
- c. Expected loss rate 50% of prospective cost.
- d. Average loss experience; for average contractor (only) severity proportional to average weekly wage.
- e. Adjusted overall collected premium for the ten given employers (includes offset to manual rates for RERP and CCPAP).

CALCULATIONS FOR EMPLOYER NUMBER 1

SCENARIO #1

	<u>RERP</u>	<u>CCPAP</u>
1. Weekly Wages per Employee	\$ 560	\$ 560
2. Annual Wages per Employee	25,200	25,200
3. Payroll for Eight Employees	201,600	201,600
4. Manual Rate	9.64	12.21
5. Hourly Wage Credit		19.7%
6. Manual Premium	19,434	19,766
7. Expected Losses	29,144	29,651
8. Actual Primary Losses	9,000	9,000
9. Actual Excess Losses	21,000	21,000
10. B	9,363	9,421
11. W	0.091	0.092
12. Mod Factor	1.008	1.003
14. Actual Premium	\$ 19,587	\$ 19,832

NOTES:

1. Actual calculations used more significant digits than shown above.
2. Above rounding conventions may not be followed in any given state.

NOTES FOR EXHIBIT 3a
CALCULATIONS FOR EMPLOYER NUMBER 1

SCENARIO #1

The hourly wage, the number of hours worked per week, and the number of weeks worked per year vary according to the description shown on page 4 of Exhibit 1. The theoretical cost is based on the assumptions given on page 2. These assumptions include the percentage of costs that are attributable to medical benefits (40%), low maximum compensation (10%), and high maximum compensation (50%). In addition, medical benefits are assumed to increase 20% for a doubling of wages; and wages of \$600 per week qualifies for the maximum benefit. These costs are shown on page 5. The cost factors have been reduced to a cost per hour worked, which is a function of the weekly wage. Obviously, this cost function is hypothetical and it makes various assumptions that might not be subject to measurement in practice.

For each sample employer, the weekly wage and cost per hour worked are shown on page 4. The example has been constructed so that each employer has the same theoretical cost (\$20,000 or \$200,000) for the year. The total number of hours worked for the employer for the year is determined by dividing the annual theoretical cost by the cost per hour worked.

The manual rates have been balanced to the total cost for the sample group of employers. This follows the normal ratemaking procedure of balancing premiums and costs for the given insured population. The hourly wage credits are based on the theoretical cost function, converting the weekly wage to an hourly wage by dividing by 35.

The manual premium for an employer is determined by multiplying the total payroll by the manual rate (and subtracting the hourly wage credit, for the CCPAP calculation). The expected losses are 150% of the manual premium (subject to rounding). This results from using three years of experience and assuming that expected losses for one year will be 50% of premium for that year. The actual primary and excess losses are assumed to be the same for all employers; the total for all employers equals 150% of the theoretical cost. The B, W, and mod factor calculations all correspond to the current RERP formula, with an average claim size of \$2,750 (subject to rounding differences). The actual premium is the manual premium times the mod factor.

DESCRIPTION OF SAMPLE EMPLOYERS

SCENARIO #1

Sample	Description	Hourly Wage	Per Employee Hours/Week	Weeks/Year	Total Hours	Number of Employees	Total Payroll	Weekly Wage	Theoretical Cost Per Hour	Total Hours
1	Average Wage	\$16	35	45	1,575	8.0	\$201,600	\$560	\$1.587	12,600
2	High Wage	20	35	45	1,575	7.6	238,614	700	1.676	11,931
3	Low Wage	10	35	45	1,575	10.3	161,817	350	1.236	16,182
4	Mix of Wages	20	35	45	1,575	4.0	126,000	700	1.676	6,300
	Total	12	35	45	1,575	4.4	83,727	420	1.353	6,977
	Total					8.4	209,727		1.506	13,277
5	Parttime/High Wage	20	20	45	900	16.8	302,769	400	1.321	15,138
6	Parttime/Low Wage	10	20	45	900	22.5	202,588	200	0.987	20,259
7	Seasonal	20	35	20	700	17.0	238,614	700	1.676	11,931
8	Overtime/High Wage	20	45	45	2,025	5.7	232,441	900	1.721	11,622
9	Overtime/Low Wage	10	45	45	2,025	7.0	142,510	450	1.403	14,251
10	Slightly Higher	17	35	45	1,575	7.7	206,519	595	1.646	12,148

DESCRIPTION OF SAMPLE EMPLOYERS

SCENARIO #2

Sample	Description	Per Employee			Number of Employees	Total Payroll	Weekly Wage	Theoretical Cost Per Hour	Total Hours
		Hourly Wage	Hours/Week	Weeks/Year					
1	Average Wage	\$16	35	45	8.0	\$201,600	\$1,587	12,600	
2	High Wage	20	35	45	7.8	245,449	1,630	12,272	
3	Low Wage	10	35	45	8.6	135,101	1,480	13,510	
4	Mix of Wages	20	35	45	4.0	126,000	1,630	6,300	
	Total	12	35	45	4.1	77,040	1,516	6,420	
5	Parttime/High Wage	20	20	45	8.1	203,040	1,572	12,720	
6	Parttime/Low Wage	10	20	45	14.8	265,537	1,506	13,277	
7	Seasonal	20	35	20	15.8	142,421	1,404	14,242	
8	Overtime/High Wage	20	45	45	17.5	245,449	1,630	12,272	
9	Overtime/Low Wage	10	45	45	5.9	238,953	1,674	11,948	
10	Slightly Higher	17	35	45	6.5	130,597	1,531	13,060	
					7.9	211,761	1,606	12,457	

COST FUNCTION AND HOURLY WAGE CREDITS

SCENARIO #1

Weekly Wage	Cost Per 10,332 Hours Worked				Cost Per Hour	Hourly Wage (35/Wk)	Credit
	Low Indemnity	Medical Benefits	Variable Indemnity	Total Cost			
\$175.0	\$1,600	\$5,520	\$2,625	\$9,745	\$0.943	\$5.00	0
192.5	1,600	5,560	2,888	10,048	0.972	5.50	0
210.0	1,600	5,600	3,150	10,350	1.002	6.00	0
227.5	1,600	5,640	3,413	10,653	1.031	6.50	0
245.0	1,600	5,680	3,675	10,955	1.060	7.00	0
262.5	1,600	5,720	3,938	11,258	1.090	7.50	0
280.0	1,600	5,760	4,200	11,560	1.119	8.00	0
297.5	1,600	5,800	4,463	11,863	1.148	8.50	0
315.0	1,600	5,840	4,725	12,165	1.177	9.00	0
332.5	1,600	5,880	4,988	12,468	1.207	9.50	0
350.0	1,600	5,920	5,250	12,770	1.236	10.00	0.0%
367.5	1,600	5,960	5,513	13,073	1.265	10.50	2.5
385.0	1,600	6,000	5,775	13,375	1.295	11.00	4.8
402.5	1,600	6,040	6,038	13,678	1.324	11.50	6.9
420.0	1,600	6,080	6,300	13,980	1.353	12.00	8.8
437.5	1,600	6,120	6,563	14,283	1.382	12.50	10.5
455.0	1,600	6,160	6,825	14,585	1.412	13.00	12.1
472.5	1,600	6,200	7,088	14,888	1.441	13.50	13.6
490.0	1,600	6,240	7,350	15,190	1.470	14.00	15.0
507.5	1,600	6,280	7,613	15,493	1.499	14.50	16.3
525.0	1,600	6,320	7,875	15,795	1.529	15.00	17.5
542.5	1,600	6,360	8,138	16,098	1.558	15.50	18.7
560.0	1,600	6,400	8,400	16,400	1.587	16.00	19.7
577.5	1,600	6,440	8,663	16,703	1.617	16.50	20.7
595.0	1,600	6,480	8,925	17,005	1.646	17.00	21.7
612.5	1,600	6,520	9,000	17,120	1.657	17.50	23.4
630.0	1,600	6,560	9,000	17,160	1.661	18.00	25.3
647.5	1,600	6,600	9,000	17,200	1.665	18.50	27.2
665.0	1,600	6,640	9,000	17,240	1.669	19.00	28.9
682.5	1,600	6,680	9,000	17,280	1.672	19.50	30.6
700.0	1,600	6,720	9,000	17,320	1.676	20.00	32.2
717.5	1,600	6,760	9,000	17,360	1.680	20.50	33.7
735.0	1,600	6,800	9,000	17,400	1.684	21.00	35.1
752.5	1,600	6,840	9,000	17,440	1.688	21.50	36.5
770.0	1,600	6,880	9,000	17,480	1.692	22.00	37.8
787.5	1,600	6,920	9,000	17,520	1.696	22.50	39.0
805.0	1,600	6,960	9,000	17,560	1.700	23.00	40.2
822.5	1,600	7,000	9,000	17,600	1.703	23.50	41.4
840.0	1,600	7,040	9,000	17,640	1.707	24.00	42.4
857.5	1,600	7,080	9,000	17,680	1.711	24.50	43.5
875.0	1,600	7,120	9,000	17,720	1.715	25.00	44.5
892.5	1,600	7,160	9,000	17,760	1.719	25.50	45.5
910.0	1,600	7,200	9,000	17,800	1.723	26.00	46.4
927.5	1,600	7,240	9,000	17,840	1.727	26.50	47.3
945.0	1,600	7,280	9,000	17,880	1.731	27.00	48.1
962.5	1,600	7,320	9,000	17,920	1.734	27.50	49.0
980.0	1,600	7,360	9,000	17,960	1.738	28.00	49.8

COST FUNCTION AND HOURLY WAGE CREDITS

SCENARIO #2

Weekly Wage	Cost Per 10,383 Hours Worked				Cost Per Hour	Hourly Wage (35/Wk)	Credit
	Low Indemnity	Medical Benefits	Variable Indemnity	Total Cost			
\$175.0	\$8,400	\$5,520	\$ 525	\$14,445	\$1.391	\$5.00	0
192.5	8,400	5,560	578	14,538	1.400	5.50	0
210.0	8,400	5,600	630	14,630	1.409	6.00	0
227.5	8,400	5,640	683	14,723	1.418	6.50	0
245.0	8,400	5,680	735	14,815	1.427	7.00	0
262.5	8,400	5,720	788	14,908	1.436	7.50	0
280.0	8,400	5,760	840	15,000	1.445	8.00	0
297.5	8,400	5,800	893	15,093	1.454	8.50	0
315.0	8,400	5,840	945	15,185	1.462	9.00	0
332.5	8,400	5,880	998	15,278	1.471	9.50	0
350.0	8,400	5,920	1,050	15,370	1.480	10.00	0.0%
367.5	8,400	5,960	1,103	15,463	1.489	10.50	4.2
385.0	8,400	6,000	1,155	15,555	1.498	11.00	8.0
402.5	8,400	6,040	1,208	15,648	1.507	11.50	11.5
420.0	8,400	6,080	1,260	15,740	1.516	12.00	14.7
437.5	8,400	6,120	1,313	15,833	1.525	12.50	17.6
455.0	8,400	6,160	1,365	15,925	1.534	13.00	20.3
472.5	8,400	6,200	1,418	16,018	1.543	13.50	22.8
490.0	8,400	6,240	1,470	16,110	1.552	14.00	25.1
507.5	8,400	6,280	1,523	16,203	1.560	14.50	27.3
525.0	8,400	6,320	1,575	16,295	1.569	15.00	29.3
542.5	8,400	6,360	1,628	16,388	1.578	15.50	31.2
560.0	8,400	6,400	1,680	16,480	1.587	16.00	33.0
577.5	8,400	6,440	1,733	16,573	1.596	16.50	34.7
595.0	8,400	6,480	1,785	16,665	1.605	17.00	36.2
612.5	8,400	6,520	1,800	16,720	1.610	17.50	37.8
630.0	8,400	6,560	1,800	16,760	1.614	18.00	39.4
647.5	8,400	6,600	1,800	16,800	1.618	18.50	40.9
665.0	8,400	6,640	1,800	16,840	1.622	19.00	42.3
682.5	8,400	6,680	1,800	16,880	1.626	19.50	43.7
700.0	8,400	6,720	1,800	16,920	1.630	20.00	45.0
717.5	8,400	6,760	1,800	16,960	1.633	20.50	46.2
735.0	8,400	6,800	1,800	17,000	1.637	21.00	47.3
752.5	8,400	6,840	1,800	17,040	1.641	21.50	48.4
770.0	8,400	6,880	1,800	17,080	1.645	22.00	49.5
787.5	8,400	6,920	1,800	17,120	1.649	22.50	50.5
805.0	8,400	6,960	1,800	17,160	1.653	23.00	51.5
822.5	8,400	7,000	1,800	17,200	1.657	23.50	52.4
840.0	8,400	7,040	1,800	17,240	1.660	24.00	53.3
857.5	8,400	7,080	1,800	17,280	1.664	24.50	54.1
875.0	8,400	7,120	1,800	17,320	1.668	25.00	54.9
892.5	8,400	7,160	1,800	17,360	1.672	25.50	55.7
910.0	8,400	7,200	1,800	17,400	1.676	26.00	56.5
927.5	8,400	7,240	1,800	17,440	1.680	26.50	57.2
945.0	8,400	7,280	1,800	17,480	1.684	27.00	57.9
962.5	8,400	7,320	1,800	17,520	1.687	27.50	58.5
980.0	8,400	7,360	1,800	17,560	1.691	28.00	59.2

ALTERNATIVE EXPOSURE BASES

EXHIBIT 2
FLORIDA CONTRACTING CLASSIFICATION
PREMIUM ADJUSTMENT PLAN

ALTERNATIVE EXPOSURE BASES



Memorandum

Government, Consumer & Industry Affairs

December 5, 1990

FL-90-21

Page 1 of 2

Contact: James R. Nau, Director 407-997-4563

FLORIDA CONTRACTING CLASSIFICATION PREMIUM ADJUSTMENT PROGRAM

The premium adjustment program originally approved effective January 1, 1984, for employers having exposure in any of the contracting classifications in Florida, has been extended into 1991. This program is mandatory and is applicable to all policies having anniversary rating dates during 1991 covering one or more of the eligible contracting classifications.

The Florida Contracting Classification Premium Adjustment Program is designed to vary an employer's workers compensation premium by way of a premium credit based upon the employer's average wage level. While the initial determination of any applicable credit is computed on a class by class basis, the credit (if any) will be applied to the employer's entire Florida standard premium in order to facilitate the carrier's application of the credit.

The premium adjustment program does not provide for any premium debits. Therefore, rate changes were necessitated for all the applicable classifications in order to offset the premium credits.

The premium adjustment program (See Florida Basic Manual—Special Rule, Exhibit 1) shall be administered as follows:

1. Each carrier shall issue a letter having standardized text (Exhibit 2) to any insured having a policy containing one or more of the applicable classifications. One letter must be issued for each qualifying policy. This letter (which must be printed by each individual carrier) should be sent to the insured prior to policy issuance or within sixty days after effective date. The carrier must maintain proof of mailing in its files and make such proof available to the Florida Insurance Department on request.
2. The insured shall complete the required information and mail the completed form to NCCI's Atlantic Division, formerly South Atlantic Council on Compensation Insurance.
3. NCCI's Atlantic Division will compute the insured's average hourly wage for each classification, the applicable classification premium credit, and the overall policy credit factor. These calculations will be displayed on a Policy Credit Work Sheet (Exhibit 3). A copy of this work sheet will then be mailed to the carrier.
4. The carrier shall use this policy credit factor in the calculation of the insured's estimated premium at policy issuance. In those cases where the carrier receives the policy credit factor after the insured's policy has been issued, the policy shall be so endorsed (See Exhibit 4).
5. Upon audit, the carrier shall use the same policy credit factor in the calculation of the insured's final earned premium. Additionally, the carrier shall verify the data originally provided by the insured for the computation of the policy credit factor by reviewing those records upon which the insured's data was originally based. If this process uncovers any errors, revised payroll and/or hours worked, data must be submitted to NCCI's Atlantic Division. The revised data will be used to calculate a revised policy credit factor.

Contact: James R. Nau, Director 407-997-4563

6. The policy credit factor is to be applied to the premium determination process directly after the application of experience modification and prior to any deviations and premium discount. The policy credit factor, if available upon policy issuance, must be displayed on the policy Declarations Page. If the factor is not available upon policy issuance, the required endorsement must be attached to the policy.
7. The earned premium dollar adjustment amount due to the application of the policy credit factor must be reported on unit statistical reports under Classification Code 9046. This amount must be reported on lines D, E, F or G since it is not subject to experience modification (See Exhibit 5).
8. No adjustment to aggregate standard earned premium reported on the aggregate Calls for Experience is required because of this premium credit. In other words, reported aggregate standard earned premium must include the effects of these premium credits.

Please review the above, along with the attached exhibits, carefully with your underwriting, auditing and statistical personnel.

Attachments

**FLORIDA BASIC MANUAL—SPECIAL RULE
FLORIDA CONTRACTING CLASSIFICATION PREMIUM ADJUSTMENT PROGRAM**

The Florida Contracting Classification Premium Adjustment Program provides for a premium credit for up to one year for a policy which contains one or more contracting classifications. A credit may be applicable to those policies commencing with their anniversary date in calendar year 1991.

The basis for determining the credit is the total payroll (excluding overtime premium pay) and hours worked for each contracting classification for the third calendar quarter in 1990 as reported to taxing authorities. If the insured did not engage in operations for the complete quarter, then the last complete quarter prior to policy year inception shall be used or, if there was no complete quarter of operations prior to the policy inception, then the first complete quarter after policy inception shall be used. A credit may be determined for each contracting classification by dividing the total payroll, excluding overtime premium pay, by the number of hours worked to arrive at the average hourly wage for the classification. In the absence of specific records for salaried employees, it will be assumed each such individual worked forty (40) hours per week. The credit for average hourly wage is listed below:

<u>Average Hourly Wage</u>	<u>Credit From Manual Prem.</u>	<u>Average Hourly Wage</u>	<u>Credit From Manual Prem.</u>
\$ 9.99 or less	None	\$13.76–\$14.00	15%
\$10.00–\$11.50	5%	\$14.01–\$14.25	16%
\$11.51–\$11.75	6%	\$14.26–\$14.50	17%
\$11.76–\$12.00	7%	\$14.51–\$14.75	18%
\$12.01–\$12.25	8%	\$14.76–\$15.00	19%
\$12.26–\$12.50	9%	\$15.01–\$15.50	20%
\$12.51–\$12.75	10%	\$15.51–\$16.00	21%
\$12.76–\$13.00	11%	\$16.01–\$16.50	22%
\$13.01–\$13.25	12%	\$16.51–\$17.00	23%
\$13.26–\$13.50	13%	\$17.01–\$17.50	24%
\$13.51–\$13.75	14%	over \$17.50	25%

The total contracting classification credit amount, in dollars, must be calculated and then divided by the total policy premium at manual rates—including contracting and non-contracting classifications. The result would be the percentage credit which is to be applied to the 1991 policy. When calculating the total policy credit the percentage shall be rounded to the nearest whole number with .5 being rounded upward (as an example, 4.4 rounded to 4% and 4.5 rounded to 5%).

The insured shall submit the required payroll and hours worked information to the National Council on Compensation Insurance, Atlantic Division, for calculation of any applicable credit. The carrier shall, upon audit, verify the information that was submitted by the insured and used in the calculation of the credit. If the carrier discovers an error in the original request for policy credit, the revised information must be submitted to the National Council on Compensation Insurance, Atlantic Division, for recalculation. If the insured does not furnish records to verify the payrolls and hours worked originally submitted and used in the calculation of the credit, there shall be no credit applied to the policy.

The credit, authorized by the National Council on Compensation Insurance, Atlantic Division, shall appear on item 4 of the Policy. If the credit is not available at the time of policy issuance, the carrier shall endorse the policy to provide this credit information.

Carriers are required to use the approved form to notify all their insureds, who have one or more contracting classifications on their policy, that they may be eligible for a premium adjustment credit.

“Contracting classifications” are those classifications subject to the following code numbers:

0050	5040	5213	5445	5538	6018	6235	7601
0052	5057	5215	5462	5551	6045	6236	7855
1322	5059	5221	5474	5606	6204	6237	8227
3365	5069	5222	5479	5610	6206	6251	9534
3719	5102	5223	5480	5645	6213	6252	9545
3724	5146	5348	5491	5651	6214	6306	9549
3726	5160	5402	5506	5703	6216	6319	
5020	5183	5403	5507	6003	6217	6325	
5022	5188	5437	5508	6005	6229	6400	
5037	5190	5443	5509	6017	6233	7538	

(Name of Insured)
(Address)
(Anytown, State, Zip Code)

**FLORIDA CONTRACTING CLASSIFICATION PREMIUM ADJUSTMENT PROGRAM
WORKERS COMPENSATION PREMIUM CREDIT APPLICATION FOR 1991**

The Florida contracting classification Premium Adjustment program has been extended for employers engaged in contracting operations and is applicable to policies *with effective dates on or after January 1, 1991*.

A special premium calculation, which may result in a premium credit for you, will be based on average hourly pay rates for each classification of contracting operations. In order that your premium may be correctly established, please return the completed premium credit application, as set out on the reverse side of this letter, to the

National Council on Compensation Insurance
Atlantic Division
P.O. Box 3098
Boca Raton, FL 33431

They will advise us of any premium credit applicable.

If they do not receive this application, your 1990 premium calculation will not reflect any possible premium credit.

For each applicable classification (both contracting and non-contracting) covering your company's operations in the state of Florida, report the *total* Florida payroll (excluding overtime premium pay) and the corresponding *total* number of hours worked, *for the third calendar quarter (JULY, AUGUST, SEPTEMBER) of 1990 as reported to taxing authorities*.

Note #1: If you did not engage in contracting operations during the third quarter of 1990, the requested information to be provided should, then, be for the last complete calendar quarter prior to the effective date of your workers compensation policy.

Note #2: If you are a *new business (no prior operations)*, submit the requested information, *for the first complete calendar quarter following the effective date of your workers compensation policy when available*.

Note #3: In the absence of specific records for salaried employees, you should assume that each individual worked forty (40) hours per week.

Please preserve your payroll records which formed the basis for this declaration as we will be required to verify the reported information in order for any premium credit to be applied.

Thank you for your cooperation.

Sincerely,

Turn Page Over For Premium Credit Application



**Florida Contracting Classification Premium Adjustment Program
Policy Credit Worksheet**

Carrier: _____

Insured: _____

Policy Number: _____ Period: From _____ To _____

Non-Contracting Classifications:

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Class Code	Payroll	Manual Rate	Manual Premium [(2) ÷ 100] x 3	Average Hourly Wage	Credit Percentage	Credit Dollar Amount (4) x (6)
					XXX	XXX
					XXX	XXX
					XXX	XXX
					XXX	XXX
					XXX	XXX
					XXX	XXX

Contracting Classifications:

Total Manual Premium ▶ <i>(All Classifications)</i>				Total Credit ▶		

Total Manual Premium + Total Credit = Policy Credit ▶ 0. ____

1.00 - Policy Credit = Policy Credit Factor ▶ 0. ____

Prepared by: _____

FLORIDA CONTRACTING CLASSIFICATION PREMIUM ADJUSTMENT ENDORSEMENT

The premium for the policy may be adjusted by a Florida Contracting Classification Premium Adjustment factor. The factor was not available when the policy was issued. If you qualify, we will issue an endorsement to show the premium adjustment factor after it is calculated.

Notes:

1. This endorsement may be used when an insured's credit adjustment factor is not available when the policy is issued.
2. An appropriate typewritten entry may be made on the policy Information Page, Item 4, instead of using this endorsement.

STATISTICAL REPORTING

1. The earned premium dollar adjustment amount due to the application of the policy credit factor must be reported on unit statistical reports under Classification Code 9046. This amount must be reported on lines D, E, F or G since it is not subject to experience modification.
2. No adjustment to aggregate standard premium reported on the aggregate Call for Experience is required because of this premium credit. In other words, reported aggregate standard earned premium must include the effects of these premium credits.

ALTERNATIVE EXPOSURE BASES

EXHIBIT 3

**MISSOURI CONTRACTING CLASSIFICATION
PREMIUM ADJUSTMENT PLAN**

ALTERNATIVE EXPOSURE BASES

Memorandum

Government, Consumer & Industry Affairs

March 20, 1990

MO-90-1

Page 1 of 2

Contact: Kenneth Robinson, Director 314-843-4001

MISSOURI CONTRACTING CLASSIFICATION PREMIUM ADJUSTMENT PROGRAM

The Missouri Division of Insurance has approved the Missouri Contracting Classification Premium Adjustment Program effective January 1, 1990. The program will provide a premium credit to those eligible contracting employers paying wages in excess of \$12.00 per hour per contracting employee. Employers with an experience modification of 1.06 or higher are not eligible for this program. The initial calculation of any applicable credit is computed by classification. From these, a single credit will be developed to apply to the entire standard premium for Missouri.

This program does not provide for any offsetting debits. Consequently, a rate change for contracting classifications is necessary to offset the premium credits.

The premium adjustment program is detailed in the Missouri Basic Manual—Special Rule, included as Exhibit 1. It will be administered as follows:

1. Each carrier shall issue a letter having standardized text (Exhibit 2) to any insured having a policy containing one or more of the applicable classifications. One letter must be issued for each qualifying policy. This letter (which must be printed by each individual carrier) should be sent to the insured prior to policy issuance or within sixty days after effective date. The carrier must maintain proof of mailing in its files and make such proof available to the Missouri Division of Insurance on request.
2. The insured should complete the requested information and mail the completed form to NCCI's Midwestern Division.
3. NCCI's Midwestern Division will compute the insured's average hourly wage for each classification, the applicable classification premium credit, and the overall policy credit factor. These calculations will be displayed on a Policy Credit Work Sheet (Exhibit 3). A copy of this work sheet will then be mailed to the carrier.
4. The carrier shall use this policy credit factor in the calculation of the insured's estimated premium at policy issuance. In those cases where the carrier receives the policy credit factor after the insured's policy has been issued, the policy shall be so endorsed (as required in Exhibit 4).
5. Upon audit, the carrier shall use the same policy credit premium in the calculation of the insured's final earned premium. Additionally, the carrier shall verify the data originally provided by the insured for the computation of the policy credit factor by reviewing those records upon which the insured's data was originally based. If this process uncovers any errors, revised payroll and/or hours worked data must be submitted to NCCI's Midwestern Division. The revised data will be used to calculate a revised policy credit factor.
6. The policy credit factor is to be applied to the premium determination process directly after the application of experience modification and prior to any deviations and premium discount. This policy credit factor, if available upon policy issuance, must be displayed on the policy Declarations Page. If the factor is not available upon policy issuance, the required endorsement must be attached to the policy (see Exhibit 4).

Contact: Kenneth Robinson, Director 314-843-4001

7. The earned premium dollar adjustment amount due to the application of the policy credit factor must be reported on unit statistical reports under Classification Code 9046. This amount must be reported on lines D, E, F or G since it is not subject to experience modification (see Exhibit 5).
8. No adjustment to aggregate standard earned premium reported on the aggregate Calls for Experience is required because of this premium credit. In other words, reported aggregate standard earned premium must include the effects of these premium credits.

Please review the above, along with the attached exhibits, carefully with your underwriting, auditing and statistical personnel.

MISSOURI BASIC MANUAL - SPECIAL RULE
MISSOURI CONTRACTING CLASSIFICATION PREMIUM ADJUSTMENT PROGRAM

Exhibit 1

The Missouri Contracting Classification Premium Adjustment Program provides for a premium credit for up to one year for a qualifying policy. To qualify, a policy must contain one or more contracting classifications and have an experience rating of 1.05 or lower. Policies not subject to experience rating will be eligible for the Missouri Contracting Classification Premium Adjustment Program. The Missouri Contracting Classification Premium Adjustment Program may be applied to qualifying policies with an anniversary rating date of January 1, 1990 and thereafter.

The basis for determining the credit is the total payroll (excluding overtime premium pay) and hours worked for each contracting classification for the third calendar quarter of the year preceding the policy anniversary rating date as reported to taxing authorities. If the insured did not engage in operations for the complete quarter, then the last complete quarter prior to the policy year inception shall be used, or, if there was no complete quarter of operations prior to the policy inception, then the first complete quarter after the policy inception shall be used. A credit may be determined for each contracting classification by dividing the total payroll, excluding overtime premium pay, by the number of hours worked to arrive at the average hourly wage for the classification. In the absence of specific records for salaried employees, it will be assumed each such individual worked forty (40) hours per week. The credit for average hourly wage is listed below:

<u>Average Hourly Wage</u>	<u>Credit from Manual Premium</u>
\$11.99 or less	None
\$12.00 - \$13.50	5%
\$13.51 - \$14.00	6%
\$14.01 - \$14.50	7%
\$14.51 - \$15.00	8%
\$15.01 - \$15.50	9%
\$15.51 - \$16.00	10%
\$16.01 - \$16.50	11%
\$16.51 - \$17.00	12%
\$17.01 - \$17.50	13%
\$17.51 - \$18.00	14%
\$18.01 - \$18.50	15%
\$18.51 - \$19.00	16%
\$19.01 - \$20.00	17%
\$20.01 - \$20.50	18%
\$20.51 - \$21.00	19%
\$21.01 and over	20%

The total contracting classification credit amount, in dollars, must be calculated and then divided by the total policy premium at manual rates - including contracting and noncontracting classifications. The result would be the percentage credit which is to be applied to the qualifying policy. When calculating the total policy credit, the percentage shall be rounded to the nearest whole number with .5 being rounded upward. (As an example, 4.4 rounded to 4% and 4.5 rounded to 5%.)

The insured shall submit the required payroll and hours worked information to the NCCI - Midwestern Division for calculation of any applicable credit. The carrier shall, upon audit, verify the information that was submitted by the insured and used in the calculation of the credit. If the carrier discovers an error in the original request for policy credit, the revised information must be submitted to the NCCI - Midwestern Division for recalculation. If the insured does not furnish records to verify the payrolls and hours worked originally submitted and used in the calculation of the credit, there shall be no credit applied to the policy.

The credit, authorized by the NCCI - Midwestern Division, shall appear on Item 4 of the Policy. If the credit is not available at the time of policy issuance, the carrier shall endorse the policy to provide this credit information.

Carriers are required to use the approved form to notify all of their insureds, who have one or more contracting classifications on their policy, that they may be eligible for a premium adjustment credit.

"Contracting classifications" are those classifications subject to the following code numbers:

0050	5040	5188	5403	5505	5703	6216	6306	9534
1322	5057	5190	5437	5506	5705	6217	6319	9545
3365	5059	5213	5443	5515	6003	6229	6325	9549
3719	5067	5215	5445	5538	6005	6233	6400	
3724	5069	5221	5462	5551	6045	6235	7380*	
3726	5102	5222	5474	5606	6204	6236	7538	
5020	5146	5223	5479	5610	6206	6237	7601	
5022	5160	5348	5480	5645	6213	6251	7855	
5037	5183	5402	5491	5651	6214	6252	8227	

*Code 7380 may be used only on policies where more than 50% of the total premium is produced by one or more of the contracting classifications listed.

(Name of Insured)
(Address)
(Any Town, State, Zip Code)

**MISSOURI CONTRACTING CLASSIFICATION PREMIUM ADJUSTMENT PROGRAM
WORKERS COMPENSATION PREMIUM CREDIT APPLICATION FOR 1990**

The Missouri Contracting Classification Premium Adjustment Program has been approved for employers engaged in contracting operations and is applicable to policies with effective dates on or after January 1, 1990.

A special premium calculation, which may result in a premium credit for you, will be based on average hourly pay rates for each classification of contracting operations. In order that your premium may be correctly established, please return the completed premium credit application, as set out on the reverse side of this letter, to the:

NCCI - Midwestern Division
P.O. Box 19430
Springfield, Illinois 62794-9430

They will advise us of any premium credit applicable.

If they do not receive this application, your 1990 premium calculation will not reflect any possible premium credit.

For each applicable classification (both contracting and non-contracting) covering your company's operations in the state of Missouri, report the total Missouri payroll (excluding overtime premium pay) and the corresponding total number of hours worked, for the third calendar quarter (JULY, AUGUST, SEPTEMBER) of 1989 as reported to taxing authorities.

Note #1: If you did not engage in contracting operations during the third quarter of 1989, the requested information to be provided should, then, be for the last complete calendar quarter prior to the effective date of your workers compensation policy.

Note #2: If you are a new business (no prior operations), submit the requested information, for the first complete calendar quarter following the effective date of your workers compensation policy when available.

Note #3: In the absence of specific records for salaried employees, you should assume that each individual worked forty (40) hours per week.

Please preserve your payroll records which formed the basis for this declaration as we will be required to verify the reported information in order for any premium credit to be applied.

Thank you for your cooperation.

Sincerely,

1989 WORKERS COMPENSATION—PREMIUM CREDIT APPLICATION

Exhibit 2
(continued)

INSURED _____
POLICY NO. _____ EFFECTIVE DATE _____ ISSUING OFFICE _____

Notice: Unless Code(s), total wages paid, total hours worked, calendar quarter reported are indicated and application is signed, it cannot be processed. Contact your agent if assistance is desired.

CLASSIFICATION	CODE	TOTAL MISSOURI WAGES PAID*	TOTAL HOURS WORKED
Example: Electrical Wiring	5190	\$8,000	520
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

* EXCLUDING OVERTIME PREMIUM PAY.

The foregoing is based on actual wages and hours worked, as reflected in our payroll records, for the complete calendar quarter ending _____.

SIGNATURE _____ POSITION _____ DATE _____

Missouri Contracting Classification Premium Adjustment Program
POLICY CREDIT WORKSHEET

CARRIER: _____
 INSURED: _____
 POLICY NUMBER: _____ PERIOD: FROM _____ TO: _____

NON-CONTRACTING CLASSIFICATIONS:

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
CLASS CODE	PAYROLL	TOTAL HOURS WORKED	MANUAL RATE	MANUAL PREMIUM ((2) ÷ 100) × (4)	AVERAGE HRLY. WAGE (2) ÷ (3)	CREDIT PERCENTAGE	CREDIT DOLLAR AMOUNT ((5) × (7))
					XXX	XXX	XXX
					XXX	XXX	XXX
					XXX	XXX	XXX
					XXX	XXX	XXX
					XXX	XXX	XXX

CONTRACTING CLASSIFICATIONS:

TOTAL MANUAL PREMIUM ► _____ (All Classifications) TOTAL CREDIT ► _____

Prepared By: _____ TOTAL CREDIT ÷ TOTAL MANUAL PREMIUM = POLICY CREDIT ► 0. _____

Date: _____ 1.00 - POLICY CREDIT = POLICY CREDIT FACTOR ► 0. _____

MISSOURI CONTRACTING CLASSIFICATION PREMIUM ADJUSTMENT ENDORSEMENT

The premium for the policy may be adjusted by a Missouri Contracting Classification Premium Adjustment factor. The factor was not available when the policy was issued. If you qualify, we will issue an endorsement to show the premium adjustment factor after it is calculated.

Notes:

1. This endorsement may be used when an insured's credit adjustment factor is not available when the policy is issued.
2. An appropriate typewritten entry may be made on the policy Information Page, Item 4, instead of using this endorsement.

STATISTICAL REPORTING

1. The earned premium dollar adjustment amount due to the application of the policy credit factor must be reported on unit statistical reports under Classification Code 9046. This amount must be reported on lines D, E, F or G since it is not subject to experience modification.
2. No adjustment to aggregate standard premium reported on the aggregate Call for Experience is required because of this premium credit. In other words, reported aggregate standard earned premium must include the effects of these premium credits.

ALTERNATIVE EXPOSURE BASES

EXHIBIT 4

**MASSACHUSETTS CONSTRUCTION CLASSIFICATION
PREMIUM ADJUSTMENT PLAN**

ALTERNATIVE EXPOSURE BASES

MASSACHUSETTS CONSTRUCTION CLASSIFICATION PREMIUM ADJUSTMENT PROGRAM

The above program is effective 12:01 A.M., January 1, 1991 and thereafter. The program applies to employers eligible for experience rating having exposure in any of the enumerated construction classifications in Massachusetts.

The Massachusetts Construction Classification Premium Adjustment Program is designed to vary an employer's workers' compensation premium by way of a premium credit based upon the employer's average wage level. While the initial determination of any applicable credit is computed on a class-by-class basis, the credit (if any) will be applied to the employer's entire Massachusetts standard premium in order to facilitate the carrier's application of the credit. The program will provide a premium credit to those eligible construction employers paying in excess of \$18.00 per hour on average per construction employee.

The program does not provide for any premium debits. Therefore, rate changes are required for all the applicable classifications in order to offset the premium credits.

The program (see Massachusetts Basic Manual - Special Rule, EXHIBIT 1) shall be administered as follows:

1. Each carrier shall issue a letter, with Application on reverse side, having standardized text (EXHIBIT 2), to any insured having a policy containing one or more of the applicable classifications. One letter must be issued for each qualifying policy. This letter (which must be printed by each individual carrier) should be sent to the insured prior to policy issuance or within sixty (60) days after effective date. The carrier must maintain proof of mailing in its files and make such proof available to the Massachusetts Division of Insurance on request.
2. The insured shall complete the required information and mail the completed form to:

The Workers' Compensation Rating and Inspection
Bureau of Massachusetts
P.O. Box 9005
Boston, MA 02205
Attention: Underwriting Department

3. The Workers' Compensation Rating and Inspection Bureau of Massachusetts will compute the insured's average hourly wage for each classification, the applicable classification premium credit, and the overall policy credit factor. These calculations will be displayed on a Policy Credit Work Sheet (EXHIBIT 3). A copy of this Work Sheet will then be mailed to the carrier.

4. The carrier shall use this policy credit factor in the calculation of the insured's estimated premium at policy issuance. In those cases where the carrier receives the policy credit factor after the insured's policy has been issued, the policy shall be so endorsed by use of Massachusetts Construction Classification Premium Adjustment Endorsement WC 20 04 03 (EXHIBIT 4).
5. Total expected losses used in the calculation of the insured's experience modification will be decreased by the policy credit factor.
6. The policy credit factor is to be applied to the premium determination process directly after the application of experience modification and prior to any deviation and premium discount. This policy credit factor, if available upon policy issuance, must be displayed on the Information Page of the policy (EXHIBIT 5). If the factor is not available upon policy issuance, the required endorsement must be attached to the policy.
7. Upon audit, the carrier shall use the same policy credit factor in the calculation of the insured's final earned premium. Additionally, the carrier shall verify the data originally provided by the insured for the computation of the policy credit factor by reviewing those records upon which the insured's data was originally based. If this process uncovers any errors, revised payroll and/or hours worked, data must be submitted to The Workers' Compensation Rating and Inspection Bureau of Massachusetts. The revised data will be used to calculate a revised policy credit factor.
8. The earned premium dollar modification amount due to the application of the policy credit factor must be reported on unit statistical reports under Classification Code 9046. This amount must be reported on lines D, E, F or G since it is not subject to experience modification (EXHIBIT 6).

Please carefully review the above, including attached EXHIBITS, with your underwriting, auditing and statistical personnel.

MASSACHUSETTS BASIC MANUAL - SPECIAL RULE
MASSACHUSETTS CONSTRUCTION CLASSIFICATION PREMIUM ADJUSTMENT PROGRAM

The Massachusetts Construction Classification Premium Adjustment Program provides for a premium credit for a qualifying policy which contains one or more construction classifications. Only policies subject to experience rating are eligible for the program.

The basis for determining the credit is the total payroll (excluding overtime premium pay) and hours worked for each construction classification for the third calendar quarter of the year preceding the policy inception date as reported to taxing authorities. If the insured did not engage in operations for the complete quarter, then the last complete quarter prior to the policy year inception shall be used, or if there was no complete quarter of operations prior to the policy inception then the first complete quarter after the policy inception shall be used. A credit may be determined for each construction classification by dividing the total payroll, excluding overtime premium pay, by the number of hours worked to arrive at the average hourly wage for the classification. In the absence of specific records for salaried employees, it will be assumed each such individual worked forty (40) hours per week. The credit for average hourly wage is listed below:

<u>Average Hourly Wage</u>	<u>Credit From Manual Premium</u>
\$17.99 or less	0%
\$18.00 - \$18.50	5%
\$18.51 - \$19.00	6%
\$19.01 - \$19.50	7%
\$19.51 - \$20.00	8%
\$20.01 - \$20.50	9%
\$20.51 - \$21.00	10%
\$21.01 - \$21.50	11%
\$21.51 - \$22.00	12%
\$22.01 - \$22.50	13%
\$22.51 - \$23.00	14%
\$23.01 - \$23.50	15%

<u>Average Hourly Wage</u>	<u>Credit From Manual Premium</u>
\$23.51 - \$24.00	16%
\$24.01 - \$24.50	17%
\$24.51 - \$25.00	18%
\$25.01 - \$25.50	19%
\$25.51 - \$26.00	20%
\$26.01 - \$26.50	21%
\$26.51 - \$27.00	22%
\$27.01 - \$27.50	23%
\$27.51 - \$28.00	24%
\$28.01 and over	25%

The total construction classification credit amount, in dollars, must be calculated and then divided by the total policy premium at manual rates - including construction and non-construction classifications. The result would be the percentage credit which is to be applied to the qualifying policy. When calculating the total policy credit, the percentage shall be rounded to two decimal places. (As an example, .1547 rounded to .15 and .1551 rounded to .16.)

The insured shall submit the required payroll and hours worked information to The Workers' Compensation Rating and Inspection Bureau of Massachusetts for calculation of any applicable credit. The carrier shall, upon audit, verify the information that was submitted by the insured and used in the calculation of the credit. If the carrier discovers an error in the original request for policy credit, the revised information must be submitted to The Workers' Compensation Rating and Inspection Bureau of Massachusetts for recalculation. If the insured does not furnish records to verify the payrolls and hours worked originally submitted and used in the calculation of the credit there shall be no credit applied to the policy.

The credit authorized by The Workers' Compensation Rating and Inspection Bureau of Massachusetts, shall appear on Item 4. of the Information Page of the policy. If the credit is not available at the time of policy issuance, the carrier shall endorse the policy to provide this credit information.

Carriers are required to use the approval form to notify all of their insureds, who have one or more construction classifications on their policy, that they may be eligible for a premium modification credit.

"Construction classifications" are those classifications subject to the following code numbers:

3365	5102	5223	5480	5645	6233	8227
3724	5146	5348	5506	5651	6251	9014
3726	5160	5402	5507	5701	6252	9529
5020	5183	5403	5508	5703	6306	9534
5022	5188	5437	5509	5705	6319	
5037	5190	5443	5538	6003	6325	
5040	5213	5445	5545	6005	6400	
5057	5215	5462	5547	6204	7538	
5059	5221	5474	5606	6217	7601	
5069	5222	5479	5610	6229	7855	

**MASSACHUSETTS CONSTRUCTION CLASSIFICATION PREMIUM ADJUSTMENT PROGRAM
APPLICATION**

INSURED Sample Construction Co., Inc.

FEDERAL EMPLOYERS ID NO. _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

POLICY NO. WC12345 EFFECTIVE DATE 2/1/91 ISSUING OFFICE Boston

NOTICE: Unless Code(s), total wages paid, total hours worked, calendar quarter reported are indicated and application is signed, it cannot be processed. Contact your agent if assistance is desired.

CLASSIFICATION(S)	CODE	TOTAL MASSACHUSETTS WAGES PAID*	TOTAL HOURS WORKED
Concrete Construction	5213	\$46,176	2080
Carpentry	5403	32,339	1560
Excavation	6217	23,639	1040
Contractors Yard	8227	16,640	1040
Executive Supervisor	5606	13,000	520
Salesmen	8742	45,000	1560
Clerical	8810	19,500	2600

* EXCLUDING OVERTIME PREMIUM PAY.

The foregoing is based on actual wages and hours worked, as reflected in our payroll records, for the complete calendar quarter ending 9/30/90.

SIGNATURE _____ POSITION _____ DATE _____

(Name of Insured)
(Address)
(Town/City, State, Zip Code)

**MASSACHUSETTS CONSTRUCTION CLASSIFICATION PREMIUM ADJUSTMENT PROGRAM
WORKERS' COMPENSATION PREMIUM CREDIT APPLICATION FOR 1991**

The Massachusetts Construction Classification Premium Adjustment Program has been proposed for employers engaged in construction operations and is applicable to policies eligible for experience rating with effective dates on or after January 1, 1991.

A special premium calculation, which may result in a premium credit for you, will be based on average hourly pay rates for each classification of construction operations. In order that your premium may be correctly established, please return the completed premium credit application, as shown on the reverse side of this letter to:

The Workers' Compensation Rating and Inspection
Bureau of Massachusetts
P.O. Box 9005
Boston, MA 02205
Attention: Underwriting Department

They will advise us of any premium credit applicable.

If they do not receive this application, your 1991 premium calculation will not reflect any possible premium credit.

For each applicable classification (both construction and non-construction) covering your company's operations in the state of Massachusetts, report the total Massachusetts payroll (excluding overtime premium pay) and the corresponding total number of hours worked for the third calendar quarter (July, August, September) of 1990 as reported to taxing authorities.

Note #1: If you did not engage in construction operations during the third quarter of 1990, the requested information to be provided should then be for the last complete calendar quarter prior to the effective date of your workers' compensation policy.

Note #2: If you are a new business (no prior operations), submit the requested information for the first complete calendar quarter following the effective date of your workers' compensation policy when available.

Note #3: In the absence of specific records for salaried employers, you should assume that each individual worked forty (40) hours per week.

Please preserve your payroll records which formed the basis for this declaration as we will be required to verify the reported information in order for any premium credit to be applied.

Thank you for your cooperation.

Sincerely,

Turn Page Over For Premium Credit Application

MASSACHUSETTS CONSTRUCTION CLASSIFICATION PREMIUM ADJUSTMENT PROGRAM
POLICY CREDIT WORKSHEET

CARRIER: _____

INSURED: Sample Construction Co., Inc.

POLICY NUMBER: WC 12345 PERIOD: FROM 2/1/91 TO 2/1/92

NON-CONSTRUCTION CLASSIFICATIONS:

(1)	(2)	(3)	(4)	(5)	(6)	(7)
CLASS CODE	PAYROLL	MANUAL RATE	MANUAL PREMIUM [(2) + 100] X 3	AVERAGE HOURLY WAGE	CREDIT PERCENTAGE	CREDIT DOLLAR AMOUNT (4) X (6)
8742	45000	.75	338	XXX	XXX	XXX
8810	19500	.37	72	XXX	XXX	XXX
				XXX	XXX	XXX
				XXX	XXX	XXX
				XXX	XXX	XXX

CONSTRUCTION CLASSIFICATIONS:

5213	46176	38.80	17,916	22.20	13	2,329
5403	32339	38.79	12,544	20.73	10	1,254
6217	23639	11.21	2,650	22.73	14	371
8227	16640	8.46	1,408	16.00	-	-
5606	13000	7.17	932	25.00	18	168
TOTAL MANUAL PREMIUM (All Classifications)			35,860	TOTAL CREDIT		4,122

(4,122 + 35,860) TOTAL CREDIT + TOTAL MANUAL PREMIUM = POLICY CREDIT 0.11

Prepared By: _____

(1.00 - .11) 1.00 - POLICY CREDIT = POLICY CREDIT FACTOR 0.89

WORKERS COMPENSATION AND EMPLOYERS LIABILITY INSURANCE POLICY

WC 20 04 03

Original Printing

Effective January 1, 1991

Standard

MASSACHUSETTS CONSTRUCTION CLASSIFICATION PREMIUM ADJUSTMENT ENDORSEMENT

The premium for the policy may be adjusted by a Massachusetts Construction Classification Premium Adjustment factor. The factor was not available when the policy was issued. If you qualify, we will issue an endorsement to show the premium adjustment factor after it is calculated.

Notes:

1. Attach this endorsement to a policy showing Massachusetts in Item 3.A. of the Information Page when an insured's credit adjustment factor is not available when the policy is issued.
2. An appropriate typewritten entry may be made in Item 4. of the Information Page instead of using this endorsement.

SAMPLE PREMIUM CALCULATION

MASSACHUSETTS CONSTRUCTION CLASSIFICATION PREMIUM ADJUSTMENT PROGRAM

LOCATIONS, CLASSIFICATION AND PAYROLL IN MASSACHUSETTS
 Calculation of Estimated Annual Premium:

Describe by location the duties of employees	Class Code	Number of Employees	Total Payroll	Rate	Premium
Concrete Construction	5213	4	150,072	38.80	58,228
Carpentry NOC	5403	3	105,102	38.79	40,769
Excavation	6217	2	76,827	11.21	8,612
Contractors Yard	8227	2	54,080	8.46	4,575
Executive Supervisor	5606	1	52,000	7.17	3,728
Clerical Office Employees NOC	8810	5	78,000	0.37	289
Salesperson, Collectors or Messengers - Outside Drivers, NOC	8742	3	180,000	0.75	1,350
Employers Liability / /	7380				
Total Premium					117,551
Experience Modification (1.11)					12,931
[1] MASSACHUSETTS CONSTRUCTION CLASSIFICATION PREMIUM ADJUSTMENT POLICY CREDIT (11%)					-14,353
Standard Premium					116,129
ARAP Adjustment (1.14)					16,258
(116,129 X .107) [2] Less Premium Discount (if applicable)					12,426
Expense Constant					160
(116,129 + 16,258 - 12,426 + 160) Total Estimated Annual Premium					120,121
(116,129 X 1.9%) Mass. D.I.A. Assessment (1.9%) of Standard Premium					2,206
(120,121 + 2,206) Total of Estimated Annual Premium and Mass. D.I.A. Assessment					122,327

- As issued by this Bureau.
- In this example, the Stock Discount (Table 7) was used. Those carriers using the Non-Stock System of Expenses would use Table 8.
- The Mass. D.I.A. Assessment is based on Standard Premium.

STATISTICAL REPORTING

1. The earned premium dollar adjustment amount due to the application of the policy credit factor must be reported on unit statistical reports under Classification Code 9046. This amount must be reported on lines D, E, F or G since it is not subject to experience modification.

Experience Rating and Construction Classification
Premium Adjustment Program

Those classifications to which this program applies will have the manual rate raised above the otherwise indicated average rate so as to provide money with which to pay the discounts. Some insureds in these classes will pay the manual rate with no discount while others will get discounts. Thus the starting points prior to experience rating differ for these risks.

In order to maintain the balance of the experience rating plan the expected losses which enter into the calculation of experience modifications have to reflect these different starting points. The Expected Loss Rate (ELR)¹ in the manual would correspond to the manual rate. Thus expected losses derived from this ELR are the losses we expect for a risk getting no discount from the manual rate. These risks have higher than average expected losses for the class. For risks getting a discount, the expected losses are lower by the amount of the discount. These risks have lower than average expected losses for the class. The ELR times payroll would produce expected losses too high for these risks.

Therefore, the expected losses derived by summing the product of ELR's and payrolls for individual classes will be multiplied by the discount applied to the policy. This will provide an appropriate starting place for comparison with actual losses in the calculation of the experience modification.

The effect will be that large risks who receive discounts will find that their experience modification will be somewhat higher. This makes sense since, to the extent a risk's own losses enter into setting its rate via experience rating, discount is redundant. A risk will always be better off in total getting the discount; the change in experience modification will only partially offset the effect of the discount. Similarly, a risk getting no discount will find its higher manual rate only partially offset by a decrease in its experience modification.

¹Expected Losses = ELR x Payroll

ALTERNATIVE EXPOSURE BASES

EXHIBIT 5
OREGON LOSS RATIO ADJUSTMENT PROGRAM



ALTERNATIVE EXPOSURE BASES

LOSS RATIO ADJUSTMENT PROGRAM RULE
Applicable in Oregon †*

CLASSIFICATION CODES

0050	5040	5213	5445	5538	6017	6233	6400
1322	5057	5215	5462	5551	6018	6235	7538
2703*	5059	5221	5474	5606	6045	6236	7601
3365	5069	5222	5479	5610	6204	6237	7855
3719	5102	5223	5480	5645	6206	6251	8227
3724	5146	5348	5491	5651	6213	6252	9529
3726	5160	5402	5506	5703	6214	6260	9530
5020	5183	5403	5507	5705	6216	6306	9539*
5022	5188	5437	5508	6003	6217	6319	9545
5037	5190	5443	5511*	6005	6229	6325	9549
							9553**

*Classification applicable only in Oregon.

**Classification applicable only in Illinois.

A. INTRASTATE RISKS

Experience rated risks shall be subject to the loss ratio adjustment program (LRAP) provided more than 50% of the risk's total expected losses are generated by one or more of the above classifications.

The rating organization shall adjust the experience modification for all eligible risks in the following manner:

1. Multiply the discount ratio for each of the above classifications by 1.05.
2. Apply the increased discount ratio to the expected losses for each of the above classifications to produce revised expected primary losses and expected excess losses.
3. Recalculate the experience modification using the expected primary losses and expected excess losses as determined in (2).
4. Calculate the following ratio:

$$R = \frac{\text{Risk Total Actual Losses}}{\text{Risk Total Expected Losses} \times \text{Recalculated Experience Modification}}$$

5. Determine the loss ratio adjustment factor by referencing the point at which the R factor calculated in (4) intersects the risk's expected loss total contained in the Credit/Debit Table on Page A-11.

6. Determine the adjusted experience modification by multiplying the recalculated experience modification in (3) by the loss ratio adjustment factor in (5).

B. INTERSTATE RISKS

Experience rated risks with multi-state operations shall be subject to the loss ratio adjustment program (LRAP) provided:

- a. one or more states in the rating have approved the loss ratio adjustment program and,
- b. more than 50% of the total expected losses in at least one approving state(s) are generated by one or more of the above classifications.

The rating organization shall adjust the experience modification for all eligible risks in the following manner:

1. Multiply the discount ratio for each of the above classifications by 1.05, in each state where this adjustment applies.
2. Apply the increased discount ratio to the expected losses for each of the above classifications to produce revised expected primary losses and expected excess losses.
3. Recalculate the experience modification using the expected primary losses and expected excess losses as determined in (2).

† Not applicable in Nebraska effective November 1, 1989; not applicable in Maryland effective July 1, 1990; not applicable in Illinois effective September 1, 1990.

4. Calculate the following ratio:

$$R = \frac{\text{Total Actual Losses in States Where This Adjustment Applies}}{\text{Total Expected Losses in States Where This Adjustment Applies}} \times \text{Recalculated Experience Modification}$$

5. Determine the loss ratio adjustment factor by:

a. Referencing the point at which the R factor calculated in (4) intersects with risk's expected

loss total combined in the Credit/Debit Table on Page A-11.

b. Divide the expected losses for those states where this adjustment applies, by the total expected losses for all states in the rating.

c. Multiply (b) times the credit or debit determined in (a).

6. Determine the adjusted experience modification by multiplying the recalculated experience modification in (3) times the loss ratio adjustment factor in (5).

★

* Not applicable in Nebraska effective November 1, 1989.

LOSS RATIO ADJUSTMENT PROGRAM
CREDIT/DEBIT TABLE
TOTAL EXPECTED LOSSES (IN 000)

R	0.0	2.5	5.0	7.5	10.0	12.5	15.0	17.5	20.0	22.5	25.0	27.5	30.0 And Over
.0	1.00	.90	.84	.80	.76	.73	.70	.67	.64	.62	.59	.57	.55
.05	1.00	.92	.86	.82	.79	.76	.73	.70	.68	.66	.64	.62	.60
.10	1.00	.93	.88	.84	.81	.78	.76	.74	.72	.70	.68	.66	.65
.15	1.00	.93	.89	.86	.83	.81	.79	.77	.75	.73	.72	.70	.69
.20	1.00	.94	.91	.88	.85	.83	.82	.80	.78	.77	.75	.74	.73
.25	1.00	.95	.92	.89	.87	.86	.84	.83	.81	.80	.79	.78	.77
.30	1.00	.96	.93	.91	.89	.88	.86	.85	.84	.83	.82	.81	.80
.35	1.00	.96	.94	.92	.91	.90	.88	.87	.86	.85	.85	.84	.83
.40	1.00	.97	.95	.94	.92	.91	.90	.89	.89	.88	.87	.86	.86
.45	1.00	.98	.96	.95	.94	.93	.92	.91	.91	.90	.89	.89	.88
.50	1.00	.98	.97	.96	.95	.94	.94	.93	.92	.92	.91	.91	.91
.55	1.00	.98	.97	.97	.96	.95	.95	.94	.94	.94	.93	.93	.93
.60	1.00	.99	.98	.97	.97	.97	.96	.96	.95	.95	.95	.95	.94
.65	1.00	.99	.99	.98	.98	.97	.97	.97	.97	.96	.96	.96	.96
.70	1.00	.99	.99	.99	.98	.98	.98	.98	.98	.97	.97	.97	.97
.75	1.00	1.00	.99	.99	.99	.99	.99	.99	.98	.98	.98	.98	.98
.80	1.00	1.00	1.00	.99	.99	.99	.99	.99	.99	.99	.99	.99	.99
.85	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	.99	.99	.99	.99	.99
.90	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1.05	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1.10	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1.15	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.01	1.01	1.01	1.01	1.01
1.20	1.00	1.00	1.00	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
1.25	1.00	1.00	1.01	1.01	1.01	1.01	1.01	1.01	1.02	1.02	1.02	1.02	1.02
1.30	1.00	1.01	1.01	1.01	1.02	1.02	1.02	1.02	1.02	1.03	1.03	1.03	1.03
1.35	1.00	1.01	1.01	1.02	1.02	1.03	1.03	1.03	1.03	1.04	1.04	1.04	1.04
1.40	1.00	1.01	1.02	1.03	1.03	1.04	1.04	1.04	1.05	1.05	1.05	1.05	1.06
1.45	1.00	1.02	1.03	1.03	1.04	1.05	1.05	1.06	1.06	1.06	1.07	1.07	1.07
1.50	1.00	1.02	1.03	1.04	1.05	1.06	1.06	1.07	1.08	1.08	1.09	1.09	1.09
1.55	1.00	1.02	1.04	1.05	1.06	1.07	1.08	1.09	1.09	1.10	1.11	1.11	1.12
1.60	1.00	1.03	1.05	1.06	1.08	1.09	1.10	1.11	1.11	1.12	1.13	1.14	1.14
1.65	1.00	1.04	1.06	1.08	1.09	1.10	1.12	1.13	1.14	1.15	1.15	1.16	1.17
1.70	1.00	1.04	1.07	1.09	1.11	1.12	1.14	1.15	1.16	1.17	1.18	1.19	1.20
1.75	1.00	1.05	1.08	1.11	1.13	1.14	1.16	1.17	1.19	1.20	1.21	1.22	1.23
1.80	1.00	1.06	1.09	1.12	1.15	1.17	1.18	1.20	1.22	1.23	1.25	1.26	1.27
1.85	1.00	1.07	1.11	1.14	1.17	1.19	1.21	1.23	1.25	1.27	1.28	1.30	1.30
1.90	1.00	1.07	1.12	1.16	1.19	1.22	1.24	1.26	1.28	1.30	1.32	1.34	1.35
1.95	1.00	1.08	1.14	1.18	1.21	1.25	1.27	1.30	1.32	1.34	1.36	1.38	1.40
2.00	1.00	1.10	1.16	1.20	1.24	1.27	1.30	1.33	1.36	1.38	1.41	1.43	1.45
And Over													

ALTERNATIVE EXPOSURE BASES

EXHIBIT 6

**NEW YORK COMPENSATION INSURANCE RATING BOARD
CONTRACTOR CLASS STUDY**

ALTERNATIVE EXPOSURE BASES

NEW YORK COMPENSATION INSURANCE RATING BOARD

200 East Forty-Second Street, New York, New York 10017

Telephone (212) 697-3535 Fax (212) 972-1393

Expressly Prepared For:
General Building Contractors
of New York State, Inc

Subject: Basis of Premium

At the request of the General Building Contractors of New York State, Incorporated, a study was undertaken by the Rating Board to review the proposal for introduction of a premium determination method which would exclusively use hours to measure exposure to hazards.

General

In connection with this review, several hundred employers were subjected to physical audits whereby their accounting records were examined to establish whether complete and verifiable records of "hours worked" were available. Our study showed that 53% of the employers did have some form of hourly records. However, it is of significance that the balance did not keep any hourly records at all. And it is also important to mention that none of the employers that maintained hours worked records had their hours summarized or broken down by categories of work, e.g., concrete construction, factory, clerical, outside sales, etc.

It is of note that the availability of "hours worked" records changed rather dramatically when certain categories in the construction industry only were reviewed. This part of the study disclosed that over 90% of the higher paying employers did have hours worked records available, and about 60% of the lower wage paying employers in that industry had hours worked records available.

Background of Current System

The present system involves premium charges based on a uniform rate per hundred dollars of payroll for each employee, subject to the type of work involved. If the payroll method was replaced with the number-of-hours worked per employee, we must all ask ourselves how would this affect the current pricing system as it relates to an employers premium?

The current rate per each \$100 of payroll for workers compensation premium is predicated on the anticipated *total payrolls* for each industry and the expected losses for that industry. This system must produce a sufficient amount of premium to cover the *actual* losses for each industry. *It is important to note that this premium "need" to pay actual losses and expenses does not change regardless of the basis of premium; e.g., payrolls, hours, etc.* If the Basis of Premium was changed to other than payroll, then it is expected that there would be a redistribution of the needed premium among the employers in each classification.

Hours Worked V. Use of Payrolls

How would that redistribution be made? Well it would come about naturally, based upon the reported exposure to operations (hours.) However, this system would be affected considerably by the fact of whether an employer did or did not keep records. And of course, whether the records were maintained accurately, and whether the "hours" could be verified somehow.

In theory, the hours-worked method would appear to be the most reasonable way of developing workers compensation premiums. But there is a most serious negative downside in relying solely on hours-worked that must be considered. And the risk is that hours-worked will indeed be subject to inaccuracies, discrepancies, and abuses.

What would be the difference between an hours-worked system and the use of payrolls? The difference involves verification, because payrolls are physically paid to employees, checks are drawn on banks, and multiple tax reports must be completed by employers and filed with governmental agencies who periodically audit these filings. These verification capabilities generally assure that the payrolls used are the payrolls expended, and therefore, are the proper payrolls to be taken by insurance company auditors. This is not the same scenario with the use of hours-worked because as already stated, in too many cases the hours are not available and are not verifiable. Yet, the loss *need* remains the same. Consequently we believe that those employers who maintain good records will pay a greater portion of the premium need than those who do not keep accurate and verifiable records.

As an incidental concern, the auditing of hours by insurance carriers will become more expensive and necessarily generate higher expenses to be added to the "rate". For example: if an employee earned \$24,000 per year, this would currently involve (240) \$100 units of payroll. Translating this into units of hours-worked would mean that, without overtime, we might be dealing with about 2000 hours of actual working time per employee, to "verify" per year. Our study revealed a 26% increase in auditing expense to "audit" hours-worked records..

How would an employer check the accuracy of the insurance carrier's billing of hours? With substantial difficulty, we believe. In a 200 employee firm, for example, this could represent 400,000 hours which have to be extracted from unsummarized records provided the hours are available. And what about the problem of trying to separate this by the type of work done; e. g., clerical, outside sales, inside sales, and the whole gamut of contracting classifications? What checks and balances are there for both the insurance company auditor in developing a billing, or the policyholder who wishes to check the charges? This will likely generate more questions and controversies concerning the accuracy of billings. And there would be difficulties when charges for uninsured subcontractors were required where no hours whatsoever are recorded. Inaccurate estimating of non-recorded hours worked would become prevalent, and seriously affect the accuracy of billings as well as the data base used by a rate service organization and the rates it produces. Think about this; will both carriers and policyholders physically go through a set of records independently to add hours, employee by employee, and classification by classification, if the hours are recorded? Would an insurance auditor be able to accept a computer print-out prepared by the insured? No, because the carrier "audit" would then be a meaningless process. And unlike payrolls, when an "hours" audit is completed, there is no way to reconcile this mass of hourly figures with any summary records, such as the employer's disbursements book, general ledger and quarterly and annual payroll tax returns. With

such a system it would not take long before some very creative and imaginative hours-worked records, or reportings, would be made available " For the insurance company's use only".

While no system, or method, is perfect, on balance, the use of payrolls for premium determination purposes is far superior, and more reliable as a measuring tool for developing equitable premium charges from employer to employer. Additionally, it is far less vulnerable; initially to serious auditing difficulties, and subsequently, to improper ratemaking, than an hours-worked method would be.

Review of Ironworkers' Experience

As part of our review, the G.B.C. was requested to provide the Rating Board with a comprehensive listing of their members who are the " higher paying" employers in the State. Ultimately, we were furnished through various sources, including the G.B.C., names of employers engaged in several contracting activities. This list was culled to extract those employers involved with iron & steel erection, because this subject was originally raised with concern for the iron and steel erection employers. The Board then conducted a review of the available experience collected for the three classification codes which comprise the iron and steel erection industry. This experience revealed the following:

1. The high paying employers' payroll and losses for each of the classification codes accounts for a sizable portion of the total experience available for both categories of employers. The actual percentages for each class are shown below:

<u>Class</u>	<u>High Paving Employers</u>	
	<u>% of Payroll</u>	<u>% of Losses</u>
5040 Iron or Steel Erection-Frame Structure	95.0	87.0
5057 Iron or Steel Erection-Frame Structure N.O.C.	95.2	99.4
5059 Iron or Steel Erection-Frame Structure Up to 2 Stories	77.1	88.5

1. The above statistics were based on the data provided to us. There was an "unknown" portion of total experience for these codes, but we believe the unknown experience would likely project to develop similar proportions. Based upon this assumption, it is clear that the experience of the high paying employers is basically responsible for the rate of each classification shown above.

2. In two of the three categories shown (codes 5057 and 5059), the loss experience of the high paying shops is somewhat worse than that of the open shops. If, in fact, a disproportionately higher amount of payroll is presently collected from the high paying employers, then it is reasonable to expect that the ratio of losses to payroll should be lower for the high

paying segment. However, based on the above loss ratios, the higher paying employers incur a disproportionately higher percent of the total losses.

3. Since most of the classification payroll belongs to the higher paying employers, a change to hours worked as a basis of premium will have little or no significance on the total premium paid. Regardless of the premium basis, a specific amount of premium is needed to cover losses and expenses for each industry. Because the experience composition of these classes is largely derived from higher wage paying employers, the bulk of the premium would still come from the higher paying employers, and any new rate structure would self-correct for this regardless of the basis of premium.

Conclusion

We are emphatically opposed to the substitution of "hours worked" as the basis of premium, because it would completely destroy the establishment of equitable premium charges from employer to employer.

It is understandable that the G.B.C. may view the "hours worked" theory as a simplified approach to handling the perceived problem, but we submit that their posture does not recognize the serious pitfalls that are masked within an hours worked system. As already stated, we believe that higher paying members of the G.B.C., under an hours worked basis of premium, would be subjected to paying a substantially higher percentage of the premium needed to cover the losses and expenses for the iron and steel erection classifications than at present.

Members of the G.B.C. may believe that they are presently paying a higher percentage of the needed premium per classification, and support that view with their estimates of a 1/3 disparity in hourly wages. Actually, after application of an improved experience rating and premium discount which high paying employers enjoy, the difference is narrowed considerably.

ALTERNATIVE EXPOSURE BASES

EXHIBIT 7
NCCI ALTERNATIVE EXPOSURE
BASE COST ESTIMATES

ALTERNATIVE EXPOSURE BASES



National
Council on
Compensation
Insurance

Systems Development

Richard O. Heard, Jr.
Assistant Vice President

February 26, 1991

Mr. Brett Miller, ACAS
Arthur Andersen & Company
Thirteenth Floor
1345 Avenue of the Americas
New York, New York 10105

Dear Brett:

I have attached our analysis of the costs associated with capturing and implementing an alternative measure of exposure, in addition to the current unlimited payroll. We have gone to some length to explain the industry-wide implications, which would have significant costs. Estimation of these costs would require a survey of insurance companies, agents, and other rating bureaus. I note that Milliman & Robertson's proposal for the NAIC review (for objective 6b) includes mention of this survey approach, and I assume that you would undertake this effort.

Please let me know if you have any questions or need any additional information.

Yours truly,

A handwritten signature in black ink, appearing to read "Richard O. Heard, Jr.", written in a cursive style.

Richard O. Heard, Jr.

In conjunction with the NAIC review being conducted by Milliman & Robertson (M&R), NCCI has been asked to estimate the costs associated with implementing an alternate exposure base. This alternative would be collected and processed *in addition to* the current exposure measure, unlimited payroll. Candidate alternatives identified by M&R include limited payroll, person-hours, and average weekly wage. This response will not attempt to address the efficacy or actuarial fitness for use of one method of measuring exposure over another, but will instead focus on the industry-wide implications and specific NCCI costs associated with implementing such a change.

The costs of implementing a change to the exposure base are manifested in three areas: collecting the necessary information, reporting that information to NCCI and independent bureaus, and using the information in ratemaking and experience rating calculations.

Collection

The exposure measure, whether a derivative of payroll or some other measure, must be collected at the point of sale of insurance. Changes to this measure will therefore require new information to be presented by prospective insureds. Existing agent procedures and systems (e.g. rate quote systems and customer databases) will require modifications. The ACORD application for insurance, the assigned risk application, and any other applications used by independent bureaus must be changed to gather the alternative exposure measure. These types of changes typically require specific filings in each state, complicating the implementation process, as different effective dates are possible.

As with any exposure measure, the information must be readily available and commonly defined at the time of collection. To the extent that measures other than unlimited payroll are less uniformly available or subject to interpretation, agent costs will increase and delays in binding coverage may occur, thus having a detrimental effect on service levels.

Insurance company systems must be modified to accept and process the new application information, and the industry standard policy information page must be changed to display both current unlimited payroll and the alternative exposure measure. Finally, the exposure measure must be verifiable. A measure other than unlimited payroll will have implications on company and bureau costs to inspect and audit insured records to ensure the accuracy of the exposure.

Reporting

Companies report policy coverage information and statistical information to NCCI, independent state rating bureaus, and industrial commissions. Each of these entities will require systems and procedural changes to accept an alternative measure of exposure. Of great importance in determining an implementation date is the close association of the above in using common data reporting formats. With both the Workers Compensation Statistical Plan (WCSP) and policy information reporting, most bureaus including NCCI share standard hard copy and electronic data reporting specifications.

In this regard, all bureaus must make the necessary changes and agree on an implementation date. The following WCSP format change requests are now pending from New Jersey, Texas, and NCCI, with California contemplating a statistical plan rewrite:

- allocated loss adjustment expenses (ALAE);
- deductibles;
- employers' liability;
- four digit year;
- rate deviation percent;
- group policy identification;
- self insurance policy identification;
- small premium policy plan identification;
- employers' rejected risk fund identification; and
- social security number of claimant.

An alternate exposure measure must be added to the list and considered along with the other requested changes. NCCI's Statistics Committee, at its February 7, 1991 meeting, passed the following recommendation:

"That the collection of ALAE on unit reports and annual calls be accomplished in conjunction with other changes required to satisfy the needs of all rating bureaus and users of the data."

This would reduce the incremental cost of reporting an additional exposure measure, while having the likely negative impact of delaying the implementation timeframe until all changes are agreed upon.

These changes will also have cost implications for hard copy reporting, as the current "unit report" format cannot be expanded to accommodate additional data elements. This will change the unit report form factor, requiring changes to manual filing and micrographic equipment and procedures. The changes will also have cost implications for electronic reporting, as the existing data record formats must be expanded to accommodate the additional data. While there is sufficient room on the current exposure record (where payroll is reported) for some of the above requested changes, there is not sufficient room for all.

Usage

Once collected and reported to NCCI, the alternative exposure measure would be used in ratemaking and experience rating calculations. Prior to usage, existing data validation and quality checks would be changed to include the alternative exposure measure. NCCI-company communications, in the form of error reports and turnaround documents, would also be changed, as would manuals and procedures documentation. Finally, ratemaking and experience rating systems would be changed to include the new measure, and existing report formats modified to display the new inputs and results of alternative calculations.

The transition from the existing unlimited payroll to the alternative exposure method must also be considered. Ratemaking and experience rating calculations require at least three years of data, and statistical data are reported 20 months after the policy inception date (with the M&R review now studying the efficacy of using four or five years for classification ratemaking). This will produce a significant lag between the start of collection by the insurance agent and the ultimate use of the measure in ratemaking and experience rating calculations.

Specific NCCI Costs

The cost implications for NCCI implementation of an alternative exposure measure are shown in two ways: as stand-alone costs, assuming no other statistical plan changes were implemented, and as incremental costs, assuming most or all of the other requested changes identified above were also implemented. In all cases, these estimates are rough. More precise estimates can be made later when more details are known about which specific changes would be made, and how the changes would be included in our systems. The cost estimates have been made using \$50 per hour, with a 1,500 hour work year, yielding annual costs of \$75,000 per person-year.

Total stand-alone costs for the required changes are estimated to be approximately 13 person-years of programming and end-user specification and testing efforts, or about \$975,000. Perhaps more importantly, the magnitude of the required effort and the extensive impact throughout nearly all of NCCI's critical business functions would severely inhibit our ability to proceed with other systems development efforts during this time. The incremental costs above and beyond those required to implement the other requested WCSP changes are significantly less, at about 2 person-years, or \$150,000. The costs are explained below in four areas: data reporting, data verification, ratemaking systems changes, and experience rating systems changes.

Reporting

NCCI's keypunch facility (ACS) keys most hard copy policies and all hard copy unit reports received by NCCI, and would key the additional exposure information. Assuming current record counts and an average seven position alternate exposure

field, keying costs would be approximately **\$20,000/year**, both stand-alone and incremental.

Inclusion of a new data element will require a change to the unit report form and to the WCSP tape reporting specifications. Changes will be required in NCCI's up-front processing systems to capture the data. Exposure (payroll) is not currently captured in NCCI's policy issue capture system (PICS), therefore, no incremental costs would be incurred. However, exposure is integral to all NCCI unit report processing systems, and significant changes would be required.

NCCI's up-front report processing systems include the IDV/IMG systems, the Unit Report Control (URC) system, and the unit report database (now under construction). Stand-alone changes to these systems to accommodate an additional exposure data element would require approximately **2 person-years**, or about **\$150,000**. Incremental costs for the changes above and beyond those required to process the other WCSP changes would be negligible.

These estimates assume that all existing printing and filing of mag tape submitted unit reports would be replaced by the new unit report database. If this is not the case, significant additional costs would be incurred to adopt a new unit report form factor, including hard copy filing and micrographic processing.

Verification

Two types of verification are applicable: ensuring the reported data accurately represent the true exposure presented by the insured, and ensuring that the data in NCCI's systems matches that reported to NCCI. For the former, NCCI conducts risk inspections and, in some states, premium audits. The costs (which have not been estimated) for these activities would increase to include an alternate exposure measure, primarily due to the increased difficulty in auditing the information. The costs for internally editing and validating the reported data would be negligible. However, existing data validation routines and reports produced as part of the classification ratemaking process would be affected; these are discussed below.

Ratemaking Calculation

NCCI's classification ratemaking systems begin with WCSP (unit report) data and include data validation and summarization by class code, for a given state and reporting period. The final product is a variety of reports, including A-sheets (pure premiums), schedule Z, and NC-235 formats for exposure, premium, and loss totals by class. Changes would be required throughout these processes, including the production of final rates showing calculations with both exposure measures (current unlimited payroll and the chosen alternative measure). Stand-alone changes to these systems to accommodate an additional exposure data element would require approximately **5 person-years**, or **\$375,000**, including end-user

involvement for requirements and testing. Incremental costs for the changes above and beyond those required to process the other WCSP changes (assuming the changes would include the ALAE separation) would be approximately 1 person-year, or \$75,000.

Experience Rating Calculation

NCCI's experience rating systems begin with rating data stored from the prior year's rating, governed by a profile that establishes what data are to be included in the calculation. Exposure information is integral to the experience rating calculation in its use in determining expected losses. The inclusion of an alternate exposure measure would require significant changes throughout the experience rating systems, including NCCI's risk directories, the file containing prior rating data (compress files), online inquiry and corrections systems, and the printed experience rating worksheets and related output products.

Stand-alone changes to these systems to accommodate an additional exposure data element would require approximately 6 person-years, or \$450,000, including end-user involvement for requirements and testing. Incremental costs for the changes above and beyond those required to process the other WCSP changes (assuming the changes would include the ALAE separation) would be approximately 1 person-year, or \$75,000.

The total costs for systems changes are summarized below:

NCCI IMPLEMENTATION COSTS		One-Time	Incremental	Ongoing
Reporting	ACS keying IDV/IMG system	2 person-years	0	\$20,000
Verification		?		
Ratemaking		5 person-years	1 person-year	
Experience Rating		6 person-years	1 person-year	
TOTAL		13 person-years \$975,000	2 person-years \$150,000	\$20,000

ALTERNATIVE EXPOSURE BASES

EXHIBIT 8

**NCCI CORRESPONDENCE CONCERNING COST/WAGE
RELATIVITY GRAPHS**

ALTERNATIVE EXPOSURE BASES



May 15, 1991

Mr. Michael A. McMurray, FCAS, MAAA
Consulting Actuary
MILLIMAN & ROBERTSON, INC.
251 South Lake Avenue, Suite 400
Pasadena, California 91101

RE: NAIC EXAMINATION - EXPOSURE BASE

Dear Michael:

I am resending the Cost Relativity/Ratio to Average Wage graphs that I faxed to you on Monday. Additionally, I am supplying the DRAFT of the narrative. As each page indicates, this Report is still preliminary in values, descriptions, and conclusions. The information should thus be released only to the NAIC exam team. The final Report, which will ultimately be released in monograph form, will be forwarded to you upon completion.

I am confident that this material will be of great value to you. Please call if concerns arise.

Very truly yours,

James F. Mallon
JFM/cb

Enclosures

TOTAL PAYROLL/HIGH WAGE PAYERS

Over the last couple of years there has been increasing dialogue regarding total payroll as the exposure base for workers compensation. Concern has been expressed by high wage payers feeling that they are subsidizing the medium and/or low wage payers within the total payroll concept. The intent of this analysis is to put into perspective the cost relationships associated with high wage payers versus low wage payers to determine if there is truly inequity in the system.

There are articles and booklets describing the need for a premium base being exposure sensitive, practical, available and verifiable. Total payroll comes out substantially ahead for workers compensation as practical, always available and verifiable. Manhours as a premium base fails to meet the availability and verifiability criteria as well as not being practical. The workers compensation premium base must also have characteristics that equitably predict the level of losses. The following analysis addresses this area.

Claims Cost Relativity by Pre-Injury Wage

This analysis basically is for the contracting group. Contracting classes can have a substantial variation in high wage versus low wage payers. The addendum defines the data base that was used for this analysis.

Exhibit I shows the average claim cost relativity by average wage range. It reveals that average claim costs rise steadily with increases in the average wage. Previous discussions have generally assumed that the average claim cost would begin to plateau at 150% of the average weekly wage. This is because many states have benefit levels that are two-thirds of the pre-injury weekly wage subject to the maximum of the state average weekly wage. This exhibit illustrates that the average claim cost relativities continue to rise materially and are not leveling off.

Exhibits II and III show the corresponding indemnity/medical average claim cost relativity versus average wage range. Again, a material increase is exhibited, especially for indemnity benefits.

Exhibit IV gives a perspective as to why the average claim cost continues to rise. The average duration associated with each of the ranges above 0.25 increases as the average wage increases. This implies that higher pre-injury weekly wages being earned are associated with longer durations. Higher wage earners have a greater expectation from medical care. Higher wage earners tend to be in more urban areas which have access to a greater variety of medical specialists and state-of-the-art medical technologies all of which carry with them higher medical costs. Additionally, one could expect the duration to increase due to additional knowledge of the workers

compensation system that a higher wage earner generally has. Also, most union shops, which generally are higher wage earners, have in-depth knowledge as to all associated benefit programs including workers compensation. This is not intended as a negative comment. It is a realization that the more knowledgeable individuals are about their benefits, the more the potential use of them exists.

Exhibit V summarizes the total claim cost relativities from Exhibit I into two wage groups: above and below 1.25 times the average wage. As mentioned previously, weekly benefits generally are two-thirds of the pre-injury wage subject to a maximum weekly benefit equal to 100% of the state average weekly wage. As such, one would expect that claim costs on workers with pre-injury wages greater than 1.5 times the average wage would be subject to limitation. However, since the wage relativities in this study are based on contracting classes which have a higher average wage than statewide, we would expect that the index at which the maximum applies to be lower. An analysis comparing maximum weekly benefits to contracting average weekly wages indicates that the maximum weekly benefit applies at approximately 1.25 times the contracting average weekly wage. Therefore, the grouping of contracting claimants above a 1.25 pre-injury wage relativity reflects claims that would have been subject to the limiting effects of the maximums.

If benefits paid, both medical and indemnity, were exactly proportional to wages, the claim cost for a high wage earner would equal the claim cost for the low wage earner times the relativity of their wages. In Exhibit V, this would mean that the high wage group's claim cost relativity would equal 1.67 (.85 x 1.57/.80) if a 1 to 1 proportion applied. However, the flattening influences of maximums reduce this somewhat to 1.43. This implies that the loss ratio relativity between high and low wage earners is .86 to 1 instead of 1 to 1. This is derived as follows:

	(1)	(2)	(3)
<u>Wage Range</u>	<u>Average Wage Relativity</u>	<u>Average Claim Cost Relativity</u>	<u>Average Loss Ratio Relativity (2)/(1)</u>
1.26 and up (High)	1.57	1.43	
0 to 1.25 (Low)	0.80	0.85	
High/Low	1.96	1.68	0.86

This indicates the high wage payer receives 86% (1.68/1.96) as much back of his premium as a low wage payer. What this basically implies is that if \$10 is the average wage, then \$15.70 would be the average wage for the high wage payers (1.57 x \$10) and \$8.00 for the low wage payer (0.80 x \$10). Further, if \$10,000 was the average loss, then \$14,300 would be the average loss for the high wage payer (1.43 x \$10,000) and \$8,500 for the low wage payer (0.85 x \$10,000).

Revised Experience Rating Plan

There has been a recent change to the Experience Rating Plan which generally has made the plan more responsive, especially for an employer with premium under a quarter of a million dollars. This plan has currently been approved in 30 states. To illustrate how the Revised Experience Rating Plan responds to different wage payers, a number of examples were run through the plan.

The examples were for a group of "large risks" and a group of "small risks" for both high and low wage payers. The two assumptions that went into each of the individual cases for the high wage/low wage payers were that both had the same number of employees, and the loss ratio relativity was 85% (the previous analysis indicated .86). In other words, a number of \$75,000 risks (large risks) were generated under the low wage scale. Each risk had a different loss distribution. For each of those cases, an experience mod was developed. For the comparable high wage payers at 2.0 times the average wage, the risks would have \$150,000 in premiums, with severities at 1.7 times the low wage risks' losses reflecting the aforementioned loss ratio relativity (wage relativity x loss ratio relativity = severity relativity; $2.0 \times 85\% = 1.7$). Experience mods were generated for those cases. In addition, average wages of 2.5 and 3.0 times as great were also run with comparable loss relationships. The same analysis was run again for small risks (\$12,500 low wage premium). The following is a summary of the output from the analysis as shown in detail on Exhibit VI:

	<u>Average Experience Mod</u>		<u>Average Experience Mod Relativity (H/L)</u>
	<u>Low Wage</u>	<u>High Wage</u>	
<u>High Wage = 2.0 x Low Wage</u>			
Large Risk	1.04	.90	.87
Small Risk	1.06	.95	.90
<u>High Wage = 2.5 x Low Wage</u>			
Large Risk	1.04	.87	.84
Small Risk	1.06	.93	.89
<u>High Wage = 3.0 x Low Wage</u>			
Large Risk	1.04	.85	.82
Small Risk	1.06	.91	.87

Each of the modifications shown are an average of five cases with different loss ratio assumptions and different size of losses under the constraints indicated. The low wage average mod stays the same because it is the base, whereas the high wage experience modification varies due to the average wage being paid each employee for the different examples. The actual modifications are not as important as the relativities between high and low wage payers. As one can discern, a substantial differential results in the modifications being produced for the high wage versus low

wage payers in all scenarios (between .82 and .90). In all cases the average high wage payer receives the benefit of the Revised Experience Rating Plan due to his pre-defined higher wage versus loss ratio relativity indicated previously. This suggests strongly that the average experience modification will materially change the high wage/low wage payers' standard premium relativities, probably in the range of 10% to 20%. This is approximately the shortfall indicated previously from the claim cost wage relativities.

Premium Discount

Premium Discount is a reflection of cost savings associated with the size of premium. In our examples cost savings would be relevant due to the "same size" employer but different wage levels. The premium discount for a \$5,000 policyholder is zero, whereas, the premium discount factor for a \$10,000 policyholder is 5.4%. The credit for the \$20,000 risk is 8.2% of premium, while for the \$50,000 risk it's 9.8%, and for a \$100,000 risk, the premium discount credit is 10.4%. Depending upon the premium size, either a material credit is given when compared to smaller risks or a modest additional credit percentage for larger risks.

Summary

From the analysis above, the following general conclusions can be reached:

- The higher the wage, the higher propensity to have increased average severity per claim.
- The Revised Experience Rating Plan responds substantially to high/low wage payers.
- Premium Discount also brings down the higher wage payers' net premium relationship versus the lower wage payers.

An example of net premium versus manual premium is as follows:

	<u>Low Wage Payer</u>	<u>High Wage Payer</u>
Manual premium	\$20,000	\$50,000
Experience Mod	1.06	.93
Standard Premium	\$21,200	\$46,500
Premium Discount Factor	.917	.903
Net Premium	\$19,434	\$41,977

If the average total loss for a low wage paying contracting risk was \$15,000, and if

an 85% loss ratio relativity for the high wage payer is appropriate, it would imply \$31,875 of losses ($\$50,000/\$20,000 \times .85 \times \$15,000$) for the high wage payer. The following comparison of losses versus net premium would result:

	<u>Losses as % of Net Premium</u>
Low Wage	77.2%
High Wage @ 85% loss relativity	75.9%

The average quantifications performed throughout this analysis imply that the net premium and losses associated with low and high wage payers generate commensurate premiums for the associated losses. Given that loss adjustment expenses, which are the biggest expense item, are highly correlated to the losses implies that insureds, even if they are paying two to three times the average wage, incur benefits that are commensurate with that relationship.

While there are optional rating plans such as retrospective rating or dividend plans that further adjust the individual policyholder's final cost, experience rating and premium discount alone respond well towards achieving equity in premiums charged the high and low wage payers.

Manhours

This analysis demonstrates that manhours would do a gross injustice as a premium base as a reflection of actual exposure. Manhours basically would imply that individuals should pay the same workers compensation premium per employee regardless of the substantially delineated additional benefits the high wage employees receive. This would be contradictory to the facts and would require a substantial subsidy to the high wage payers. This is in addition to the expense of keeping records of hours worked and the difficulty in verification. Further, since manhours is not an inflation-sensitive exposure base, higher annual rate increases would be needed to capture the rise in costs due to wage inflation.

Limited Payroll

Limited payroll also has significant flaws. First, there is the problem of maintaining separate records of limited payroll solely for workers compensation coverage. This would be even more onerous for a multi-state risk due to likely variations in the payroll limit by state. The second and fundamental problem is that limited payroll does not correspond to actual exposure. The earlier exhibits clearly show that claim costs continue to rise with wages in spite of maximum weekly benefits. Third, is the problem of annual updates of the payroll cap to keep pace with benefits. To the

extent to which the limit is kept low through the politicization of workers compensation filings, the inequity of the system would be exacerbated. Further, if the limit were to remain artificially low, the inflation-sensitive benefits of payroll as an exposure base would be lost.

Conclusion

This paper has clearly illustrated the equity of the current system of using total payroll as the exposure base for workers compensation insurance. Alternate exposure bases, such as manhours and limited payroll, have strong disincentives initially from the viewpoint of record keeping and verification. Most important, however, is that total payroll is better in correlating exposure to loss potential, which in turn leads to a more equitable and preferable system.

Addendum

Exhibits I-IV were developed using data from NCCI's Call for Detailed Claim Information (DCI). The DCI statistics used span eight accident years (1980-1987) and twelve states*. Accident years 1988 and 1989 were not used since the expected development on these claims is high. To apply an even development factor would be ignoring the fact that the development is, in fact, not evenly distributed by claim. This would bias any analysis looking to differentiate ultimate loss values by types of claims (in this case by pre-injury wage levels).

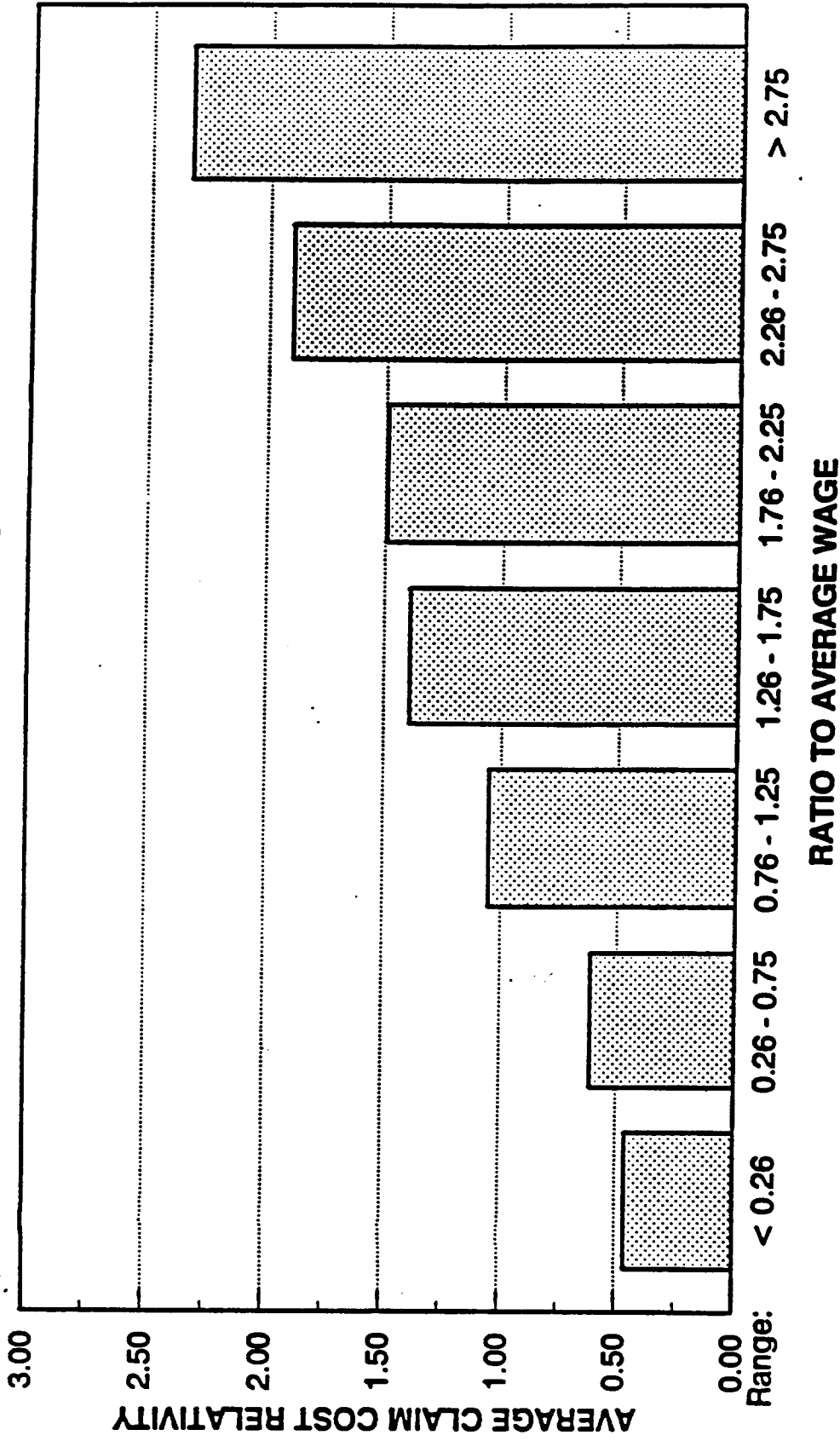
The data were normalized to remove wage/cost differences between years and states by indexing each state for each accident year separately, then weighting these indexes to derive the group total. Claims with extreme values were excluded from the database. The edits excluded claims with durations of 0 or greater than 2000 weeks, losses greater than \$1,000,000, and pre-injury wages less than .05 times or greater than 5 times the state average.

The figures were based on statistics for Contracting classes only. Therefore, the costs are compared to an average pre-injury wage index based on just Contracting classes.

The analysis in this paper was done using claim counts to weight the state indexes to total. An alternate study giving each state equal weight produces similar results in the aggregate.

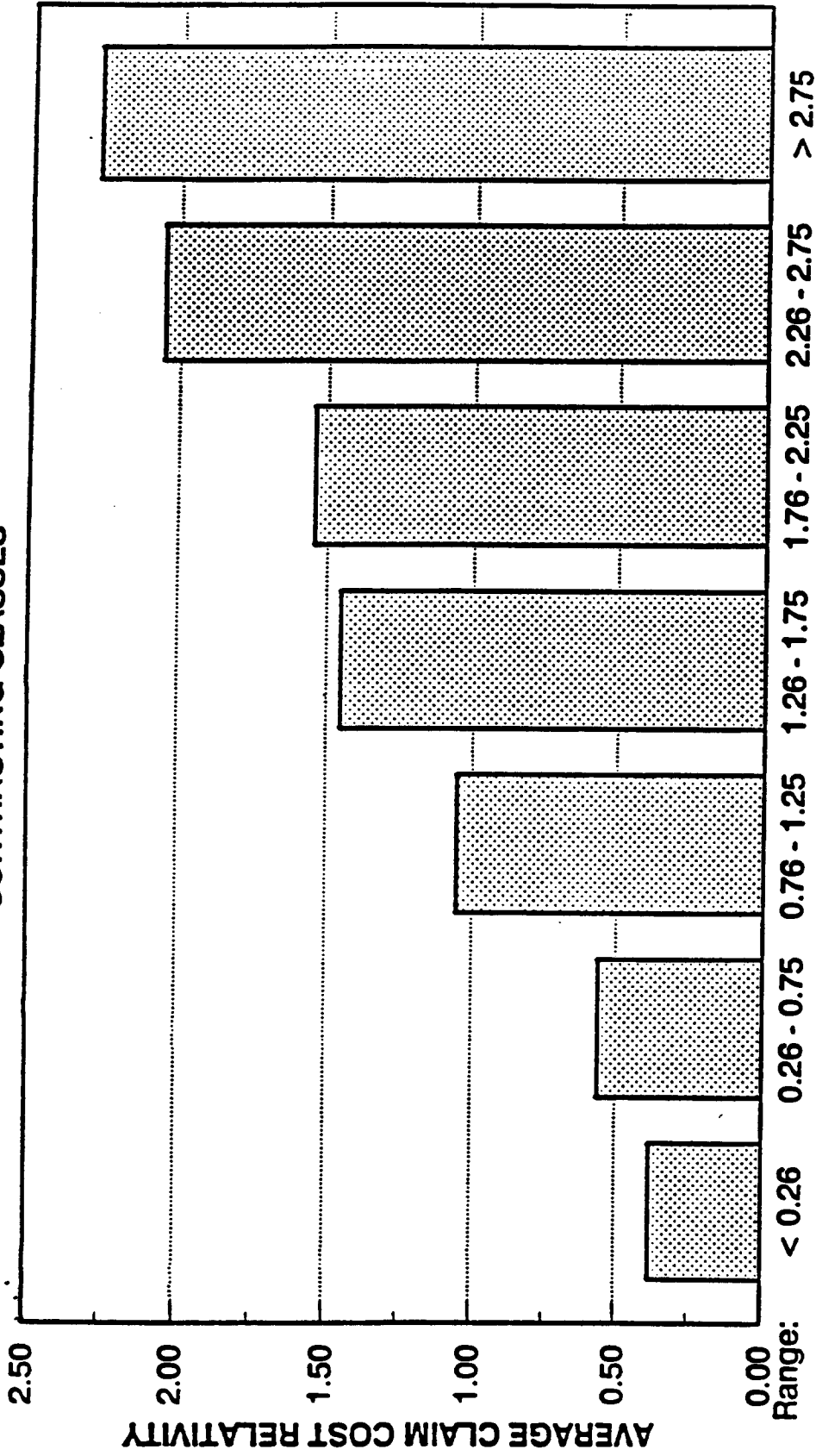
* Over the eight year period, there were thirteen states that were part of the Call for Detailed Claim Information. They include: Florida, Georgia, Hawaii (83-87), Illinois, Kentucky, Louisiana (83-87), Maine, Massachusetts, Michigan, Minnesota, New Mexico (86-87), and Oregon (83-87). Pennsylvania was also part of the DCI Call but could not be used since Pennsylvania class codes do not readily correlate to NCCI codes.

TOTAL CLAIM COST RELATIVITY BY WAGE CONTRACTING CLASSES



Detailed Claim Information
NATIONAL COUNCIL ON COMPENSATION INSURANCE

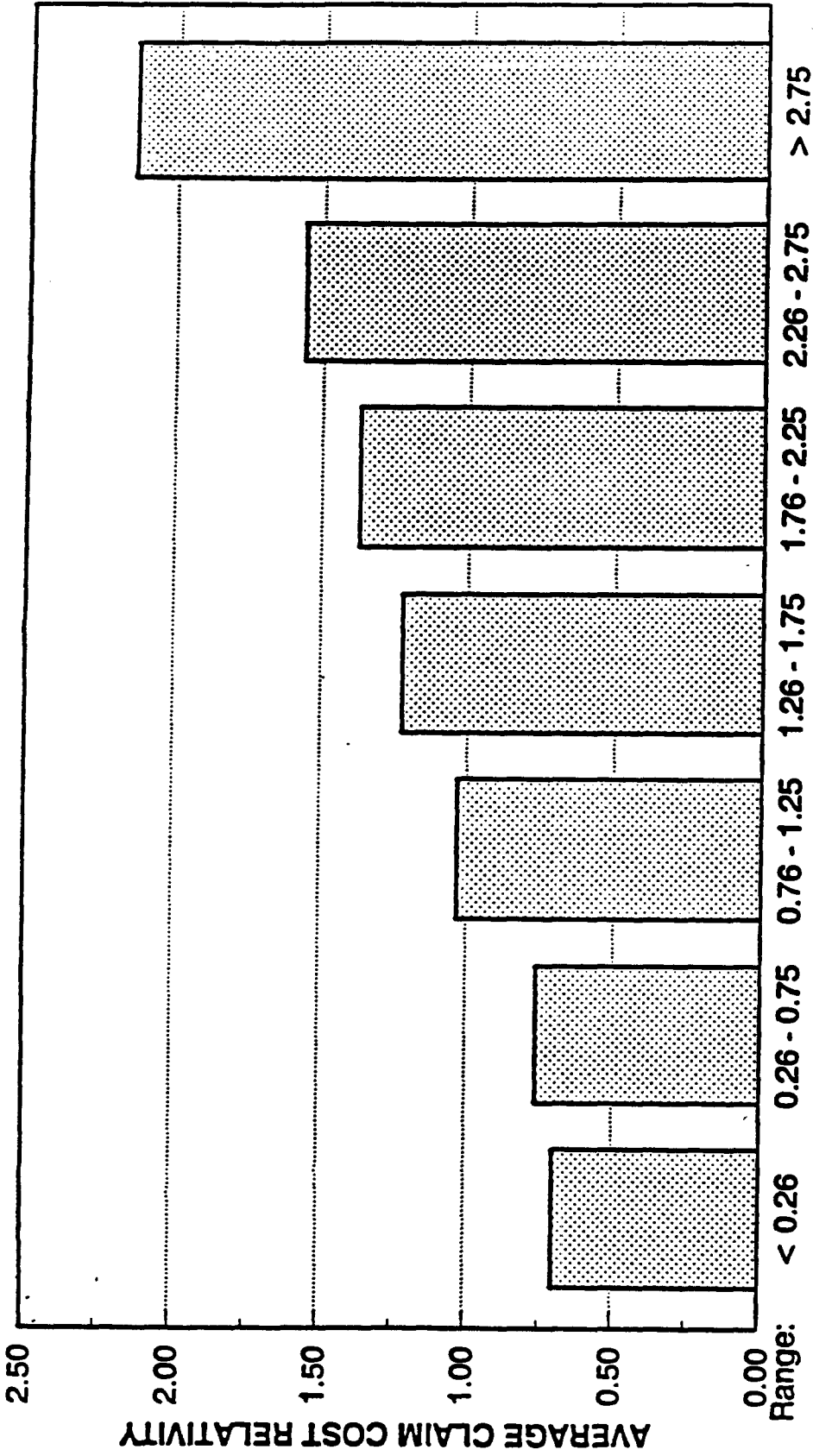
INDEMNITY CLAIM COST RELATIVITY BY WAGE CONTRACTING CLASSES



RATIO TO AVERAGE WAGE

Detailed Claim Information
NATIONAL COUNCIL ON COMPENSATION INSURANCE

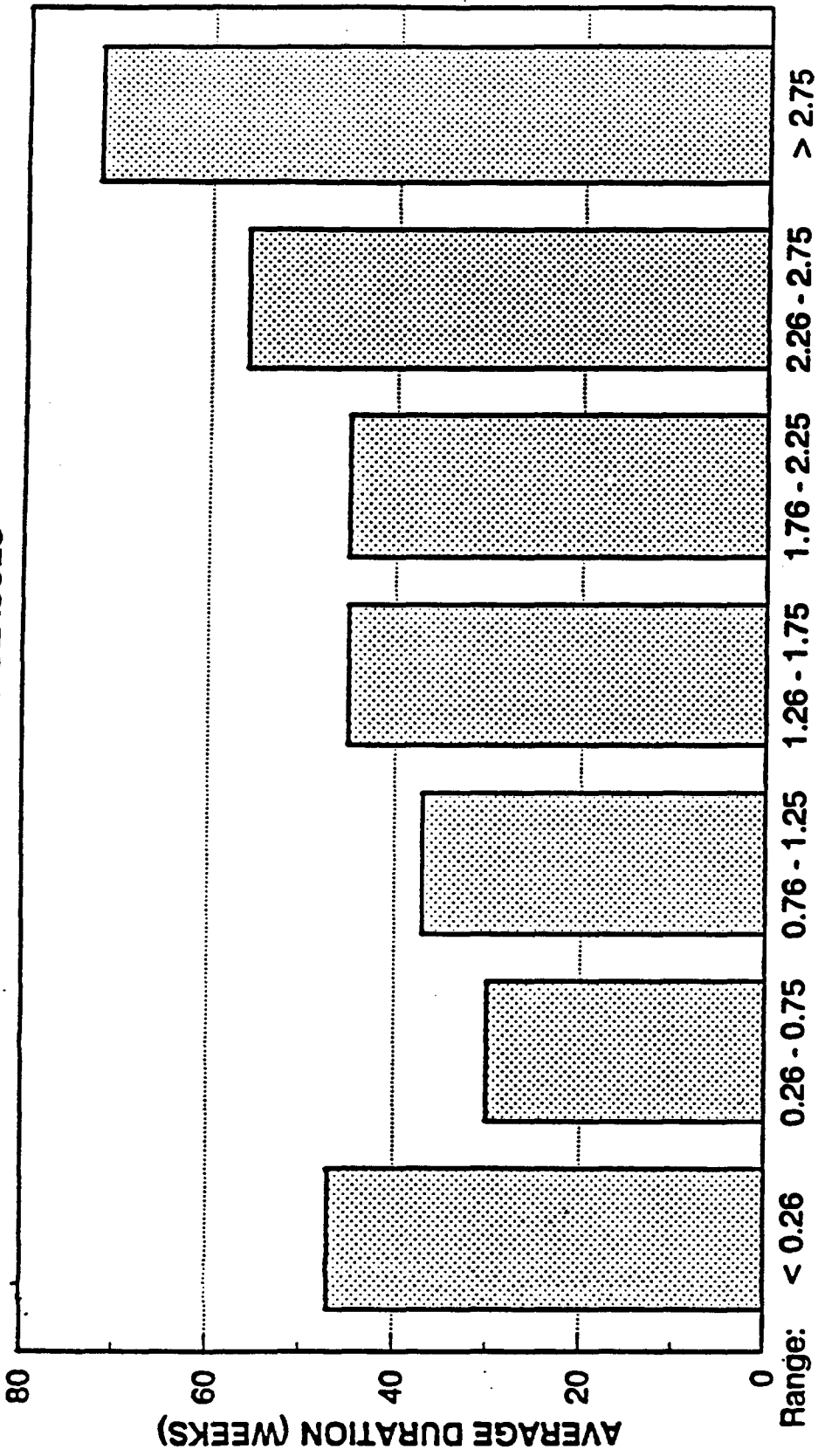
MEDICAL CLAIM COST RELATIVITY BY WAGE CONTRACTING CLASSES



RATIO TO AVERAGE WAGE

Detailed Claim Information
NATIONAL COUNCIL ON COMPENSATION INSURANCE

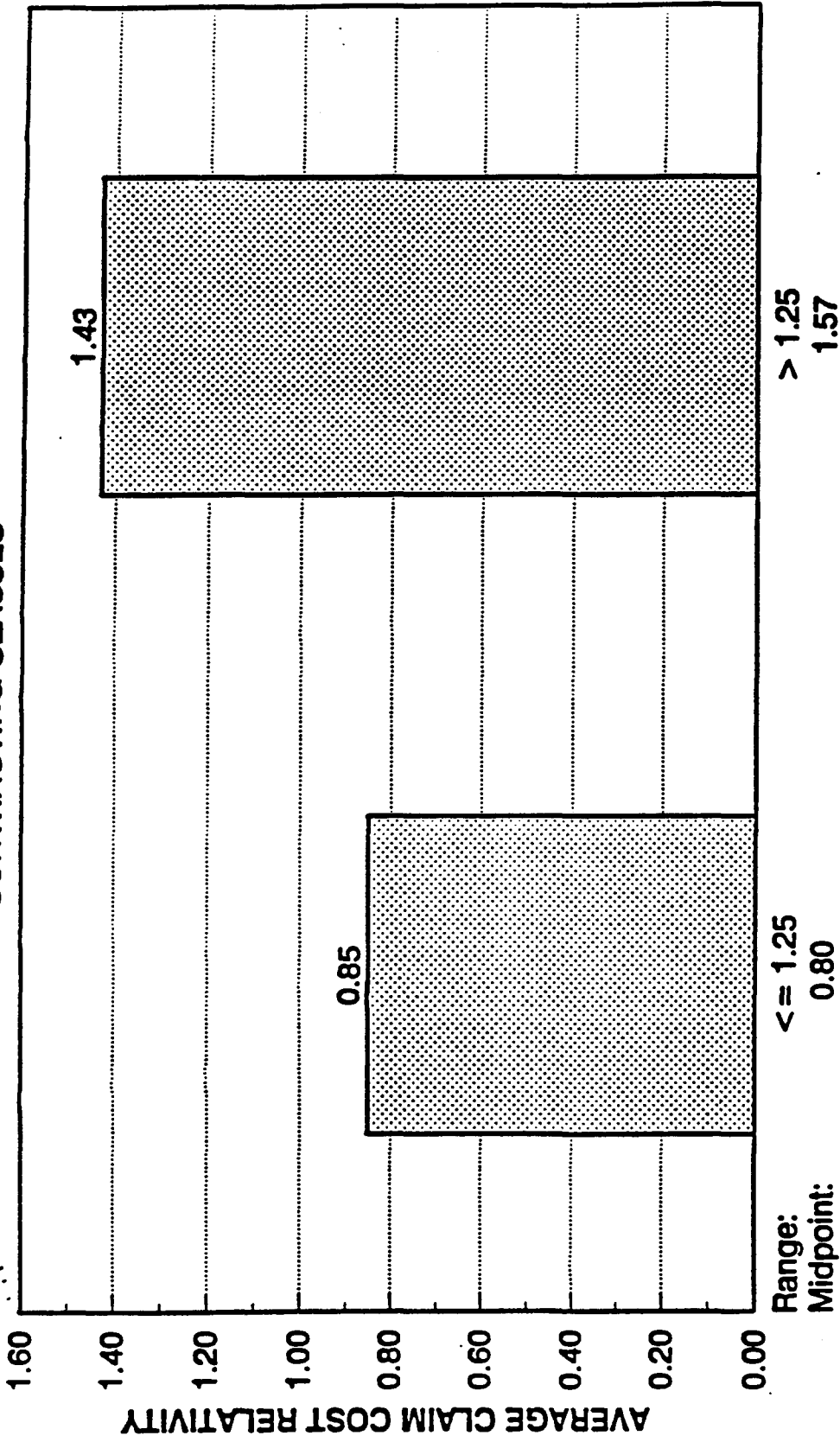
AVERAGE DURATION BY WAGE CONTRACTING CLASSES



RATIO TO AVERAGE WAGE

Detailed Claim Information
NATIONAL COUNCIL ON COMPENSATION INSURANCE

TOTAL CLAIM COST RELATIVITY BY WAGE CONTRACTING CLASSES



Range: ≤ 1.25
Midpoint: 0.80

RATIO TO AVERAGE WAGE

Detailed Claim Information
NATIONAL COUNCIL ON COMPENSATION INSURANCE

EXPERIENCE MOD RELATIVITY: HIGH WAGE TO LOW WAGE

LOSS RATIO RELATIVITY = 85%

LARGE RISK

	Low Wage Exp Mod	High Wage Wage=2.0x Exp Mod	High/Low Exp Mod Relativity	High Wage Wage=2.5x Exp Mod	High/Low Exp Mod Relativity	High Wage Wage=3.0x Exp Mod	High/Low Exp Mod Relativity
Case 1	0.96	0.81	0.84	0.77	0.80	0.74	0.77
Case 2	0.96	0.87	0.91	0.85	0.89	0.83	0.86
Case 3	1.19	1.03	0.87	1.01	0.85	1.00	0.84
Case 4	1.43	1.15	0.80	1.10	0.77	1.08	0.76
Case 5	0.68	0.62	0.91	0.60	0.88	0.58	0.85
Average	1.04	0.90	0.87	0.87	0.84	0.85	0.82

SMALL RISK

	Low Wage Exp Mod	High Wage Wage=2.0x Exp Mod	High/Low Exp Mod Relativity	High Wage Wage=2.5x Exp Mod	High/Low Exp Mod Relativity	High Wage Wage=3.0x Exp Mod	High/Low Exp Mod Relativity
Case 1	1.01	0.90	0.89	0.88	0.87	0.85	0.84
Case 2	1.01	0.96	0.95	0.96	0.95	0.95	0.94
Case 3	1.14	1.02	0.89	0.99	0.87	0.98	0.86
Case 4	1.34	1.13	0.84	1.09	0.81	1.06	0.79
Case 5	0.79	0.75	0.95	0.74	0.94	0.73	0.92
Average	1.06	0.95	0.90	0.93	0.89	0.91	0.87

AVERAGE EXPERIENCE MOD RELATIVITY: HIGH/LOW

	Wage=2.0x Loss=1.700x	Wage=2.5x Loss=2.125x	Wage=3.0x Loss=2.550x
Overall Average	0.89	0.87	0.85

State of Oregon - Workers' Compensation Department

REFINED CONSTRUCTION CLASSIFICATIONS

ADVANTAGES

1. It addresses the specific problem.
2. It is relatively simple to implement.
3. There is precedent for this approach.
4. There would be only minor disruption of the rating system and it should be relatively easy to quantify.

DISADVANTAGES

1. Acceptable definitions of additional sub-classes are not clear-cut.
2. Verification and non-manipulation of further classification criteria would be difficult to maintain.
3. The actuarial credibility of further classifications may be limited.

APPENDIX C

EVALUATION OF NATIONAL COUNCIL ON COMPENSATION INSURANCE STUDY

Discussion of Proposal

The National Council on Compensation Insurance (NCCI) proposed solution to the inequities in the workers' compensation rates due to wage variability is a modification of the Experience Rating Plan for construction employers. This modification consists of two components: (a) an additional credit/surcharge based on expected losses and the ratio of actual losses to expected losses; and (b) an increase of 15 points in the D ratios for each classification. In a subsequent filing made in Maryland, the D ratio adjustment was dropped to 5 points. There are no proposed changes in the rating procedures for non-experience rated insureds.

The credit formula is very general in scope; it does not directly address the issue of inequities due to wage differences. It is designed to correct, in part, the premiums charged to experience rated insureds. As the size of an insured increases, so will the adjustment. Therefore, small experience rated insureds will be charged almost the same premium as under the current formula, with the change being in the direction of

more equitability.

The assumption underlying the increase in the D-ratio is that a higher percentage of losses are expected to be primary losses. We understand from the NCCI that this shift in losses from excess to primary is supported by the actual loss data for experience rated construction employers. The effect of this shift is to lower the premium charged for all experience rated insureds. If it is assumed that the lower wage paying employers also tend to be the small, non-experience rated employers, then it is reasonable to conclude that this is the desired effect. That is, the low hourly wage paying employers currently have a total manual premium that is low relative to that charged the higher hourly wage paying employers. Based on the available data, we cannot evaluate the validity of the selection of 5 or 15 points as the amount of change in the D-ratios.

Since the proposed modification is intended to make the Experience Rating Plan more responsive, the premium charged an insured using the proposed formula will be more volatile than using the current formula. Both aspects of the proposal result in more credibility being given to the actual experience of the insured. The modification formula increases credibility with the size of the insured; whereas, the D-ratio change has a greater relative effect on smaller experience rated insureds. We are not

aware of any strong actuarial support for the increased credibility, particularly for the smaller insureds. This is the result of giving more credibility to the insured's actual experience, even though the expected claim frequency is very low, and, therefore, highly variable.

The NCCI proposal does not address the issue of any inequities in premiums for non-experience rated insureds. Based on the data presented, we do not believe that any conclusions can be drawn regarding inequities among non-experience rated insureds or between experience rated and non-experience rated insureds.

Validity of Conclusions

Using the survey data of all employers answering the wage question, the NCCI states that "Medical benefit costs increase as injured worker's wage increases." However, the three year experience rating data indicate that the opposite may be true. We cannot draw any conclusions regarding the equity of frequency or severity separately based on these data because of the necessary combination of all of the classes. Individual classes have different frequency, severity and rate assumptions which distort analyses on an all-classes-combined basis.

The NCCI also states that "Workers in more hazardous occupations are the ones that receive higher wages." Although this is

intuitively reasonable, the data from the survey are inconclusive with regard to this point. We believe that the primary conclusion that can be drawn relating hazard to wages is that any increase in hazard is less than proportional to the increase in wages. Both claim frequency and pure premiums calculated with respect to wages indicate that the hazard per dollar of payroll is less for the high paying employers.

An analysis of the equity of the NCCI proposal using the experience rating data indicates that some of the existing inequity in the premium is removed. However, it appears that significant inequities may still remain between high and low wage paying employers. We do not believe that data for non-experience rated insureds are sufficient to draw any conclusions, one way or the other. In our opinion the data are inconclusive and no firm conclusions regarding the true magnitude of the equitability problem or the effectiveness of the proposed solutions can be drawn. Given the data limitations that are inherent in the Oregon survey, we believe that the only conclusive finding is that a problem does exist.

Validity of the Sample

We believe that the survey and sampling procedures used by the NCCI are reasonable. However, we have some concerns about the validity of the resulting data. It is possible that different

APPENDIX D

EVALUATION OF FUTURE COST ANALYSTS STUDY

Discussion of Proposal

The Future Costs Analysts (FCA) proposal involves a change in the premium bases used for construction workers in Oregon. FCA proposes that premiums for medical benefits and for compensation benefits with a low maximum be based on hours worked. High maximum compensation benefits would be based on limited payroll. FCA mentions several alternatives to the premium basis change that would produce the same effect, including a credit or surcharge applied based on average hourly wages and an additional experience modification factor applied based on average hourly wages.

Underlying the use of hours worked is the assumption that all three components of loss (frequency, duration, and benefit) are the same per hour worked for all employers in each classification. Concerns regarding the use of hours worked are its lack of responsiveness to claim severity differences among insureds, its lack of sensitivity to inflation, and the availability of accurate and verifiable data. Medical costs from year-to-year are likely to vary more closely with wages than with hours worked, as similar economic forces affect both wages and medical costs. FCA cites the fact that the State of Washington

has used hours worked as an exposure base for fifty years in support of the contention that hours worked can be properly collected. It should be noted that Washington has recently considered changing the exposure base away from hours worked and that actuarial equity was not the sole reason for not implementing a change.

The use of indexed limited payroll as an exposure base implies that both duration and frequency are proportional to hours worked and that the weekly benefit is proportional to the limited average weekly wage. Similar concerns about the feasibility of collecting accurate and verifiable data for limited payroll have been expressed as for hours worked. As with hours worked, there is currently no evidence either way as to whether the data can be collected. However, it should be noted that the industry did actually use limited payroll for many years prior to the 1970's. Further study of this matter is necessary before any concrete conclusions can be drawn.

Validity of Assumptions

In their report, FCA presents the distribution of employers' average wages in support of their contention that wage levels vary significantly within a given class. This distribution includes data from all classifications in the construction industry, and, therefore, may overstate the variability within

class due to potential wage variation in the average wages between classes. Of course, the data by classification would be too sparse to be credible. In addition, while the average wages appear to vary, FCA does not provide a "standard" of variability for comparison.

The use of both the limited payroll and hours worked premium basis assumes that frequency is proportional to hours worked. For at least some insureds, high wages may be a reflection of higher hazard. As discussed in detail in Appendix C, the survey data is inconclusive on this point.

FCA also addresses the issue of whether medical benefits are related to wages. However, unlike the NCCI, FCA concludes that these benefits are independent of wages. All medical benefits are unlimited in terms of total cost. The possibility does exist that the frequency and/or severity of medical benefits can increase as wages increase due to higher hazard. Again, the Oregon survey does not provide any conclusive data on this point.

FCA states in their report that "Indemnity costs generally will be proportional to wages, limited to the wages qualifying for the maximum benefit." They address the frequency and weekly benefit components of the indemnity benefits as being proportional to hours worked and limited average weekly wage, respectively. They

do not, however, discuss the duration component. We believe that the extra wages paid above the maximum may reflect the potential for longer duration of benefits due to higher hazard for many insureds.

In summary, we agree that high maximum indemnity weekly benefits are more directly related to limited than to unlimited payroll. However, we believe that for certain insureds within a classification the wages above the limit may be indicative of an increase in hazard attributable to claim frequency, duration, and the potential for unlimited medical benefits. We do not believe that the data from the Oregon survey is conclusive on these issues.

FCA Comments Regarding NCCI Proposal

One of FCA's concerns regarding the NCCI proposal is the increased impact of a large, fortuitous claim on a small or average sized insured. This increased volatility is caused by both aspects of the proposed NCCI change, as discussed in more detail in Appendix C.

In their discussion of the NCCI's selection of data, FCA states that "there was a very significant difference in the bias against high wage payers shown in the larger group." The two pairs of indexed loss ratios shown are based on the two different data

bases used. We do not have available to us the indexed loss ratios based on the one year unit statistical plan data for the 1,061 matched employers separately. However, a comparison of all 1,458 experience rated risks with the total sample population indicates that such a bias may not exist. The indexed loss ratios for the two groups are as follows:

	<u>1,983 Employers</u>	<u>1,458 Employers</u>
Low Wage Payers	1.23	1.22
High Wage Payers	0.73	0.73

Data regarding the 1,061 matched employers versus all employers regarding biases against union employers indicate that the selection process may actually exaggerate the discrepancy between union and non-union employees, as shown below. Again, the indexed loss ratios were calculated using the unit statistical plan data.

	<u>1,983 Employers</u>	<u>1,061 Employers</u>
Union	0.92	0.86
Non-Union	1.17	1.22

In addition to the above points regarding potential distortions that may have been introduced by the selection of the 1,061

employers, we would like to clarify the fact that the 1,061 employers were the employers, in the total population of 1,983 employers, who responded to the wage question, who were experience rated, and whose employer survey identification numbers could be matched with NCCI experience rating data. Of the remaining 922 employers, 525 were not experience rated and 397 were experience rated but not matched. We found no evidence that the 1,061 insureds were subjectively selected for inclusion.

FCA expresses concern regarding the NCCI's use of indexed loss ratios in measuring equity of the various proposals. They maintain that the revised premium should be measured against future loss experience rather than the losses used in determining the rates. "By the very nature of insurance, it can be expected that claims in the future periods will not replicate exactly the claims from the past." This statement applies to the entire concept of any prospective rating plan as opposed to the measure of equity selected. We believe that whatever biases are introduced by comparing losses and estimated premiums from the same experience period are probably relatively constant between proposals. Also, the limitations of the study, discussed in Appendix C, need to be considered in evaluating the validity of the measures chosen.

APPENDIX E

STAFF PARTICIPATION IN PROJECT

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Pasadena, California

**SECTION IIB - PART 6
ALTERNATIVE EXPOSURE BASES
TECHNICAL SUPPLEMENT**

TECHNICAL SUPPLEMENT B

**"Study of Premium Equity By Employer Groups." Prepared by National
Council on Compensation Insurance, 1984.**

**SECTION IIB - PART 6
ALTERNATIVE EXPOSURE BASES
TECHNICAL SUPPLEMENT**

December 6, 1991

NCCI Examination - Volume VIII - Section IIB - Part 6

MILLIMAN & ROBERTSON, INC.

**STUDY OF
PREMIUM EQUITY
BY EMPLOYER GROUPS**

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 - Why The Issue Must Be Clarified
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- A–Identification Of Premium Inequities
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SECTION 1 — WHAT IS THE ISSUE?

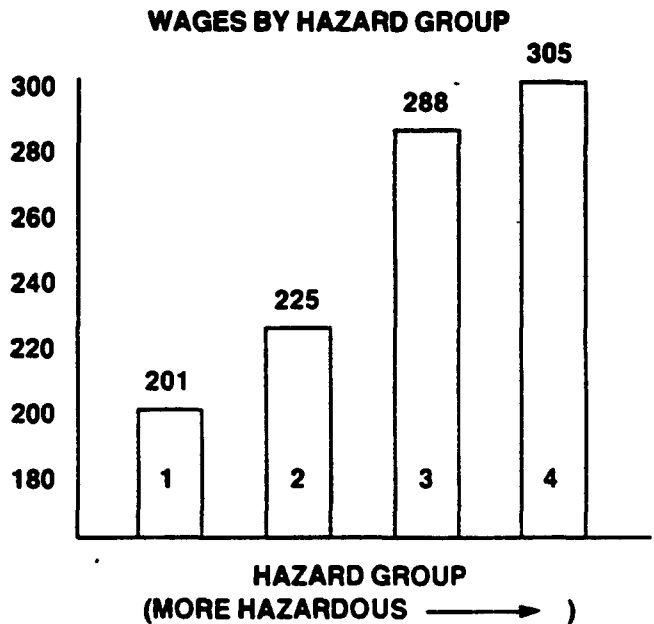
THE APPARENT ISSUE — premium is determined by multiplying the rate times the total payroll times the experience rating modification. *If* two employers have the same number of employees doing the same things, and *if* the two employers have the same benefit costs, they can end up paying different premiums *if* one employer pays higher wages.

WORKERS COMPENSATION POLICY ABC INSURANCE COMPANY

Class	Rate	Payroll	Manual Premium
1234	7.00	100,000	7,000
5678	4.00	50,000	2,000
9876	2.00	50,000	1,000
SUM			10,000
EXPER. MOD.			.80
STD. PREM.			8,000

WHY THE ISSUE MUST BE CLARIFIED — the fact that higher wages produces higher premium, by itself, is *not* unfair. It is only unfair if benefit costs are not also higher. Actual data shows that:

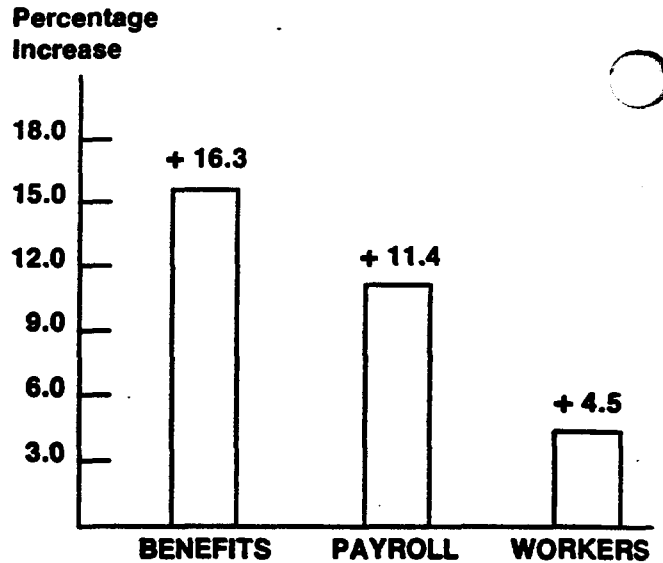
Workers in more hazardous occupations are the ones that receive higher wages.



SOURCE:
NCCI DETAIL
CLAIM CALL

Historical data shows that total claim costs track closer to total wages.

ANNUAL COUNTRYWIDE INCREASES



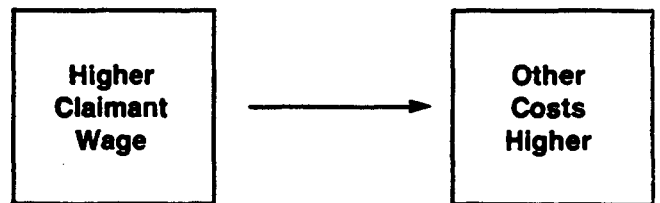
Lost time benefits are a function of employee wages. Less than 12% of injured workers receive the maximum weekly benefit.

BENEFIT: WAGE
Weekly benefit directly proportional to weekly wage for 88% of claimants.

Medical benefit costs increase as injured worker's wage increases. This is due to costs from urbanization, level of medical services availability, and other items.

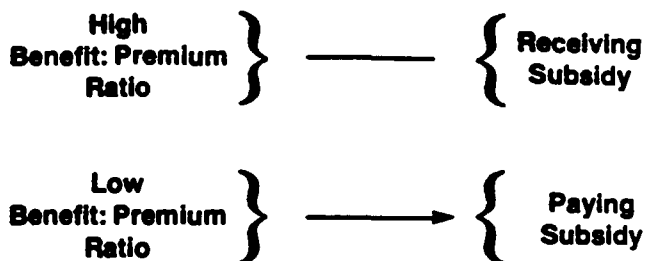
MEDICAL COST FACTORS
Urbanization
Availability
Utilization

Other compensation costs such as rehabilitation, attorney fees, etc., are higher when the claimant's wage is higher.



There is no problem when higher wages generate higher premiums if there are also higher claim costs.

THE REAL ISSUE — is there a category of employer for which the ratio of benefits to premium is too high (the category being subsidized) with another category for which the ratio of benefits to premium is too low (the category that is paying the subsidy).



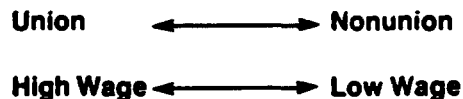
For a very large insured, the Experience Rating Program today sees that his premium is fully responsive to his benefit costs. As the size of the employer being observed decreases, the employer's premium enjoys more stability, but less responsiveness to his own benefit costs.

FIND ACCEPTABLE BALANCE POINT

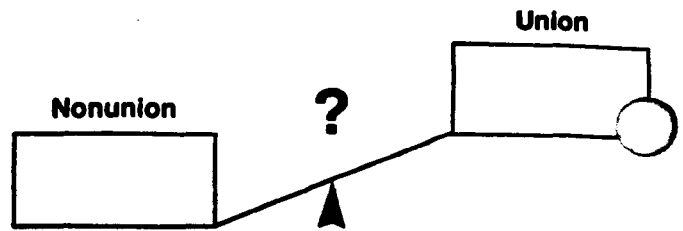


The categories of employers for which the question as to whether one group is being called upon to subsidize another are generally defined as union employers versus nonunion employers, or high wage paying employers versus low wage paying employers. The issue is only relevant when there are significant differences among employers that are within the same occupation classification.

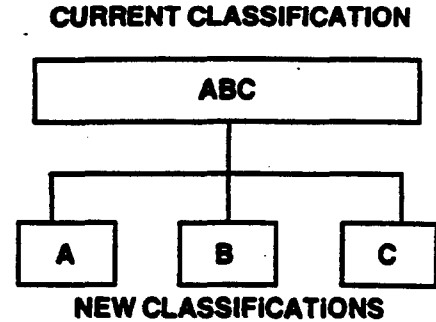
TYPES OF EMPLOYERS



First, it is necessary to identify whether there exists a systematic difference in the benefits to premium ratio for the various categories of employers.



Then, if a difference is found, the question becomes: can it be resolved directly by restructuring classification descriptions and/or the steps in determining manual premium?



Another approach is to adjust the current Experience Rating Program, which is an extension of risk classification, to make individual employer premiums correlate more closely with the particular employer's benefit costs.

SOURCE OF CONCERN — two specific segments of the construction industry have been concerned. These are: employers of union labor, and union labor itself.

Public officials have also expressed concern because of their interest in maintaining a workers compensation program which:

provides the maximum fairness (equity) in the way the costs of workers compensation benefits are allocated to individual employers,

and

encourages (and rewards) safety in the workplace.

**FAIRNESS
&
SAFETY**

SECTION 2 – SOURCES OF INFORMATION ON THE ISSUE

INSURANCE STATISTICS – provide information on premium and claim costs. The segregation of this information between high and low wage paying practices of employers, or between union and nonunion employers is not available. This is not information recorded in the course of the ordinary insurance transaction.

<u>Item</u>	<u>Available Information</u>
Premium	Yes
Claim Cost	Yes
Unionized	No
Wage Level	No

SPECIAL SURVEY – was issued with the goal of factually identifying whether or not a problem existed, and if so, what were the unique characteristics of these employers.

Surveyed classifications represented every occupation or industry for every individual or association representative that voiced concern at the numerous public hearings in Oregon.

**Covered Employers In
42 Classifications**

- The list of 42 classifications was developed with the Oregon Insurance Department.
- The survey was issued by the Governor of Oregon, whose Office had selected the firm that did the survey.
- The survey was designed and issued by the firm of Bardsley & Haslacher, Inc. under the direction of Dr. Robert M. Friedman, Vice President.

SECTION 3 – IS THERE A PROBLEM? – WHAT IS IT?

THE ONLY SOURCE OF ACTUAL DATA – to date there is only one source of scientifically collected actual data (as compared to hypothetical examples or arbitrarily selected illustrations) on the fairness of premium paid by wage level of employer, or unionization of employer. That source is the Special Survey.

WHAT THE SPECIAL SURVEY SHOWS

- For employers so small as to not be included in the current Experience Rating Program:
 - There is no bias against union employers as a group.
 - There is no bias against high wage paying employers as a group.
 - Non-experience rated employers in the survey represented 2.2% of the premium (i.e., work force) in the construction industry.
- For employers large enough to be included in the current Experience Rating Program:
 - There appears to be in the majority of the 42 classifications experience which shows a difference in the benefit cost per premium dollar for employers paying more than \$500 per week as compared to those who pay less than \$500. Per premium dollar, high wage paying employers on average result in a lower benefit cost. That is, their benefit to premium ratio is lower.
 - Similarly, per premium dollar, union employers have a lower benefit cost ratio in the 42 classifications.
- As everyone would expect, the results in both of the above instances are not uniform. Some high wage employers have very high benefit costs, and some union employers have very high benefit costs.

**NO BIAS FOR SMALL
(NON-EXPERIENCE RATED)
EMPLOYERS**

BENEFIT COSTS PER PREMIUM DOLLAR

High Wage	–	11% Less
Low Wage	–	6% More

BENEFIT COSTS PER PREMIUM DOLLAR

Union	–	12% Less
Nonunion	–	14% More

- Two important underlying differences were observed in the benefit cost patterns for union employers as opposed to nonunion employers.

1. The number of claims per premium dollar was lower for union employers.
2. Actual "excess" losses for union employers was lower than expected ("excess" losses are those portions of high cost claims that are discounted in determining the actual premium of a smaller employer in the experience rating process).

UNION EMPLOYERS

- Lower claim frequency per Premium Dollar
- Lower than expected "Excess" Claim Cost

SECTION 4 – CRITERIA FOR A SOLUTION

FAIRNESS – is achieved to the extent that there is meaningful relationship for each employer of benefit costs to the premium he must pay. This relationship of cost to premium should be as similar as possible regardless of how the population of employers is segmented or categorized.

ABILITY TO AVOID MANIPULATION – of the premium calculation process by the insurer, the agent, or the employer is imperative if the program is to produce fairness (and equity) from employer to employer. The method of premium computation must be:

- Clearly definable.
- Only require input which is readily available for all employers.
- Fully verifiable by agents, carrier auditors and bureau inspectors.

EFFICIENCY – requires that any additional recordkeeping for all insureds, and insurers be kept to an absolute minimum. It further requires that extra steps in determining premium also be held to an absolute minimum.

MAINTAIN THE SAME TOTAL PREMIUM – is an integral part of any solution. The allocation, or reallocation, of workers compensation costs to individual employers should not change the total premium.

FAIRNESS –

Match Premium to Claim Cost.

NON-MANIPULATIVE

- Clearly Definable.
- Input Available.
- Input Verifiable.

EFFICIENT

Must not create additional work.

PREMIUM

Reallocated without changing total.

SECTION 5 – THE EXPERIENCE RATING SOLUTION

PROPOSED CHANGES

- **Increased responsiveness**—the current Experience Rating Program has reflected a balance between responsiveness to experience and stability of price for individual employers that has been accepted by most industries for many decades. However, in certain segments of the construction industry in certain states discontent has been expressed. The program of additional premium credits and surcharges described in detail in Appendix B, serves to increase price responsiveness to individual employer benefit costs.
- **Less reliance on the average excess benefit cost experience** of all employers in the classification, and more reliance upon the actual experience of the individual employer. This is accomplished by increasing the D-Ratios only for the particular classification, and then only when the individual employers have significant exposure in those classifications.
- **A solution which is problem specific**—does not change the result for those employers where change is not appropriate. Some categories of employers (e.g. non-rated) have not shown evidence of a problem, and should not have their traditional balance of responsiveness to stability changed. This is accomplished by the specific eligibility criteria as described in Appendix B.
- **Does not result in a requirement to increase manual rates to achieve fairness**, but rather achieves price responsiveness through changes in experience rating plan values.

ADDITIONAL CREDITS AND SURCHARGES

- **Lower Actual Claim Cost Reduces premium.**
- **Higher Actual Claim Cost Increases Premium.**

- **Reduce Expected Excess Costs.**

- **Solution is Problem Specific.**

- **Does Not Increase Rates.**

SOLVES THE REAL ISSUE – which is to more closely align the premiums of individual employers with their actual benefit costs.

- Reduces the premium of employers with low benefit costs per premium dollar.
- Increases the premium of employers with high benefit costs per premium dollar.
- Further encourages employer safety actions by increasing the premium reduction for good results and increasing the premium surcharge for poor results.
- Is problem specific. It addresses the real issue rather than arbitrarily reducing the premium of all employers in a particular category, whether they deserve the reduction or not—and arbitrarily increasing the premium of all of the remaining employers, whether they deserve it or not.
- Does not increase the work, nor overhead costs, of employers, agents or carriers.

SOLUTION

- Increases Fairness.
- Encourages Safety.
- Problem Specific.
- Efficient.

APPENDICES

APPENDIX A

Identification of Premium Inequities

With the receipt of the responses to the employer survey, NCCI now possessed the capability of comparing an insured's actual premium and loss experience with the characteristics of his operation. The first step in this process was a matching of the survey responses to the workers compensation experience incurred under policies effective between July 1980 and June 1981, inclusive. Inasmuch as the concerns expressed over the equity of the current rating system centered around relative wage levels, this matching process was only performed for those 1,983 insureds who completed questions 22 and 23 under the survey. This first gathering of insurance data was also united to the premium and loss experience incurred under the classification for which the employer was surveyed. The insurance statistics gathered included the following for the insured's surveyed classification:

- Total Payroll
- Manual Premium (1980 Rate x Payroll)
- Standard Earned Premium (Manual Premium x Experience Rating Mod)
- Number of Claims (Both lost time and medical only)
- Incurred Indemnity Losses
- Incurred Medical Losses

Each employer was categorized according to his average pay scale in \$100 brackets and the insurance experience summarized for the employers within each bracket. The results of this summarization did indeed portray that in the surveyed classification the high paying employers generated better loss ratios than low paying employers. A clear distinction could be made for those employers paying an average of more than \$500 per full work week versus those paying less than \$500. The results of this comparison can be seen in Exhibit 1.

A similar comparison was made between union employers and non-union employers with the knowledge that union employers are generally the higher wage payers within any particular trade and, thus, classification. Again, discernable differences in loss ratios in the surveyed classifications were apparent where the loss ratio for the union employers was 10% better than average (index of .90) and the non-union 21% worse (index of 1.21). The results of these comparisons are shown on Exhibit II.

In order to isolate the problem further an examination of the premium and loss experience of the surveyed classifications for risks not eligible under the experience rating plan was made. These risks represented only 2% of the premium volume and showed that no clear loss ratios differences exist (see Exhibit III).

While these analyses did portray premium inequities, they did exclude the premium and loss experience incurred in any other classes by those employers and was based upon only one year of insurance data. In order to expand the analyses and ensure that the loss ratio patterns extended over more years, a match was made against the employers' insurance data utilized in the experience rating plan. Of the original 1,983 insureds, 1,061 were experience rated for whom a match could be made between the survey response and the rating data. The experience represented three policy years of premium and loss data (1979, 1980 and 1981) and included all of the workers compensation experience incurred by those employers. As seen in Exhibits IV and V the same loss ratio patterns existed for union/non-union comparisons and high/low wage payers.

OREGON EXPERIENCE BY EMPLOYER WAGE LEVELS
(POLICY YEAR 7/80 to 6/81)

ALL RISKS THAT REPORTED WAGE INFORMATION

AVERAGE WEEKLY WAGE	NUMBER OF EMPLOYEES	NUMBER OF EMPLOYERS	STANDARD PREMIUM	NUMBER OF CLAIMS	INDEMNITY LOSSES	MEDICAL LOSSES	TOTAL LOSSES	INDEXED LOSS RATIO
\$101	176	59	\$ 198,889	15	\$64,287	\$25,038	\$89,325	1.50
101-200	400	151	405,491	40	181,586	105,910	287,496	2.37
201-300	1,635	381	1,515,533	125	281,677	168,459	450,136	1.00
301-400	2,683	505	3,105,969	199	643,517	383,925	1,027,442	1.10
401-500	3,764	409	5,190,657	385	1,309,879	703,746	2,013,625	1.30
501-600	2,216	221	3,747,647	160	529,552	330,702	860,254	0.77
601-700	1,839	151	2,208,010	100	388,523	206,892	595,415	0.90
701-800	898	55	1,854,445	62	178,497	113,113	291,610	0.53
801	505	51	676,943	20	75,672	36,020	111,692	0.55
TOTAL	14,116	1,983	\$18,903,584	1,106	\$3,653,190	\$2,273,805	\$5,726,995	1.00

SUMMARY

AVERAGE WEEKLY WAGE	NUMBER OF EMPLOYEES	NUMBER OF EMPLOYERS	STANDARD PREMIUM	% OF TOTAL	% OF TOTAL	INDEXED LOSS RATIO
\$500	8,658	1,505	\$10,416,538	75.9%	55.1%	1.23
500	5,458	478	8,487,045	24.1%	44.4%	.73
TOTAL	14,116	1,983	\$18,903,584	100.0%	100.0%	1.00

OREGON EXPERIENCE BY EMPLOYER WAGE LEVELS

UNION VS. NON-UNION EMPLOYERS

ALL RISKS

<u>UNION EMPLOYERS</u>		<u>ALL RISKS</u>							<u>INDEXED</u>
<u>AVERAGE</u>	<u>NUMBER OF</u>	<u>NUMBER OF</u>	<u>MANUAL</u>	<u>NUMBER OF</u>	<u>INDERNITY</u>	<u>MEDICAL</u>	<u>TOTAL</u>	<u>LOSS RATIO</u>	
<u>WEEKLY WAGE</u>	<u>EMPLOYEES</u>	<u>EMPLOYERS</u>	<u>PREMIUM</u>	<u>CLAIMS</u>	<u>LOSSES</u>	<u>LOSSES</u>	<u>LOSSES</u>		
< \$101	31	6	\$ 37,543	2	\$ 8,940	\$ 4,146	\$ 13,086	1.21	
101-200	84	17	123,458	6	16,929	11,212	28,141	0.79	
201-300	302	48	504,255	20	59,866	32,555	92,421	0.62	
301-400	1066	105	1,413,750	73	264,644	154,356	419,000	1.03	
401-500	2263	143	3,684,754	266	1,038,803	525,468	1,564,271	1.45	
501-600	1686	138	3,198,172	116	375,760	225,814	601,574	0.66	
601-700	1431	101	1,968,362	90	322,448	189,723	512,171	0.90	
701-800	796	38	1,782,566	50	115,952	89,144	205,096	0.41	
> 801	460	34	628,320	17	56,301	24,216	80,517	0.45	
TOTAL	8,119	630	\$13,341,180	640	\$2,259,643	\$1,256,634	\$3,516,277	0.90	

NON-UNION EMPLOYERS

<u>AVERAGE</u>	<u>NUMBER OF</u>	<u>NUMBER OF</u>	<u>MANUAL</u>	<u>NUMBER OF</u>	<u>INDERNITY</u>	<u>MEDICAL</u>	<u>TOTAL</u>	<u>INDEXED</u>
<u>WEEKLY WAGE</u>	<u>EMPLOYEES</u>	<u>EMPLOYERS</u>	<u>PREMIUM</u>	<u>CLAIMS</u>	<u>LOSSES</u>	<u>LOSSES</u>	<u>LOSSES</u>	<u>LOSS RATIO</u>
< \$101	145	53	\$ 147,433	13	\$ 55,347	\$ 20,892	\$ 76,239	1.79
101-200	316	134	296,376	34	164,657	94,698	259,355	3.03
201-300	1334	333	1,041,345	105	221,811	135,904	357,715	1.17
301-400	1617	400	1,785,086	126	378,873	229,569	608,442	1.17
401-500	1501	266	1,668,017	119	271,076	178,278	449,354	0.93
501-600	529	83	810,073	44	153,792	104,888	258,680	1.10
601-700	408	50	380,935	10	66,075	17,169	83,244	0.76
701-800	102	17	190,486	12	62,545	23,969	86,514	1.55
> 801	45	7	50,411	3	19,371	11,804	31,175	2.14
TOTAL	5,997	1,353	\$6,370,162	466	\$1,393,547	\$817,171	\$2,210,718	1.21

OREGON EXPERIENCE BY EMPLOYER WAGE LEVELS
(POLICY YEAR 7/80 to 6/81)

NON-EXPERIENCE RATED RISKS

<u>Average Weekly Wages</u>	<u>Standard Premium</u>	<u>Indexed Loss Ratio</u>
<101	18,858	.40
101-200	61,963	1.30
201-300	104,477	.55
301-400	114,688	1.03
401-500	61,658	1.52
501-600	34,808	1.43
601-700	23,969	.28
701-800	3,773	.01
>801	<u>9,596</u>	<u>2.05</u>
	433,790	1.00
<500	361,644	.99
>500	<u>72,146</u>	<u>1.05</u>
	433,790	1.00
Union	73,744	1.72
Non-union	<u>360,046</u>	<u>.85</u>
	433,790	1.00

OREGON EXPERIENCE BY EMPLOYER WAGE LEVELS

COMPARISON OF UNION VS. NON-UNION EMPLOYERS

EXPERIENCE RATED RISKS

AVERAGE WEEKLY WAGE	NUMBER OF EMPLOYEES	NUMBER OF EMPLOYERS	MANUAL PREMIUM	NUMBER OF CLAIMS	INDemnITY LOSSES	MEDICAL LOSSES	TOTAL LOSSES	INDEXED LOSS RATIO
< \$101	9	3	\$ 74,630	11	\$ 1,297	\$ 2,925	\$ 4,222	0.23
101-200	52	12	604,166	70	55,553	41,646	97,199	0.64
201-300	163	26	2,409,968	167	267,344	161,469	428,813	0.71
301-400	592	70	10,178,014	740	1,708,693	995,191	2,703,884	1.06
401-500	726	78	8,278,801	494	1,386,162	617,226	2,003,388	0.97
501-600	870	86	9,853,653	553	1,098,651	471,250	1,569,901	0.64
601-700	731	56	6,700,194	452	1,162,461	466,643	1,629,104	0.97
701-800	212	18	3,319,540	184	304,426	183,440	487,866	0.59
> 801	213	23	1,250,134	146	297,402	111,367	408,769	1.31
TOTAL	3,568	372	\$42,669,100	2,817	\$6,281,989	\$3,051,157	\$9,333,146	0.88

* NON-UNION EMPLOYERS

AVERAGE WEEKLY WAGE	NUMBER OF EMPLOYEES	NUMBER OF EMPLOYERS	MANUAL PREMIUM	NUMBER OF CLAIMS	INDemnITY LOSSES	MEDICAL LOSSES	TOTAL LOSSES	INDEXED LOSS RATIO
< \$101	70	22	\$ 619,101	47	\$ 110,298	\$ 61,829	\$ 172,127	1.11
101-200	159	55	1,054,985	89	351,817	80,845	432,662	1.64
201-300	668	166	4,137,272	425	788,251	483,826	1,272,077	1.23
301-400	1,011	227	11,356,296	984	1,620,228	849,018	2,469,246	0.87
401-500	842	143	10,456,906	600	2,031,827	1,416,977	3,448,804	1.32
501-600	298	39	5,238,831	343	997,190	657,529	1,654,719	1.26
601-700	214	26	1,948,136	96	386,921	180,025	566,946	1.16
701-800	60	8	811,514	40	140,141	52,705	192,846	0.95
> 801	8	3	18,359	2	0	388	388	0.08
TOTAL	3,330	689	\$35,641,400	2,626	\$6,426,673	\$3,783,142	\$10,209,815	1.14

OREGON EXPERIENCE BY EMPLOYER WAGE LEVELS

EXPERIENCE RATED RISKS

AVERAGE WEEKLY WAGE	NUMBER OF EMPLOYEES	NUMBER OF EMPLOYERS	MANUAL PREMIUM	NUMBER OF CLAIMS	INDemnITY LOSSES	MEDICAL LOSSES	TOTAL LOSSES	INDEXED LOSS RATIO
< \$101	79	25	\$ 693,731	58	\$ 111,595	\$64,754	\$176,349	1.02
101-200	211	67	1,659,151	159	407,370	122,491	529,861	1.28
201-300	831	192	6,547,240	592	1,055,595	645,295	1,700,890	1.04
301-400	1,603	297	21,534,310	1,724	3,328,921	1,844,209	5,173,130	0.96
401-500	1,568	221	18,735,707	1,094	3,417,989	2,034,203	5,452,192	1.16
501-600	1,168	125	15,092,484	896	2,095,841	1,128,779	3,224,620	0.86
601-700	945	82	8,648,330	548	1,549,382	646,668	2,196,050	1.02
701-800	272	26	4,131,054	224	444,567	236,145	680,712	0.66
> 801	221	26	1,268,493	148	297,402	111,755	409,157	1.29
TOTAL	6,898	1,061	\$78,310,500	5,443	\$12,708,662	\$6,834,299	\$19,542,961	1.00

SUMMARY

AVERAGE WEEKLY WAGE	NUMBER OF EMPLOYEES	NUMBER OF EMPLOYERS	MANUAL PREMIUM	% OF TOTAL	% OF TOTAL	INDEXED LOSS RATIO
< \$500	4,292	802	\$49,170,139	75.6%	62.8%	1.06
> 500	2,606	259	29,140,361	24.4%	37.2%	0.89
TOTAL	6,898	1,061	\$78,310,500	100.0%	100.0%	1.00

APPENDIX B

Experience Rating As A Solution

While wage levels were focused upon by the consumers as creating inequities in the current system, pay practices by themselves will not necessarily create problems. If all the employers in the same classification paid their employees similar wages, even though they may be extremely high, inequities would not occur as the rate would contemplate those wage levels. It is only where the classification plan groups dissimilar insureds, including high and low wage payers, into the same classification that inequities will emerge. It is exactly this case that was demonstrated in the previous section and, thus, actual loss experience did not coincide with the expected loss experience as predicted by the employers' level of premium.

The experience rating plan acts as a natural extension of the classification system. It is intended to introduce more equity into the rating system by comparing an individual employer's actual loss experience to his expected loss experience. A modification to the employer's premium is made as a result of that comparison. The experience rating plan must, of course, balance between the need to be responsive to an employer's loss experience and, yet, be relatively stable. This balance is achieved by placing emphasis upon the occurrence of a claim as opposed to the size of the claim, with the claim size having more significance in the rating as the size of the employer increases. This is accomplished in the experience rating process through the separate analysis of what is termed "primary" and "excess" losses. The key element in the level of emphasis to be placed upon expected claim frequency in the experience rating plan is the D ratio, and 100% minus the D ratio.

While the experience rating plan was designed so as to limit the degree to which a smaller employer's premium could change, it should have operated to eliminate most, if not all, of the differences in loss ratios for large groups of insureds. Inasmuch as the current experience rating plan did not respond sufficiently to the better than expected loss experience of the union employers as a group, it needed to be made more responsive to the employer's actual loss experience. Therefore, as the first part of the solution, NCCI proposes superimposing an additional credit/debit approach to the current experience rating plan.

The first step in the process is determining to what extent the experience rating plan adjusted the employer's level of expected losses through modification of his premium to coincide with his actual loss experience. This comparison can be drawn by dividing the employer's actual losses by his expected losses times the experience rating modification. To the extent that this ratio is greater or less than 1.00, the desire for pure stability limited the responsiveness of the experience rating plan. A ratio of less than 1.00 implies better loss experience, while a ratio greater than 1.00 implies worse loss experience.

By superimposing additional premium credits for ratios less than 1.00 and debits (surcharges) for ratios greater than 1.00, the experience rating plan can be made more responsive to an individual's actual loss experience. There, of course, still needs to be a balance between responsiveness and stability. If the plan were made so as to be completely responsive, the whole concept of insurance is contradicted.

The NCCI, therefore, began analyzing the operation of the current experience rating plan by size of insured and by the distribution of their loss experience within each size category. Alternative combinations of credits and debits were tested so as to restrain the amount by which an individual insured's premium may change from year to year, while at the same time achieving enough responsiveness so as to minimize the inequities in the current system. The attached Exhibit I is the resultant combination of additional credits and debits. It is produced from the formula shown at the bottom of the exhibit that grades the credits and debits both as to size of insured and as to the ratio of his actual loss experience to his modified expected loss experience.

In examining the loss experience for the various groups, NCCI observed another difference between union and non-union employers. Union employers incurred almost 15% less actual excess losses than expected, in addition to having a somewhat lower claim frequency per dollar of payroll. As noted earlier, it is the D ratio and 100% minus the D ratio that is the key element in placing emphasis on claim frequency and developing expected excess losses to be incorporated into the rating process. Therefore, the NCCI also proposed a 15 point increase in the otherwise calculated D-ratios of each of the 42 classifications when rating an eligible insured. This has the effect of placing more emphasis upon primary losses in the rating process when claims occur.

Since the experience rating modifications are developed based upon an insured's entire workers compensation experience, it

was necessary to measure the equity of the proposal using all of the classification data for the surveyed employers. The results of these tests showed that the proposed solution equalized the high wage/low wage and union/non-union modified expected losses (and thus premium) and actual losses through revised experience rating modifications to be applied to each insured's premium in the following way:

	<u>Indexed Ratio</u>
Union	.98
Non-Union	1.02
High Wage	.98
Low Wage	1.01

In order that the program not apply to those insureds with only incidental exposure in one of the affected classes, the NCCI proposes limiting the revised rating procedures to those insured who have a majority of their expected losses in the offsetted classifications (i.e., if the sum of their expected losses in the classes exceeds 50%). Testing this eligibility rule showed that 6,100 insureds out of 7,600 with any exposure in the offsetted classes qualified for the program.

Preliminary tests on these insureds showed that there will be a negative off-balance between the total premium produced by the NCCI proposal for construction classes and the current premium produced from these classes. In order to maintain the same overall total premium, the off-balance will be reflected through an adjustment in the expected loss rates.

THREE YEAR EXPECTED LOSSES (IN 000)

R/E	0.0	2.5	5.0	7.5	10.0	12.5	15.0	17.5	20.0	22.5	25.0	27.5	30.0
0.0	1.00	0.90	0.84	0.80	0.76	0.73	0.70	0.67	0.64	0.62	0.59	0.57	0.55
0.05	1.00	0.92	0.86	0.82	0.79	0.76	0.73	0.70	0.68	0.66	0.64	0.62	0.60
0.10	1.00	0.93	0.88	0.84	0.81	0.78	0.76	0.74	0.72	0.70	0.68	0.66	0.65
0.15	1.00	0.93	0.89	0.86	0.83	0.81	0.79	0.77	0.75	0.73	0.72	0.70	0.69
0.20	1.00	0.94	0.91	0.88	0.85	0.83	0.82	0.80	0.78	0.77	0.75	0.74	0.73
0.25	1.00	0.95	0.92	0.89	0.87	0.86	0.84	0.83	0.81	0.80	0.79	0.78	0.77
0.30	1.00	0.96	0.93	0.91	0.89	0.88	0.86	0.85	0.84	0.83	0.82	0.81	0.80
0.35	1.00	0.96	0.94	0.92	0.91	0.90	0.88	0.87	0.86	0.85	0.85	0.84	0.83
0.40	1.00	0.97	0.95	0.94	0.92	0.91	0.90	0.89	0.89	0.88	0.87	0.86	0.86
0.45	1.00	0.98	0.96	0.95	0.94	0.93	0.92	0.91	0.91	0.90	0.89	0.89	0.88
0.50	1.00	0.98	0.97	0.96	0.95	0.94	0.94	0.93	0.92	0.92	0.91	0.91	0.91
0.55	1.00	0.98	0.97	0.96	0.96	0.95	0.95	0.94	0.94	0.94	0.93	0.93	0.93
0.60	1.00	0.99	0.98	0.97	0.97	0.97	0.96	0.96	0.95	0.95	0.95	0.95	0.94
0.65	1.00	0.99	0.99	0.98	0.98	0.97	0.97	0.97	0.97	0.96	0.96	0.96	0.96
0.70	1.00	0.99	0.99	0.99	0.98	0.98	0.98	0.98	0.98	0.97	0.97	0.97	0.97
0.75	1.00	1.00	0.99	0.99	0.99	0.99	0.99	0.99	0.98	0.98	0.98	0.98	0.98
0.80	1.00	1.00	1.00	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
0.85	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
0.90	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1.05	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1.10	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1.15	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.01	1.01	1.01	1.01	1.01
1.20	1.00	1.00	1.00	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
1.25	1.00	1.00	1.01	1.01	1.01	1.01	1.01	1.01	1.02	1.02	1.02	1.02	1.02
1.30	1.00	1.01	1.01	1.01	1.02	1.02	1.02	1.02	1.02	1.03	1.03	1.03	1.03
1.35	1.00	1.01	1.01	1.02	1.02	1.03	1.03	1.03	1.03	1.04	1.04	1.04	1.04
1.40	1.00	1.01	1.02	1.03	1.03	1.03	1.04	1.04	1.05	1.05	1.05	1.05	1.06
1.45	1.00	1.02	1.03	1.03	1.04	1.05	1.05	1.06	1.06	1.06	1.07	1.07	1.07
1.50	1.00	1.02	1.03	1.04	1.05	1.06	1.06	1.07	1.08	1.08	1.09	1.09	1.09
1.55	1.00	1.02	1.04	1.05	1.06	1.07	1.08	1.09	1.09	1.10	1.11	1.11	1.12
1.60	1.00	1.03	1.05	1.06	1.08	1.09	1.10	1.11	1.11	1.12	1.13	1.14	1.14
1.65	1.00	1.04	1.06	1.08	1.09	1.10	1.12	1.13	1.14	1.15	1.15	1.16	1.17
1.70	1.00	1.04	1.07	1.09	1.11	1.12	1.14	1.15	1.16	1.17	1.18	1.19	1.20
1.75	1.00	1.05	1.08	1.11	1.13	1.14	1.16	1.17	1.19	1.20	1.21	1.22	1.23
1.80	1.00	1.06	1.09	1.12	1.15	1.17	1.18	1.20	1.22	1.23	1.25	1.26	1.27
1.85	1.00	1.07	1.11	1.14	1.17	1.19	1.21	1.23	1.25	1.27	1.28	1.30	1.30
1.90	1.00	1.07	1.12	1.16	1.19	1.22	1.24	1.26	1.28	1.30	1.32	1.34	1.35
1.95	1.00	1.08	1.14	1.18	1.21	1.25	1.27	1.30	1.32	1.34	1.36	1.38	1.40
2.00	1.00	1.10	1.16	1.20	1.24	1.27	1.30	1.33	1.36	1.38	1.41	1.43	1.45

* Credit or = $1 - \frac{[.085 \times E \times (1-R) \times (abs(1-R))^{1.25}]}{(E + 2.5)^5}$
Debit

**SECTION IIB - PART 6
ALTERNATIVE EXPOSURE BASES
TECHNICAL SUPPLEMENT**

TECHNICAL SUPPLEMENT C

"Oregon Survey on Premium Equity for Workers' Compensation Insurance." Prepared by Bardsley & Haslacher, Inc., Spring 1984.

OREGON SURVEY ON PREMIUM
EQUITY FOR WORKERS'
COMPENSATION INSURANCE

Spring, 1984

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Survey Implementation	5
Non-Respondent Survey	12
Verification Of Responses	16

Appendix:

Cover Letter From Governor Accompanying Survey

Follow-Up Letter To Non-Respondents

Copy Of Survey Questionnaire

Copy Of Survey Of Non-Respondents

OREGON SURVEY ON PREMIUM EQUITY FOR WORKERS' COMPENSATION INSURANCE

This report reports on the method used to collect information for a study mandated by the Oregon Legislative Assembly on equity of premium for workers' compensation insurance.

The data were collected and compiled for the National Council On Compensation Insurance (N.C.C.I.) by Bardsley & Haslacher, Inc., an independent and impartial research organization with operations in the Western United States.

Purpose

During the 1983 Session of the Oregon Legislative Assembly, a number of highly technical questions were raised on equity of premium for workers' compensation insurance.

It was concluded that there was insufficient empirical evidence to guide legislators in determining if remedial steps were required, and, if so, what they should be.

At the close of the Session, the Insurance Commissioner was directed to undertake a study in cooperation with the National Council On Compensation Insurance on equity of premium issues in Oregon and to provide recommendations for legislative actions to the 1985 Legislative Session based on the research.

Bardsley & Haslacher, Inc., was commissioned to conduct a survey of companies and individuals carrying workers' compensation insurance in construction occupations. The data collected were provided to the National Council to be used in conjunction with other information to arrive at recommendations, if warranted, for changes in the basis of premium.

Survey Format

The survey was conducted by the research organization using a mail panel method. This involved contacting potential respondents up to three times to obtain a completed questionnaire.

The initial contact was by mail and included a cover letter from the Governor of Oregon, copy of the survey questionnaire, and stamped return envelope.

In the cover letter, the Governor explained the purpose of the project, requested participation, and assured participants of complete confidentiality of responses.

A second contact was made via telephone by the research organization with those who did not reply approximately two weeks after the initial mailing. The purpose was to determine if the survey was received, answer any questions, and encourage participation.

Approximately three weeks later, remaining non-respondents were sent a second questionnaire, cover letter from the research organization requesting return of the survey, and a postpaid return envelope.

No further contacts were made.

All survey instruments and related materials are appended to this report.

Survey Sampling Plan

This was a census survey. In other words, an attempt was made to obtain participation from the reported total population of insureds in the state covered by workers' compensation during the last three years in 41 construction occupations.

The unit of analysis was company or individual carrying the workers' compensation insurance policy.

To avoid sending multiple questionnaires to companies with coverage in more than one construction occupation, and thus discouraging returns, insureds in each construction occupation were ranked in descending order by amount of payroll relative to other insureds in the same occupational category.

In cases where the insured was covered in more than one occupational category, the construction occupation with the highest rank, accounting for the most payroll relative to the total was selected.

For those few situations where the insured had two occupations with the same rank, the percentage of payroll relative to the total payroll in the job class was examined, and the occupation accounting for the larger percentage was chosen for inclusion in the study.

Using this system of selection, 75% of the total payroll in the 41 construction classifications, or 8,291 insured companies or individuals, were designated for inclusion.

Pretest

Proposed questions were provided by the National Council On Compensation Insurance, which the research organization put into questionnaire form in preparation for pretesting.

The draft questionnaire was finalized on November 17, 1983, and pretested beginning on December 5, 1983, with respondents from construction occupations listed in the table below

PRETEST SAMPLE DESIGN: 1/

<u>Occupational Classification</u>	<u>Sample Size</u>
5057 - Iron Or Steel Erectors (NOC)	29
5551 - Roofing (All Kinds)	208
5651 - Carpentry - Multi-Family Dwellings	197

1/ The total population of reported insureds is larger than the sample size. The difference is due to duplicate N.C.C.I. listings and insufficient information for mailing. Actual number of insureds is: 5057 = 33; 5551 = 221; and, 5651 = 221.

The pretest sample design was a purposive type. In other words, companies were selected only if they had payroll in one of the three pretest occupational categories.

In cases where a company or individual employed workers in multiple construction classifications, it was selected only if its payroll in one of the three pretest occupations was larger relative to any other construction category in which it employed covered workers.

The pretest mail panel was completed on January 27, 1984, with results as shown in the table below

PRETEST RESPONSE RATE:

<u>Occupational Classification</u>	<u>Sample Size</u>	<u>Return Rate</u>
5057 - Iron & Steel Erection (NOC)	29	38%
5551 - Roofing (All Kinds)	208	54%
5651 - Carpentry - Multi-Family Dwellings	197	45%

Analysis of pretest findings led to minor changes in question wording and survey format in preparation for execution of the full survey. These were reviewed and approved by N.C.C.I. principals assigned to the project on February 6, 1984.

Survey Implementation

The full survey was executed in two phases, the first commencing on February 15, 1984, and the second beginning on March 9, 1984.

The execution was preceded by a publicity campaign conducted by the National Council on Compensation Insurance, and its Oregon Office, to create awareness of the project and encourage completion and return of questionnaires.

Each phase consisted of a full mail panel, including an initial mailing of a cover letter, questionnaire, and return envelope; a second contact with non-respondents by telephone or mail, depending

on availability of a telephone number; and, a follow-up mailing to remaining non-respondents.

The table below shows the number of potential respondents in the sampling frame and number of surveys mailed and delivered. The difference between the total potential respondents and the number of questionnaires delivered is due to surveys returned as undeliverable by the post office, duplicate listings on N.C.C.I. records, and insufficient address information for mailing.

In total, there were 7,816 potential respondents covered by workers' compensation insurance during the last three years in 38 construction occupations. This excludes three occupations surveyed in the pretest, and one classification (5069) that has a negligible payroll in Oregon.

Of this number, 81% were included in the mail panel and sent questionnaires, or 6,294 in total, while the remainder were undeliverable by the post office, duplicate listings on N.C.C.I. records, or lacking sufficient information for mailing.

The percentage of questionnaires undeliverable by the post office was 11% of the sampling frame, or 851 in total.

The full disposition of the survey mailing is shown in the next table

N.C.C.I. SAMPLE DISPOSITION

<u>Occupational Classification Number</u>	<u>Total Listing</u>	<u>Mailed & Delivered</u>
3724 - Millwright Work	360	277
3726 - Boiler Installation	31	23

N.C.C.I SAMPLE DISPOSITION: (CON'T)

Occupational Classification Number	Total Listings	Mailed & Delivered
5022 - Masonry	234	193
5040 - Iron & Steel Erection	28	23
5059 - Frame Structures	35	27
5102 - Door Frame Or Sash Erection	36	25
5103 - Plumbing	509	406
5190 - Electrical Wiring	495	401
5213 - Concrete Construction	172	137
5215 - Concrete Work	231	189
5221 - Cement Work	315	257
5348 - Tile Work	84	68
5403 - Carpentry	402	321
5437 - Carpentry (Cabinet Work & Interior Trim)	231	187
5445 - Wall Board Installation	226	169
5462 - Glazier	115	87
5474 - Painting Or Paper Hanging	352	295
5479 - Insulation Work	154	107
5506 - Street or Road Construction	207	172
5507 - Cleaning Right- Of-Way	163	140

N.C.C.I SAMPLE DISPOSITION: (CON'T)

Occupational Classification Number	Total Listing	Actually Mailed
5508- Rock Excavation	29	27
5511- Logging Road Construction	232	210
5538 - Sheet Metal Work	403	327
5606 - Contractors	155	118
5645 - Carpentry Construction	1,494	1,187
6003 - Pile Driveways	21	16
6005 - Jetty Or Breakwater Construction	9	8
6204 - Drilling	88	71
6217 - Excavation	375	310
6229 - Irrigation & Drainage System Construction	100	79
6306 - Sewer Construction	90	67
6319 - Gas Mains Connection Construction	123	107
6325 - Conduit Construction For Cables	44	34
6400 - Fence Construction (Metal)	84	72
7538 - Electric Light Or Power Line Construction	22	17

N.C.C.I SAMPLE DISPOSITION: (CON'T)

<u>Occupational Classification Number</u>	<u>Total Listing</u>	<u>Actually Mailed</u>
7500 - Telephone Or Telegraph Company	98	83
7501 - Telephone, Telegraph, Or Fire Alarm Construction	30	22
7505 - Burglar Alarm	<u>39</u>	<u>35</u>
Total	7,816	6,294

The mail panel was concluded on May 11, 1984, the last day for receipt of completed questionnaires.

The overall (mean) average response rate (weighted) was 66%. The highest return was 88% from Pile Driveways and Drivers, while the lowest was 49%, respectively, for classifications 5445 -- Wall Board Installations Within Buildings, and 7500 - Telephone or Telegraph Company.

Rates of return for each job classification can be seen in the table below

WORKERS' COMPENSATION SURVEY RETURNS

<u>Occupational Classification</u>	<u>Surveys Sent</u>	<u>Surveys Received</u>	<u>% Returned</u>
3724 - Millwright Work	277	189	68%
3726 - Boiler Installation	23	16	70%
5022 - Masonry	193	138	72%
5040 - Iron & Steel Erection	23	17	74%

WORKERS' COMPENSATION SURVEY RETURNS: (CON'T)

<u>Occupational Classification</u>	<u>Surveys Sent</u>	<u>Surveys Received</u>	<u>% Returned</u>
5059 - Frame Structures	27	17	63%
5102 - Door Frames Or Sash Erection	25	14	56%
5183 - Plumbing	406	270	67%
5190 - Electrical Wiring	401	300	75%
5213 - Concrete Construction	137	87	64%
5215 - Concrete Work	189	101	53%
5221 - Cement Work	257	152	59%
5348 - Tile Work	68	48	71%
5403 - Carpentry	321	221	69%
5437 - Carpentry Cabinet Work & Interior Trim	187	120	64%
5445 - Wall Board Installation	169	83	49%
5462 - Glazier	87	52	60%
5474 - Painting Or Paper Hanging	295	183	62%
5479 - Insulation Work	107	76	71%
5506 - Street or Road Construction	172	136	79%
5507 - Cleaning Right- Of-Way	140	84	67%
5508 - Rock Excavation	27	19	70%

WORKERS' COMPENSATION SURVEY RETURNS: (CON'T)

Occupational Classification	Surveys <u>Sent</u>	Surveys <u>Received</u>	% <u>Returned</u>
5511 - Logging Road Construction	210	137	65%
5538 - Sheet Metal Work	327	198	61%
5606 - Contractors	118	78	66%
5645 - Carpentry Construction	1,187	736	62%
6003 - Pile Driveways	16	14	88%
6005 - Jetty Or Breakwater Construction	6	5	83%
6204 - Drilling	71	53	75%
6217 - Excavation	310	212	68%
6229 - Irrigation & Drainage System Construction	79	49	62%
6306 - Sewer Construction	67	43	64%
6319 - Gas Mains Connection Construction	107	80	75%
6325 - Conduit Construction For Cables	34	17	50%
6400 - Fence Construction (Metal)	72	37	51%
7538 - Electric Light Or Power Line Construction	17	13	77%
7600 - Telephone Or Telegraph Company	83	41	49%

N.C.C.I SAMPLE DISPOSITION: (CON'T)

<u>Occupational Classification</u>	<u>Surveys Sent</u>	<u>Surveys Received</u>	<u>% Returned</u>
7601 - Telephone, Telegraph Or Fire Alarm Construction	22	17	77%
7605 - Burglar Alarm Installation	<u>35</u>	<u>23</u>	66%
Total	6,294	4,086	

Non-Respondent Survey

A survey of non-respondents was carried out among those who did not return a completed questionnaire after three contacts.

The purpose was to determine rationales for not responding.

There were a variety of reasons given for failing to complete the survey. Most often it was stated the survey was not received or not filled out because of lack of time.

The non-respondent survey was conducted by telephone with a random sample of 103 insureds for whom a telephone number was available.

All calls were made from May 11 to 15, 1984 by trained telephone interviewers from the central location telephone interviewing facility of the research firm. An interviewer-supervisor constantly monitored the effort.

The interviewer began by asking non-respondents if the occupation about which they had been sent a questionnaire was accurate.

Here is how the question was put

"First, your firm's worker' compensation policy indicates that you employ workers who are classified in class code (INSERT CLASS CODE), working in (INSERT CLASS DESCRIPTION). Is this accurate?"

In total, 91% of the non-respondents said the class code for which they had been sent a questionnaire was correct.

Next, the survey sought to determine the status of the non-respondent's firm.

Well over eight out of every ten called indicated they were actively in business, as shown in the next table

CURRENT STATUS OF NON-RESPONDENT FIRM:

	<u>3</u>
Actively In Business	84%
No Construction Operations In Last 12 Months	4
Not In Business.	4
No Employees In Job Class	4
No Work Bid In Last 12 Months	3
Other.	<u>1</u>
Total.	100%

Sample Size: (103)

Two approaches were used to ascertain rationales for not returning a completed questionnaire.

First, the following open-end question was posed

"Would you mind just indicating the reasons why you didn't happen to complete and return the questionnaire you were sent?"

Second, a closed-end question was asked along the same lines, but with specific answer categories to choose from.

There is a high degree of consistency in answers using the two types of questioning. The most frequent answers to both queries are that either the non-respondent did not receive a questionnaire, or received one but was too busy to complete it.

First, here are the rationales for not responding using the open-ended questioning approach.

REASONS FOR NOT RETURNING COMPLETED QUESTIONNAIRE (OPEN-ENDED):

	<u>2</u>
<u>Did Not Receive Questionnaire:</u>	35%
"Don't recall seeing questionnaire." "Might have been mistaken for junk mail." "Perhaps lost in the shuffle." "Never received."	
<u>To Busy:</u>	33
"Too busy to fill it out." "Looked like it would be too much paper work." "Manager too busy."	
<u>Not Necessary:</u>	17
"Didn't think it was necessary." "Didn't understand how it could affect anything as far as workers' compensation was concerned." "No employees."	
<u>Sent It In:</u>	12
"Returned it." "Returned it twice." "Returned second questionnaire."	
<u>Not In Business:</u>	2
<u>Undecided:</u>	<u>2</u>
<u>Total:</u>	101% 1/
<hr/>	
Sample Size:	(103)

1/ Adds to more than 100% due to multiple reasons.

The closed-end follow-up question asked was

"Just to clarify your reasons, which one of the following reasons that I will read best explains why you didn't happen to complete and return your questionnaire?"

Answers mirror those previously stated

REASONS FOR NOT RETURNING COMPLETED QUESTIONNAIRE (CLOSED-ENDED):

	<u>3</u>
Never Got Around To It	22%
Never Received Questionnaire	22
It Was Misplaced	15
It Was Returned.	10
It Was A Waste Of Time	9
Didn't Think It Applied To Company	6
Too Long	4
Didn't Have Access To Information.	3
Forgot To Return It.	1
Other.	<u>7</u>
Total.	100%

Sample Size: (103)

The claim of not having been sent a survey by between approximately one-fifth and one-third of non-respondents is inconsistent with records of the research company, which show that all those telephoned for this follow-up study were sent two questionnaires.

However, it is possible that the interviewees did not personally receive a survey as N.C.C.I. records contain only firm names and not those of individuals.

Records of those indicating they returned the questionnaire, or returned two questionnaires -- approximately 10% -- indicate that

in a few instances a completed survey was sent back to the research company. When the record keeping for the total survey effort was brought up to date, the change in status of these participants was made.

Other reasons for not returning a completed questionnaire -- which constitute the rationales of the plurality -- "too busy," "didn't think it was necessary," etc. -- cannot be explained without further research on attitudes of insured individuals and companies, which is beyond the scope of this project.

Verification Of Responses

The research firm and Oregon Council On Compensation Insurance (O.C.C.I.) cooperated in a small study to verify answers of respondents.

The research company furnished O.C.C.I. with names of insureds who completed a questionnaire, and requested O.C.C.I. to visit the work site and gather information that could be compared to answers furnished on the survey.

Information was gathered on 38 insureds, one from each occupational classification included in the full study. Insured companies or individuals were selected for inclusion in the verification based on the following criteria

- Full completion of the survey --
an answer provided for every question
on the survey; and,
- Located in Tri-County or Willamette
Valley.

The first criterion was based on the need to have information on the questionnaire that could be cross-checked by D.C.C.I., while the second was designed to minimize travel and expense related to conducting the verification study.

Based on these criteria, insureds were selected at random for inclusion in the verification effort. Names of potential respondents were sent to D.C.C.I. along with survey questions to be asked. Answers of respondents were not provided. Thus the Oregon Council had no knowledge of what interviewees indicated on the questionnaire returned to the research company. The field work was carried out from April 25 to June 20, 1984.

A representative of D.C.C.I. was then sent to the work site of the insured to collect the information needed for the study. It was not possible to target the same individual who completed the questionnaire for interviewing at the work site because the survey had been filled out anonymously to fulfill the promise of confidentiality.

All data were forwarded to the research company which made the comparison between the information stated on the respondent's questionnaire and that collected at the work site by D.C.C.I.

The following questions were used for verification purposes

(Please see next page)

- Total number of years insured involved with job classification covered by the survey questionnaire previously sent (Question #3);
- Average number of workers covered under workers' compensation policy; (Question #8);
- Ownership of vehicles regularly used to transport employees to Oregon job sites (Question #14); and,
- Purchase or lease of heavy equipment during the last three years, or not (Question #15).

Overall, there was agreement in about three out of every four cases between information supplied by the respondent on the survey questionnaire and that related to O.C.C.I. during the personal visit to the insured.

For the first question verified, information was available for 36 of the 38 insureds included in the study, and in 72% of the cases there was either a one-to-one correspondence between answers obtained using the two data gathering methods or a difference of five years or less.

The table below shows the percentage of agreement for each of the four questions included in this small-scale verification study. . .

PERCENTAGE OF AGREEMENT FOR QUESTIONS IN VERIFICATION STUDY:

<u>Question Number</u> <u>(Please See Above)</u>	<u>Percentage Agreement Between</u> <u>Survey Response & O.C.C.I. Visit</u>
3	72%
8	76%
14	72%
15	75%

It is unlikely that in a verification study, such as this one, that there would be complete agreement between responses on the survey questionnaire and data collected during a personal visit.

Inconsistencies are due to

- Potential differences between the person completing the questionnaire and individual interviewed at the work site;
- Potential mis-interpretations of questions using the two questioning approaches;
- Potential mis-representations of information on either the survey questionnaire, or to the O.C.C.I. during the field visit; and/or,
- Use of untrained interviewers to gather the information needed to carry out the verification.

APPENDIX

- Cover Letter From Governor
Accompanying Survey
 - Follow-Up Letter To Non-
Respondents
 - Copy Of Survey Questionnaire
 - Copy Of Survey Of Non-
Respondents
-

VICTOR ATIYEH
GOVERNOR



OFFICE OF THE GOVERNOR
STATE CAPITOL
SALEM, OREGON 97310

November 10, 1983

Dear Fellow Oregonian:

All of us share a deep concern over present economic conditions and future prospects for a healthy business climate in Oregon. In the absence of a sound economic base, thousands of Oregonians will be faced with lack of opportunity for future gainful employment. It is, therefore, vitally important that each of us do all we can to ensure that Oregon lives up to its economic potential.

As many of you know, one area of particular concern both to me and to members of the Oregon Legislative Assembly has been equity of premium associated with workers' compensation insurance in Oregon. Many hours were spent in debating this very issue during the 1983 legislative session. In the end, the Legislature, with my full concurrence, instructed the Insurance Commissioner and the State's Workers' Compensation insurance rate-making organization to oversee the conduct of an in-depth survey of Oregon employers engaged in construction activities.

The findings of this study are to be reported back to the Legislature by the Insurance Commissioner at the beginning of the 1985 session so that any remedial steps deemed necessary can be taken to ensure equity of workers' compensation insurance premium charges in Oregon.

Attached is a questionnaire that has been designed by experts in the field to provide data necessary for resolving this nagging question once and for all. As your firm has been identified as one which is engaged in construction work, you are being called on to provide us with answers to the questions. The research is being conducted by an independent research organization. They have placed a small number on your questionnaire so returns can be checked off as they are received. Your individual responses will be treated in strict confidence. No firm's individual replies will ever be singled out or will they be used for any purpose than that outlined.

Obviously, a study of this kind to be statistically valid must obtain a very high level of response. Accordingly, I would ask each of you to attach the highest priority to the timely completion and return of the enclosed questionnaire. A stamped return envelope is provided.

If there are any questions concerning the survey, please feel free to call Stanley V. Sparks, National Council on Compensation Insurance, Portland, (503) 228-4173.

Your cooperation to strengthen Oregon's economy is very much appreciated.

Sincerely,

A handwritten signature in dark ink, appearing to read "Victor Atiyeh", written over a horizontal line.

Victor Atiyeh
Governor

Bardsley & Haslacher, Inc.

MARKETING / 1880 S.W. FIFTH AVENUE • PORTLAND, OREGON 97201 • (503) 228-9360
RESEARCH / Media • Market • Audience • Public Opinion • Motivation Research
CONSULTANTS / PORTLAND, OREGON • PALO ALTO, CALIFORNIA • SALT LAKE CITY, UTAH

April 16, 1984

Dear Friend:

I am writing about the survey of Oregon employers engaged in construction activities that was mandated by the State Legislature, with full concurrence of the Governor. We have not yet received your completed questionnaire.

This is the first statewide survey of its kind. It will provide needed information to resolve the debate over equity of premiums associated with workers compensation insurance. Results are critical to developing a healthy business climate for Oregon.

The large number of returns is very encouraging. But, the success depends on receiving a questionnaire from everyone contacted, even firms who believe they should not be included. It is very important that we receive a response from each firm contacted. This is so all firms listed as being engaged in construction can be accounted for, no matter what their status. This is a vital necessity for the statistical validity of the research.

It is for these reasons that I am sending you a second questionnaire and postpaid return envelope. May I urge you to complete and return it as soon as possible. Even if you feel you should not be included, it is essential that we have your returned questionnaire with your present status checked off in Question #1.

No one's individual answers will ever be singled out. All replies will be kept strictly confidential by the research firm. The number on your questionnaire is solely to check returns off the mailing list as they are received.

If you have any questions, call our office collect at (503) 228-9360, and ask for Diana Persson. If not, please return your questionnaire as soon as possible, either fully completed or with the appropriate explanation checked off in Question #1.

On behalf of the Governor and State Legislature, thank you for your public spirited participation.

Most Sincerely,

Robert M. Friedman, Ph.D
Study Director

DIRECTIONS: For each question, please check the box that best fits your answer, or write in your reply. Example: [X]. If the questionnaire does not apply to you, check the appropriate reason in Question #1. All replies will be kept strictly confidential. Results for individual firms will never be singled out. Comments are welcome and can be noted in the margins of the questionnaire. When completed, please place your questionnaire into the postpaid envelope and return. THANK YOU VERY MUCH FOR YOUR TIME.

1 - It has been determined from your firm's workers' compensation policy that you employ workers who are classified as:

3724 -MILLWRIGHT WORK
Job Classification

If this is inaccurate, please check the one box that best describes your current status and return your questionnaire in the enclosed postpaid envelope. ALL OTHERS, PLEASE CONTINUE.

- a. No work bid in last twelve months
b. No construction operations in last twelve months
c. Not in business
d. No employees in this job class
e. Other (please explain):

2 - For this classification, please check yes or no according to whether each of the following types of specialty work is performed by your firm, or not.

Table with 3 columns: Question type (a-k), Yes, No. Rows include: Air conditioning machinery installation, service, repair; Erection or dismantling of machinery; Machinery service or repair; Gasoline pump and tank installation; Gasoline pump service or repair; Overhead door installation - wooden, residential or commercial; Pollution control equipment installation; Commercial or agricultural pump installation, service or repair; Commercial refrigeration machinery or equipment installation, service or repair; Platform or beam type scales installation, service or repair; Truck/Trailer refrigeration installation, service or repair.

ello, my name is _____ of J. dsley & Haslacher. I am calling to talk with _____ (INSERT NAME
 NON-RESPONDENT.) Recently, we sent your firm a questionnaire about worker's compensation
 behalf of the State of Oregon. We followed that with a telephone call to your company
 and another reminder letter. The time has now past for receipt of completed questionnaires, and
 your firm's has not been received. Every company to whom a questionnaire was sent has the right
 to refrain from completing it and sending it back. I would appreciate it if I could ask just
 a few questions so we can compare those who did respond to the survey with those who did not.
 In this way, we will know if our sample of completed questionnaires is representative of the
 companies involved in construction operations in Oregon or not. Your answers will be kept
 strictly confidential. The data will help determine the validity of the total study. May I
 please have your cooperation and ask these few questions?

- 1 - Yes
- 2 - No
- 3 - Refused/No answer/DK

First, your firm's worker's compensation policy indicates that you employ workers who are classified in class code _____, working in

Is this accurate?

- 1 - Actively in business
- 2 - No work bid in last 12 months
- 3 - No construction operations in last 12 months
- 4 - Not in business
- 5 - No employees in this job class
- 6 - Other _____

Which one of the following best describes your firm's current status?

- Would you mind just indicating the reasons why you didn't happen to complete and return the questionnaire you were sent? (PROBE FOR COMPLETE ANSWER)

- 1 - Didn't think it applied to company
- 2 - Don't have access to information
- 3 - Too long
- 4 - Never got around to it
- 5 - Never received questionnaire
- 6 - Forgot to return it
- 7 - It was a waste of time
- 8 - It was misplaced
- 9 - Other (Please explain) (DO NOT READ)

Just to clarify your reasons, which one of the following reasons that I will read best explains why you didn't happen to complete and return your questionnaire?

(READ REASONS ON LIST AT LEFT)

12 - Refused/No answer/DK

 Average No. of Workers

Could you please estimate the average number of workers per year covered under your workers' compensation policy for this class code?

 Union

 Non-Union

For a typical job during the last three years, could you tell me what percentage of employees in job class _____ have been members of a union, and what percentage have not been members of a union?

Thank you for all the questions I have. You have been very cooperative and helpful. Thank you much for your time.

 Phone Number

 Interviewer's Signature

 Time Ended

 Date

13a- (IF YES ON Q. 13) How many employees received a bonus just during the past year? Write in the total number of employees receiving each percentage amount of total wage before taxes paid as a bonus.

<u>% Of Total Wages</u>	<u>No. Of Employees Receiving Bonus Last Year</u>
Less than 5%	_____
5% to 14%	_____
15% to 20%	_____
Over 20%	_____

14 - Does your firm own any vehicles that have been regularly used to transport employees to Oregon job sites during the past three years, or not? Yes No

15 - How about heavy equipment? During the past three years, has your firm purchased or leased any heavy equipment, or not? Yes No

16 - Has it been the practice of this firm, in the past three years, to use work crews, or not? Yes (Ans. Q. 16a) No (Skip to Q.17)

16a - (IF YES ON Q. 16) Approximately how many employees are usually assigned per supervisor?

<input type="checkbox"/>	Less than 5
<input type="checkbox"/>	5 to 9
<input type="checkbox"/>	10 to 14
<input type="checkbox"/>	15 to 19
<input type="checkbox"/>	20 or more

17 - Has your firm operated a formal accident prevention program during the last three years, or not? Yes No

18 - During the last three years, what was the approximate average percentage of your employees terminated with each contract? Just your best estimate, please.

<input type="checkbox"/>	Less than 10%
<input type="checkbox"/>	10% to 19%
<input type="checkbox"/>	20% to 29%
<input type="checkbox"/>	30% to 39%
<input type="checkbox"/>	40% to 49%
<input type="checkbox"/>	50% to 59%
<input type="checkbox"/>	60% to 69%
<input type="checkbox"/>	70% to 79%
<input type="checkbox"/>	80% to 89%
<input type="checkbox"/>	90% to 100%

19 - For the same time period, what was the approximate average percentage of employees moving from job site to job site? Again, just your best estimate, please.

<input type="checkbox"/>	Less than 10%
<input type="checkbox"/>	10% to 19%
<input type="checkbox"/>	20% to 29%
<input type="checkbox"/>	30% to 39%
<input type="checkbox"/>	40% to 49%
<input type="checkbox"/>	50% to 59%
<input type="checkbox"/>	60% to 69%
<input type="checkbox"/>	70% to 79%
<input type="checkbox"/>	80% to 89%
<input type="checkbox"/>	90% to 100%

20 - In which one county have most of your Oregon job sites been located during the past three years? _____ (County)

21 - For a typical job during the last three years, what percentage of employees in job class 3724 — Millwright Work — have been members of a union, and what percentage have not been members of a union. (Your total should add to 100%)

_____	Union
_____	Non-Union
100%	

22 - Which category best describes the current average hour wage base you pay your employees in job class 3724 — Millwright Work — for each of the following types of work?

	Less Than \$5 Per Hr.	\$5 To \$7.50 Per Hr.	\$7.51 To \$9 Per Hr.	\$10 To \$14/Hr.	\$15 To \$19/Hr.	\$20 Or More/Hr.	Not Applicable
Mechanics:							
Journeyman	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Apprentices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Skilled Craftsmen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Crane Operators:							
Journeyman	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Apprentices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Skilled Craftsmen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Estimators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Laborers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Foremen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Supervisors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (WHAT?) _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

23 - JUST FOR THE PAST YEAR, please answer each of the following. Just your best estimate. Write in N.A. wherever not applicable.

	Average Number Of Weeks Worked	Average Number Of Hours Worked Per Week Per Worker	Maximum No. Employed	Minimum No. Employed
Mechanics	_____	_____	_____	_____
Crane Operators	_____	_____	_____	_____
Estimators	_____	_____	_____	_____
Laborers	_____	_____	_____	_____
Foremen	_____	_____	_____	_____
Supervisors	_____	_____	_____	_____
Other (WHAT?) _____	_____	_____	_____	_____

ON BEHALF OF THE GOVERNOR, THANK YOU FOR YOUR PUBLIC SPIRITED COOPERATION!
 Please Return Your Questionnaire In The Enclosed Postpaid Envelope

- In total, how many years has your company been involved with Millwright Work — job class 3724? Just your best estimate. Total Years

4 - During the past three years, about what percentage of your time has been spent working for the following? (Your total should add to 100%.)

a. Sole proprietorships	_____	%
b. Government at any level	_____	%
c. Corporations	_____	%
d. Partnerships	_____	%
e. Individuals	_____	%
	100%	

5 - Over the past three years, what percentage of your time has been spent with work that has been subcontracted to your firm? Again, your best estimate. %
Subcontracted Work

6 - What is the approximate dollar amount of the average contract you have worked on during the past three years? \$
Average Contract

7 - During the past three years, what has been the average number of weeks you have worked on a typical contract? Just your best estimate.
Avg. No. Of Weeks Per Contract

8 - For the past three years, please estimate the average number of workers per year covered under your workers' compensation policy for class code 3724 — Millwright Work.
Average No. Of Workers

9 - Has it been the policy of this firm during the past three years to provide any of the following benefits directly to full or part-time employees in class code 3724 — Millwright Work — rather than to a union fund, or not? (Please check yes or no for each)

	<u>Yes</u>	<u>No</u>
a. Paid Sick Days	<input type="checkbox"/>	<input type="checkbox"/>
b. Paid Holidays	<input type="checkbox"/>	<input type="checkbox"/>
c. Paid Vacations	<input type="checkbox"/>	<input type="checkbox"/>
d. Pension Plans Other Than Social Security	<input type="checkbox"/>	<input type="checkbox"/>
e. Profit Sharing Plan	<input type="checkbox"/>	<input type="checkbox"/>

10 - Over the past three years, have your full or part-time employees in class code 3724 — Millwright Work — received medical benefits from a company or union sponsored health plan for non-work related injuries, or not? Yes No

11 - During the last three years, have you hired employees in class code 3724 — Millwright Work — who were involved in a formal apprenticeship program, or who completed a formal apprenticeship program, or not? Yes No

12 - How many of your employees, if any, in job class 3724 — Millwright Work — are currently certified with the Oregon Bureau of Labor & Industries as having completed a formal apprenticeship program?
No. Of Certified Employee

13 - During the past three years, have you paid any bonuses to employees belonging to job class 3724 — Millwright Work? Yes (Answer Q. 13a) No (Skip to Q. 14)

13a- (IF YES ON Q. 13) How many employees received a bonus just during the past year? Write in the total number of employees receiving each percentage amount of total wage before taxes paid as a bonus.

<u>% Of Total Wages</u>	<u>No. Of Employees Receiving Bonus Last Year</u>
Less than 5%	_____
5% to 14%	_____
15% to 20%	_____
Over 20%	_____

14 - Does your firm own any vehicles that have been regularly used to transport employees to Oregon job sites during the past three years, or not? Yes No

15 - How about heavy equipment? During the past three years, has your firm purchased or leased any heavy equipment, or not? Yes No

16 - Has it been the practice of this firm, in the past three years, to use work crews, or not? Yes (Ans. Q. 16a) No (Skip to Q.17)

16a - (IF YES ON Q. 16) Approximately how many employees are usually assigned per supervisor? Less than 5
 5 to 9
 10 to 14
 15 to 19
 20 or more

17 - Has your firm operated a formal accident prevention program during the last three years, or not? Yes No

18 - During the last three years, what was the approximate average percentage of your employees terminated with each contract? Just your best estimate, please.

<input type="checkbox"/>	Less than 10%
<input type="checkbox"/>	10% to 19%
<input type="checkbox"/>	20% to 29%
<input type="checkbox"/>	30% to 39%
<input type="checkbox"/>	40% to 49%
<input type="checkbox"/>	50% to 59%
<input type="checkbox"/>	60% to 69%
<input type="checkbox"/>	70% to 79%
<input type="checkbox"/>	80% to 89%
<input type="checkbox"/>	90% to 100%

19 - For the same time period, what was the approximate average percentage of employees moving from job site to job site? Again, just your best estimate, please.

<input type="checkbox"/>	Less than 10%
<input type="checkbox"/>	10% to 19%
<input type="checkbox"/>	20% to 29%
<input type="checkbox"/>	30% to 39%
<input type="checkbox"/>	40% to 49%
<input type="checkbox"/>	50% to 59%
<input type="checkbox"/>	60% to 69%
<input type="checkbox"/>	70% to 79%
<input type="checkbox"/>	80% to 89%
<input type="checkbox"/>	90% to 100%

20 - In which one county have most of your Oregon job sites been located during the past three years? _____ (County)

21 - For a typical job during the last three years, what percentage of employees in job class 3724 — Millwright Work — have been members of a union, and what percentage have not been members of a union. (Your total should add to 100%) _____ Union
_____ Non-Union
100%

22 - Which category best describes the current average hour wage base you pay your employees in job class 3724 -- Millwright Work -- for each of the following types of work?

	Less Than \$5 Per Hr.	\$5 To \$7.50 Per Hr.	\$7.51 To \$9 Per Hr.	\$10 To \$14/Hr.	\$15 To \$19/Hr.	\$20 Or More/Hr.	Not Applicable
Mechanics:							
Journeyman	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Apprentices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Skilled Craftsmen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Crane Operators:							
Journeyman	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Apprentices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Skilled Craftsmen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Estimators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Laborers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Foremen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Supervisors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (WHAT?) _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

23 - JUST FOR THE PAST YEAR, please answer each of the following. Just your best estimate. Write in N.A. wherever not applicable.

	Average Number Of Weeks Worked	Average Number Of Hours Worked Per Week Per Worker	Maximum No. Employed	Minimum No. Employed
Mechanics	_____	_____	_____	_____
Crane Operators	_____	_____	_____	_____
Estimators	_____	_____	_____	_____
Laborers	_____	_____	_____	_____
Foremen	_____	_____	_____	_____
Supervisors	_____	_____	_____	_____
Other (WHAT?) _____	_____	_____	_____	_____

ON BEHALF OF THE GOVERNOR, THANK YOU FOR YOUR PUBLIC SPIRITED COOPERATION!

Please Return Your Questionnaire In The Enclosed Postpaid Envelope

3 - In total, how many years has your company been involved with Millwright Work — job class 3724? Just your best estimate. Total Years

4 - During the past three years, about what percentage of your time has been spent working for the following? (Your total should add to 100%.)

a. Sole proprietorships	_____	%
b. Government at any level	_____	%
c. Corporations	_____	%
d. Partnerships	_____	%
e. Individuals	_____	%
	<u>100%</u>	

5 - Over the past three years, what percentage of your time has been spent with work that has been subcontracted to your firm? Again, your best estimate. %
Subcontracted Work

6 - What is the approximate dollar amount of the average contract you have worked on during the past three years? \$
Average Contract

7 - During the past three years, what has been the average number of weeks you have worked on a typical contract? Just your best estimate.
Avg. No. Of Weeks Per Contract

8 - For the past three years, please estimate the average number of workers per year covered under your workers' compensation policy for class code 3724 — Millwright Work.
Average No. Of Workers

9 - Has it been the policy of this firm during the past three years to provide any of the following benefits directly to full or part-time employees in class code 3724 — Millwright Work — rather than to a union fund, or not? (Please check yes or no for each)

	<u>Yes</u>	<u>No</u>
a. Paid Sick Days	<input type="checkbox"/>	<input type="checkbox"/>
b. Paid Holidays	<input type="checkbox"/>	<input type="checkbox"/>
c. Paid Vacations	<input type="checkbox"/>	<input type="checkbox"/>
d. Pension Plans Other Than Social Security	<input type="checkbox"/>	<input type="checkbox"/>
e. Profit Sharing Plan	<input type="checkbox"/>	<input type="checkbox"/>

10 - Over the past three years, have your full or part-time employees in class code 3724 — Millwright Work — received medical benefits from a company or union sponsored health plan for non-work related injuries, or not? Yes No

11 - During the last three years, have you hired employees in class code 3724 — Millwright Work — who were involved in a formal apprenticeship program, or who completed a formal apprenticeship program, or not? Yes No

12 - How many of your employees, if any, in job class 3724 — Millwright Work — are currently certified with the Oregon Bureau of Labor & Industries as having completed a formal apprenticeship program?
No. Of Certified Employee

13 - During the past three years, have you paid any bonuses to employees belonging to job class 3724 — Millwright Work? Yes (Answer Q. 13a) No (Skip to Q. 14)

(As part of an NAIC examination of NCCI, Milliman & Robertson, Inc. has prepared a report which describes the workers compensation ratemaking procedures utilized by NCCI. The purpose of this technical supplement is to provide reference material supporting this report).

**RATEMAKING PROCEDURES
DESCRIPTION OF NCCI RATEMAKING METHODOLOGIES**

**NCCI EXAMINATION
VOLUME VIII - SECTION IIB - PART 6
ALTERNATIVE EXPOSURE BASES
TECHNICAL SUPPLEMENT**

December 6, 1991

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**SECTION IIB - PART 6
ALTERNATIVE EXPOSURE BASES
TECHNICAL SUPPLEMENT**

As a part of an NAIC examination of NCCI, Milliman & Robertson, Inc. was engaged to address two questions dealing with Alternative Exposure Bases for workers compensation.

The purpose of this Technical Supplement is to provide reference material including:

- A. "Review of Alternative Premium Bases for Oregon Workers' Compensation Insurance." Prepared by Milliman & Robertson, Inc., March 14, 1985.
- B. "Study of Premium Equity By Employer Groups." Prepared by National Council on Compensation Insurance, 1984.
- C. "Oregon Survey on Premium Equity for Workers' Compensation Insurance." Prepared by Bardsley & Haslacher, Inc., Spring 1984.

**SECTION IIB - PART 6
ALTERNATIVE EXPOSURE BASES
TECHNICAL SUPPLEMENT**

December 6, 1991

NCCI Examination - Volume VIII - Section IIB - Part 6

MILLIMAN & ROBERTSON, INC.

**SECTION IIB - PART 6
ALTERNATIVE EXPOSURE BASES
TECHNICAL SUPPLEMENT**

TECHNICAL SUPPLEMENT A

"Review of Alternative Premium Bases for Oregon Workers' Compensation Insurance." Prepared by Milliman & Robertson, Inc., March 14, 1985.

**SECTION IIB - PART 6
ALTERNATIVE EXPOSURE BASES
TECHNICAL SUPPLEMENT**

December 6, 1991

NCCI Examination - Volume VIII - Section IIB - Part 6

MILLIMAN & ROBERTSON, INC.

MILLIMAN & ROBERTSON, INC.
EXECUTIVE SUMMARY
REVIEW OF ALTERNATIVE
PREMIUM BASES FOR
OREGON WORKERS' COMPENSATION INSURANCE

Prepared for Oregon Workers' Compensation Department
Salem, Oregon

Prepared by Milliman & Robertson, Inc.

March 14, 1985

MILLIMAN & ROBERTSON, INC.

EXECUTIVE SUMMARY

REVIEW OF ALTERNATIVE

PREMIUM BASES FOR

OREGON WORKERS' COMPENSATION INSURANCE

Milliman & Robertson, Inc. (M&R) was engaged by the Workers' Compensation Department of the State of Oregon to review the relative advantages and disadvantages of various alternative premium bases for workers' compensation insurance. The findings of our study are presented in this executive summary and are discussed in more detail in our full report.

SUMMARY OF RECOMMENDATIONS AND CONCLUSIONS

Based on our findings, we recommend the following course of action for the Task Force's consideration:

- 1) The National Council on Compensation Insurance (NCCI) proposal calling for continuation of the unlimited payroll premium basis with a more responsive Experience Rating Plan should be implemented immediately for the construction classes.
- 2) Steps should immediately be taken to begin collecting hours worked for the construction classes. The goals of the data collection proposal are to conclusively assess

the practical problems involved in collecting this information and to provide more complete data for quantifying premium basis alternatives in the future.

The findings upon which our recommendations are based include the following:

- 1) We agree with both NCCI and Future Costs Analysts, Inc. (FCA) that a premium inequity of some degree does exist for construction classes under the current basis for calculating Oregon workers' compensation premiums.
- 2) We do not agree that the results of the Bardsley & Haslacher, Inc. survey and the subsequent analyses by the NCCI and FCA provide conclusive evidence in support of any one alternative premium basis. This is not due to a flawed survey or faulty analyses; rather, it is the inevitable result of trying to use a necessarily limited sample to project the insurance experience of a diverse group of risks over a long period of time.
- 3) We are not aware of any estimates of the additional expense involved in compiling and verifying hours worked. In terms of the total workers' compensation premium volume for the construction classes, the long-term on-going costs may be insignificant. However, the one time transition costs may be considerable.

- 4) In our opinion, the information compiled to date is insufficient to either estimate the true equity of the system or to evaluate the implications of substantial changes in premium basis on the total rate adequacy of the workers' compensation system.

In summary, we do believe that an actuarial equity problem exists for a significant segment of the construction industry. Further, we agree that some remedial action is appropriate at this time. However, we do not believe that the interests of actuarial equity and overall rate adequacy would be served by making large-scale changes in the method of calculating workers' compensation premiums on the basis of the various analyses performed to date. In any event, we do suggest that an effort be made to begin compiling hours worked for construction employers to permit more complete analysis in the future and to answer the practical questions that have been raised.

ALTERNATIVE PREMIUM BASES

The following provides the M&R evaluation of each of the proposed premium bases. A complete discussion of the advantages and disadvantages of each proposal is included in our full report.

Unlimited Payroll (current basis)

At this time, unlimited payroll appears to be the best proxy for total hazard measurement that is readily available and verifiable. However, significant flaws do exist and should be corrected.

Limited Payroll (capped at wage equating to benefit maximum)

By ignoring the potential hazard differentials for employers paying wages in excess of the payroll limitation, this premium basis may, for certain insureds, simply correct one inequity while creating another. However, using the additional exposure data that we propose be collected, the proposal does deserve further study.

Cents-Per-Hour Worked

We believe that cents-per-hour is not sufficiently reflective of risk differentials to be used as the sole basis for workers' compensation manual premiums. However, in our opinion, a combination of cents-per-hour and payroll may eventually prove to be a viable and improved alternative, at least for the construction classes.

Unlimited Payroll with a Modified Experience Rating Plan

This proposal is a reasonable first step to correcting the apparent actuarial equity problems that have been identified. However, we do not believe that this is necessarily the best final solution. More complete data should be compiled and analyzed before a substantial deviation from existing rating practices is recommended.

Limited Payroll & Cents-Per-Hour

We believe that the loss of intuitive hazard responsiveness is a significant drawback in light of the inconclusiveness of the analyses to date and the uncertain practical problems with this option. We are concerned that if premium adjustments are made at this time, they may subsequently need to be reversed when actual insurance data is compiled.

Average Hourly Wage Adjustments Superimposed on Unlimited Payroll

Our observations on these options are the same as those for the limited payroll/cents-per-hour approach.

Number of Employees

We do not believe that this is a viable option. To date, we are not aware that this alternative has been seriously considered in Oregon.

Refinement of Construction Classifications

At this time, it does not appear that further refinement of the construction classes can be accomplished in a socially acceptable manner that significantly improves the actuarial equity of the rating structure. However, we would not eliminate this option from future consideration, since this approach to equity problems has been successfully used in other jurisdictions.

DISCUSSION OF NCCI AND FCA PROPOSALS

The NCCI has proposed the use of unlimited payroll with a modified Experience Rating Plan. FCA has put forth the limited payroll/cents-per-hour proposal and its variations. These proposals are based on numerous significant conclusions drawn from the Oregon survey. While we believe that the survey and sampling procedures used in the Oregon study are reasonable, we have some concerns about the validity of drawing conclusions based on the resulting data. There are several areas where NCCI and FCA have drawn opposing conclusions using the same data; we do not believe that we would have drawn either set of conclusions from the available data.

DISCUSSION OF THE EFFECT OF FILE & USE ON EQUITY CONSIDERATIONS

We would expect the File and Use law to help correct actuarial inequities. However, the correction will take time as carriers identify misrated market segments. The correction process will be more immediate and more complete for larger employers that command greater market attention. We believe that the Oregon rating law will take substantially longer to benefit the smaller employers.

OBSERVATIONS FROM OTHER STATES

At this time, the overwhelming majority of states are using unlimited payroll as a workers' compensation premium base. Several states have considered other bases in recent years; however, few have made significant changes because of the lack of a conclusively more equitable alternative to unlimited payroll.

The use of cents-per-hour in Washington has been the one most frequently cited as a potential prototype for Oregon. It is important to realize that this system has been in effect for many years and the problems and costs of transition to an hours worked basis are no longer well-documented. With the existence of an exclusive state fund, substantial deviations from actuarial equity will not necessarily have any impact on the coverage availability for particular classes of business. However, in a competitive environment such as Oregon, deviations from actuarial equity can create economic disincentives for private insurers to write the affected classes.

The Florida credit table implemented in 1984 is essentially the same concept as proposed by FCA for Oregon. In filing the plan, the NCCI specifically stated that this was an interim proposal pending completion of more extensive studies on the issue of premium base equity. At this time, we have no information on which to evaluate the successes or failures of the interim plan.

PREMIUM CHANGES FOR AFFECTED EMPLOYER GROUPS

The NCCI proposal will have a significantly greater impact on the medium and large employers, i.e. those whose own loss experience are given substantial credibility in the application of the Experience Rating Plan. Both the limited payroll and the FCA proposals are essentially unaffected by an insured's own loss experience and will result in substantially greater premium


increases for the small and medium sized employers. Within this category, the lower average weekly wage employers will experience the greatest increases.

SOURCES OF INFORMATION

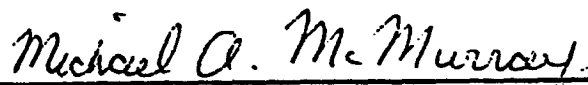
The information used for this study were provided to us by NCCI, FCA, the Governor's Task Force on Premium Equity in Workers' Compensation Insurance and the Oregon Workers' Compensation Department. We want to acknowledge all of these organizations for their cooperation in providing us with the data and responding to our questions in a timely manner.

It has been a pleasure for Milliman & Robertson, Inc. to have been of service to the State of Oregon. We are looking forward to discussing our findings in more detail.

Milliman & Robertson, Inc.
March 14, 1985



James R. Berquist
Fellow, Casualty Actuarial Society
Member, American Academy of Actuaries



Michael A. McMurray
Fellow, Casualty Actuarial Society
Member, American Academy of Actuaries

MILLIMAN & ROBERTSON, INC.
REVIEW OF ALTERNATIVE
PREMIUM BASES FOR
OREGON WORKERS' COMPENSATION INSURANCE

Prepared for Oregon Workers' Compensation Department
Salem, Oregon

Prepared by Milliman & Robertson, Inc.

March 14, 1985

MILLIMAN & ROBERTSON, INC.
REVIEW OF ALTERNATIVE
PREMIUM BASES FOR
OREGON WORKERS' COMPENSATION INSURANCE

Milliman & Robertson, Inc. (M&R) was engaged by the Workers' Compensation Department of the State of Oregon to review the relative advantages and disadvantages of various alternatives for improving the equitability of the premium basis for workers' compensation insurance. The findings of this study are presented to the Governor's Task Force on Premium Equity in this report.

SCOPE OF STUDY

The full scope of the M&R analysis is detailed in the Statement of Work section of our contract with the State of Oregon. This can be found in Appendix A of this report. In summary, the objectives of this study were to evaluate the assumptions and procedures used by the National Council on Compensation Insurance (NCCI) and Future Cost Analysts (FCA) in the development of their respective proposals for assuring premium equity. The study was to include a discussion of the relative equity of each of the alternatives, including cents-per-hour and capped payroll. Other relevant issues, e.g. the potential impact of open competitive rating, were also to be addressed.

SUMMARY OF RECOMMENDATIONS & CONCLUSIONS

In order to put our comments and recommendations into proper perspective, an understanding of the concept of "equity" is necessary. As a point of reference, we cite the following definition taken from a text included in the syllabus of examinations for the Casualty Actuarial Society:

Actuarial equity - the concept that each person insured should pay a premium commensurate with his or her loss exposure.

The issue of "actuarial equity" has been the primary focus of our study. However, there is another concept, that of "social equity", that should at least be recognized before a final decision on a workers' compensation premium basis is made. Our review of the material previously produced on premium base equitability indicates that these two concepts have, at times, been intermingled in the discussion on premium bases. From the source cited earlier, the latter equity definition is as follows:

Social equity - the concept that each insured pay a premium commensurate with his or her ability to pay.

In light of our findings discussed below, we recommend the following course of action for consideration by the Task Force:

1) The NCCI proposal calling for continuation of the unlimited payroll premium basis with a more responsive Experience Rating Plan should be implemented immediately for the construction classes. We do not consider this approach to necessarily be a permanent or complete solution to the equity problem. Rather, we consider it a reasonable first step that is not likely to cause premium changes that are subsequently reversed.

2) Steps should immediately be taken to begin collecting hours worked for the construction classes. The goals of the data collection proposal are to conclusively assess the practical problems involved in collecting this information and to provide more complete data for quantifying future premium basis alternatives. This latter objective is particularly important to definitively evaluate the actuarial and social equity considerations of premium basis changes on the smaller, non-experience rated employers. In our opinion, the Oregon survey data for these insureds is too sparse to be conclusive, yet it is these same insureds who are most likely to experience a total premium increase as the result of a basis change.

Conversations with those familiar with the Washington system indicate that it may take 2 to 3 years to collect

the necessary information. By concentrating on the construction classifications, it may be possible to speed up the process. In any event, we believe that this proposal will not only answer the questions of practicality for construction risks, but will provide valuable insight as to the possibility of extending the approach to other workers' compensation classifications.

Our findings concerning the actuarial equity of the workers' compensation premium basis are as follows.

- 1) We agree with both NCCI and FCA that a premium inequity of some degree does exist for construction classes under the current basis for calculating Oregon workers' compensation premium. A significant percentage of high wage paying construction employers (presumably union employers) are paying a disproportionate share of the total premium for the affected classifications in relation to benefits paid.

The following table of estimated premium equity indices were derived from the Oregon survey and the three-year losses contained in the NCCI experience rating data files. These indices illustrate the potential magnitude of the equity problem:

	<u>Construction Employers</u>		
	<u>Union</u>	<u>Non-Union</u>	<u>Total</u>
High Average Weekly Wage	.81	1.26	.93
Low Average Weekly Wage	.98	1.08	1.04
Total	.90	1.12	1.00

NOTE: 1. An index less than 1.00 indicates a relative premium redundancy; an index greater than 1.00 indicates a relative deficiency.

- 2) We do not agree that the results of the Bardsley & Haslacher, Inc. survey and the subsequent analyses by the NCCI and FCA provide conclusive evidence in support of any one alternative premium basis. This is not because of a flawed survey or faulty analyses; rather, it is the inevitable result of trying to use a necessarily limited sample to project the insurance experience of a diverse group of risks over a long period of time. The extreme difference in positions taken by the NCCI and FCA, both of which reflect the input of competent actuaries, illustrates this fact.
- 3) In our opinion, the studies do provide strong evidence that cents-per-hour alone will not provide an equitable premium basis for workers' compensation insurance. Such a basis will not adequately address indemnity benefit differences that are a function of wages and, to a lesser

extent, inherent hazard differences among insureds within the same manual classification. However, the studies do indicate that cents-per-hour used in conjunction with payroll may enhance the equity of the system.

- 4) To the best of our knowledge, no definitive work has been done to determine if employee hours worked are, or can be, readily available and verifiable for Oregon employers. Based on Task Force discussions on the topic, there is reason to believe that hours worked may be easier to monitor than in the past, at least for construction industry employers. In our opinion, this point must be clarified before the usefulness of cents-per-hour as a partial premium basis can be determined. Even if an hours worked approach were to be considered theoretically superior, such a system would not be more equitable, either on a actuarial or a social basis, if it cannot be audited and isolated from insured manipulation to the same degree as the current unlimited payroll basis.

- 5) We are also not aware of any estimates of the additional expense involved in compiling and verifying hours worked. In terms of the total workers' compensation premium volume for the construction classes, the long-term ongoing cost may be insignificant. However, for individual insureds,

particularly the smaller companies, the additional expense could be significant and may adversely impact coverage availability. This particular issue is more closely related to social than to actuarial equity.

Although the long-term costs of capturing hours worked may not be prohibitive, the one-time transition costs may be considerable. Data processing systems, reporting forms, ratemaking systems, and auditing procedures would all have to be revised to implement such a change. Since many NCCI and individual insurer systems are nationwide in scope, change for one state can have an impact outside of the state as well.

- 6) In our opinion, the information compiled to date is insufficient to either gauge the inequities of the system or evaluate the implications of substantial change in premium basis on the total rate adequacy of the workers' compensation line. The results of a significant shift away from unlimited payroll under Oregon's File and Use rating law are extremely difficult to predict. However, it almost certainly will slow the re-stabilization of the workers' compensation market that has been taking place since the introduction of open rating.

In summary, we do believe that an actuarial equity problem exists for a significant segment of the construction industry. Further, we agree that some remedial action is appropriate at this time. However, we do not believe that the interests of actuarial equity and overall rate adequacy would be served by making large-scale changes in the method of calculating workers' compensation premiums on the basis of the various analyses performed to date. A clearly superior alternative to unlimited payroll has not yet been identified, although a combination of payroll and cents-per-hour does appear to have promise. In any event, we do suggest that an effort be made to begin compiling hours worked for construction employers in order to answer the practical questions that have been raised.

ALTERNATIVE PREMIUM BASES

As background information, the "premium base" is a measurement of a particular insured's exposure to loss. The premium base is multiplied by the rates contained in the workers' compensation manual to derive the total manual premium for the insured. The total premium collected at the beginning of the policy term is the manual premium adjusted for any experience rating modifications, expense constant and minimum premium considerations, and other rating variables that might apply. There can be further adjustments in the net cost of workers' compensation at the end of the policy term due to the application

of retrospective rating plans and/or dividend payments and exposure record audits.

To put the premium base controversy into perspective, it is important to note that the issue was first addressed in writing by the actuarial profession in the 1929 Proceedings of the Casualty Actuarial Society in an article titled "Notes on Exposure and Premium Bases". The author, Paul Dorweiler, and his reviewers entered into a discussion of the merits and drawbacks of using payroll as a premium base, with emphasis on the equity of the approach for the skilled mechanical and building trades. The arguments presented were essentially the same as those that evolved from the Oregon study, with no resolution reached. Obviously, this is not a new or quickly resolved issue.

The following is a discussion of the principal advantages and disadvantages of the 8 premium basis alternatives that have been proposed at various times for construction workers in Oregon. The list of advantages and disadvantages is not exhaustive; instead, we have concentrated on the primary characteristics which, in our opinion, affect the relative actuarial equity of each option. For a more exhaustive listing of the perceived strengths and weaknesses, please refer to Appendix B.

We emphasize that the individual benefits and drawbacks discussed

below do not necessarily reflect the opinions of M&R. They do reflect our judgment concerning the most significant points that have been raised at various times. The M&R opinion regarding the relative merits of each is presented in the M&R evaluation.

Unlimited Payroll (current basis)

To the extent that the combination of wage levels and hours worked are a reasonable proxy for exposure, the foremost advantage to this premium basis is that it is reflective of the total hazard (i.e. claim frequency, duration of injury and average benefits) presented by an insured. A further advantage that should not be taken lightly is that unlimited payroll data is readily available and auditable for every insured.

The most significant disadvantage is that differences in average weekly wages that are not always related to variances in occupational hazard (e.g. union and non-union employers competing for the same contracts) can result in apparent actuarial inequities in the rating system.

M&R EVALUATION: At this time, unlimited payroll appears to be the best proxy for total hazard measurement that is readily available and verifiable. However, significant flaws do exist and should be corrected.

Limited Payroll (capped at wage equating to benefit maximum)

The principal advantage to this basis is that it is reflective of the total hazard for employees below the wage qualifying for the maximum benefit. It does, to an extent, temper distortions in the rating system attributable to non-hazard related average wage variations.

The primary disadvantage is that it ignores occupational claim frequency and injury duration characteristics that may be reflected in wage levels higher than the established maximum. There is concern that a capped payroll may be more subject to insured manipulation, although there is a historical precedent for payroll limitation.

M&R EVALUATION: By ignoring the potential hazard differentials for employers paying wages in excess of the payroll limitation, this premium basis may, for certain insureds, simply correct one inequity while creating another. However, the proposal does deserve further study using the additional exposure data that we propose be captured.

Cents-Per-Hour Worked

The advantage of this approach is that it circumvents the problem of average wage variations within a class which are not hazard related. Also, there is an intuitive correlation

between claim frequency and hours worked.

The critical disadvantage to cents-per-hour is that it ignores potential differences in the injury duration and severity characteristics among insureds within a classification. There are also problems concerning the data availability and verifiability, the ramifications on the workers' compensation ratemaking process, and the response of the insurance carriers under the File and Use law. Any actual or perceived imbalance in the overall rate adequacy resulting from a change based on inconclusive information could seriously impair market availability and stability.

M&R EVALUATION: We believe that cents-per-hour is not sufficiently reflective of risk differentials to be used as the sole basis for workers' compensation manual premiums. However, in our opinion, a combination of cents-per-hour and payroll may eventually prove to be a viable and improved alternative, at least for the construction classes.

Unlimited Payroll with a Modified Experience Rating Plan

The greatest advantage to this proposal is that it does not reduce the overall responsiveness of the underlying premium basis, but does significantly address the observed inequities for large, high wage paying employers. It can be implemented

immediately without creating other unintended actuarial equity problems.

The most significant disadvantage is that it does nothing to reduce premium inequities that may exist between the small or average sized high and low wage paying employers. Further, it may be overly responsive to fortuitous large claims for these employers.

M&R EVALUATION: This proposal is a reasonable first step to correcting the apparent actuarial equity problems that have been identified. However, we do not believe that this is necessarily the best final solution. More complete data should be compiled and analyzed before a substantial deviation from existing rating practices is recommended.

Limited Payroll & Cents-Per-Hour

This approach would involve using the capped payroll discussed above for indemnity benefits and cents-per-hour for medical. The key advantage is that it significantly reduces the premium distortions due to average weekly wage differences that may be unrelated to hazard. Further, it does provide a limited proxy for recognizing potential claim frequency, duration and average indemnity benefit characteristics among risks in the same class.

The principle disadvantages are the practical problems discussed above for the two bases separately and the potential loss of hazard responsiveness for certain high wage paying employers. Those insureds most likely to pay higher total premiums under this proposal are the small, low wage paying employers for which the Oregon survey results are the least conclusive. These are the insureds who generally do not have experience rating or other plans available to them to temper manual rate inequities.

M&R EVALUATION: We believe that the loss of intuitive hazard responsiveness is a significant drawback in light of the inconclusiveness of the analyses to date and the uncertain practical problems with this option. We are concerned that if premium adjustments are made at this time, they may subsequently need to be reversed when actual insurance data is compiled.

Average Hourly Wage Adjustments Superimposed on Unlimited Payroll

FCA presented two possible options for implementing the concept of limited payroll and cents-per-hour while maintaining unlimited payroll. The options include:

- a supplemental premium discount table and

- a supplemental premium discount and surcharge table.

The main advantages and disadvantages are essentially the same as for the limited payroll/cents-per-hour proposal. One additional advantage would be that the basic concept of an inflation sensitive exposure base (i.e. payroll), which has helped to keep wide swings in the indicated manual rates to a minimum, would be retained in the overall ratemaking process. A further disadvantage would be the necessity of maintaining three exposure measures for each insured in order to calculate both manual premium and the supplemental adjustments.

M&R EVALUATION: Our observations on these options are the same as those for the limited payroll/cents-per-hour approach.

Number of Employees

The advantages of number of employees as a premium basis are its inherent simplicity and relative ease of verification.

Further, there are no potential premium distortions due to average weekly wage variations.

A major disadvantage to this approach is that the number of employees is generally not a reasonable indicator of claim

frequency, injury duration or average benefit levels payable.

M&R EVALUATION: We do not believe that this is a viable option. To date, we are not aware that this alternative has been seriously considered in Oregon.

Refinement of Construction Classifications

The most significant advantage to this approach is that it goes to the heart of the problem: insureds within a particular manual class have distinctly different hazard potential as related to payroll. Segregation of such risks would not disrupt the current ratemaking and rating systems and there is certainly precedent for creating specialized classes.

The critical disadvantage is that such sub-classes have not yet been defined in a clear cut manner that is not susceptible to field manipulation. Also, the actuarial credibility of the data compiled for sub-classes may be too limited to correct the perceived problem.

M&R EVALUATION: At this time, it does not appear that further refinement of the construction classes can be accomplished in a socially acceptable manner that significantly improves the actuarial equity of the rating

structure. However, we would not eliminate this option from future consideration since this approach to equity problems has been successfully used in other jurisdictions.

REVIEW OF THE NCCI AND FCA ANALYSES

The NCCI solution to the inequities in the workers' compensation rates is a modification of the Experience Rating Plan for construction employers. This modification consists of two components: (a) an additional credit/surcharge based on expected losses and the ratio of actual losses to expected losses; and (b) an increase of 15 points in the "D ratios" for each classification. As discussed above, the credit formula will correct a portion of any inequities in the premiums charged to experience rated insureds. The effect of the increase in the D ratio is to further increase the amount of reliance placed on an insured's own experience in developing total workers' compensation premium. A complete discussion of this proposal is presented in Appendix C.

FCA proposes that premiums for medical benefits and low maximum benefits be based on hours worked. The remainder of the indemnity benefits would be based on limited payroll. This proposal is discussed in more detail in Appendix D. Underlying these premium bases is the assumption that higher wages do not reflect higher hazard as measured by frequency or duration of

injuries.

We believe that the survey and sampling procedures used by the NCCI in the Oregon Study were reasonable. However, we have some concerns about the validity of drawing conclusions based on the resulting data. Our major concerns (discussed in more detail in Appendices C and D) include the potential for: (1) biases in the data introduced by the elimination of insureds for practical reasons; (2) biases in the premium and loss data due to the immaturity of the data; and (3) biases introduced by the selection of the measures of inequity. There are several areas, for instance, the relationship between medical severity and wages, where the NCCI and FCA have drawn opposing conclusions based on the same data; we do not believe that we would have drawn either conclusion from the available data.

To illustrate the inconclusiveness of the data compiled to date, we have included, as Exhibit 1, a comparison of the "premium equity indices" resulting from the various proposals under consideration. The data used for this comparison are the NCCI calculated three-year aggregate loss ratios to standard premium for the identified experience rated employers. Based on our observations of the survey experience, we believe that this may be the best data compiled for the sample for drawing conclusions.

In their evaluation of the results, the NCCI concentrated on the relationship between union and non-union employers. In fact, the NCCI proposal does appear to address this discrepancy better than the other proposals. On the other hand, FCA concentrated on the discrepancy between high and low average wage payers. From that perspective, the FCA proposal appears more effective.

If one were to evaluate the proposals by minimizing the average overall "inequity", giving equal weights to each union status/wage level cell, the NCCI proposal would appear to be slightly preferable. However, with the data limitations discussed earlier, we cannot attach much significance to such a measurement.

DISCUSSION OF THE EFFECT OF FILE & USE ON EQUITY CONSIDERATIONS

In a study performed for the California Assembly in 1982, open rating for workers' compensation was presented as one possible long-term solution to the classification equity problems that may exist for this line of coverage. The point was that if the insurance industry was substantially free to react, market forces would identify and compete for those workers' compensation insureds that are inaccurately priced in terms of inherent risk. For example, if high wage paying union employers were consistently overcharged for coverage, this class of risk would present a potential "pocket of profit" for insurers. Once this

fact was recognized, there would be intense competition for this segment of the market, which eventually would result in a lower premium level for the class. In other words, market forces operating in an open rating environment would correct any existing price inequities.

With its File and Use statute for workers' compensation rates, Oregon comes closer to true open rating for the line than most other states. Therefore, the economic scenario discussed above is more likely to be realized in Oregon than in most other jurisdictions at this time. Although we do not have sufficient expertise in economic theory to discuss all aspects of open rating in depth, we do offer the following observations of how the issue of workers' compensation premium equity might be affected by the state's File and Use law.

- 1) Since its enactment in 1982, Oregon carriers have used the statute to create a broad spectrum of overall rate levels. In this respect, the File and Use law is functioning as planned. However, most insurers are still highly dependent on NCCI data and expertise to determine how rate levels should be spread among individual classes. This is not necessarily due to a failure in the open rating system. Instead, most companies simply do not yet have the amount of data necessary to deviate from the implied

NCCI class relativities on an actuarially sound basis. We expect the insurance carriers to deviate from the NCCI classification relativities more frequently in the future when more internal information is compiled.

- 2) On a related point, insurance carriers are still becoming accustomed to a workers' compensation system operating in a more competitive environment. We believe that many carriers are still more concerned with the practical operations issues and have not yet had the opportunity to make full use of this new pricing flexibility. Unfavorable underwriting results in recent years for the workers' compensation line in Oregon may also have reduced the amount of classification rating refinement that has taken place.

- 3) Even before the advent of File and Use, the higher aggregate payroll employers had more of a competitive advantage than the smaller employers. This is not due to any actuarial inequities; rather, it is due to the attractiveness of the size of premium generated by the larger employers and the fact that they are more likely to qualify for supplemental rating plans (e.g. experience rating, retrospective rating, dividend plans, et al) that can tailor costs more closely to the actual experience of

the specific insured. The qualification standards for such plans are generally based on actuarial credibility criteria; i.e. the statistical sufficiency of one's own experience to be used in insurance pricing.

Under File and Use, we expect this to continue. This will result in a substantial correction in any manual rate inequities that exist for the larger high wage paying construction employers. However, the small and average sized, high wage paying employers are less likely to benefit from this process.

In summary, we would expect the File and Use law to help correct actuarial inequities. However, the correction will take time as carriers identify misrated market segments. The correction process will be more immediate and more complete for larger employers that command greater market attention. We do believe that Oregon's rating law will take substantially longer to benefit the smaller employers.

OBSERVATIONS FROM OTHER STATES

At this time, the overwhelming majority of states are using unlimited payroll as a workers' compensation premium base. Although several states have considered other bases in recent years, few have made significant changes. For the most part, the

decisions not to change were made because a conclusively more equitable alternative that was both readily available and verifiable could not be identified. However, we are not aware of any state that has undertaken an analysis as complete as was performed in Oregon.

The following is a list of states that have implemented, or will soon implement, an alternative to unlimited payroll:

- Washington: cents-per-hour, since 1933;
- Nevada: limited payroll;
- Florida: limited payroll/cents-per-hour credit table for construction classes implemented in 1984; and
- Maryland: Experience Rating Plan modification proposal filed by NCCI in January, 1985.

The Washington situation has been the one most frequently cited as a potential prototype for Oregon. In fact, Washington apparently has been able to compile both hours worked and payroll for insureds with satisfactory results. However, it is important to realize that this system has been in effect for many years and the problems and costs of transition to an hours worked basis are no longer well documented.

Another point to consider in attempting to draw analogies with Washington is the particular delivery system that each state has

for workers' compensation coverage. Unlike Oregon, Washington employers only have a choice between self-insuring and obtaining coverage from an exclusive state fund. Private commercial carriers do not write workers' compensation insurance in the state.

With an exclusive state fund, substantial deviations from actuarial equity will not necessarily have any impact on the coverage availability for particular classes of business. However, in a competitive environment, deviations from actuarial equity can create economic disincentives for private insurers to write the affected classes. Therefore, a premium basis that appears to function satisfactorily in Washington may not work at all in Oregon. Interestingly, Washington has studied the possible transition to a payroll basis of some type in recent years. We understand that such a change has not taken place due primarily to social considerations, not issues of actuarial equity.

The workers' compensation delivery system in Nevada (i.e. self-insurance or an exclusive state fund) is quite similar to that of Washington. Therefore, any analogies drawn between Nevada's use of a limited payroll basis and the expected results of using a similar base in Oregon are subject to the same constraints as discussed above. However, we reiterate that prior

to the 1970's payroll limitations were commonplace in competitive environments. This does indicate that such a concept is at least feasible.

The Florida credit table implemented in 1984 is essentially the same concept as proposed by FCA for Oregon. Credits are applied to the standard premium for construction classifications based on average hourly wages. The credits range from 0% for hourly wages of \$9.99 or lower to 25% for wages in excess of \$17.50. Because this is a credit only table, a net loss in total premium volume would be realized. To offset this loss, a manual rate increase, averaging 4% for the construction classes, was simultaneously implemented. However, the actual manual rate increase by individual class varied between 0% and 33%.

In filing the Florida Contracting Classification Premium Adjustment Plan, the NCCI specifically stated that this was an interim proposal pending completion of more extensive studies (presumably the Oregon survey) on the issue of premium base equity. At this time, we have no information on which to evaluate the successes or failures of the interim plan.

On January 18, 1985, the NCCI filed with the State of Maryland essentially the same proposal as they set forth for Oregon. Entitled the Loss Ratio Adjustment Program, LRAP includes the

same supplemental Experience Rating Plan credit/surcharge table, applicable just to construction classifications, as developed for Oregon. However, the "D ratio" increase proposed for the construction classes was only 5 points compared to the 15 point increase suggested for Oregon. Both "D ratio" changes will tend to increase the amount of experience rating modification for construction insureds, although the Maryland approach will temper the impact that volatile actual losses may have on the standard premium.

PREMIUM CHANGES FOR AFFECTED EMPLOYER GROUPS

As part of our review we have attempted to quantify the possible impact that the various premium basis alternatives could have on the affected construction employer groups. As discussed above, one of our main concerns about any dramatic change in the exposure basis under the current File and Use environment is that the ultimate net premium level adjustments are very uncertain. However, we do offer the following information as a rough gauge of the amount of change that could be expected.

In evaluating these estimates, several points should be considered. First, there will be many exceptions to the general conclusions drawn. As examples of the levels of change that might be expected, we have relied on the premium calculations made by the NCCI for "typical" insureds. The results can and

will vary by insured and by insurer. Second, the actual premium depends on the specific parameters of each proposal. We would fully expect some changes in the parameters before they are finalized for an actual rate filing. Third, a rate increase, per se, for some insureds is not necessarily "bad". When considering rating modifications in the interests of actuarial equity, by definition some insureds will have increases while others will have decreases. This is the inevitable result of correcting inappropriate subsidies within the rating structure.

The NCCI prepared standard premium comparisons for four scenarios: the current system, the indexed limited payroll proposal, the FCA limited payroll/cents-per-hour approach, and the NCCI Experience Rating Plan modification proposal. The following are the observations by type of construction employer group.

Table of Sampled Oregon Construction Employer
Standard Premium Changes

	<u>NCCI Proposal</u>		<u>Indexed Limited Payroll</u>		<u>FCA Proposal</u>	
	<u>#</u>	<u>Range</u>	<u>#</u>	<u>Range</u>	<u>#</u>	<u>Range</u>
Small Employer						
<u>High Losses</u>						
(3 Insureds)						
Increases	1	1%	2	3%-10%	1	45%
Decreases	--	--	1	40%	2	2%-43%
<u>Low Losses</u>						
(5 Insureds)						
Increases	--	--	4	6%-14%	4	4%-22%
Decreases	3	5%-14%	1	12%	1	17%
Medium Employer						
<u>High Losses</u>						
(1 Insured)						
Increases	1	6%	1	11%	1	18%
Decreases	--	--	--	--	--	--
<u>Low Losses</u>						
(4 Insureds)						
Increases	--	--	3	10%-14%	3	7%-26%
Decreases	4	16%-40%	1	9%	1	15%
Large Employer						
<u>High Losses</u>						
(2 Insureds)						
Increases	2	17%-23%	1	7%	--	--
Decreases	--	--	1	24%	2	1%-28%
<u>Low Losses</u>						
(3 Insureds)						
Increases	--	--	3	2%-5%	2	4%
Decreases	3	9%-26%	--	--	1	4

NOTES: 1. Employer size is determined as follows:

	<u>Current Standard Premium</u>
Small	Less than \$3,000
Medium	\$3,001 to \$50,000
Large	Greater than \$50,000

2. Low loss employers are identified as those with actual losses less than expected losses; high loss employers are those with actual losses greater than the expected levels.

No comparison was done for actual insureds with a cents-per-hour only premium basis. However, we would anticipate that a cents-per-hour approach would affect the same category of insureds as the FCA proposal. We would expect that the range of premium increases and decreases would be more exaggerated with an hours worked base.

In summary, the NCCI proposal will have a significantly greater impact on the medium and large employers, i.e. those whose own loss experience is given substantial credibility in the application of the Experience Rating Plan. Both the limited payroll and the FCA proposals are essentially unaffected by an insured's own loss experience and will result in substantially greater premium increases for the small and medium sized employers. Within this category, the lower average weekly wage employers will experience the greatest increases.


SOURCES OF INFORMATION

The information used for this report were provided to us by NCCI, FCA, the Governor's Task Force on Premium Equity in Workers' Compensation Insurance and the Oregon Workers' Compensation Department. We have reconciled the information provided by the various organizations to the extent possible within the limited time available. We have discussed any significant differences in


this report.

We would like to extend our appreciation to all of these organizations for their timely response to our questions and requests for further information.

Milliman & Robertson, Inc.
March 14, 1985



James R. Berquist
Fellow, Casualty Actuarial Society
Member, American Academy of Actuaries



Michael A. McMurray
Fellow, Casualty Actuarial Society
Member, American Academy of Actuaries

State of Oregon - Workers' Compensation Department
COMPARISON OF NCCI CALCULATED PREMIUM EQUITY INDICES
FOR SURVEY CONSTRUCTION EMPLOYERS

	<u>Current System</u>	<u>NCCI Proposal</u>	<u>Limited Payroll</u>	<u>FCA Proposal</u>
<u>Union Employers</u>				
<u>Average Weekly Wage</u>				
Less than \$500	.98	1.08	.95	.93
Greater than \$500	.81	.82	.84	.89
----- Total	----- .90	----- .95	----- .90	----- .90

Non-Union EmployersAverage Weekly Wage

Less than \$500	1.08	1.06	1.07	1.04
Greater than \$500	1.26	1.02	1.30	1.34
----- Total	----- 1.12	----- 1.05	----- 1.12	----- 1.10

Average Weekly Wage
Not Greater than \$500

Union	.98	1.08	.95	.93
Non-Union	1.08	1.06	1.07	1.04
----- Total	----- 1.04	----- 1.07	----- 1.01	----- .99

Average Weekly Wage
Greater than \$500

Union	.81	.82	.84	.89
Non-Union	1.26	1.02	1.30	1.34
----- Total	----- .93	----- .89	----- .97	----- 1.02

NOTES:

1. Indices based on 3 year loss ratios to standard earned premium.
2. An index less than 1.00 indicates a relative premium redundancy; an index greater than 1.00 indicates a relative deficiency.

APPENDIX A

Statement of Work

AMENDMENT TO PERSONAL SERVICES CONTRACT

1. This contract is between the State of Oregon acting by and through its Workers' Compensation Department hereafter called the Department, and Milliman and Robertson hereafter called the Contractor.

2. Addendum No. 1 to original contract number 229.

3. The contract entered into on February 15, 1985, between the Department and contractor shall be amended as follows:

Paragraph 1. Statement of Work is replaced with the following:

a. Contractor agrees to accomplish the following work under this contract:

- 1) Analyze the data collected and procedures used by the National Council on Compensation Insurance (NCCI) for determining a more equitable basis for Workers' Compensation premiums in the construction industry in Oregon. The objective will be to evaluate the validity of the assumptions and procedures used by the NCCI to reach their previously published conclusions.
- 2) Critique the proposed solutions recommended by the NCCI in the "Study of Premium Equity by Employer Groups" and by Future Cost Analysts, Inc. in "An Equitable Basis for Workers' Compensation Premiums." The critique will include identification of the advantages and disadvantages of each alternative that has been considered, including the current system.
- 3) Review the alternatives to total payroll premium basis, including, but not limited to, cents-per-hour and capped payroll.
- 4) Discuss the possible impact of File and Use (open competitive rating) on the alternative premium bases.
- 5) Discuss the relative equity of each of the alternative premium bases and recommend the most equitable alternatives.
- 6) Review the results from other states that have implemented or considered alternatives to the current system.
- 7) Prepare a formal report on the results of the evaluation and findings for items 1-6. The report will include an explanation of the methodology used and assumptions made to arrive at the conclusions.

- 8) Present findings to the Governor's Task Force on Premium Equity and the Joint Senate and House Labor Committees.
- 9) Contractor agrees to the following delivery schedule for the work mentioned in (1)(a): March 15, 1985.

4. In performing the above, it is understood and agreed that all other terms and conditions of the original contract are still in effect.

Dated this 26 day of February, 1985.

CONTRACTOR(S)

By James R. Bergant
Title _____
2/22/85
Date _____

STATE OF OREGON by and through its Workers' Compensation Department

By Bobby S. Mink
Title _____
2/26/85
Date _____

APPROVED AS TO LEGAL SUFFICIENCY

By Dale K. Roman
Title _____
2/28/85
Date _____

APPROVED
EXECUTIVE DEPARTMENT

By _____
Title _____
APPROVED
FEB 28 1985
Date Thomas J. Montecosi

3091A/klc

APPENDIX B

Detailed Listing of the Advantages and Disadvantages
of Selected Premium Basis Alternatives

State of Oregon - Workers' Compensation Department

UNLIMITED PAYROLL

ADVANTAGES

1. The exposure base is readily available and verifiable.
2. It reflects the total exposed risk.
3. It is more responsive to the economic climate than the cents-per-hour proposal; ergo, less dramatic rate changes and more predictability for budgeting.
4. It avoids the arbitrary and potentially inequitable "head" count syndrome that limitations on payroll can induce.
5. It gives the opportunity for maximum front-end rate responsiveness to economic changes.
6. It provides less opportunity for manipulation by large insureds; ergo, more equity for all insureds.
7. It produces lower front-end premiums for small insureds who do not have an experience rating plan safety valve.
8. Overall, this proposal will entail less of a record keeping expense.

State of Oregon - Workers' Compensation Department

UNLIMITED PAYROLL

DISADVANTAGES

1. Variations in average weekly wages will produce inequitable premiums.
2. There will be no reflection of the maximum weekly benefit in the rates.
3. Frequency should be more directly related to hours worked.
4. The duration of each injury should be more directly related to hours worked.
5. The duration of each injury should not vary within each class.
6. Medical and low-maximum or lump-sum indemnity benefits should be the same for all workers in a class.
7. The Experience Rating Plan does little to temper inequities for the construction industry.

State of Oregon - Workers' Compensation Department

UNLIMITED PAYROLL

REJOINDERS TO DISADVANTAGES

1a. Under normal conditions, competitive forces lead to uniformity of average weekly wages for specific work activity.

b. There will always be exceptions, but the proposal must fit the typical situation.

c. This proposal is tempered by application of the Experience Rating Plan. This avoids measuring hazard by "head" count.

2a. The proposal must recognize that premium is based on both frequency and severity.

b. Also, total payroll addresses, indirectly, the potential seriousness of injury.

c. The same logic that would say "cap" exposure due to indemnity benefit "cap", would imply an unlimited exposure basis for unlimited medical benefits.

3. There is no firm statistical basis to support the contention that medical is not correlated with payroll.

State of Oregon - Workers' Compensation Department

NCCI PROPOSAL

UNLIMITED PAYROLL WITH MODIFIED EXPERIENCE RATING PLAN

ADVANTAGES

1. This proposal maintains the advantages of unlimited payroll.
2. It addresses, at least partially, the particular problem faced by the construction industry, without disrupting other classes.
3. It could serve as a model for other problem classes.
4. It produces nominal rate dislocations.
5. It requires minimal additional expense.

DISADVANTAGES

1. One large claim can cause substantial swings in experience rating modifications.
2. Swings would hurt smaller experience rated employers more.
- 3a. Based on actuarial theory, wage differentials are too large to be corrected by the experience rating plan, even as modified.
b. Also based on actuarial theory, the average construction company does not have enough claims to be credible. This observation concentrates on the smallest employers.
4. The NCCI will not apply this proposal outside of the construction industry; ergo, NCCI does not think it is desirable for other industries.
5. This proposal does not completely eliminate inequities.

REJOINDERS TO DISADVANTAGES

1. This proposal relates directly to actual loss experience.
2. No "loss free" risks are required to have a rate increase.

State of Oregon - Workers' Compensation Department

INDEXED LIMITED PAYROLL

ADVANTAGES

1. The Indexed Limited Payroll proposal addresses maximum weekly benefits.
2. It recognizes variations in average weekly wages.
3. If indexed adequately, this proposal measures exposure better than the cents-per-hour proposal.
4. With some additional cost, Indexed Limited Payroll will be readily available and verifiable.
5. This proposal gives some potential relief to high-wage payers who do not qualify for a significant experience rating modification.

State of Oregon - Workers' Compensation Department

INDEXED LIMITED PAYROLL

DISADVANTAGES

1. Indexed Limited Payroll requires additional record keeping.
2. It produces less of a measure of total exposure.
3. It can degenerate into a "head" count.
4. It can be more inequitable to small insureds who do not have the Experience Rating Plan as a safety valve.
5. It requires higher front-end rates which adversely impact low-wage payers or smaller insureds.
6. This proposal redistributes premium from high-wage payers to low-wage payers.
7. It is subject to some manipulation, which is not fair to insureds who do abide by the premium reporting rules.
8. It disregards the cost of additional medical benefits.
9. It also disregards the loss experience of the individual insureds.
10. "Loss-free" insureds would pay more premiums.

REJOINDERS TO DISADVANTAGES

1. The expense of the additional record keeping is relatively small.
2. If indexed adequately, the payroll limitation still measures the total exposure for most insureds.

State of Oregon - Workers' Compensation Department

CENTS-PER-HOUR WORKED

ADVANTAGES

1. The cents-per-hour proposal circumvents the problem of varying average weekly wages for some classes of hazards.
2. This proposal reflects size of employer and length of time on a job.
3. The most reasonable assumption is that employers in the same class will have the same number of claims per hour worked.
4. For medical, low-maximum and lump-sum indemnity, costs should only vary with the frequency, which varies with hours worked.
5. There is no relationship between rehabilitation costs and wages.
6. In Oregon's study, over 40% of workers earned more wages than were necessary to qualify for maximum benefits.

State of Oregon - Workers' Compensation Department

CENTS-PER-HOUR WORKED

DISADVANTAGES

1. Hours worked are not universally collected, available or verifiable. It would not be fair to require those who would report honestly to subsidize the insurance costs of those who would not.
2. The implementation of this proposal requires additional expense.
3. Data would need to be collected for several years before it could be of value in pricing.
4. Activities that are more strenuous or hazardous may have different frequencies per hour worked.
5. Cents-per-hour worked ignores urbanization, availability and utilization phenomena affecting medical costs.
6. The Experience Rating Plan essentially corrects for inequities anyway.
7. This proposal is not as responsive to the economic climate as other proposals.
8. It would have the greatest potential negative impact on smaller (non-experience rated) employers.
9. Changing the data base to cents-per-hour will produce an unknown impact on rate and overall premium levels.
10. Implementation of this proposal will further exasperate uncertainty caused by the File and Use system.
11. The relationship between rate levels and wages is ignored.

State of Oregon - Workers' Compensation Department

CENTS-PER-HOUR WORKED

REJOINDERS TO DISADVANTAGES

1. Some less hazardous jobs (e.g. foreman) can actually have higher payrolls.
2. An Experience Rating Plan does nothing for non-experience rated risks and little for smaller qualifying employers.
3. Oregon's study "disproved" the urbanization, availability and utilization theories for medical benefits.
4. The greatest negative impact is simply a correction of past rating inequities.
5. It is unlikely that necessary data is not readily available.
6. The additional expense of implementing this proposal is nominal and justifiable.
7. This proposal assumes that hazard differences are adequately handled by the classification system.

State of Oregon - Workers' Compensation Department

FCA PROPOSAL

LIMITED PAYROLL / CENTS-PER-HOUR WORKED

ADVANTAGES

1. The FCA proposal removes any possibility of average weekly wage variance distortions affecting medical and low-maximum indemnity.
2. This proposal maintains a relationship to wages for those indemnity benefits affected by wages.
3. It has the same advantages as both the limited payroll proposal and the cents-per-hour worked proposal.

DISADVANTAGES

1. Implementation of this proposal would present additional cost and verifiability problems.
2. This proposal would increase premiums for "loss-free" small insureds with low wages.
3. It ignores certain hazard differences affecting medical and, to a lesser extent, indemnity benefits.
4. It is not as responsive to economic climate as other methods would be.
5. Under this proposal, the system is subject to greater manipulation.
6. Implementation of this proposal will further exasperate uncertainty caused by the File and Use system.

REJOINDERS TO DISADVANTAGES

1. This proposal has the same features as both the limited payroll and the cents-per-hour worked proposals.

State of Oregon - Workers' Compensation Department

FCA PROPOSAL

CREDIT TABLE OR CREDIT/SURCHARGE TABLE

BASED ON AVERAGE HOURLY WAGES

ADVANTAGES

1. This proposal has the same advantages as the combination limited payroll/cents-per-hour worked proposal.
2. It also maintains the basic concept of unlimited payroll.

DISADVANTAGES

1a. Implementation of a "credit-only" proposal would create a substantial increase in manual rates, resulting in collected premium increases for small employers.

b. Although base rates could be kept close to their current levels with a credit/surcharge table, collected premiums for small employers would probably go up.

2. This proposal would require regular updating of the tables.
3. It also encompasses the same disadvantages as the combination limited payroll/cents-per-hour worked proposal.

State of Oregon - Workers' Compensation Department

NUMBER OF EMPLOYEES

ADVANTAGES

1. The number of employees method is easy to comprehend and implement.
2. There are no average weekly wage distortions.

DISADVANTAGES

1. The number of employees insured does not reflect the amount of time each employee is exposed to any potential hazard.
2. The number of employees insured also does not reflect the types of injuries suffered and thus no estimation of the benefit or the duration of the injury can be made.

**RATEMAKING PROCEDURES
EVALUATION OF RATEMAKING METHODOLOGIES**

**NCCI EXAMINATION
VOLUME IX - SECTION IIB - PART 7
EXPERIENCE RATING PLAN**

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EXPERIENCE RATING PLAN

I. INTRODUCTION

Experience Rating Plan is intended to increase the accuracy of the premium calculation system by incorporating the recent experience of an insured as an enhancement to the classification process. The NCCI Experience Rating Plan is a prospective rating plan; i.e., it is used to determine the rate for a policy period prior to the availability of actual claim experience for that period. The Experience Rating Plan provides a refinement to the class rates which are determined by the type of business, in an effort to assess the appropriate premium rate for a particular insured.

The Experience Rating Plan results in an experience modification factor which is applied to the manual rate in order to determine the rate for a particular insured.

The fundamental technique in experience rating is to compare the historical experience of the insured with the expected experience (based on the insured's class) in order to adjust the price of the insurance provided. The experience rating plan is intended to use information contained in the historical experience of the insured to the extent it is a relevant predictor of future experience.

The impact of random variation in claim experience is reduced through the use of credibility weighting. The experience rating formula assigns a credibility (or weight) to the actual historical losses of the insured. This credibility represents its predictive power relative to that of the expected losses based on the manual rate for the insured's class. The complement of the credibility (the remaining weight) is assigned to the expected losses.

NCCI has filed the Revised Experience Rating Plan (Item E-1235) in most of the jurisdictions where it is the licensed rating bureau. In the remainder of this report, we will refer to the Revised Experience Rating Plan as RERP, and the Prior Experience Rating Plan as PERP. Where it is not important to distinguish between RERP and PERP, we will refer to the Experience Rating Plan as ERP.

The objectives of this report are to describe and evaluate the current NCCI Experience Rating Plan.

EXPERIENCE RATING PLAN

EXPERIENCE RATING PLAN

II. SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

The following are our conclusions about the NCCI experience rating plan. Direct reference is made to questions the NAIC asked us to address in this study.

A. Procedures and Formulas Used by NCCI

Objective (7a): Is the NCCI's Revised Experience Rating Plan (RERP) actuarially sound? What improvements could be made in the plan?

In responding to this objective (7a), we examined the following issues:

1. Accuracy of the RERP
2. **Credibility:** Credibility refers to the weight given to each risk's actual losses in the experience modification formula. We compare NCCI credibilities against optimum credibilities produced through regression formulas.
3. **Split Point:** The NCCI experience rating plan splits a risk's actual losses into primary and excess components. The primary loss in the RERP is the first \$5,000 of each loss and the excess is the balance. We examine whether the plan could be improved by increasing or decreasing the split point.
4. **Balance of plan:** The balance of the experience rating plan refers to whether or not the average experience modification factor is 1.0. We examine whether the NCCI plan is balanced, and if not, whether it should be.
5. **Administration:** We review the internal methods and procedures of NCCI to evaluate whether the experience rating plan is properly administered.

Each of these is discussed in more detail below.

1. Accuracy of the RERP

We have evaluated the accuracy of the Revised Experience Rating Plan, and find it to be more accurate, on average, than the Prior Experience Rating Plan it replaces.

EXPERIENCE RATING PLAN

In Section III.G. we discuss an alternate experience rating formula which is a combination of both a formula used by the Insurance Services Office and the current NCCI approach. The alternate formula (discussed below) would adjust expected excess losses by an experience modification factor based on primary losses, whereas the current NCCI expected excess losses are not affected by the actual primary losses.

2. Credibility

An analysis of the credibility formulas currently used by NCCI is included in Section V. We found that historical primary losses were predictive of both future primary losses and future excess losses. As a result, under the RERP, primary credibilities are above the optimum level needed to predict primary losses alone. This increase is reasonable under the constraints of the RERP, since there is no other way to reflect the ability of primary losses to predict future excess losses given the structure of the RERP formula.

We have developed an Alternate Experience Rating Formula which directly incorporates primary losses as a predictor of future excess losses. Under this formula the primary experience modification would be used to adjust the expected excess losses before the application of excess credibility. This procedure would result in an experience modification to expected excess losses (based on primary losses) even if the credibility of actual excess losses were zero.

We believe that primary and excess losses are correlated. As a result, we believe that the Alternate formula can be expected to produce more accurate results than the RERP (or a version of the RERP in which the parameters have been optimized as in the Alternate formula). However, the degree of improvement is not clear. We recommend that further testing be done by NCCI using more states and more time periods to evaluate the degree of improvement produced by the Alternate formula. If the degree of improvement is found to be substantial, then we would recommend implementing the Alternate formula as soon as is practical. If the improvement is found to be minor, then the practical difficulties involved in implementing a change in the formula make it appropriate to postpone implementation until such time as other significant changes are being implemented, or possibly to forego implementation altogether. This will be a matter of professional judgment.

It should be noted that a change to the Alternate formula should not be expected to affect the total premium adequacy for all risks combined in a given state.

EXPERIENCE RATING PLAN

In addition to developing the Alternate formula, we have developed a technique for estimating the credibility parameters which best fit a given set of data. If NCCI does replace the RERP with the Alternate formula, we recommend that they refine the parameters by applying that technique to countrywide data. It should be noted that adjustments to the optimized parameters may be appropriate for practical purposes.

3. Split Point

The equity of a split point is evaluated in Section VII.

Use of a split point increases the accuracy, and therefore, the equity of an experience rating plan. The predictive value of prior experience is lower for extremely high loss amounts than for moderate to low loss amounts. As a result, without a split point, an unusually large single loss would produce a larger debit than is warranted, while unusually low loss amounts would produce a smaller credit than is warranted.

The current split point of \$5,000 represents a reasonable compromise between minimizing "linearization error" and maximizing the amount of data classified as primary. Significantly increasing or decreasing the split point results in a deterioration of the performance of the plan as measured by both the modified Loss Ratio and the Mean Squared Error tests.

4. Balance of plan

Recommendations for improvements in ELR and D-ratio calculations are given in Section IV which, if implemented, should produce reasonably balanced results for the plan. We conclude that if these recommended changes are implemented and if ELR's are updated on a regular basis, any persistent off-balance that results will be due to real cost differences between experience rated risks and the average of all risks. We believe that if such differences are manifested in the experience modification factors, they should be eliminated through adjustments in the manual rate structure, to the extent practical. To the extent that this is not practical, they should be allowed (as they currently are by NCCI) rather than eliminated through adjustments to the ELR's. Overall rates are not necessarily inadequate or excessive due to the existence of an experience rating plan off-balance.

5. Administration

Administration of the ERP is evaluated in Section VIII. There is evidence that the calculations resulting in ELR and D ratios are appropriately checked and documented in

EXPERIENCE RATING PLAN

NCCI files. Further, reasonable safeguards exist against manipulation of the data by the insured. Finally, the experience rating modification is calculated by computer, and a worksheet is produced showing the calculation and underlying data. This worksheet is sent to the carrier of record, and is made available to the insured and its agent or service provider.

B. Number of Years to be Used in Experience Rating

Objective (7b): To what extent would experience rating be more accurate if more than three years of data were used? Specifically consider the use of five years of data. Discuss the additional cost that might be applicable if five years of data were used.

Our evaluation of the number of years of experience to be included in the ERP is in Section VII. Our conclusions concerning the number of years to be used are as follows:

Our testing, using the Alternate formula and optimized RERP, suggest that the accuracy of the experience rating plan would be improved by expanding the experience period to five years from the current three years. Further testing based on data from additional states and, preferably, using fourth and fifth report data for the two additional years should be done before deciding to go ahead with this change.

Inclusion of the fourth and fifth years of experience would entail significant implementation costs as well as substantial ongoing costs.

In addition to the impacts on accuracy and cost, extension of the experience period to five years could affect the perception of the plan's reasonableness by policyholders. Some policyholders already consider it inappropriate to use data as old as the oldest year currently used in experience rating; the addition of two older years would exacerbate this perception.

C. Extension of the Plan to Small Risks

Objective (7c): What credits would be indicated for small loss free risks? To what extent would it be practicable to debit small risks for higher than expected losses?

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The loss experience of small risks is described and evaluated briefly in Section III.D and in more detail in Section XI.

In Section XI, we describe a procedure for estimating the indicated credit for small loss free risks. In addition, we describe a Claim Free Credit Plan (CFCP).

Applying that procedure to the data for the states we have reviewed, the indicated credit for a small risk with three years of claim free experience is approximately 7%. In order to balance that credit, eligible small risks with at least one claim in three years should be debited approximately 13%. If the decision is made to implement a CFCP, we recommend that NCCI estimate the indicated credits and debits using the method we have described (including the noted refinements).

A CFCP is a compromise between the equity and loss control incentive of a full experience rating plan and the ease of operation of the current system of manual rates for small risks. If introduced, the CFCP would improve the equity of the premium charged to average sized unrated risks (i.e., those not eligible for experience rating). It is, however, likely to result in less equity than the current system for the largest and the smallest unrated risks. For large unrated risks (i.e., those close to, but below, the experience rating threshold) the CFCP may result in debits for risks whose experience is no worse than expected. For very small risks, the CFCP is likely to produce a larger swing in premium than is warranted by the credibility of actual experience. On average, the CFCP would cause unwarranted premium increases for large unrated risks and unwarranted decreases for the smallest risks.

We recommend against implementing a Claim Free Credit Plan of the type studied in this report, because of the inequities discussed above. Alternative approaches could reduce these inequities by varying the credits and surcharges according to the size of the risk and possibly according to the sizes of claims, but such a plan would be significantly more complicated and difficult to administer.

It should be noted that the credibility that would be assigned to the larger unrated risks, if they were eligible for experience rating, is high enough (see Exhibit 12) to suggest that experience rating would improve the accuracy of the rates for such risks. Our understanding is that NCCI has slowed the updating of eligibility requirements so that inflation will cause smaller risks to become eligible. We consider this appropriate.

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D. Accuracy of Current Formulas Used to Calculate ELR's and D-Ratios

Objective (7d): Are the formulas used to calculate Expected Loss Rates (ELR's) and "D" ratios sound? Does the NCCI's method of introducing RERP tend to result in a revenue increase?

It is our conclusion that the methods used in calculating ELR's and D-Ratios could be improved in several ways in order to increase the accuracy of the experience rating plan. Both the ELR and D-ratio calculations are described and analyzed for accuracy in Section IV.

We believe that the calculation of ELR's can be significantly improved by:

1. Calculating loss development removal factors separately for serious, non-serious and medical categories, and utilizing each classification's distribution of serious, non-serious, and medical pure premiums as weights to calculate the average. As a temporary measure, NCCI may find it more practical to calculate loss development removal factors by hazard group until their ratemaking programs can be modified. This would result in more accurate expected losses to be compared against actual losses for each class.
2. Using a weighted rather than a straight average to combine loss development, trend, and benefit changes removal factors for the three policy years in the experience period. The weights for this average should be based on the actual distribution of ultimate expected losses by policy year, with adjustments to reflect any factors that have already been removed. We expect that this will result in more weight being given to the most recent policy period and a more correct overall effect of the plan.
3. Updating the tables of excess ratios to reflect more recent data. Test the impact of multiple claim occurrences and disease losses on the loss limitation factors. Modify these loss limitation factors if the additional limitations on these losses are significant.
4. Eliminating the 1.01 off-balance adjustment factor.
5. Changing the method used to calculate the trend removal factor to reflect the varying impact of medical trend recently included in the NCCI's industry group differentials.

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We believe the D-ratio calculations can be improved as follows:

1. The total losses in the denominator of the D-Ratio should be adjusted to reflect the impact of the per claim and other loss limitations of the plan.
2. The data used to evaluate D-Ratios should include losses at first, second, and third reports. The current methodology includes losses only at first report.

E. Premium Impact of Implementing RERP

The premium impact of implementing the RERP is evaluated in Section IX. We conclude that the NCCI's method of introducing the RERP does not tend to result in a premium increase or decrease.

F. Experience Rating Plan Off-Balance Impact on Ratemaking Methodology

Objective (8c): Does the NCCI ratemaking formula accurately account for any off-balance due to the experience rating plan? Does the NCCI adequately adjust the expected loss rates (ELR's) and D-ratios to maintain off-balance at a reasonable level? What improvements could be made in the NCCI's procedures?

Standard NCCI methodology does not address changes in experience rating off-balance, although adjustments have been made by NCCI in some cases. The implicit expectation is that if rate revisions are made on a timely basis (regardless of whether the full amount of the requested rate revision is granted), then off-balance movements should be relatively small and have insignificant effects on overall rate levels. As Exhibit 5 demonstrates, however, a number of states have experienced significant off-balance movements.

We recommend that standard NCCI methodology identify off-balance levels and movements during the experience periods used for trending and rate level indications. An attempt should be made to determine the cause of significant off-balance swings whenever they are seen.

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Proper action in response to significant off-balance swings would be a function of the cause identified. We would recommend that adjustments not be made when changes are attributed to a change in the mix of risks which are insured. The situations in which we would often expect that adjustments would be appropriate include:

1. a change in the experience rating plan itself (e.g., rules, such as eligibility requirements, or formulas such as those for calculating ELR's) or
2. delays in updating ELR's and D-ratios, due to prior delays in the approval of rate changes.

In these cases, some distortion could be expected to occur (if no adjustments are made) in the overall rate change indication, through misestimation of the trend factor and/or through an inconsistency between the average off-balance underlying the latest policy year and accident year loss ratios and that likely in the future period for which rates are being estimated.

One or both of the above situations have occurred in recent years in many states. The trends observed in Exhibit 16 suggest that such situations have in fact caused distortions in several states. However, the data underlying Exhibit 16 excludes interstate risks, because their effect on individual state off-balances has not been compiled by NCCI. Interstate risks account for over half of the total premium volume.

We have recommended certain adjustments (Section XII.A) in the ratemaking procedure to eliminate these distortions. However, to implement those adjustments, it is necessary to develop data on the average off-balances on an individual state basis, including interstate risks.

We recommend that NCCI develop data on average off-balances on an individual state basis, including interstate risks, for all policy years and calendar/accident years used in a rate filing (including those underlying the trend calculation). This data is essential both for monitoring average off-balances (to help detect distortions) and for adjustments to correct for the distortions.

NCCI has sometimes included appropriate adjustments in its rate analysis, but often has not. In some cases, the adjustments made by NCCI were designed to reduce or eliminate a change in average off-balance (by adjusting the ELR's), while it would have been more accurate to allow the off-balance to change and to make an offsetting adjustment to the

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manual rates. If an adjustment is made to the ELR's in order to mitigate a change in average off-balance that would otherwise occur, this should be disclosed in the filing. It should be recognized that this type of adjustment represents a choice of stability in place of accuracy. Also, it is important to keep track of such adjustments and take them into account in subsequent rate analyses; if this is not done, they can result in a distorted view of trends or of experience loss ratios in subsequent filings.

G. Impact of Deductibles on Experience Rating

It is our understanding that data is currently reported to NCCI net of deductibles in eight states. Reporting data in this way significantly complicates and degrades the application of an experience rating plan. Theoretically, under such a reporting system, the ELR's and D ratios underlying expected losses for each risk should be adjusted to reflect the amount of that risk's deductible (if any). We understand that NCCI is currently developing an approximate adjustment procedure to apply in these states. We have not evaluated that procedure. Such an adjustment is needed in order to avoid inequity in the rating of risks.

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III. DETAILED DESCRIPTION OF THE PERP AND THE RERP

In this Section, we provide descriptions of the PERP and the RERP, with emphasis on the aspects of the plan that changed in the transition from the PERP to the RERP. We also discuss the concepts involved in the selection of the plan formulas and parameters, with some discussion of the advantages and disadvantages of alternate approaches.

A. Definition of Terms

In the equations that follow, the following definitions apply:

A = Actual Total Losses: the sum of actual case basis incurred losses, after reflecting certain limitations.

A_p = Actual Primary Losses: the primary portion (defined later) of actual total losses.

A_e = Actual Excess Losses: the excess portion of actual total losses ($A - A_p$).

E = Expected Losses: the expected loss rate (ELR) for each class times the payroll for each class divided by 100, summed over all classes and years.

E_p = Expected Primary Losses: the ELR for each class times the D-ratio for each class times the payroll for each class divided by 100, summed over all classes and years.

E_e = Expected Excess Losses: expected losses minus expected primary losses ($E - E_p$).

W = Weighting Value: number in the state's table of Weighting Values contained in the state pages of the Experience Rating Plan Manual. W is a number between 0 and 1, inclusive. W is based on the risk's volume of expected losses. W is multiplied by the primary credibility values to produce excess credibility values.

B = Ballast Value: number in the state's table of Ballast Values contained in state pages of the Experience Rating Plan Manual. B is also based on the risk's volume of expected losses. B is used directly in the calculation of primary credibility values, and indirectly in the calculation of excess credibility values.

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B. Eligibility

Not every employer is eligible for experience rating. Although the minimum varies by state, a typical minimum annual premium of \$4,500 based on standard manual rates currently applies. Having satisfied this requirement, it is mandatory that the employer's manual premium be modified by the application of the state approved Experience Rating Plan. In contrast, the experience rating plans for most commercial casualty lines such as the plan promulgated by the Insurance Services Office (ISO) for general liability insurance are not mandatory in most states. In the remainder of this report, the term "rated risks" will mean risks eligible for experience rating.

C. Split of the Plans Between Primary and Excess Losses

In both the PERP and the RERP, losses are subdivided between primary and excess components. In both plans, less credibility is attributed to excess losses than to primary losses. Therefore, if two similar risks (A and B) each have the same dollar amount of loss experience, but A has a small number of large (i.e., including excess) losses, while B has a large number of small losses, B's experience results in a higher experience modification factor.

The RERP is a "single split" plan. The first \$5,000 of each claim is considered the primary loss portion and the portion, if any, of each claim above \$5,000 is considered the excess loss portion. For example, a \$12,000 loss would have a primary portion equal to \$5,000 and an excess portion equal to \$12,000 - \$5,000, or \$7,000.

The PERP is a "multi-split" plan in which a formula, rather than a fixed dollar value, determines the split between primary and excess losses. For claims less than \$2,000, the total loss is considered to be primary. Above \$2,000, the primary portion of a claim is given by the formula:

$A_p = 10,000 A / (A + 8,000)$, where A is the total loss amount.

For example, a \$10,000 loss would have a primary portion equal to \$5,556, and an excess portion equal to \$10,000 - \$5,556, or \$4,444. Given the nature of the above formula, the primary portion of a loss can never exceed \$10,000, regardless of the magnitude of the total loss on the claim.

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The discount ratio (D-Ratio) represents the ratio of expected primary losses to expected total losses. These ratios vary by class and also differ between the PERP and the RERP, since the split points for these plans differ.

D. Credibility of the Plans

Credibilities under the RERP differ from credibilities under the PERP. For small risks, primary credibilities are larger and excess credibilities are somewhat larger under the RERP. For large risks, primary credibilities are smaller and excess credibilities are much smaller under the RERP. The effect of these credibility changes is to give a greater swing (range) to the experience modification factors for the smaller risks and a narrower swing to the modification factors for the larger risks.

For example, a small risk with better than average loss experience for its class, as measured by the class' expected loss, will receive a larger credit (i.e., a smaller experience modification factor) under the RERP than the PERP. Conversely, a small risk with worse than average experience will receive a larger debit (i.e., a larger experience modification factor) under the RERP than the PERP.

For larger risks, the credits and debits will have a narrower swing under the RERP than under the PERP and, therefore, the magnitudes of individual risk experience rating credits and debits will be reduced.

The credibilities for both primary and excess losses are defined by formulas under both the PERP and the RERP. For both plans, the credibilities are expressed as functions of total expected losses using the following formulas:

$$Z_p = E / (E + B), \text{ and } Z_e = W \times Z_p \text{ where}$$

Z_p = the credibility of primary losses,

Z_e = the credibility of excess losses,

E = the total expected losses for the risk during the experience period (normally 3 years), and

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B and W are rating plan parameters which vary as functions of E and S (defined as the Self-Rating Point under the PERP and the State Reference Point under the RERP). Under the RERP, S is defined as 250 x the average cost per claim in each state. Under the PERP, S is 25 times the average serious cost per claim averaged with the prior year's value. B and W are determined by formulas which differ between the PERP and the RERP.

It is instructive to note the differences between the formulas for B and W in the PERP and the RERP, and the resulting effects on the plan credibilities and the experience modification factors. First, for the PERP:

B remains constant at \$20,000 for expected loss values ranging from \$0 to \$25,000. Above \$25,000, B decreases linearly as a function of expected losses to 0 at the self-rating point S. B remains equal to 0 at amounts exceeding S.

W equals 0 for expected loss values ranging from \$0 to \$25,000. Above \$25,000, W increases linearly as a function of expected losses from 0 to 1.0 at the self-rating point S. W remains equal to 1.0 at amounts exceeding S.

A consequence of B reaching zero at S under the PERP is that the primary credibility Z_p reaches 100% at S. In addition, because W reaches 1.00 at S, the excess credibility also reaches 100% at S. Thus, above S, the risk is deemed by the PERP to be fully credible and the prospective premium for the risk is based fully on the historical loss experience for that risk (with adjustments for trend, benefit changes and loss development) and not on the expected losses, as derived from NCCI manual rates.

Under the RERP, B and W are given by the following formulas:

$$B = E \times (.1E + .01S) / (E + .0028S), \text{ subject to a minimum of } \$7,500,$$

$$W = [(E + .0204S) \times (1.1E + .0128S)] / [(1.75E + .8204S) \times (E + .0028S)], \text{ subject to a minimum of } .07.$$

The nature of these RERP formulas determines that the credibility of neither primary or excess losses will ever equal 100%, even above the state reference point S. As E increases to S and beyond, B asymptotically approaches $.1 \times E$ and the primary credibility approaches $(1 / (1+.1)) = 91\%$. W asymptotically approaches $1.1/1.75 = .63$. The excess credibility therefore never exceeds $.91 \times .63 = 57\%$.

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At low values of E, B equals \$7,500. This amount is much lower than \$20,000, which applies under the PERP for smaller values of E. Lower values of B translate to higher primary credibilities given the above formula for Z_p . Hence, for smaller risks, the RERP assigns higher credibility to primary losses than does the PERP.

At low values of E, W equals .07, compared to 0 under the PERP. Thus, excess losses always have credibility equal to at least 7% of the credibility of primary losses.

One aspect of the change in credibilities from the PERP to the RERP is that the loss experience for any risk, even one with expected losses exceeding the state reference point S, is not treated as being fully credible under the RERP. This is a logical change since full credibility implies that there is no predictive value associated with the manual rate when compared to the risk's historical losses. The PERP implicitly assumed full credibility of both primary and excess losses for risks with expected losses exceeding S.

The RERP always assigns less credibility to excess losses than to primary losses. This is also true for the PERP when expected losses are below S. This seems reasonable because of the more random nature of excess losses, and is consistent with the results of our study as described elsewhere in this report.

E. Formula for the Experience Modification Factor

The experience rating formula is the same under the RERP and the PERP. This formula, in its conceptual form is:

$$M = \frac{Z_p \times A_p + (1-Z_p) \times E_p + Z_e \times A_e + (1-Z_e) \times E_e}{E}$$

where M	= Experience Modification Factor
A_p	= Actual Primary Losses
A_e	= Actual Excess Losses
E_p	= Expected Primary Losses
E_e	= Expected Excess Losses
E	= Total Expected Losses = $E_p + E_e$
Z_p	= Primary Credibility
Z_e	= Excess Credibility

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In the application of the plan, the above formula is not used directly. Since the credibilities are functions of expected losses E and parameters B and W, the formula for M is expressed directly as a function of these variables. The resulting formula becomes:

$$M = [A_p + B + W \times A_e + (1-W) \times E_e] / [E + B]$$

A maximum of three years of loss experience is normally used in this formula. Generally, the three years are consecutive policy periods ending 12, 24 and 36 months prior to the effective date of the experience modification factor.

Actual losses are case basis incurred losses as reported to NCCI through the Workers Compensation Statistical Plan as of the loss evaluation date. They are not adjusted by NCCI in the rating calculation, except that very large losses are truncated at certain loss limitations. Expected losses are computed by multiplying the exposure units (i.e., number of hundreds of dollars of unlimited payroll) by the "expected loss rate" (ELR) for each risk class. The ELR is calculated by NCCI from the existing manual rates for each class and state by adjusting for the impacts of:

- expenses and profit trend
- subsequent law changes
- loss development
- an "off-balance" adjustment
- large loss limitations.

With these adjustments, the ELR's x exposures should be comparable to the reported losses and, if the risk is average within the NCCI classification structure, the resulting experience modification factor should ideally equal 1.00.

Expected losses must also be divided between primary and excess components. This is done using discount ratios, or D-ratios, which vary by class. The D-ratio is the expected ratio of primary losses to total losses.

If an insured operates in more than one of the states where interstate rating applies, special procedures must be applied in the application of the ERP since different state reference points (S) apply and hence different B and W values apply. To compute the B and W values for the interstate insured, those values are computed for each state separately, given the total expected losses for the insured in all states combined, and the results are averaged

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together for the states using the expected losses for each state as weights. After B and W values are computed in this manner, the experience modification factor is computed as it would be for an intrastate insured.

F. Other Experience Rating Plan Rules

1. Definition of Risk - Combination of Entities

The experience of several entities and policies must sometimes be combined for purposes of experience rating. The rules for the combination are based on common majority interest. Broadly speaking, all entities which have common ownership (50% or more) are combined into a single unit for purposes of experience rating. In practice, the rules for the combination of entities are quite complex. A complete discussion of these rules is contained in the NCCI Experience Rating Manual. A single entity or a group of entities which are combined to form the basis for an experience modification factor is called a "risk."

2. Experience Period

The experience period is the historical time frame which defines the experience to include in the experience rating calculation. It generally consists of the three most recently completed policy years that expired at least one year before the effective date of the experience modification factor. Rules exist which provide longer or shorter experience periods in certain circumstances.

3. Plan is Mandatory

The Experience Rating Plan is mandatory for all eligible risks. Two tests are used to determine experience rating eligibility. If a risk satisfies either test, it is eligible. The first test compares the premium at manual rates for the latest two years combined to a threshold. This first threshold is currently \$9,000 to \$10,000 in most states, but some states have thresholds as low as \$3,500. The second test compares the premium averaged over more than two years to an amount which is half of the first threshold.

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4. Payrolls and Losses

The actual audited payroll and loss experience of the risk is collected for the policies in the experience period. It is based on the data submitted through the Workers Compensation Statistical Plan. The losses are defined in the Statistical Plan. Generally, losses are valued as of 18 months after policy inception for the most recent of the three policy years, 30 months after inception for the middle policy year, and 42 months after inception for the earliest policy year.

5. Loss Limitations

The losses that are used in the experience rating plan are limited to certain amounts. Losses are divided into categories for this purpose. The categories are: state workers compensation act losses; United States Longshore and Harbor Workers (USL&HW) compensation act losses; employers liability claims; and disease losses.

State act claims and USL&HW act claims have both per claim (i.e., per injured worker) limits and per occurrence limits. The Prior Experience Rating Plan calculated the per claim limitation as 10% of the Self Rating Point. As mentioned earlier, the Self Rating Point is approximately equal to 25 times the average serious cost per claim. The Revised Experience Rating Plan calculates the per claim limitation as 10% of the State Reference Point. The State Reference Point is approximately equal to 250 times the average cost of all claims (serious and non-serious). In general, the Revised Experience Rating Plan results in much lower per claim loss limits.

The per occurrence limit is twice the per claim limit. The maximum primary loss amount per claim is \$5,000 for RERP and \$10,000 for PERP. Per occurrence primary losses are limited to twice the maximum primary amount per claim.

Employers liability losses have only a single per claim limit.

For each year in the experience period, the total of disease losses is limited to three times the state act per claim limitation plus 120% of the risk's expected losses for that year. Primary disease losses are limited to three times the maximum primary amount plus 40% of the risk's expected losses for that year.

In most cases, these loss limitations have been substantially lowered in the transition from the PERP to the RERP.

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6. Intrastate and Interstate Operation of the Plan

The experience rating plan contains special rules for risks with operations in more than one state of the group of states where interstate rating applies. If a risk is eligible for experience rating in at least one such state, but has experience in more than one such state, the interstate rating rules apply in those states. In general, interstate rules provide for the calculation of credibilities based on the volume of expected losses in all those states combined. Intrastate rating is used in the states where interstate rating has not been approved by the regulatory authorities. Interstate rating has been adopted as a rating plan by 39 states and the District of Columbia. Of the remaining 11 states, 5 states have intrastate rating plans only and 6 states have exclusive state funds. Intrastate credibilities are based only on the volume of expected losses within the state being rated.

G. Comparison of NCCI, ISO and Alternate Formulas

The formula described above has been used by NCCI for many years. However, alternative formulas present some advantages and disadvantages relative to the one used.

Although the formula described above is used for workers compensation, a different formula is used by Insurance Services Office (ISO) for commercial automobile and general liability lines of insurance. For these lines, only basic limits (i.e., primary) losses enter into the rating calculation and an experience modification factor is computed based upon a comparison of basic limits losses against expected basic limits losses.

Under the ISO approach, the experience modification factor, which is computed from the basic limits loss data, is applied not only to the basic limits manual premium, but also to the excess limits manual premium. The assumption is made that the ratio of excess limits premium to basic limits premium equals the excess limits factor, which should remain constant for all risks within a class. Therefore, the excess premiums charged to cover excess losses vary, depending on the experience modification factor determined from the basic limits, or primary, loss data.

The NCCI approach is significantly different from the ISO approach with respect to the calculation of premium to cover excess losses. Under the NCCI approach, the estimated excess losses are not affected by the actual primary losses. This difference can be illustrated with a hypothetical example:

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Suppose a risk has:

Expected primary losses	= \$30,000
Actual primary losses	= \$15,000
Primary credibility	= 50%
Expected excess losses	= \$60,000
Actual excess losses	= \$25,000
Excess credibility	= 5%

Using the NCCI formula, the modification for the risk would equal $(.50 \times 15 + .50 \times 30 + .05 \times 25 + .95 \times 60)/90 = .90$

For this example, the risk's premium is decreased by 10%, although primary and excess losses are only half as high as the expected losses and the credibility of the primary losses is 50%. The credit is only 10% because the credibility of the excess losses is only 5% and a large portion of the total expected losses are excess, i.e., the D-ratio equals 1/3, or .33.

In our example, the expected excess losses = \$60,000, while the expected primary losses = \$30,000, a multiple of 2:1. Yet, when we compute credibility weighted excess losses equal to $.05 \times 25,000 + .95 \times 60,000 = 58,250$ and credibility weighted primary losses equal to $.50 \times 15,000 + .50 \times 30,000 = 22,500$, the ratio $58,250/22,500 = 2.59$ exceeds 2:1. It therefore seems likely that, for this risk, the NCCI formula over estimates the expected value of excess losses. This would be true if (as our tests indicate) a lower than expected amount of primary losses indicated proportionately lower excess losses, in the absence of credible excess loss data.

Under the ISO approach, the modification based on primary losses is, in effect, applied to the expected excess losses. Continuing our example, the experience modification factor would then be defined as:

$$\begin{aligned} M &= M_p = [Z_p \times A_p + (1-Z_p) \times E_p] / E_p \\ &= (.50 \times 15 + .50 \times 30)/30 = .75 \end{aligned}$$

The alternate approach recommended in this report is a hybrid of NCCI and ISO approaches, in which the expected excess losses are adjusted by an experience

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modification factor based on primary losses. The formula for the overall modification then becomes:

$$M = [Z_p \times A_p + (1-Z_p) \times E_p + Z_e \times A_e + (1-Z_e) \times E_e \times M_p] / E$$

In our example, M equals $(.50 \times 15 + .50 \times 30 + .05 \times 25 + .95 \times 60 \times .75)/90 = .74$

The alternative formula can be expected to be more accurate if it can be shown that primary and excess losses for individual risks are significantly correlated (i.e., risks whose primary losses tend on average to be higher than the expected primary losses - based on ELR's - have proportionately higher excess losses on average). In our study, described in Section V.D of this report, we find that such a correlation exists.

In the preceding example, we have used the same credibilities for all three experience rating formulas (i.e., the RERP, ISO and Alternate formulas) for illustration purposes. However, the optimal credibilities actually are substantially higher for the RERP formula than for the Alternate formula, as shown in Exhibit 12. (We have not studied the optimal credibilities for the ISO formula, but would expect them to be closer to those for the Alternate formula than the RERP formula).

The reason the RERP primary credibilities are higher is to compensate for the fact that the excess loss estimate in that formula does not take into account the informational value of past primary losses in estimating whether the risk's future excess losses (on average) will be higher or lower than expected. The reason the RERP excess credibilities are also higher than the Alternate excess credibilities is that the unadjusted expected excess losses (used in the RERP formula) are not as accurate as estimators of future excess losses as are the adjusted expected excess losses (used in the Alternate formula). That is, the estimate against which the actual excess losses are credibility weighted is a poorer estimate in the case of the RERP and, as a result, the RERP gives greater weight to the actual excess losses.

The difference in credibilities results in experience modification factors that are generally much closer to one another than indicated by the preceding example. In effect, the RERP provides a closer approximation to the appropriate experience modifications by using higher credibility factors.

In the above example, if the Alternate formula credibilities (.50 for primary losses and .05 for excess losses) are left unchanged but the corresponding, higher RERP credibilities (approximately .95 for primary losses and .10 for excess losses) are used in the RERP

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formula, the modification produced by the RERP formula becomes: $(.95 \times 15,000 + .05 \times 30,000 + .10 \times 25,000 + .90 \times 60,000)/90,000 = .80$.

This is closer to the Alternate formula estimate of .74 than was the RERP estimate calculated previously (.90).

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IV. ANALYSIS OF OPERATION AND OFF-BALANCE OF PERP AND RERP

This Section is divided into several sub-sections, each containing a description and evaluation of technical aspects of the plan. We describe and evaluate the calculation of Expected Loss Rates (ELR's), D-ratios, and the plan off-balance.

A. Description of Expected Loss Rate (ELR) Calculation

The expected losses used in both the PERP and the RERP are based on the manual rates and the risk's payrolls by class. However, because the actual losses used in the plan are undeveloped and untrended, and include no provision for expense, several adjustments are made to the manual rates to put them on the same basis. These adjustments are made through the use of Expected Loss Rate Factors (ELRF's) which are multiplied by the manual rate to produce the ELR for each class. ELRF's are calculated separately for each of the four hazard groups. (NCCI groups classes into four "hazard groups" on the basis of the expected average claim size within each class.) These four ELRF's are then multiplied by the manual rates by class to produce Expected Loss Rates (ELR's). The expected losses used in the experience rating plan are the products of the ELR's and the risk's payroll by class.

A sample calculation of ELRF's is shown on Exhibits 1 and 2. The sample calculation is not an NCCI form, but is our consolidation of several of their forms. This is done for ease of exposition and, except for potential rounding differences, will produce the same results.

The ELRF's can be thought of as including the following six factors:

- Expense and profit removal factor
- Trend removal factor
- Benefit change or law amendment removal factor
- Loss development removal factor
- Off-balance adjustment factor
- Loss limitation factor

The following is a detailed description of each of these factors. Row numbers refer to the rows on Exhibit 1.

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1. Expense and profit removal factor - The rates (in administered pricing states) include allowances for insurance company expenses and underwriting profit (positive or negative). Row 1 shows the Target Cost Ratio, usually shown in Exhibit II of the rate filing. This ratio represents the portion of the proposed manual rate which is expected to be used to pay losses and loss adjustment expenses. In Row 3 the Target Cost Ratio is divided by the loss adjustment expense factor (Row 2) to obtain the expense and profit removal factor. In the sample calculation shown in Exhibit 1, this factor implies that (1-.646) or 35.4% of the manual rate represents allowance for profit and expenses. In loss cost states, the expense and profit removal factor generally removes only loss-based assessments and loss adjustment expenses (if applicable).
2. Trend removal factor - The average accident date underlying a set of manual rates is usually about three years more recent than the average accident date of claims entering the experience rating formula. Thus, in order to be comparable to the actual losses in the experience period, the manual rates need to have three years of loss ratio trend removed. This "de-trending" is accomplished in two steps. The Financial Data Loss Ratio shown in Row 4 is the loss ratio used to calculate the overall change in manual rates. It reflects adjustments to current rate level, ultimate loss level, current benefit level, and trend to the midpoint of the period in which the rates will be used. Row 7 shows the Statistical Plan Loss Ratio trended to the average date of loss of the experience period. The Statistical Plan Loss Ratio is generally one to two years earlier than the experience rating period. Since the Statistical Plan Loss Ratio is also adjusted to current manual rate level, ultimate loss level, and current benefit level, the ratio of Rows 7 and 4 represents the trend from the experience period to the period in which the rates will be used. In the example shown in Exhibit I for instance, the losses implicit in manual rates need to be reduced by (1-.841) or 15.9% to bring them back to the cost levels existing when the actual losses in the experience period occurred.
3. Law amendment removal factor - The latest rates include the impact of law amendments subsequent to the experience period. Law amendment factors are calculated to reflect the average impact of law changes between the experience period and the period in which the rates will be used. Separate law amendment factors are calculated by type of injury, and a weighted average law amendment factor is calculated for each of the three years of the experience period (Row 9). Statistical plan total losses for each policy year for all classes combined are used as weights. The law amendment removal factors are the inverses of the law amendment factors.

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4. Loss development removal factors - The losses implicit in the manual rates are projected to an ultimate level. The losses entering the experience rating period, however, are valued as of 18 months after the policy effective date for the most recent year, 30 months for the middle year, and 42 months for the earliest year. These are the statistical plan first, second, and third reports, respectively. Therefore in order to be made comparable, the losses included in the manual rates need to be adjusted to remove projected development of case incurred losses subsequent to these evaluations. For each year in the experience period, Row 10 shows the expected ratio of reported case incurred losses to ultimate losses. For example, for the 1986-87 period (the earliest year in Exhibit 1), third report losses represent approximately 90.7% of ultimate losses. Thus the ultimate losses included in the manual rates would have to be reduced by $(1-.907)$ or 9.3% to be comparable to 1986-87 actual losses.

Law amendment removal factors and loss development removal factors are calculated separately for each of the three policy periods included in the experience period. These two sets of factors are combined in Row 11. A simple unweighted average is then taken of the resulting three factors to produce a single law amendment and development removal factor.

5. Off-balance adjustment factor - The factor shown in Row 12 is a one percent adjustment factor which Gillam¹ explains is designed to reflect the fact that, on average, insureds large enough to be eligible for experience rating have loss ratios (at manual rates) approximately one percent lower than average.

6. Loss limitation factor - A final adjustment is made to exclude the impact of large losses that exceed the per claim and other loss limitations (described in Section III.F.5) applied to data that enters the experience rating modification formula. The method used is an adaptation of the method described by Harwayne² and used for many years in retrospective rating. An example of the application of this method is presented in Exhibit 2.

¹ William R. Gillam, "Calculation of Experience Rating Values and Plan Parameters," *Casualty Actuarial Society Forum*, Spring 1990, p48.

² Harwayne, Frank, "Accident Limitations for Retrospective Rating," *Proceedings of the Casualty Actuarial Society*, Volume LXIII, 1976, p1.

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Line 1 of Exhibit 2 shows a \$49,000 amount, labelled as 10% of the State Reference Point. This is the loss limitation amount in this example.

Lines 2, 5 and 8 are the average reported claim costs (before any limitations) for fatal, permanent total, and major permanent partial claims, respectively, during the three year Worker's Compensation Statistical Plan period in the rate filing.

Lines 3, 6 and 9 are ratios of the \$49,000 loss limitation amount to the average claim cost for each type of loss.

The ratios from lines 3, 6 and 9 are then entered into an excess loss distribution table to obtain ratios of excess losses (above the \$49,000 amount) to total losses for each type of loss. These ratios are shown on lines 4, 7 and 10.

The excess to total ratios on lines 4, 7 and 10 are then averaged together to produce an overall average excess ratio on line 12. The proportions of losses by injury type are used as weights. Note that it is assumed, as an approximation, that minor permanent partial, temporary total and medical only injury types do not generate losses above the limitations. These calculations are done separately for each of the four hazard groups.

The loss limitation factors in line 13 are the complements of the weighted average excess ratios in line 12. They are used as factors to adjust the unlimited rates to the level anticipated for losses with the per claim and other limitations used in experience rating. Since the level of excess losses varies considerably among hazard groups, a separate factor is used for each hazard group.

The ELRF's are calculated as the products of the factors described above. There is a separate factor for each hazard group. The product of the ELRF and the manual rate equals the ELR used for experience rating.

B. Evaluation of the ELR Calculation

We have evaluated a sample of the calculations by NCCI of the expected loss rates for four states. We found that the worksheets were correctly filled out and calculated with the appropriate data. In addition, there is evidence in the files of who was responsible for completing the forms, as well as checksheets that identify unusual results to be brought to

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the attention of the supervisor. However, we believe that the calculations could be improved in several important respects.

1. Trend removal factor - In calculating manual rates, NCCI has implemented a procedure that adjusts the industry group differentials for relative differences in wage growth by industry group. The purpose for this adjustment is to correct the medical trend factor to properly reflect varying wage growth by industry group. The net effect of this ratemaking procedure is to apply slightly different trend factors to each of the manufacturing, contracting, and all other industry groups. The impact of these differential trend factors should be, but are not currently, reflected in the removal of trend for the calculation of ELR's.

We recommend that NCCI reflect the varying impact of trend on each of the three industry groups in the calculation of ELR factors. This will require the calculation and application of separate ELR factors by industry group. We understand that the current NCCI ratemaking computer programs are equipped to accommodate different ELR factors by industry group.

2. Loss development removal factors - The most important changes we recommend in the calculation of ELR's involve the loss development removal factors discussed in Section IV.A.4 above. We believe that the accuracy of these factors can be substantially improved in two ways. The first is to better reflect the distribution of serious and non-serious losses by class. The second is to reflect the actual distribution of expected losses among the three policy periods that make up the experience period. The following Sections discuss each of these changes in more detail.

2a. Loss development reflecting the class distribution of serious, non-serious and medical losses.

During the rate review process, NCCI divides losses into four categories: serious indemnity, serious medical, non-serious indemnity, and non-serious medical. When calculating manual rates by class, loss development is applied separately for each of these categories. In general, the serious loss development factors are far larger than the non-serious loss development factors. In the experience rating calculation, however, the amount removed through the application of the ELR factor is based on the average amount of loss development, using the statewide average distribution of losses by category. Thus, while on average the correct amount is removed, the amount removed for any particular class is likely to be inaccurate.

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If a class has predominantly serious losses, the manual rate will include a greater than average provision for loss development. Since only the average loss development is removed through the ELR factor, the expected losses will be too high when compared to the undeveloped actual losses for that class. Thus, NCCI ELR's used in the experience rating plan are overstated for the more hazardous classes (those with greater proportions of serious losses) and are understated for the less hazardous classes. The effect of this is to understate the indicated experience modification factor for hazardous classes and overstate the factor for less hazardous classes.

The results of our tests support this conclusion. The table below shows normalized ratios of actual to expected losses, averaged over all six years of data examined in this study. Expected losses were uniformly adjusted so that the aggregate actual-to-expected loss ratio equaled 1.0 in each of the years (normalized). The averages use the amounts of expected losses in each cell as weights. The downward trend across hazard groups is consistent with our prediction that expected losses are, in general, underestimated for the less hazardous classes and overestimated for the more hazardous classes. We were not able to ascertain the reason for the high ratio for Florida in hazard group IV other than the comparatively smaller volume of data and the higher volatility of the losses for this hazard group. Nevertheless, the pattern is in general consistent and illustrates the need for some modification to NCCI's current procedure for calculating ELR's.

Table I - Normalized Ratios of Actual to Expected Losses by Hazard Group

HAZARD GROUPS	STATE			
	Florida	Maine	Nebraska	Utah
I	1.111	1.366	1.346	1.592
II	1.029	1.219	1.104	1.051
III	.969	.858	.925	.976
IV	1.304	.890	.715	.877
ALL	1.000	1.000	1.000	1.000

There are two changes that should be reasonably practical to implement that will help to correct for this problem. The first change is to calculate loss development removal factors separately by hazard group. These factors would then reflect the different distribution of

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serious and non-serious losses in each hazard group. It should be possible to implement this change immediately without substantial procedural or programming changes. Distributions of serious and non-serious losses by hazard group are already used in the calculation of the loss limitation factor (discussed in Section IV.A.6 above). These distributions could also be used to calculate average loss development factors that vary by hazard group. Since the final ELR factors already vary by hazard group, no additional modifications need to be made.

The second change would be more exact but would also be more difficult to implement. It would consist of calculating loss development removal factors separately by class, directly using the mix of serious, non-serious, and medical losses within the class. We recommend that NCCI use the pure premiums underlying the proposed rates (see part IIA - NCCI Ratemaking Procedures, page 71) as weights to apply to serious, non-serious and medical development factors. NCCI currently uses these pure premiums underlying proposed rates to calculate the classification's D-ratio. We are suggesting they employ a similar method to calculate ELR's. This would reduce random fluctuations in proportions of losses by type of injury for small volume classes.

We recommend that the first change (by hazard group) be adopted immediately and replaced by the second change (by serious, non-serious, medical) when this more complicated method can be implemented.

2b. Loss development by policy period reflecting the actual distribution of ultimate losses

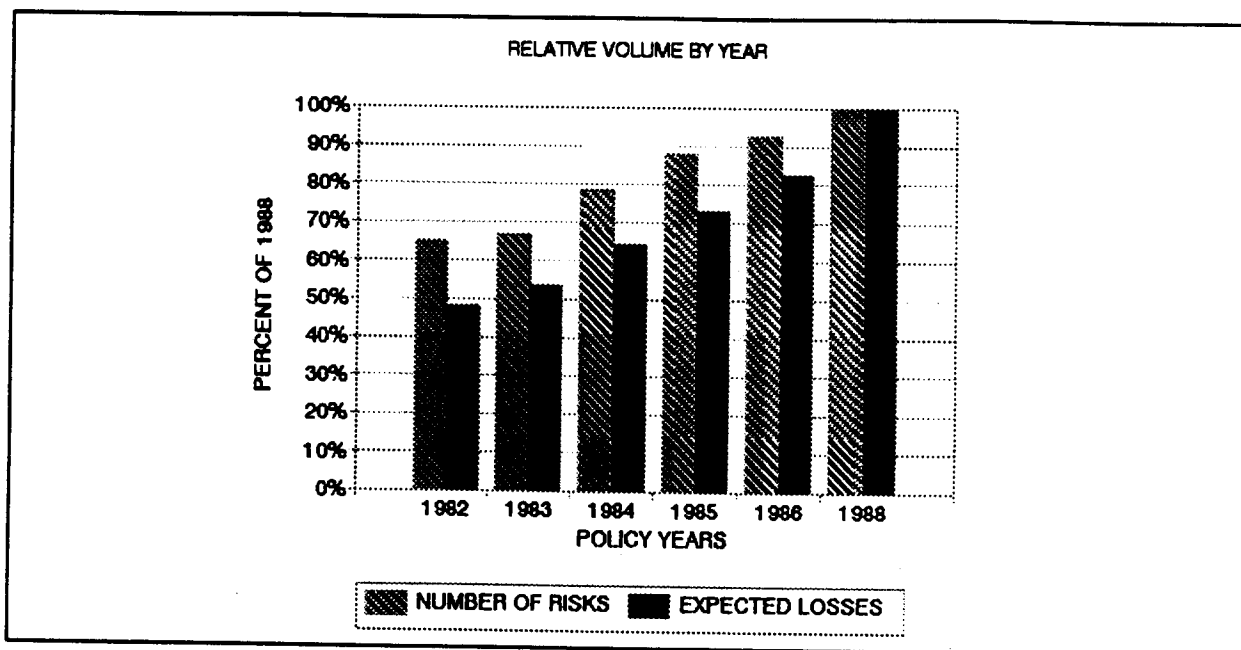
The second problem with the current procedure involves the use of an unweighted average to combine the loss development removal factors for the three policy years included in the experience period. This method assumes that all three of the policy years have equal volumes of expected ultimate losses. This is unlikely to be true in practice. Because of trend and upward adjustments in benefit levels, we would expect the more recent policy years to have higher volumes. In addition, experience rated risks are more likely to have exposure in the more recent periods. New businesses are constantly starting; thus, not all experience rated risks have been in business long enough to have exposures in each of the experience rating policy periods. Thus, the distribution of exposures will be skewed toward the more recent periods.

The chart below shows the comparative level of ultimate expected losses and number of risks for all experience rating risks developing rated-size exposures in 1988 based on the

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sum of the data in the four states sampled. As expected, this distribution is skewed toward the more recent policy periods.

Chart 1 - Number of Risks and Expected Losses as a percent of the Latest Year



The skewed exposure distribution of rated risks indicates that there is comparatively more first report than third report data used in experience rating. The current calculation of ELR factors assumes an equal distribution of exposures. Thus, the actual data used in experience ratings is more recent (i.e., less mature) than contemplated by the current calculation of ELR's. The fact that actual losses are less mature than expected losses has two offsetting effects. The impact of trend and benefit level changes causes the average level of actual losses to be higher than contemplated by the current ELR's. The impact of loss development causes the average level of actual losses to be lower than contemplated by the current ELR's.

The impact of loss development is likely to be greater than the impact of benefit level changes and trend, in most states. This results in ELR's that are too high in these states. This implies a tendency to underestimate experience modification factors (absent other distortions).

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This could be corrected in several ways. The first is to calculate separate ELR's for each year of the experience period. While this would be the most accurate approach, it would also be the most difficult. Substantial changes would need to be made to the experience modification programs and the ratemaking programs. In addition, ELR factors, which already vary by hazard group, will need to vary by experience period as well. This would substantially add to the complexity of an already complex rating program.

We recommend a less accurate, but more practical method. This method would be to calculate approximate policy period weights based on data similar to that in the table discussed above. As in the current methodology, average development, trend, and amendment factors would be calculated. However, these averages would be weighted rather than unweighted. The weights would be based on the ultimate expected losses, by policy period, with adjustments to reflect any factors that have already been removed. For example, if trend is viewed as being removed first, and then loss development, then the ultimate expected losses would be reduced to remove trend (by policy period) to calculate the weights to be applied to loss development removal factors. Note that this method would correct the overall bias but might still leave significant inaccuracies for individual risks.

3. Off-balance adjustment factor - We believe that the expected losses used in experience rating should be based on the average loss level underlying manual rates. If the actual level of an individual risk's losses was equal to this average, its experience modification factor would be 1.0 and it would be properly charged the manual rate. If the actual level of an individual risk's losses was higher, then to the extent its actual losses were credible, it would receive a debit to the manual rate. Likewise if the actual level of an individual risk's losses was lower, then to the extent credible, a credit would be applied to the manual rate.

The 1.01 off-balance adjustment factor applied by NCCI in the calculation of ELR's reduces the expected losses from the level implicit in the manual rates and, thereby, increases the modification factor slightly. Depending on the actual cost differential between experience and non-experience rated risks, this has the potential to create a slight subsidy of non-experience rated risks by experience rated risks. We believe that the 1.01 adjustment factor should be eliminated from the ELR calculations.

An example may help to clarify this:

Assume (temporarily) that both experience rated risks and non-experience rated risks have the same loss ratio at manual rates. Then, if the 1.01 factor were not incorporated in the

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ELR's, the ELR's would also reflect the average experience of all risks. The resulting experience modifications would average 1.0 and the manual rate would properly be the average rate charged.

Alternately, suppose that experience rated risks always had loss ratios (at manual rates) that averaged one percent lower than those of non-experience rated risks. An average experience modification credit of one percent would properly reflect the cost differential. However, if an individual risk's actual losses averaged one percent lower than expected losses, the experience modification factor would be a credit of less than one percent. This is because the credibility dilutes the true cost differential. We have generally found that a one percent change in expected losses produces roughly a one-third percent change in experience modification factor. Thus, a true cost differential of one percent would result in an average experience modification factor of about .997.

If, under this circumstance, the NCCI's 1.01 correction for off-balance factor is applied, the average experience modification factor of .997 will move to 1.000. Thus, if experience rated risks have one percent better loss ratios than non-rated risks, the 1.01 factor eliminates the credit that otherwise would result from the partial consideration of this difference by the credibility factors.

If the 1.01 factor is maintained even if there is no true cost differential, ELR's will be one percent too low, manual rates will be too low, and experience modifications will be too high.

If it can be reasonably demonstrated that there is a true underlying cost differential between experience rated risks and non-experience rated risks, then it would be appropriate to reflect this difference in the manual rating system instead of the experience rating plan. Attempts to build such an offset into the experience rating plan, will create inequities due to the partial credibility ascribed to individual risk experience.

We believe that the ELR's should reflect the loss costs underlying manual rates. In this manner, the experience modification factors of experience rated risks will reflect differences, to the extent they are credible, between a risk's actual losses and those reflected in the manual rates. We therefore recommend that NCCI eliminate the use of the 1.01 correction for off-balance factor.

4. Loss limitation factor - The Harwayne normalized loss distribution tables used to calculate excess ratios are based on data that is now approximately twenty years old. The

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lower per claim loss limitations effective with the Revised Experience Rating Plan place more importance on accurately calculating these values. Table II below shows the decreases in loss limitations that would occur in the change from PERP to RERP, for the four main sample states used in this study.

Table II - Loss Limitations Under PERP and RERP

State	State Act Loss Limitations (per claim)	
	Prior Experience Rating Plan	Revised Experience Rating Plan
Florida	165,500	70,500
Maine	187,000	111,000
Nebraska	143,500	49,000
Utah	109,000	38,500

While the Harwayne tables reflect changes in the scale of the claim size distribution through the use of ratios to the average, the shape of the claim size distribution has probably changed in the last twenty years. We recommend that NCCI update the study used to develop these tables. Studies of this nature should be performed regularly by NCCI (e.g., every 3 years) since it is quite possible that the shapes of the workers compensation claim size distributions are changing, and the limited expected losses should reflect these changes.

Exhibit 3 shows the results of our comparison, based on data provided to us by NCCI, of the predicted against the actual loss limitation factors for Florida, Maine, Nebraska, and Utah. The predicted loss limitation factors are calculated in the manner shown in Exhibit 2. The results appear reasonably consistent with the indications, given the randomness inherent in excess losses. However, because of the age of the study used to construct the Harwayne tables, and the increased importance of the loss limitation factors under the Revised Experience Rating Plan, we believe NCCI should review and potentially revise the loss distribution tables used to calculate the loss limitation factors. NCCI programs used to extract the data we requested for this study could be easily adapted to extract the size of

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loss distributions needed to create revised excess loss tables. We recommend that NCCI undertake such a study.

The NCCI method for calculating loss limitation factors does not reflect the additional limitations that are applied per-occurrence or the special limitation of disease losses. Given the latency associated with disease losses, it is possible that they emerge beyond the first, second, and third report used in the experience period. If so, the loss development that is removed will appropriately account for this limitation. However, we believe that NCCI should evaluate the impact of both multiple claim occurrences and disease losses. NCCI should modify their calculation of loss limitation factors if the additional limitations on these losses are significant.

C. Description of D-Ratio Calculation

The D-ratios are the ratios of expected primary to total expected losses (after capping by the per claim limit) for a risk. Partial D-ratios are calculated separately for serious, non-serious, and medical losses. The overall D-ratio for a class is the weighted average of the partial D-ratios using serious, non-serious and medical pure premiums as weights. A sample calculation of partial D-ratios is included in Exhibit 4. The following is a description of that calculation.

Rows 1 and 2 show the latest available total indemnity and medical losses from the statistical plan as of first report, before the impact of loss limitations. Columns A, B, and C divide these losses into three categories based on whether the loss is serious, non-serious, or medical only.

Row 4 shows the corresponding primary losses again subdivided by category.

Rows 5 and 6 show a subdivision of the primary losses in Row 4 between medical and indemnity based on the corresponding breakdown for all losses (Rows 1 and 2).

The partial D-ratios for serious and non-serious losses reflect only indemnity while the ratio for medical includes all medical payments. An adjustment is made to account for this in Rows 7 and 8. The first report D-ratios are then calculated in Row 9 as the ratio of Rows 7 and 8.

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The primary losses in Row 7 are based on the loss distribution among serious, non-serious, and medical losses that exists at first report. However, because development beyond first report is significantly different for each loss category, that distribution will change at second and third reports. In order to adjust for this, Row 11 shows the distribution by loss category of the sum of the latest three years of losses adjusted to current benefit levels, ultimate loss levels, etc. The final partial D-ratio factors are then the products of the first report partial D-ratio factors in Row 9 and the ratios of the three year loss category distribution in Row 11 and the first report loss category distribution in Row 10.

D. Evaluation of D-Ratio Calculation

We believe that there are two improvements that should be made in the current method of calculating D-ratios. D-ratios are currently based on first report statistical plan data. However, they are applied to expected losses that are combinations of first, second, and third report data. It is likely that loss development affects total losses more than primary losses. As a result (before considering the other distortion discussed below), the average D-ratios tend to be overstated and the experience modification factors tend to be understated.

Another distortion works in the opposite direction. The losses used in the denominator of the D-ratio calculation are losses unlimited by the loss limitations. However, D-ratios are applied to expected losses that have been reduced to reflect loss limitations. The use of unlimited losses in this manner tends (before considering the other distortion mentioned above) to understate the D-ratios and overstate the experience modification factors.

The net effect of these two distortions depends upon the relative level of loss development and the amount of excess losses. The Revised Experience Rating Plan lowers the loss limitations substantially. Therefore, the impact of the losses in excess of loss limitations assumes greater importance than under the Prior Experience Rating Plan.

We recommend basing D-ratios on three years of data (first, second, and third report), and reflecting the impact of the loss limitations in the denominator used to calculate these ratios. If this is not possible, tests should be performed to ascertain the relative impact of the primary and total losses, and adjustments should be made accordingly. The proportion of losses in excess of the loss limitation is directly estimated in the calculation of ELR's and should be removed from the denominator of the D-ratios.

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E. Description of Plan Off-Balance

The off-balance of the Experience Rating Plan refers to the difference between manual and standard premium, and reflects the average experience modification factor. The average experience modification factor can differ from 1.0 for a variety of reasons. First, there is randomness in any collection of actual risk experience, and this randomness will affect the average experience modification factors. Second, risks that are eligible for experience rating can be better or worse, as a group, than average. Third, among the group of rated risks, the loss ratios may vary by size of the insured. Since the larger risks also receive larger credibility, this will affect the plan off-balance. Finally, an off-balance may result if the ELR's or D-ratios are overestimated or underestimated. The accuracy of ELR's and D-ratios is evaluated in sections IV.B and IV.D of this report.

We would expect that the average level of ELR's could be estimated fairly well for the experience periods to which they are applied. For example, unanticipated trends should not be a problem as comparable overall statistical plan data is available for 1-2 years prior to the experience rating experience period and financial loss data is available for one or more years after the experience period used for experience rating. A similar situation exists regarding loss development and law amendment adjustment. Thus, development, trend and law amendment adjustments are essentially an interpolation problem, rather than an extrapolation problem.

Significant off-balances can develop if ELR's are allowed to become out of date. NCCI generally revises ELR's at the same time that it revises rates. If rates are not filed or approved regularly, then the ELR's will not be updated through the normal rate review cycle. During a period of positive trends, if ELR's are not updated, the expected losses used in experience rating will be too low by the amount of trend between the current experience rating period and the experience period originally targeted by the ELR's. This will cause experience modification factors to rise, on average.

However, because credibility only gives partial weight to actual experience, the increase in experience modification factors will be less than the increase in costs due to the trend factor. With significant positive trends, outdated rates will result in premium inadequacies. These inadequacies will be lower for the larger risks with significant credibilities, and higher for the non-rated and smaller rated risks with lower credibilities.

If rates are regularly updated, however, average experience modification factors should normally remain relatively close to 1.0. This may be true even if rates are actually

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inadequate or excessive. Rates may, for example, be inadequate if the actual loss development applicable to the latest financial data is higher than predicted by the selected factors, if the trend factor is too low to compensate for the actual level of cost increases, or if the expense and profit provisions are less than the actual needs. Since all the expense, profit, development, trend, and other projections built into the manual rate are removed to calculate ELR's, inaccuracies in these values will not have a material effect on the resulting experience modification factors. However, if rates are inadequate or excessive to a large degree, the average experience modification factor may differ from 1.00.

Thus, experience modification factors will not generally correct for inadequate or excessive rates.

F. Evaluation of Plan Off-Balance

Adjusting expected losses and expected primary losses to equal the corresponding actual losses in total for all experience rated risks in a state, should result in an average experience modification factor of about 1.0 if risks have similar experience (loss ratios at manual rates) regardless of the size of the risk. We have recalculated the experience rating modification factors for policy year 1988 for all experience rated risks in four test states, using expected losses adjusted as described above. The results are shown in the table below:

Table III - Average Experience Modification Factors

STATE	PRIOR EXPERIENCE RATING PLAN	REVISED EXPERIENCE RATING PLAN
Florida	.993	.995
Maine	1.037	1.023
Nebraska	1.011	1.016
Utah	1.011	1.020
AVERAGE	1.005	1.006

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These experience modification factors are based on the experience in policy years 1984, 1985, and 1986. Each risk's experience modification factor is weighted by 1988 expected losses to produce the average experience modification factors.

Expected losses have been adjusted so that, in the aggregate, actual losses are equal to expected losses. Expected primary losses contain a similar adjustment. These adjustments are equivalent to the assumption that ELR's and D-ratios are accurate in predicting the true expected loss levels of experience rated risks as a group during the experience period.

These data indicate that if ELR's and D-ratios were on average correct for experience rated risks, the off-balance of the plan would be small. If the ELR's and D-ratios were appropriate for all risks, but not for experience rated risks by themselves, the average experience modification factors could differ from 1.0 by larger amounts. This difference would be due to the potential differences between the loss ratios of risks of different sizes, randomness, and the tempering impact of credibility.

We believe that the calculation of ELR's and D-ratios will produce expected losses and expected primary losses that are reasonably accurate, provided the current calculation is modified as recommended in this report.

To summarize, these suggested modifications are as follows:

1. Adjust the trend removal factor to correctly reflect the differential impact of medical trend applied to each of the industry groups.
2. Do not use the assumption that expected ultimate losses are uniformly distributed by policy year to calculate law amendment and loss development removal factors. Rather, calculate or approximate the actual distribution of expected ultimate losses.
3. Use the individual class distributions of serious, non-serious and medical losses to calculate loss development and law amendment removal factors to calculate the ELR factor for each class.
4. Eliminate the off-balance adjustment factor of 1.01.
5. Adjust the D-ratio calculation to use three years of statistical plan data at first, second and third report in place of the single year at first report used currently.

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6. Adjust the D-ratio calculation to reflect limited expected losses in the denominator.

It is likely that these changes will cause a change in the off-balance of the experience rating plan. The average change in the off-balance due to a change in the calculation of ELR's and D-ratios should be evaluated. Manual rates (and ELR's) should be adjusted by a factor to reflect the new off-balance in such a manner that standard premium is unaffected by the change.

Exhibit 5 shows the average experience modification factors for experience rated risks in each of the NCCI states from 1983 through 1990. An average is shown reflecting the premium weighted average of these factors. The average for the more recent years is slightly lower than 1.0. In 1983, the intrastate average was significantly less than 1.0. We conclude, that on average, the experience rating plan is roughly balanced.

The magnitudes of the average experience modification factors in some states, and the changes in these factors, (e.g., Louisiana, Maine, Oklahoma, Tennessee) indicate the need to closely monitor the changes in average experience modification factors over time.

Off-balances can exist due to randomness in the experience of the collection of risks evaluated, differences in manual loss ratios by size of risk, inaccuracies in the calculation of ELR's and D-ratios, and ELR's and D-ratios that have become out of date. We believe that the known inaccuracies in the calculation of ELR's and D-ratios should be corrected, and that NCCI should make every effort to keep ELR's, D-ratios, and manual rates up to date.

If risk experience as measured by loss ratios at manual rates differs systematically among risks of various sizes, this should be evaluated and reflected directly in the manual rating structure. Because the actual experience of each individual risk receives only partial credibility, the experience rating plan cannot correct for any known biases in manual rates.

Note that some differences in manual loss ratios that cannot practically be identified or corrected by the manual rating structure may exist among groups of risks. In this circumstance, the experience modification factor will reflect some of this difference. If systematic differences among risks exist, but cannot be identified and corrected in the manual rating structure, then we believe that such differences should be allowed to be manifested in each individual risk's experience modification factor.

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The average experience modification factor should be examined over time and by state by NCCI. If significant non-random off-balances are observed, NCCI should attempt to determine the cause. Significant non-random off-balances are an indication that an additional rating variable exists that is not currently reflected in the existing pricing structure (assuming that ELR's and D-ratios are accurate). NCCI should attempt to identify these additional rating variables (if any) and directly incorporate them into the manual rating structure, if practical.

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V. ANALYSIS OF PRIMARY AND EXCESS CREDIBILITY FORMULAS

Primary and excess credibility are functions of the employers' expected losses and the state (or states for interstate ratings). These credibilities have a significant impact on the results of the ERP and are the most important aspects of the plan that were changed with the RERP. In our analysis described below, we address the actuarial aspects of the experience modification formulas and credibility formulas developed by NCCI.

The first question addressed is whether NCCI formulas are theoretically sound. As discussed in Section C.2., the answer to this question depends on whether actual historic primary losses are predictive of future excess losses. We developed and applied a number of tests of the predictive value of the primary losses. The results of these tests are discussed in Section D.1. In addition we recommended and tested an adjustment to NCCI formulas to account for the relationship between primary and excess losses.

The second question addressed is the selection of parameters once a set of formulas has been chosen. In Section C.3. we discuss a procedure for selecting parameters which provide the best fit to a given set of data. In that same section we also discuss a retrospective test to determine how well a set of parameters has performed. In Section D.2. we apply those tests to determine how well the RERP parameters perform on the data from a sample of states.

A. Description of Data Used in Our Study

Our analysis is based on individual risk data supplied to us by NCCI for the following six states:

- Florida
- Colorado
- Illinois
- Maine
- Nebraska
- Utah

These states were selected by M&R in order to provide a representative sample of state characteristics, including size.

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For all six states the following information was provided by risk, by policy year, and by class:

- Risk ID
- Effective Date
- Class Code
- Hazard Group
- Payroll
- Expected Losses
- Expected Primary Losses
- Actual Losses split into 6 layers by size of claim
- PERP Primary Losses

This information was provided for the most recent six available policy years by combining information from several NCCI files. For all policy years the calculation of expected losses was based on the Expected Loss Rates (ELR's) and D-Ratios calculated by NCCI and contained in the most recently approved rate filing.

B. Data Adjustments and Segmentation

The data described in Section A was used by Milliman & Robertson to produce a data base which showed the following information for each risk, for each policy year:

1. Actual total rateable losses (rateable losses are those losses used in the experience modification formula, e.g., after individual claim limitations)
2. Expected total rateable losses
3. Actual losses limited to \$5,000 per claim (primary under the RERP definition)
4. Expected primary losses (total expected losses x D-ratio)

For all states except Florida, three policy years of data were reviewed. Five policy years of data were reviewed for Florida. Risks with fewer than three policy years of data were excluded.

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In addition to excluding risks with fewer than three years of data, a small number of risks were excluded because the data reported for them was considered either unreliable or unrepresentative. These consist of risks with no expected loss for a given year or negative dollar amounts.

The ratio of actual to expected losses ("loss ratio") was calculated for each risk and year. This calculation was done separately for total losses, primary losses, and excess losses (total minus primary). In order to adjust for trend, loss development or benefit change factors by year, the loss ratios were normalized by dividing by the statewide average for each year.

The risks in each state were then divided into five groups based on their size. These groups or "risk size ranges" were based on the total expected losses for the risk for the sum of the three policy years reviewed. As shown in Exhibit 6, the size ranges were selected to include the same number of risks in each range. Exhibit 6 also shows the average expected losses for each size range.

C. Description of Methodology

1. The Use of Regression to Estimate Credibility

A basic premise of an experience rating plan is that an individual risk's historical loss experience has some predictive value in projecting its future experience. In this analysis, one approach we used to evaluate the predictive value, or credibility, of historical losses was to measure the relationship between a risk's loss ratio (actual/expected losses) in one year and the same risk's loss ratio in another year or years. The relationship between years was based on a linear regression. Although these calculations are described in detail below, an example may clarify the basic approach.

Exhibit 11, Sheet 1 is a graph based on individual risk data for relatively large risks in Florida. To prepare this graph, we first adjusted and sorted the data for individual risks as follows:

- a. We "normalized" the expected loss ratios for individual risks so that the aggregate loss ratio (actual/expected losses) was equal to 1.00 for each of the policy years.

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- b. We sorted the data by total expected losses. After sorting, we divided the risks into five size groups, where each group contained the same number of risks. Exhibit 11 presents the data from the Florida size group containing the risks with the largest amount of expected losses.
- c. Within each size group, we sorted the data by the risk's primary loss ratio for the first year in the experience period and divided the risks into ten subgroups, with approximately the same number of risks in each subgroup.
- d. The graph in Exhibit 11 shows the relationship between the average Year 1 primary loss ratio for each subgroup, and the average primary loss ratio for Year 2 for the same risks.

The fact that the graphs slope upward to the right is an indication that there is a positive correlation between the loss ratios for individual risks in Years 1 and 2. As a result, observing a risk's loss ratio in year 1 provides information about that risk's loss ratio in year 2. If a straight line is fitted to the data values on the graph, the slope of the line can be interpreted as the credibility of the loss ratio data from Year 1. In fact, as shown in the following equations, the slope of the regression line represents the credibility factor which minimizes the squared error between the experience modification and the actual subsequent period loss ratio.

Years 1 through 5 are, respectively, 1986,..., 1982. In the linear regression tests, we generally treated the more recent year(s) as the independent variable and the older year as the dependent variable. The expected value of the resulting credibility estimate is the same, regardless of whether the older or newer year is treated as the independent variable in the regression.

- LR₁ = The actual loss ratio in period 1
LR₂ = The actual loss ratio in period 2
M = The experience modification (i.e., the projected loss ratio in period 2)
Z = The credibility factor

Under the RERP, the experience modification for both primary and excess losses can be written as:

$$M = Z \times LR_1 + (1-Z) \times 1$$

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Minimizing the squared projection error requires that the following sum across all risks be minimized:

$$\sum(LR_2 - M)^2 = \sum(LR_2 - Z \times LR_1 - 1 + Z)^2 = \sum[(LR_2 - 1) - Z(LR_1 - 1)]^2$$

To determine the Z which minimizes this expression, we set the derivative with respect to Z equal to 0:

$$d \{ \sum (LR_2 - M)^2 \} / dZ = 2 \sum \{ [(LR_2 - 1) - Z(LR_1 - 1)] \times (LR_1 - 1) \} = 0$$

Solving for Z produces the expression:

$$Z = \sum [(LR_2 - 1)(LR_1 - 1)] / \sum (LR_1 - 1)^2$$

The expression for the slope of a linear regression between LR1 and LR2 is:

$$\text{Slope} = \sum [(LR_2 - LR_{2avg})(LR_1 - LR_{1avg})] / \sum (LR_1 - LR_{1avg})^2$$

For normalized data $LR_{1avg} = LR_{2avg} = 1$.³ Thus the slope of the regression line equals the credibility factor which minimizes the sum of the squared prediction error.

Hence the average primary credibility of one year's losses for each size group was directly measured by the slopes on graphs prepared in the manner described above. A similar calculation was done to estimate the credibility for excess losses.

The calculations described above yield primary and excess credibilities which produce the "best" (i.e., the minimum squared error) estimates of primary and excess losses when these estimates are calculated separately. However, as shown in Section C.2, the sum of these estimates may not produce the best estimate of total losses. If primary losses are positively correlated with excess losses, simply adding the above estimate of primary losses to that of excess losses would give too little weight to primary losses. In that case it would be more accurate to estimate total losses based on a modification formula like the Alternate Formula described in Section III.G. Section C.2. discusses this issue more fully and describes the methods which we used to test the relationship between primary and excess losses.

³ In this analysis, loss ratios were normalized by year but not by size range within year. As a result, LR_{1avg} and LR_{2avg} differed slightly from 1.

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The graphs and the calculations described above were performed separately for primary and excess loss ratios, for each of the five risk size ranges described above.

Regressions were performed on the following combinations of years.

- a. Year 2 against Year 1
- b. Year 3 against Year 1
- c. Year 3 against the average of Years 1 and 2

For Florida, where data with sufficient volume were available, we also performed regressions on:

- d. Year 4 against Year 1

Exhibit 11, Sheets 2-6 summarize the results of our analysis for the five states we studied. The credibility values in Exhibit 11 have been adjusted to the bases of one, two and three years of experience, although the results were obtained from comparisons of either 1 or 2 years to a third year. These adjustments were made using the following formula:

$$\text{Credibility} = \text{Expected Loss} / [\text{Expected Loss} + k]$$

Credibility is computed by the method described above, using, for example, a comparison of data from years 1 and 2. The k term is then computed from the above formula. Given k and given the approximation that n years of losses equal n times one year of losses, credibility is computed for n (equal to 2 or 3) years of losses.

2. Correlation Between Primary and Excess Losses

If primary and excess losses were unrelated, the regression-based credibilities described in C.1 would minimize the squared error between the actual losses in the prospective period and the projected losses. However the goal in experience rating is to estimate the total losses for the prospective period given the risk's losses in the experience period. As a result, to the extent that the actual primary losses are predictive of future excess losses, they should be incorporated in the excess loss projection.

Intuitively, it seems reasonable to assume that actual primary losses are, in fact, predictive of future excess losses (on average). Primary losses can be thought of as a measure of a risk's claim frequency while excess losses are a measure of its claim severity. A primary

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modification of, for example, 2.00 suggests that the risk's claim frequency is twice the average frequency contemplated in the manual rate. If excess losses for that risk were too erratic to provide any predictive information (i.e., excess credibility = 0), we should project that the risk's claim severity will be average. However, an average severity combined with a frequency twice the average, results in excess losses twice the average (i.e., excess modification of 2.00).

The modification formula used in the RERP determines the excess modification as a function of excess credibility and actual excess losses. Therefore, for the risk described above, the RERP would project that future excess losses will be average (excess modification = 1.00). Given that frequency for this risk is twice the average, the RERP projection would be accurate only if claim severity were unusually low. The actual excess experience for this risk provides no evidence of unusually low severity. As a result, the RERP is likely to do a poor job of projecting the excess portion of total losses for this risk. Since excess losses represent the majority of total losses (approximately 70%), this is potentially a significant problem.

The following example illustrates the alternate formula we are recommending in order to address this issue.

$$\begin{aligned} \text{D-ratio} &= \text{Primary Losses/Total Losses} = 30\% \\ Z_p &= \text{Primary Credibility} = 50\% \\ Z_e &= \text{Excess Credibility} = 5\% \\ A_p/E_p &= \text{Actual Primary Loss Ratio in Experience Period} = 2.0 \\ A_e/E_e &= \text{Actual Excess Loss Ratio in Experience Period} = 2.0 \end{aligned}$$

$$\begin{aligned} \text{Primary Modification} &= 2.0 \times 50\% + 1.0 \times 50\% = 1.50 \\ \text{Excess Modification} &= 2.0 \times 5\% + 1.0 \times 95\% = 1.05 \end{aligned}$$

$$\text{Total Modification (RERP)} = 1.50 \times 30\% + 1.05 \times 70\% = 1.185$$

Because of the low credibility of actual excess losses, the RERP projection of future excess losses (1.05) is based almost entirely on the manual rate. If primary and excess losses were related this would be a poor estimate since primary losses (which have a fairly high credibility) indicate that this risk is significantly worse than average. This problem is compounded because the RERP total modification formula gives 70% weight to the projection of excess losses. As a result, the RERP would project that this risk is only 18.5% worse than average.

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A way to correct this is to replace the RERP modification formula with the following Alternate Formula which reflects actual primary losses in projecting excess losses.

Alternate Formula

$$\text{Primary Modification} = 2.0 \times 50\% + 1.0 \times 50\% = 1.50$$

$$\text{Excess Modification} = 2.0 \times 5\% + 1.5 \times 95\% = 1.53$$

(Note that the 1.5 used in the excess modification formula is the primary modification used in estimating expected excess losses).

$$\text{Total Modification (ALT)} = 1.50 \times 30\% + 1.53 \times 70\% = 1.52$$

Under the Alternate Formula, the total modification reflects the fact that the credible primary losses and the erratic excess losses indicate that this risk is significantly worse than average. In fact the total modification is only slightly different from the primary modification, reflecting the fact that actual excess losses contribute very little information to our projection of total losses.

If excess losses are related to primary losses (as we believe to be the case), the RERP can be used to approximate the more accurate Alternate Formula results in total by using primary credibility factors which are larger than the regression-based factors. The resulting overstatement of the primary modification will then approximately offset the understatement of the excess modification. This is illustrated below:

$$Z_p' = 100\%$$

$$Z_e' = 15\%$$

$$\text{Primary Modification} = 2.0 \times 100\% + 1.0 \times 0\% = 2.00$$

$$\text{Excess Modification} = 2.0 \times 15\% + 1.0 \times 85\% = 1.15$$

$$\text{Total Modification (RERP)} = 2.00 \times 30\% + 1.15 \times 70\% = 1.41$$

The above example shows that if actual primary losses are predictive of future excess losses, the RERP modification can be made to more accurately measure a risk's departure from average if the primary credibility factors used are higher than those indicated by regression. We found that the NCCI's primary credibilities were indeed higher than the average credibilities indicated by regression results based on primary losses alone. Given the structure of the RERP formula, this is reasonable, since the higher primary credibilities are

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indicative of the power of primary losses in predicting future excess losses. However, in the above example, even though the primary credibility was increased from 50% to 100%, the resulting modification was still not as high as that indicated by the Alternate Formula. In fact, in order to achieve an RERP total modification of 1.50 for this risk, without unduly increasing the credibility of erratic excess losses, primary credibility would have to be increased above 100%.

In general, the RERP primary credibility needed to make the RERP modification approximate the Alternate Formula modification is given by the following relationship:

$$Z_{p-RERP} = Z_{p-ALT} \times [1 - (1 - D\text{-ratio}) \times Z_e] / D\text{-ratio}$$

If Z_e is the same for both the RERP and the Alternate Formula⁴

From this relationship it can be seen that, for D-ratios less than 1.00, the primary credibility that will result in the most accurate modification factors under the RERP is always greater than that under the Alternate Formula. Further, the RERP primary credibility should be higher by an amount which is a function of the D-ratio. Since D-ratios vary significantly by class while credibility is independent of class, it is impossible to achieve the same accuracy with both the RERP and the Alternate Formula. If primary losses are predictive of excess losses, the Alternate Formula should be more accurate. If primary losses are not predictive of excess losses, the RERP should be more accurate.

In order to test whether primary losses are, in fact, predictive of excess losses we performed three tests. The first test involved the following regression performed on Florida data.

"X" = Primary loss ratio in Year 1

"Y" = Excess loss ratio in Year 2

This regression directly tests the implicit assumption of the RERP formula that only excess losses (not primary losses) in one year provide information about excess losses (on average)

⁴ If Z_e is allowed to vary, the relationship is $Z_{p-RERP} = Z_{p-ALT} \times [1 - (1-D) \times Z_{e-ALT}] / D + [(A_e - E_e) \times (Z_{e-ALT} - Z_{e-RERP})] / (A_p - E_p)$. In general, Z_{e-RERP} will be higher than Z_{e-ALT} because under the Alternate Formula, the complement of Z_e is being applied to a more accurate prediction of future excess losses. Therefore, it is likely that the adjustment term accounting for the difference in excess credibility will be small on an expected value basis.

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in another year. A positive slope in this regression implies that low primary loss ratios in year 1 are associated with low excess loss ratios in year 2 and, conversely, high primary loss ratios are associated with high excess loss ratios. This would imply that primary losses should be given some credibility in projecting future excess losses.

The second test involved a slightly different regression performed on Florida data.

"X" = Primary loss ratio in Year 1

"Y" = Excess loss ratio in Year 2 / Primary loss ratio in Year 2

This regression goes a step further than the previous regression. Rather than testing for the existence of a relationship, this regression tests the nature of the relationship between primary and excess losses. If there is no slope in this regression, then that implies that the ratio of the average excess loss ratio to the average primary loss ratio is a constant regardless of the risk's loss ratios in the experience period. This multiplicative relationship would support the use of the primary modification factor to adjust expected excess losses.

The third test (which is discussed in more detail in Section C.3) involved a single regression performed on all of the data simultaneously. We used four sample states: Florida, Maine, Nebraska and Utah. This regression determined the parameters (including both primary and excess credibility) which minimized the sum of the squared differences between individual risks' actual and projected total losses in the prospective period. The projected losses were based on three years of experience ending one year before the beginning of the prospective period. Throughout the remainder of this report, credibility parameters obtained through a regression of this type will be referred to as "optimized parameters".

In order to test the relationship between primary and excess losses, we calculated optimized parameters for both the RERP and the Alternate modification formulas. If actual primary losses are predictive of excess losses we would expect to find that:

- a. The optimized Alternate formula performs better than the optimized RERP formula.
- b. The optimized RERP primary credibility factors are significantly higher than the regression-based credibilities.

The results of the tests are discussed in section D.

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3. Parameter Optimization / Quintile Tests

In addition to estimating credibility factors through linear regressions performed separately by size group and by state, we estimated optimized credibility parameters based on non-linear regressions on all of the data simultaneously. Optimized parameters were calculated for the RERP and the Alternate Formula. In addition, optimized parameters were calculated to test the effect of changing the number of years in the experience period from 3 to 5 years and changing the current split point from \$5,000 to \$2,000 and \$10,000.

Plan performance is evaluated in Exhibit 7. This exhibit is divided into two sections, (a) and (b). Section (a) tests the performance of PERP, RERP and the Alternate formula on three stratifications of risk attributes. Risks are stratified by size of loss ratio in the experience period ("quintiles"), by size of expected losses, and by state. Examples of the calculations underlying Exhibit 7 are shown in Exhibit 7a, Sheet 13.

The quintiles test shows the power of the experience rating plan to equalize loss ratios regardless of underlying historical experience. The tests by size and by state look for biases that may result from the selection of a particular formula.

Section (b) tests the RERP and the Alternate formula with 5 years of data and with \$2,000 and \$10,000 primary split points using the "quintiles" stratification.

The RERP contains three parameters each for primary and excess credibility formulas that describe the shapes of these curves. In addition, there is a scale adjustment factor that varies by state. The credibility curves of RERP are as follows:

$$Z_p = [E + aG] / [Eb + cG]$$

and

$$Z_e = [E + xG] / [Ey + zG]$$

G = State scale adjustment factors, equal to state reference point(s) divided by 250,000.

a, b, c, x, y and z = parameters optimized

In the regressions, the dependent variable (left hand side) was the normalized future period actual to expected loss ratio. It was assumed that this value is a proxy for each risk's true relationship with the average. The independent variables (right hand side) were the

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credibility parameters as applied to the risk's historical actual and expected primary and excess losses in the experience modification formula. The experience modification factor is the predictor of the future average experience of the risk as compared to average.

The form of the regression is a non-linear function of the parameters a , b , c , x , y , and z , which were optimized simultaneously. A non-linear regression was performed to minimize the weighted average squared difference between the normalized future period actual to expected loss ratio and the resulting experience modification factor.

We have used the same functional form for the credibilities of the Alternate Experience Rating Plan. The six parameters are optimized using the non-linear regression approach separately for RERP and the Alternate Plan. The resulting credibilities are graphed in Exhibit 12, Sheets 1 and 2.

The first step in the performance measures shown in Exhibit 7 is to divide the data into five "quintiles". This was done as follows:

- a. Within each state (Florida, Maine, Nebraska, and Utah) the risks were divided into eight equal size groups according to expected losses.
- b. A loss ratio (actual/expected losses) was calculated for each risk for the prospective period (policy year 1988). A similar loss ratio was calculated for the experience period (the sum of policy years 1984-1986). Both the prospective and the experience period loss ratios were normalized so that the average loss ratio for each period for each state was 1.00. In addition, a "modified" prospective period loss ratio was calculated for each risk, for each modification formula being tested. The modified loss ratio was calculated as the (actual prospective period losses) / (normalized expected losses x experience rating modification).
- c. The risks in each state and size group were then ranked according to their loss ratio in the experience period and arranged into quintiles. Thus, within each state and size group, we created five groupings, each containing approximately an equal number of risks. The first quintile included the 20% of risks with the lowest experience period loss ratios while the last quintile included the 20% of risks with the highest loss ratios.
- d. For the summary exhibits shown in Exhibit 7, the quintiles by state and size group were combined.

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The first performance measure is shown in the upper third of each sheet of Exhibit 7. It shows the average modified loss ratio by quintile for each plan. For example, the second column of Exhibit 7, Sheet 1 shows the average manual loss ratio for each quintile. The manual loss ratio of .684 for the first quintile implies that the "best" 20% of risks, based on past loss ratios, have subsequent losses which are 68.4% of those anticipated in manual rates. Thus, if there were no experience rating plan, these risks would be overcharged by 46% ($1.00 / .684 - 1.00$) on average. The third column indicates that if manual expected losses are modified using the PERP, the overcharge for these risks decreases from 42% to 17% ($1.00 / .852 - 1.00$). A perfect plan would eliminate any under or overcharge. This would result in modified loss ratios of 1.000 for each quintile. The closer the modified loss ratios are to 1.000 the better the plan performance.

In comparing two plans using the modified loss ratio measure, the performance by quintile is more important than in total. The RERP clearly performs better by quintile, reducing the over or undercharge for four of the five quintiles.

The trend of the modified loss ratios across the quintiles is also meaningful. If the plan is over-responsive to historical experience (credibilities too high), the good risks of the experience period will receive experience rating modifications that are too low and the bad risks will receive modifications that are too high. If the plan is over-responsive, a downward trend in the modified loss ratios will result, when reviewed from the lowest to the highest quintile. Likewise, if the plan is under-responsive, an upward trend in the modified loss ratios will result.

As expected, the unmodified loss ratios indicate an upward trend. It indicates that the historical experience has credibility in predicting future loss ratios. Of the other plans shown in Sheet 1, only the PERP appears to exhibit a trend. In this case, it appears that there may be an upward trend, indicating a possible under-responsiveness.

The second performance measure is shown in the middle block of each sheet in Exhibit 7. This measure is a function of the modified loss ratio measure discussed above. This measure shows the squared error of the modified loss ratio for each plan multiplied by 10,000. Thus the 219 shown for the PERP for the first quintile is calculated as $[(.852-1.000)^2] \times 10,000$. If a plan did a perfect job of flattening the loss ratios by quintile, the total squared error for that plan would be zero. The better a plan performs, the closer the squared error will be to zero. This measure often provides the clearest comparison between plans.

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The final statistic shown in Exhibit 7 is the mean squared prediction error for all risks within each quintile. This is calculated as the weighted average of the square of the actual subsequent period loss ratio (actual / normalized expected) minus the predicted normalized expected loss ratio (experience modification factor). This statistic measures the variation of a risk's actual losses in a year against the losses anticipated in that risk's modified rate. Even if the modified rate were exactly equal to the true expected loss for each risk, there would still be considerable variation in the risk's actual experience from year to year. As a result, all of the plans tested produce relatively small improvements in this statistic.

D. Test Results

1. RERP Formula Versus PERP Formula

The results in Exhibit 7a, Sheet 1 (which groups risks according to the experience period loss ratio) show that the RERP is clearly superior to the PERP. Looking at the top block of statistics, the future period manual loss ratios (second column) show a clear upward trend when risks are grouped by prior period loss ratio quintile (first column). This indicates that prior period losses are predictors of future period losses.

The results in Exhibit 7a, Sheet 2 (which groups risks by state) and Exhibit 7a, Sheet 3 and 4 (which groups risks by risk size) also indicate that the RERP performs better than the PERP.

The third column of each sheet shows the performance of the PERP experience rating formula. This formula flattens the manual basis loss ratios (moves them closer to 1.0), resulting in more equitable charges than if there were no experience rating plan. However, the adjusted loss ratios in the third column indicate a significant upward trend. This means that the PERP was under-responsive to the actual experience period losses. After applying the PERP modification factor, those risks with good experience in the historical period can be expected to have lower than average loss ratios (based on standard premiums) in the future period. Similarly, those risks with bad experience in the historical experience can be expected to have higher than average loss ratios in the future period. Thus, the average credibility values of the PERP are too low.

The fourth column shows the performance of the RERP experience rating formula. Here, the trend in modified loss ratios has essentially disappeared, indicating that the overall levels of credibility in the RERP are more appropriate than in the PERP.

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The second block of statistics is based on the squared departure of each cell from the target of 1.0. Lower numbers indicate better results. The RERP significantly reduces these squared errors when compared to the manual rates. The RERP shows a clear improvement in this statistic over the PERP.

The third block of statistics shows the average squared difference (on a risk by risk basis) between actual and predicted (by the modification) loss ratios. The lower this statistic, the more accurately the modification predicts each individual risk's future period loss ratios. By this measure as well, the RERP outperforms the PERP. Not only does it result in more accurate premium for groups of risks (between quintile squared error test, above), but it produces more accurate premiums for individual risks.

2. RERP Formula Versus Alternate Formula

As discussed in Section C.2, we would expect the Alternate modification formula to perform better than the RERP if actual primary losses are predictive of future excess losses. In that Section we described three tests designed to determine whether that relationship between primary and excess losses actually existed in the data for the states we reviewed.

The results of the first test are shown in Exhibit 8. This test involves a regression of the primary loss ratio in Year 1 against the excess loss ratio in Year 2. Although the excess loss ratios are erratic, it is clear from the graphs in Exhibit 8 that there is a relationship between the average primary and excess loss ratios.

The results of the second test are summarized in Exhibit 9. In this test, the primary loss ratio in year 1 for each size group is regressed against the ratio of the excess loss ratio in year 2 to the primary loss ratio in year 2. For all five size groups, the indicated slope for this regression differs from zero by less than one standard deviation. This suggests that the excess/primary ratio in year 2 is independent of the primary losses in year 1. In other words, the actual primary loss ratio in year 1 does as good a job of predicting the expected excess loss ratio in year 2 as it does of predicting the expected primary loss ratio in year 2. Based on this test, it appears appropriate to use the primary modification factor to adjust expected excess losses.

The results of the third test are summarized in Exhibit 7a. This test compares the performance of the optimized RERP with that of the Alternate formula. Because both plans are optimized based on the same data base (four states), differences between performance reflect differences between the plans themselves. The measures of plan performance used

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are the three measures described in Section C.3. The statistics shown in pages 1 through 4 of Exhibit 7a indicate that the Alternate formula does, in fact perform better, although the degree of improvement over the RERP is unclear. The most important statistics in Exhibit 7a, in our view, are:

The mean squared error of the individual risk loss ratios (the all groups result, which is the same in all sheets of Exhibit 7a because it is independent of how risks are grouped). As noted previously in section C3, this statistic includes the random variation in actual individual risk losses, which causes the differences among the various experience rating formulas to appear small. It shows some improvement in going from the optimized RERP to the Alternate formula, but this improvement is smaller than that between the PERP and the RERP.

The between quintile squared errors in sheet 1. This measure shows better results for the Alternate formula than the RERP. However, when the risks are subdivided into eight size groups (sheets 5 through 12) the results do not clearly favor either the RERP or the Alternate formula. This may be due to random variation or could indicate that the Alternate formula does not improve accuracy for all risk sizes.

Each of these measures shows that the Alternate formula does, in fact, perform better than the RERP.

In Section C.2 we showed that if past primary losses are predictive of future excess losses, the credibility factors used in the RERP would have to be artificially high to offset the fact that primary losses are not used to adjust excess expected losses. As shown in Exhibit 12, this is in fact the case. That exhibit compares the primary credibility factors based on regression with those from the optimized RERP and Alternate plans. While the regression-based credibilities and Alternate plan are very similar, the RERP primary credibilities are significantly higher.

Based on the three tests discussed above, we believe that the Alternate formula can be expected to produce more accurate results than the RERP (or a version of the RERP in which the parameters have been optimized as in the Alternate formula). However, the degree of improvement is not clear. We recommend that further testing be done by NCCI using more states and more time periods to evaluate the degree of improvement produced by the Alternate formula. If the degree of improvement is found to be substantial, then we

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would recommend implementing the Alternate formula as soon as is practical. If the improvement is found to be minor, then the practical difficulties involved in implementing a change in the formula make it appropriate to postpone implementation until such time as other significant changes are being implemented, or possibly to forego implementation altogether. This will be a matter of professional judgment.

It should be noted that a change to the Alternate formula should not be expected to affect the total premium adequacy for all risks combined in a given state.

3. RERP Parameters Versus Optimized RERP Parameters

Exhibit 7a compares the performance of the current RERP with that of the optimized RERP. As expected, the optimized RERP performs better on the states that we reviewed. Since the quantity minimized in the optimization is the mean squared error of the individual loss ratios, the "All Groups" line of the third block of numbers in Exhibit 7a is certain to indicate better performance for the optimized RERP than the current RERP. In fact, on each of the three measures displayed in Exhibit 7a, Sheets 1-4 (i.e., when risks are grouped by the experience period loss ratio or by state or by risk size) the optimized RERP performs better than the RERP. We recommend that if NCCI does not replace the RERP with the Alternate Formula recommended above, that they recalculate RERP parameters which are optimized based on country-wide data, and use optimized parameters if they produce significantly more accurate results. Testing the accuracy of the parameters should be performed on a state by state basis. Anomalies by state should be explained and reconciled.

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VI. SPLIT BETWEEN PRIMARY AND EXCESS LOSSES

A. Introduction

In both the PERP and the RERP, a risk's losses are divided into primary and excess components. In both plans, less credibility is given to the risk's excess losses than to its primary losses. The plans differ, however, in the definition of primary and excess losses. The RERP is a "single split" plan with a split point of \$5,000. This means that the first \$5,000 of each loss is considered primary, whereas the portion, if any, of the loss above \$5,000 is considered excess. The PERP, on the other hand, is a "multi-split" plan. Under that type of plan the split between primary and excess is based on a formula rather than a fixed dollar amount. The portion allocated to primary under the PERP varies from as little as \$2,000 for small claims to as much as \$10,000 for large claims.

In this section we will evaluate the following questions:

- Is a split between primary and excess losses desirable (i.e., does it improve the accuracy of the plan)?
- Is \$5,000 an appropriate split point to use?
- How does a single split plan compare to alternatives?

B. Desirability of A Primary/Excess Split

A basic premise of the primary experience modification formula used by NCCI is that subsequent period loss ratios are a linear function of prior period loss ratios. A linear relationship would imply that the slope of the graph (and therefore the credibility) for large prior period loss ratios is the same as for small prior loss ratios. In other words, the predictive power of large loss ratios would be the same as that of small loss ratios.

It can be shown⁵ that this premise does not hold for many of the highly skewed loss distributions which are thought to apply to casualty claims. For these distributions, some

⁵ *Foundations of Casualty Actuarial Science*, Casualty Actuarial Society, 1990, p. 462.

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portion of very bad claims experience is largely random and provides little information about the risk's future loss experience. As a result, the indicated credibility for large claims is less than for small claims. Given the relationship between regression and credibility developed in Section V.C.1, we would therefore expect a graph of subsequent period loss ratios to "flatten out" with the slope (credibility) at large prior loss ratios less than that at small prior loss ratios. Using a single straight line to project future loss ratios would tend to overestimate the loss ratios for risks that had unusually bad experience while understating those of risks with good experience.

One way to address this problem is to introduce a split point. The effect of a split point is to divide a risk's experience into two parts: the primary portion which has relatively high predictive value; and the excess portion which is largely random and has relatively low predictive value. Within each of these categories the relationship between subsequent and prior period loss ratios is assumed to be linear. While this will not be perfectly accurate in practice, introducing a split point significantly reduces the difference between the actual relationship and a linear relationship (the "linearization error" of the plan) and therefore increases the equity of the plan.

C. Selecting the Appropriate Split Point

Varying the level of the split point affects both primary and excess losses. However, because primary losses are given significantly more weight in experience rating, the following discussion will focus on the effect of changing the split point on primary losses.

Selecting the appropriate split point involves a trade-off. If the split point is set too high, the linearization error in the primary credibility will be increased. However, if the split point is set too low, information which might be useful in projecting a risk's future experience will be combined with excess losses and given little credibility.

However, assuming the appropriate adjustments are made to the credibility of primary and excess losses, small changes in the split point should have little impact on the quality of the plan.

The current NCCI plan uses a single split point of \$5,000. A subjective assessment of whether the \$5,000 split point should be raised can be made by judging how close those graphs are to linear. Based on that test, it appears that the \$5,000 split point works well

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for the largest risk size ranges. Because the smaller risk size ranges show some linearization error, it would probably be inappropriate to significantly increase the split point.

A subjective assessment of whether the current split point should be reduced can be made by looking at the relative proportions of primary and excess losses. Using the \$5,000 split point, approximately 30% of total losses are classified as primary. If the split point were significantly reduced, that would potentially lead to an undesirably small percentage of losses to be given primary credibility.

Our conclusion from these subjective tests is that the \$5,000 split point should not be significantly increased or decreased. This conclusion is supported by a comparison of the performance of the optimized RERP plan using the current split point with that of optimized plans using \$2,000 and \$10,000 split points. Exhibit 7b, Sheets 1 and 2 summarize the results of that comparison. That comparison shows that significantly increasing or decreasing the split point results in a deterioration of the performance of the plan as measured by the tests discussed in Section C.3.

D. Alternatives to A Single Split Plan

There are a number of ways of reducing linearization error aside from employing a single split point. In general, however, alternates are either more complex or conceptually less intuitive than the single split plan. One alternative is the multi-split plan. Under this plan, losses are allocated between primary and excess based on a formula. As losses increase in size, a progressively larger portion is allocated to excess. While this approach has potential for increasing accuracy, it is more complex than the single split plan. The PERP is a multi-split plan.

A second alternative is to "transform" losses before using them in the experience modification formula. For example, the experience modification might be based on the logarithm of prior losses rather than the losses themselves. This would have the effect of reducing the impact of unusually bad experience. However, it would be more complex, making the plan more difficult to understand and to explain.



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VII. NUMBER OF YEARS OF EXPERIENCE TO BE USED

A. Introduction

Currently, NCCI uses three years of data in experience rating. Adding years would increase the quantity of data but would decrease the relevance of the data. At some point, the decreasing marginal value of adding one more year of data does not justify the added complication. The following section discusses the value of a five year plan relative to the current three year plan.

The impact on the accuracy of the plan is only one factor that should be considered in deciding whether to go to a five year plan. Another important consideration is the cost and difficulty of implementing such a change. There are a number of practical impediments to changing from a three to a five year plan. In Section C, we suggest an approach which will minimize those impediments.

B. Projected Impact on Plan Performance

The impact on plan accuracy of adding more years of data is primarily a function of two opposing factors. The first factor is simply that adding more years increases the size of the sample used to project each risk's future experience. As such, more weight can be given to the risk's own experience, projections of the risk's future experience are likely to be more accurate, and the plan's accuracy will be increased. If this were the only factor, it would be possible to directly estimate the impact of such a change on individual risk credibility. For example, all other things being equal, a risk with 33.3% credibility for three years of data would have 45.5% credibility if five years of data were used. Thus the weight given to the risk's own experience would increase by 37% ($45.5/33.3 - 1$). These figures are calculated using the relationship:

$$\text{Credibility} = (\# \text{ of Years}) / [(\# \text{ of Years}) + ("k")]$$

Where "k" is a constant.

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Sample Calculation of Credibility Given "N" Years of Data *

	N=3	N=4	N=5
Example 1	33.3%	40.0%	45.5%
Example 2	50.0	57.1	62.5
Example 3	75.0	80.0	83.3

* Assuming each year is equal in size and relevance.

In practice, however, the increase in credibility due to more data is at least partially offset by the decreasing relevance of the progressively older data. This factor is more difficult to quantify. In order to estimate its impact we compared the credibilities indicated by four regressions performed on Florida data. The results of those regressions are summarized on Exhibit 10.

The regressions underlying Exhibit 10 relate the primary loss ratio in year 1 to those in years 2, 3, 4, and 5. (Year 1 corresponds to policy year 1986. Year 5 corresponds to policy year 1982). As year 1 is regressed against years further into the past it becomes progressively less relevant and therefore we would expect the resulting credibilities to decrease. This is, in fact, the pattern that emerges on Exhibit 10.

In order to determine which of the two offsetting factors (increasing credibility due to more data and decreasing credibility due to decreased relevance) is more important in practice, we compared the performance of an optimized five year plan with that of an optimized three year plan. The procedure for optimizing each plan was the same as that described in Section V.C.3. The performance of each optimized plan is summarized in Exhibit 7b, Sheet 3. Based on the results shown in that exhibit, the use of five years of experience improves the performance of the plan whether the RERP or the Alternate Formula modification is used.

It should be noted that the data used in our tests for the two additional years were at 3rd report, because NCCI does not currently validate individual risk data at 4th or 5th report. We consider it likely that similar test results (Exhibit 7b, Sheet 3) would be obtained based

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on data at 4th and 5th report, if such data were available. However, the use of 3rd report data adds somewhat to the uncertainty of the test results.

From a theoretical perspective, the ideal approach would be to include as many years as are available, and to assign weights to the years in proportion to their reliability for projecting future losses. However, it might not be possible to determine the ideal weights with much accuracy, and the resulting ERP would be more complicated (e.g., development and trend factors would have to be reflected separately for each experience year) and more difficult for insureds to understand. It is not likely that this approach would be practical.

The ideal approach can, however, be useful as a theoretical benchmark against which to compare alternatives conceptually. The current three year plan gives no weight to the fourth and fifth most recent years, while a similar five year plan would give full weight to the fourth and fifth years. The ideal approach most likely falls between these two; i.e., it is likely that the fourth and fifth years should be given weights between zero and the weights implicit in the five year plan (roughly the same as the weight given to the third year, after considering the effects of trend, loss development and law amendments). Further, given the use of a single trend factor, loss development factor, etc. for all policy years combined in calculating ELRs, the single factor can provide a closer approximation for individual risks in the case of a three year plan than a five year plan, because the exposure volume for an individual risk can be growing or declining over time. This consideration was taken into account in the comparison of optimized plan results discussed above (Exhibit 7b, Sheet 3) by "normalizing" the expected loss ratio for all three or five years on a combined basis rather than year by year.

C. Costs Associated with Adding Fourth and Fifth Years

There would be substantial implementation costs as well as ongoing costs associated with the addition of a fourth and fifth year to the experience rating plan.

The implementation costs would include:

1. Research to verify or rebut the improvement in accuracy indicated by our study, and to determine the appropriate parameters for the revised experience rating plan (ELR's, D-ratios, and credibility formulas).
2. Revision of the experience rating manual, forms, and computer programs.

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3. Education of the public as to how inclusion of the additional two years will increase accuracy. Many policyholders already question the appropriateness of using the oldest year in the current three year experience rating plan.

The main areas of ongoing additional cost would be:

1. Additional editing and correction of fourth and fifth reports would entail work by both NCCI and the insurance companies. Currently, the fourth and fifth reports are used for retrospective rating and, hence, those for retrospectively rated risks are probably more reliable than those for other risks. NCCI also uses the fourth and fifth report data in studying loss development for Excess Loss Factors and class rate relativities, and in research. However, the level of accuracy required on an individual risk basis is not as high for such analyses as for experience rating.
2. Accumulation of the additional unit reports in the experience rating files would increase costs and would slow the process significantly. Each unit report shows the changes from the prior report. NCCI stores each of these incremental reports rather than only the cumulative values. Only claims with changes are listed in a given unit report. Although fewer claims have changes in the fourth and fifth unit reports than in earlier unit reports, use of the fourth and fifth reports in experience rating would require storage of the preceding first, second and third reports for those policy years.
3. Computer usage required for experience rating would be increased because of the increased size of the experience rating files and because of the additional computations required.

D. Conclusions

Based on our test results, it appears likely that the accuracy of the experience rating plan would be improved by expanding the experience period to five years from the current three years. Further testing based on data from additional states and, preferably, using fourth and fifth report data for the two additional years should be done before deciding to go ahead with this change.

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Inclusion of the fourth and fifth years of experience would entail significant implementation costs as well as substantial ongoing costs.

In addition to the impacts on accuracy and cost, extension of the experience rating plan to five years could affect the perception of the plan's reasonableness by policyholders. Some policyholders already consider it inappropriate to use data as old as the oldest year currently used in experience rating; the addition of two older years would exacerbate this perception.

Expansion of the experience period to five years might also affect the benefits of risk management perceived by some insureds. On one hand, it will take longer for an improvement or deterioration in actual claim experience to fully impact the experience rating calculations. On the other hand, temporarily good or bad experience will impact the rates for a longer time period. Our judgment is that these possible perceptions probably would have little or no impact on risk management practices.

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VIII. ADMINISTRATION OF THE EXPERIENCE RATING PLAN

In addition to reviewing the formulas used in the RERP for actuarial soundness, we have also reviewed the administration of the plan. Based on that review, we have reached the following conclusions:

1. The calculations described in Section III are performed by computer. We have reviewed a sample worksheet from the computer programs used by NCCI and have confirmed that the calculations in the sample were done correctly. The experience rating worksheet that we reviewed shows the data and describes the calculation. It is sent to the carrier of record and is made available to the insured and the agent/service representative. Thus, the experience rating calculations are ultimately reviewed by many parties, and unusual results are likely to be questioned and otherwise brought to the attention of NCCI.
2. The loss and payroll data used is collected from the insurer under the workers compensation statistical plan. The data contains losses valued by the insurers, and payrolls audited by insurers. Thus, there appear to be reasonable safeguards against the submission of false data by insureds to obtain lower premiums.
3. The data is routinely reviewed by NCCI for reasonableness. Unusual values are referred back to the reporting insurer for explanation. If an adequate explanation is not provided, the data is not included in the experience rating calculation. Part I of this Examination reviews the data checks and systems of NCCI that are relevant to experience rating.

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IX. PREMIUM IMPACT OF THE REVISED EXPERIENCE RATING PLAN

NCCI performs a test of the potential change in the premium that may be caused by the change to the RERP in each state for which such a change is proposed. The experience modification factors issued in 1986 and 1987 in each state were re-calculated using the revised formula. If the average experience modification factor for a given state was found to change in the same direction for both years by more than two percent, a special adjustment was made to ELR's to eliminate the change.

Based on the 1986 and 1987 results, 9 states showed a need to adjust ELR's in order to maintain the same average experience rating off-balance. The states and the adjustment factors that were multiplied by the ELR's are shown below:

Colorado	1.03
Oregon	1.03
Maine	1.04
Maryland	.95
Mississippi	1.02
Minnesota	1.03
Tennessee	1.10
Rhode Island	.98
Utah	.97

Table III in Section IV.F shows the average experience modification factors in the four test states after the expected losses for each risk in the experience rating period were adjusted so that the average ratio of actual to expected losses was 1.0. This adjustment of expected losses is comparable to the assumption that ELR's and D-ratios are accurate for average experience rated risks. A review of this table shows that the RERP increased the average experience modification factor in three of the four states and decreased it in one of the four states. On average, premium would have increased very slightly if no other changes were made.

Table III shows that if ELR's and D-ratios used in both the PERP and the RERP were accurate, the implementation of the RERP would not produce a significant premium impact. The slight change in the average modification noted above could easily be due to random differences in the type of loss by risk, rather than a fundamental change caused by the change in formula.

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X. TREATMENT OF MULTI-STATE RISKS

Multi-state risks that have exposures in one or more of the states with interstate experience rating plans are issued a single experience modification factor for all such states combined. Those multi-state insureds that also have operations in states that do not use interstate rating rules, have a separate experience modification factor based on only the experience in each of these states.

As mentioned in Section III.F, when interstate rating rules apply, the experience rating plan values for W and B (and hence the credibilities), are evaluated in each state using the total expected losses of the risk in all interstate rated states. The W and B values that are used for the risk are the average W and B values of the states involved, using the state expected losses as weights. In this manner, the experience rating plan reflects the credibility that results from the combined volume of expected losses in all states, while giving appropriate consideration to each state's credibility formula parameters.

The interstate experience rating rules allow the experience of large multi-state risks to be assigned much higher credibility than if the risk's experience in each state were individually rated. We believe that this increases the accuracy of the rating of most such risks.

The interstate experience rating rules may increase the potential for inaccurate experience modification factors in certain circumstances. If the exposure mix by state for an experience rated risk changes between the time of the experience period and the time the experience modification factor will be applied, then the experience in the states may be given inappropriate weight. One solution to this problem is to calculate an experience modification factor for each of the interstate rated states credibility values based on the combined volume in all interstate rated states. Each state's resulting modification factor could then be applied to the prospective manual premium generated in that state. Note that this is different from the current NCCI intrastate rating approach. The credibilities would still be based on the combined volume in all interstate rated states, but the weighting would be by the prospective period manual premiums, not by the historical period expected losses.

The advantage of the approach described above is that it accounts for differences in a risk's indicated modification by state. A potential disadvantage, however, is that it may result in too much credibility being given to states with relatively little volume in the experience period. This results from the fact that the credibilities are based on the combined volume in all states, and the weight given to a state's modification is based on the state's volume in



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the prospective rather than the experience period. It is not clear whether this disadvantage is likely to outweigh the advantage of this method in practice. We, therefore, do not recommend that NCCI adopt this modification to their interstate rating rules.

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XI. EXTENSION OF THE PLAN TO SMALL RISKS

Not every risk is eligible to be rated under the RERP. Eligibility is determined by a minimum manual premium which varies by state. The eligibility requirement effective April 1990 ranged from a \$2,000 annual premium for Kansas to a \$6,000 annual premium for Louisiana. Given an average ELR factor of approximately .30, this range corresponds to a range of approximately \$600 to \$1,800 in annual expected losses.

Currently, the majority of risks (approximately 75%) fall below the minimum premium for eligibility, and are therefore charged the manual rate irrespective of their actual historical experience. Extending the ERP to these risks would involve a significant increase in the amount of data which NCCI would need to maintain and process. One method of reflecting actual experience which does not involve extending the entire ERP, is to offer a credit for loss free experience.⁶ In order to maintain the balance of the plan, these credits would need to be offset by debits applied to the rates of all other small risks. In this section we discuss a methodology for calculating the indicated credits and debits for a three year experience period. This methodology is illustrated using data from the states we have reviewed.

We have calculated the indicated credit and debit for small risks in three steps. The first step is to estimate the percentage of small risks which are likely to be claim free during the experience period. The second step is to determine the credibility (and therefore the indicated credit) of claim free experience. The final step is to calculate a debit for risks with at least one claim in the experience period which, when offset against the credit given for claim free experience, leaves the plan in balance.

A. Probability of Claim Free Experience

NCCI does not maintain loss information by year for small risks. As a result, data was not available to directly calculate the probability of claim free experience for those risks. We have, therefore, approximated three years of experience for a small risk by observing one year of experience for risks for which data is available. One year of experience for

⁶ In the following discussion, a risk will be considered to have had a claim if it has incurred losses greater than zero as of the evaluation date. Thus, a risk which has had only claims which closed without payment would be considered claim free.

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experience rated risks with annual expected losses of \$3,000 or less was used to develop estimates of the three year experience of smaller risks. The following is an illustration of the application of this method. If a claim free credit is implemented, we recommend that NCCI apply this method to estimate the probability of claim free experience.

The following table summarizes the experience of rated risks with annual expected losses of \$3,000 or less.

Table V - Experience Rated Risks with annual Expected Losses of \$3,000 and less

Policy Year	Average Expected Loss	Percent Claim Free During Year	Percent with One or More Claims
1982	1,783	39.4%	60.6%
1983	1,952	36.6	63.4
1984	1,945	37.6	62.4
1985	2,023	38.6	61.4
1986	1,987	43.1	56.9
1988	2,076	49.0	51.0
All	1,944	40.6	60.4

The states used for this review were Florida, Maine, Nebraska, and Utah.

These probabilities were then adjusted to reflect the average three year expected loss for small risks. As shown in Exhibit 14, Sheet 2, the average annual premium for small risks for policies incepting in the period October 1, 1987 - September 30, 1988 was \$963. Assuming an average ELRF of .30, the average three year expected loss for these risks is \$867 ($= \$963 \times .30 \times 3$). In order to compare this average to the \$1,944 average calculated above, an adjustment must be made to put the two figures on the same cost level. Since the \$1,944 average is based on the period from 1982-1988, while the \$867 average is based on data for 1987-1988, it is necessary to adjust for approximately 3.1

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years of loss cost inflation⁷. If we assume that claim costs are trending at 10% per year, an \$867 average expected loss for 1987-1988 corresponds to a \$645 average 3.1 years earlier ($645 = 867 \times 1.10^{-3.1}$). A claim free probability of 40.6% for expected losses of \$1,944 corresponds to a claim free probability of approximately 74.2% ($= 40.6\% \times [645/1944]$) for expected losses of \$645. This represents the estimated probability that the average small risk will be claim free for three years.

B. Credibility of Claim Free Experience

If the Alternate Modification Formula described in Section III.C is adopted, the credit that would be given for claim free experience of small risks, if they were eligible for experience rating, is:

$$1-M = 1 - \frac{[(1-Z_p)E_p + (1-Z_e)E_e] \times M_p}{E}$$

Where

- M = The total premium modification
- M_p = The primary modification
- E = Total expected loss
- E_p = Expected primary loss
- E_e = Expected excess loss
- Z_p = Primary credibility
- Z_e = Excess credibility

Since Z_e = 0 for small risks and M_p = 1-Z_p this formula reduces to:

$$\begin{aligned} 1-M &= 1 - \frac{[(1-Z_p) \times (E_p + E_e)]}{E} \\ &= Z_p \end{aligned}$$

⁷ A further refinement that has not been made in this illustration would be to adjust for differences in the average cost levels by state.

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Thus, under the Alternate Formula, the credit indicated for claim free experience for small risks is equal to their primary credibility.

As shown in Exhibit 13, the indicated three year primary credibility for the average sized small risk (using the optimized Alternate Formula) is 7.1%.

C. Debit for All Other Eligible Small Risks

If 74.2% of small risks with three years of available experience are given a credit of 7.1%, the remaining 25.8% of eligible small risks must pay more than the manual rate in order to maintain the balance of the plan.

The magnitude of the debit which balances a 7.1% credit depends on the ratio of the expected loss for claim free small risks to the expected loss for all small risks. Since the probability of being claim free varies inversely with the size of the risk, claim free risks will probably represent less than 74.2% of the total expected loss for small risks. For the sake of this example, we have estimated that claim free small risks account for 65.0% of the expected loss for all small risks. This estimate can be refined by obtaining the distribution of unrated risks by size.

Given that the claim free proportion of expected losses is 65.0%, the magnitude of the debit which balances a 7.1% credit is 13.2% ($= 7.1\% \times 65.0\% / 35.0\%$).

In order to maintain the balance of the plan, all eligible risks must participate. If participation were voluntary, risks that would receive a debit would withdraw from the plan resulting in a net credit to small risks.

A risk would be considered eligible if:

1. the risk failed to satisfy the minimum premium requirements for eligibility in the Experience Rating Plan, and
2. the risk had premium for at least three completed years.

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D. Implementation

The following is a description of how the Claim Free Credit Plan (CFCP) would work in practice. The first three years a small risk is insured, it would not be eligible for the CFCP and would therefore be charged the manual rate irrespective of its actual loss experience. If that risk is claim free for those three years (we estimate that approximately three fourths will be), the following year it will receive a credit of 7.1%. The risk will continue to receive the 7.1% credit as long as it remains claim free. If the risk has a claim, it will receive 13.2% debits for the following three years, irrespective of its loss experience during those years.

As discussed above, this plan would be balanced in that the total credits given in a year are expected to be offset by the debits given. Balance is, however, only one consideration in evaluating a plan. Other considerations include the equity of the plan and the degree to which it encourages loss control.

With respect to equity, the CFCP improves the equity for the average small risk but may create significant inequities for individual risks. This is true for both risks receiving a debit as well as those receiving a credit. For example, consider a large unrated risk. The expected losses underlying the manual premium for this risk may reflect an expectation of one or more claims in three years. Nevertheless, if this risk's claim experience were as expected, it would receive a significant debit for having had a claim. In fact, if more than one claim is expected for this risk, it is possible that it will receive a debit even if its experience were better than expected. Clearly for this risk, the current system would be more equitable than the CFCP.

Inequities exist for very small risks as well. For these risks, the credibility of their actual experience (i.e. the degree to which it helps us project their future experience), is very low. The issue in this case is not whether a given risk deserves a debit. A single claim in three years is almost certainly worse than expected experience for very small risks. The issue for these risks is the magnitude of the modification. The CFCP is likely to produce too large a modification for risks significantly smaller than the average unrated risk. For example, consider a group of small unrated risks that are expected to have one claim in thirty years. If the manual premium is exactly accurate for each of these risks, it is likely that roughly one in ten will have a claim over any three year period. The remaining 90% will be claim free. In this case, both the claim free risks, as well as those that experienced a claim, deserve little, if any, modification to next year's manual premium. For risks this small, three years of experience may be too little data to make a credible distinction between a chance occurrence of a claim and one that reflects true differences in expected loss. The CFCP,

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however, will give 10% of the risks fairly large debits (based on the credibility of the average sized unrated risk) and the remaining 90% credits. As a result, for these risks the current system of charging manual rates regardless of prior experience may be more equitable than the CFCP.

With respect to the goal of promoting loss control, the CFCP is somewhat superior to the current system. A disadvantage of the CFCP, however, is that it does not distinguish between a risk that had one small claim three years ago and one that has had a number of large claims in each of the last three years. As a result, risks whose loss control systems mitigate damages or minimize the number of claims get no benefit.

The equity and loss control incentive of the CFCP could be improved by using credits which vary by the risk's expected loss and debits which vary by both the risk's expected loss and the frequency and severity of its loss experience. Such a plan would, however, be considerably more complex and difficult to administer than the form of the CFCP described above.

We recommend against implementing a Claim Free Credit Plan of the type studied in this report, because of the inequities discussed above. Alternative approaches could reduce these inequities by varying the credits and surcharges according to the size of the risk and possibly according to the sizes of claims, but such a plan would be significantly more complicated and difficult to administer.

E. Conclusions

In this section, we have described and illustrated a method for reflecting claim free experience in the premium of small risks. Based on the data for the states we have reviewed, the indicated credit for a small risk with three years of claim free experience is approximately 7%. In order to balance that credit, eligible small risks with at least one claim in three years should be debited approximately 13%. If the decision is made to implement the CFCP, we recommend that NCCI estimate the indicated credits and debits using the method we have described (including the noted refinements).

A CFCP is a compromise between the equity and loss control incentive of a full experience rating plan and the ease of operation of the current system of manual rates for small risks. If introduced, the CFCP would improve the equity of the premium charged to average sized unrated risks (i.e., those not eligible for experience rating). It is, however, likely to

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result in less equity than the current system for the largest and the smallest unrated risks. For large unrated risks (i.e., those close to but below the experience rating threshold) the CFCP may result in debits for risks whose experience is no worse than expected. For very small risks, the CFCP is likely to produce a larger swing in premium than is warranted by the credibility of actual experience. On average, the CFCP would cause unwarranted premium increases for large unrated risks and unwarranted decreases for the smallest risks.

We recommend against implementing a Claim Free Credit Plan of the type studied in this report, because of the inequities discussed above. Alternative approaches could reduce these inequities by varying the credits and surcharges according to the size of the risk and possibly according to the sizes of claims, but such a plan would be significantly more complicated and difficult to administer.

It should be noted that the credibility that would be assigned to the larger unrated risks, if they were eligible for experience rating, is high enough (see Exhibit 12) to suggest that experience rating would improve the accuracy of the rates for such risks. Our understanding is that NCCI has slowed the updating of eligibility requirements so that inflation will cause smaller risks to become eligible. We consider this appropriate.



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XII. EXPERIENCE RATING PLAN OFF-BALANCE IMPACT ON RATEMAKING METHODOLOGY

A. Impact of Off-Balance on Overall Rate Change

Standard premiums are used by NCCI in the determination of overall rate level change indications. These premiums reflect the impact of experience modification factors. NCCI standard ratemaking formulas indicate how much the premiums after the impact of experience modification factors should change. Through the use of standard premiums in the ratemaking formula, the premium level change anticipates any systematic off-balance inherent in the experience rating plan.

For example, suppose a state has consistently had an off-balance of 1.10. That is, standard premiums are 10% above the premiums produced by manual rates. If a 5% premium level change is indicated, this means that standard premiums should increase by 5%. If the off-balance remains 1.10, and rates are increased by 5%, premiums will also increase by 5%. Thus, the actual level of experience rating off-balance is not important in determining the correct premium level change, provided that the off-balance remains constant over time.

Conceptually, there are two ways for a change in premium level to occur. A change in rates (and/or rules) will produce a change in premium, and a change in the average off-balance of the experience rating plan will also produce a change in premium. If the average off-balance of the experience rating plan remains constant or varies randomly around a constant level, then an indicated change in standard premium level can be achieved by an identical change in manual rates. This is the procedure used by NCCI in most circumstances. We agree that it is appropriate in most circumstances.

There are some circumstances in which the average off-balance has changed or is expected to change in a systematic way. Depending on the causes of the systematic changes, special adjustments may be needed to achieve the appropriate changes in premium level.

There are three main categories of potential causes of systematic changes in experience rating off-balance:

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1. Changes in rules or calculations: Any change in experience rating rules, calculations of ELR's, D-Ratios, or credibility parameters, or the experience rating formula itself has the potential to affect the average off-balance in a systematic way.
2. Outdated ELR's and D-Ratios: If ELR's and D-Ratios are not updated regularly, they may no longer reflect the underlying loss costs in the experience rating periods for which they are used. Consequently, the average off-balance may change in a systematic manner. In general, NCCI updates the ELR's and D-Ratios whenever rates are revised. The updated ELR's and D-Ratios should normally be reasonably accurate, even in cases where NCCI and regulatory officials have disagreements regarding the rate changes themselves. The areas of disagreement (e.g., trend, loss development, expense levels, profit margin) usually have little impact on ELR's and D-Ratios.
3. Changes in the risks insured: The population of insured risks may change over time. This can cause the average experience modification factor to change as well. For example, larger risks with lower than average experience modification factors may have a greater tendency to opt for self-insurance. Consequently, if there is a trend toward self-insurance and all else remains constant, the average experience modification factor for the remaining risks will rise. Other non-random changes in the characteristics of the population of insured risks may cause changes in the average experience modification factor as well.

In categories 1 and 2, above, the change in off-balance would distort the overall rate change if no adjustment were made. If such a change occurred in the experience period used in estimating trend, the trend estimate would be distorted and should be recalculated to eliminate this distortion. Ideally, the loss ratios used in calculating the trend factor would be adjusted to reflect the future (or at least a common set of) experience rating plan rules and formulas (category 1) or appropriate ELR's and D-Ratios (category 2). Where that approach is not practical, it may be possible to restate the loss ratios used in the trend calculation at manual rates. The latter approach (using loss ratios based on manual premiums) is more susceptible to distortion by a shift in the mix of business (see discussion of category 3., below), but should generally provide a reasonable estimate of trend.

If the change described in category 1 occurs during or after the experience period used in ratemaking (usually one policy year and one accident year), then an explicit adjustment should be made to the proposed manual rates, so that the change in average off-balance will not result in an overall premium level that is inappropriately high or low.

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If the situation described in category 2 affects the loss ratios in the experience period used in ratemaking, then those loss ratios should be adjusted to the approximate levels that would have occurred if appropriate ELR's and D-Ratios had been in effect in those periods. This would put the experience years on a basis more comparable with the prospective rating period, since appropriate ELR's and D-Ratios are presumably being proposed for the prospective rating period.

In category 3, above, the resulting change in off-balance represents a partial adjustment in standard premiums to reflect a larger change in loss costs. In effect, the experience rating calculations adjust the standard premiums so that the loss ratios used in ratemaking are affected less by the shift in mix of business than they would be if manual premiums were used in ratemaking. An analogy can be made to the classification rating system: a shift of business among classifications would cause the average classification differential (analogous to the average off-balance) to change, but would not distort the overall rate change. Experience rating does not fully reflect the change in the mix of business, because of the credibility factors, so it does not completely eliminate the change in loss ratios.

We do not consider a change in the ratemaking procedure to be needed when changes in off-balance occur as a result of the causes in category 3, for two reasons. First, it would rarely, if ever, be possible to measure the impact of such a change, separating it from random variations. Second, the trend factor automatically makes the appropriate adjustment to the projected loss ratios in cases where the change in mix of insureds occurs as a trend over a period of years.

B. Past NCCI Adjustments for Changes in Off-Balance

Category 1: Changes in the experience rating plan rules and/or calculations have occurred over the years. In some cases, NCCI has made an adjustment to manual rates to reflect the change in the average off-balance. Such an adjustment was made when NCCI expected the average off-balance to change due to a change in experience rating eligibility requirements. However, there have also been circumstances in which NCCI could reasonably expect a change in off-balance, but made no offsetting adjustment to manual rates.

For example, the calculation of ELR's described in Section IV of this report reflects a change in the trend removal factor that has been implemented within the past few years. Previously, in the calculation of ELR's, trend was removed from the manual rates to the

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point where the ELR's were equivalent, from a trend perspective, to the statistical plan data underlying the classification relativity calculation. However, the experience rating plan experience period was normally later by one to two years. Thus, in periods of upward trends, the ELR's were underestimated. NCCI recognized this in the late 1980's and corrected the ELR calculation to properly reflect trend to the experience rating plan experience period. When this change was implemented, however, no off-setting adjustment was made to the rates. The change in the ELR calculation increased the expected losses used in experience rating, causing a decrease in the average experience modification factor (if all else were constant). Consequently, manual rates should have been simultaneously adjusted upward to maintain the same premium level. In some states where there were significant delays in updating rates and ELR's (which would compound the shortfall in premiums resulting from the trend removal change), the new procedure for trend removal was implemented gradually over a period of years to mitigate this impact.

Because the Revised Experience Rating Plan (RERP) was not expected to change the average off-balance, no separate adjustments to rates were made when the RERP was implemented. Individual state data was used to test whether a change in off-balance resulted from implementation of the RERP. If a significant change in off-balance was observed in the test, then NCCI made a special adjustment to the ELR's in that state to eliminate this change (discussed in greater detail in Section IX).

The changes in the experience rating system recommended in other sections of this report may cause changes in the average off-balance. When changes of this type occur, adjustments should be made in the ratemaking procedure so that the proper overall premium level change is achieved.

Category 2: In some states there have not been regular updates of ELR's and D-Ratios due to long time lags between approved rate changes. This situation is commonly accompanied by a large rate increase indication by NCCI. Since the upward trends in loss ratios are not reflected in increased ELR's and adjusted D-Ratios, it can be expected that the average experience rating off-balance will rise over time in such a state until a rate change is approved and ELR's and D-Ratios are updated. As discussed earlier, this will cause two distortions in the ratemaking procedure if no adjustments are made. First, the trend rate will tend to be understated, because the standard premiums underlying the most recent policy years' loss ratios will reflect higher average off-balances, resulting in lower loss ratios. (Note: these lower loss ratios could cause the trend rate to be overstated in filings in later years if ELR's and D-Ratios are then updated regularly.) Second, the average off-balance reflected in the latest policy year and accident year loss ratios, which are used in calculating

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the overall rate change, will be higher than that expected for the period in which the proposed rates will be used, since ELR's and D-Ratios will be updated if the rates are revised. This too causes a tendency toward underestimation of rates. However, in this case the problem is not that the indicated premium level change is distorted but that the manual rates need to be increased by an even larger percentage in order to achieve the indicated premium level increase. This may be politically difficult, but it should be recognized that if no adjustment is made, the stated rate change will be greater than the actual premium level change. The stated rate change is the change that affects the risks that are too small to meet the eligibility requirements for experience rating. The reason such risks would need a larger rate increase is that, in effect, some increases would already have occurred on average for experience rated risks, because of the impact of their own experience on their rates, and this would have reduced the indicated overall rate change.

NCCI recognizes the potential for changes in off-balance when ELR's have become outdated. NCCI has sometimes, but not always, explicitly made adjustments to the ELR's that were otherwise calculated in order to reduce the changes in off-balance.

The special adjustments made by NCCI to ELR's in order to prevent or reduce large changes in off-balance are not the most accurate approach. If the new ELR's are known to be understated, the average experience modification factors will remain overstated. This preserves an inequity between experience rated risks and non-rated risks, as well as between large and small rated risks. It would be more accurate to allow the experience modification factors to decrease but to increase the manual rates (which, in turn, would affect the ELR's through the ELRF's) so that the correct overall premium change is achieved.

However, as noted previously, the bigger increases that would result for small risks may raise problems with public acceptance. In such cases, it may be appropriate to phase in the increases in ELR's and resulting decreases in average off-balance over time. However, it is important to keep track of the impact of this on average off-balances so that they do not result in a distorted picture of trends or loss ratios in subsequent filings.

C. Historical Trends in Off-Balances

Exhibit 5 shows the average experience rating modification factors for experience rated risks. On a countrywide average basis, the average modifications are reasonably close to

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1.000 and do not appear to exhibit a significant trend. On an individual state basis, there are some significant differences from 1.000 and some significant trends.

Exhibit 16 shows the average annual change in the average off-balance over two five year periods, 1983 through 1987, and 1986 through 1990. These average changes were calculated for each of the states where we have average modification factors in Exhibit 5, Sheet 1. In Exhibit 5, the average modification factors for individual states only include intrastate ratable risks. Using the premium data in Exhibits 14 and 15, we have calculated the percentage of total premium accounted for by ratable (both intrastate and interstate) risks in each state. The average off-balance was approximated in each state by adjusting the average intrastate experience modification factor to reflect the percentage of premium that is ratable.

This will be an accurate approximation only if the average interstate experience modification is the same as the average intrastate experience modification. There is evidence, as shown in Exhibit 5, Sheet 1, that on a countrywide basis the average intrastate experience modifications are generally lower than the average intrastate experience modifications. However, since we are interested in examining changes in the average experience modification factors over time, we consider it unlikely that this approximation distorts the results observed.

Exhibit 16 shows that trends in average off-balance appear in many states. The earlier trend period, 1983 through 1987, shows that 10 out of 32 states had upward trends at the 5% significance level and no states had downward trends at the 5% level. If the data were truly random, we would expect to find approximately equal numbers of upward and downward trends, and only about 1 or 2 states with significant trends. The later trend period, 1986 through 1990, shows that 7 out of 33 states had significant trends; 4 of the 7 had upward trends and 3 had downward trends. While the numbers of upward and downward trends are about equal for this later period, there are still more states with significant trends than would normally result if the off-balances were truly random. Thus, there is statistical evidence of non-random influences on average experience rating off-balances (as could be expected based on the discussion in Section XII.B.).

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D. Conclusions and Recommendations

Standard NCCI methodology does not address changes in experience rating off-balance, although adjustments have been made by NCCI in some cases. The implicit expectation is that if rate revisions are made on a timely basis (regardless of whether the full amount of the requested rate revision is granted), then off-balance movements should be relatively small and have insignificant effects on overall rate levels. As Exhibit 5 demonstrates, however, a number of states have experienced significant off-balance movements.

We recommend that standard NCCI methodology identify off-balance levels and movements during the experience periods used for trending and rate level indications. An attempt should be made to determine the cause of significant off-balance swings whenever they are seen.

Proper action in response to significant off-balance swings would be a function of the cause identified. We would recommend that adjustments not be made when changes are attributed to a change in the mix of risks which are insured. The situations in which we would often expect that adjustments would be appropriate include:

1. a change in the experience rating plan itself (e.g., rules, such as eligibility requirements, or formulas such as those for calculating ELR's) or
2. delays in updating ELR's and D-ratios, due to prior delays in the approval of rate changes.

In these cases, some distortion could be expected to occur (if no adjustments are made) in the overall rate change indication, through misestimation of the trend factor and/or through an inconsistency between the average off-balance underlying the latest policy year and accident year loss ratios and that likely in the future period for which rates are being estimated.

One or both of the above situations have occurred in recent years in many states. The trends observed in Exhibit 16 suggest that such situations have in fact caused distortions in several states. However, the data underlying Exhibit 16 excludes interstate risks, because their effect on individual state off-balances has not been compiled by NCCI. Interstate risks account for over half of the total premium volume.

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We have recommended certain adjustments (Section XII.A) in the ratemaking procedure to eliminate these distortions. However, to implement those adjustments, it is necessary to develop data on the average off-balances on an individual state basis, including interstate risks.

We recommend that NCCI develop data on average off-balances on an individual state basis, including interstate risks, for all policy years and calendar/accident years used in a rate filing (including those underlying the trend calculation). This data is essential both for monitoring average off-balances (to help detect distortions) and for adjustments to correct for the distortions.

NCCI has sometimes included appropriate adjustments in its rate analysis, but often has not. In some cases, the adjustments made by NCCI were designed to reduce or eliminate a change in average off-balance (by adjusting the ELR's), while it would have been more accurate to allow the off-balance to change and to make an offsetting adjustment to the manual rates. If an adjustment is made to the ELR's in order to mitigate a change in average off-balance that would otherwise occur, this should be disclosed in the filing. It should be recognized that this type of adjustment represents a choice of stability in place of accuracy. Also, it is important to keep track of such adjustments and take them into account in subsequent rate analyses; if this is not done, they can result in a distorted view of trends or of experience loss ratios in subsequent filings.

EXPERIENCE RATING PLAN

EXHIBITS



EXPERIENCE RATING PLAN

EXPERIENCE RATING PLAN

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EXPERIENCE RATING PLAN

SAMPLE CALCULATION OF ELR FACTORS¹

	Policy Periods			Total/ Average
	<u>5/86 - 4/87</u>	<u>5/87 - 4/88</u>	<u>5/88 - 4/89</u>	
1. Proposed Target Cost (Loss and LAE) Ratio				.723
2. Proposed Loss Adjustment Expense Factor				1.120
3. Expense and Profit Removal Factor (1) / (2)				.646
4. Financial Data Loss Ratio (midpoint 5/1/91) ²				.905
5. Statistical Plan Loss Ratio (at midpoint 2/1/86) ³				.657
6. Statistical Plan Loss Ratio Trend Factor from 2/1/86 to 5/1/88 ⁴				1.158
7. Trended Statistical Plan Loss Ratio				.761
8. Trend Removal Factor (7) / (4)				.841
9. Law Amendment Removal Factors ⁵	.988	.995	1.000	XXX
10. Loss Development Removal Factors ⁶	.907	.859	.783	XXX
11. Law Amendment and Development Removal Factors (9) x (10)	.896	.855	.783	.845 ⁷
12. Off Balance Adjustment				1.01
13. ELR Factor Before Loss Limitation ((3) x (8)) x ((11) / (12))				.455
	Hazard Groups			
	<u>I</u>	<u>II</u>	<u>III</u>	<u>IV</u>
14. Loss Limitation Factors ⁸	.852	.818	.735	.655
15. ELR Factors (13) x (14)	.387	.371	.334	.297

¹Calculation adapted from NCCI workpapers concerning 5/1/90 proposed Nebraska filing.

²Premiums adjusted to 9/1/89 rate level, losses adjusted to 7/1/88 benefit level, developed to ultimate and trended to midpoint of proposed rates. Includes offset for change in minimum premium multiplier.

³Premiums adjusted to 9/1/89 rate level, losses adjusted to 7/1/88 benefit level and developed to ultimate.

⁴Midpoint of experience rating plan experience period.

⁵Inverse of weighted average of law amendment factors. Losses by injury type used as weights.

⁶Inverse of weighted case incurred development factors to ultimate. Development factors are those used in pure premium exhibits excluding the adjustment to policy year aggregate level. Weights are losses by serious, non-serious, and medical, after adjustment to 7/1/88 benefit level.

⁷Unweighted Average.

⁸From Exhibit 2.

CALCULATION OF LOSS LIMITATION FACTOR¹

	Hazard Group			
	<u>I</u>	<u>II</u>	<u>III</u>	<u>IV</u>
1. 10% of Proposed State Reference Point (Loss Limitation)	49,000	49,000	49,000	49,000
2. Average Fatal Cost ²	119,737	141,392	168,856	191,139
3. Ratio to Average for Fatal (1) / (2)	.41	.35	.29	.26
4. Excess Ratio for Fatal ³ (From Harwayne tables)	.683	.742	.801	.830
5. Average Perm Total Cost ²	184,818	216,698	224,500	282,912
6. Ratio to Average for Perm Total (1) / (5)	.27	.23	.22	.17
7. Excess Ratio for Perm Total ³ (From Harwayne Tables)	.821	.859	.868	.911
8. Average Major Perm Partial Cost ²	59,877	61,996	69,415	75,375
9. Ratio to Average for Major Perm Partial (1) / (8)	.82	.79	.71	.65
10. Excess Ratio for Perm Partial ³ (From Harwayne Tables)	.320	.334	.376	.411
11. (A) Fatal Weight Factor	.019	.028	.059	.115
(B) Perm Total Weight Factor	.024	.034	.043	.060
(C) Major P.P. Weight Factor	.361	.396	.481	.475
12. Weighted Average Excess Ratio	.148	.182	.265	.345
13. Loss Limitation Factor 1.000 - (12)	.852	.818	.735	.655

¹Calculation adapted from NCCI workpapers concerning 5/1/90 proposed Nebraska rate filing.

²The state average cost per case for all hazard groups combined is adjusted for each hazard group using countrywide differentials based on the latest 1st, 2nd, and 3rd reports of Statistical Plan Data.

³Excess ratios are the proportion of total (indemnity and medical) losses in excess of the loss limitation (1).

PRIOR EXPERIENCE RATING PLAN - LOSS LIMITATION FACTORS ¹				
STATE	HAZARD GROUPS			
	I	II	III	IV
Predicted Loss Limitation Factors				
Florida	.963	.953	.934	.901
Maine	.965	.957	.938	.912
Nebraska	.976	.966	.944	.906
Utah	.978	.970	.946	.908
Actual Loss Limitation Factors				
Florida	.930	.921	.949	.776
Maine	1.00	.973	.930	.761
Nebraska	1.00	.970	.922	.855
Utah	1.00	.889	.936	.862
REVISED EXPERIENCE RATING PLAN - LOSS LIMITATION FACTORS				
STATE	HAZARD GROUPS			
	I	II	III	IV
Predicted Loss Limitation Factors				
Florida	.835	.812	.746	.684
Maine	.891	.876	.830	.782
Nebraska ²	.852	.818	.735	.655
Utah	.876	.851	.770	.693
Actual Loss Limitation Factors				
Florida	.866	.832	.836	.672
Maine	.984	.938	.858	.652
Nebraska	1.00	.874	.808	.621
Utah	.809	.812	.808	.683

¹ Loss limitation factors are the proportion of total losses that remain after the impact of loss limitations. They are used in the calculation of ELR factors (Exhibit 2).

²Exhibit 2.

CALCULATION OF DISCOUNT RATIO FACTORS¹

	(A) <u>Serious</u>	(B) <u>Non-Serious</u>	(C) <u>Medical</u>	(D) <u>Total</u>
1. Total Indemnity Losses ²	20,203,556	15,563,631	XXX	XXX
2. Total Medical Losses ²	11,128,455	15,578,048	6,229,082	32,935,585
3. Total Losses (1) + (2)	31,332,011	31,141,679	6,229,082	68,702,772
4. Total Primary Losses ³	2,639,782	15,875,150	5,900,705	XXX
5. Estimated Indemnity Primary (4) x ((1) / (3))	1,702,659	7,937,575	XXX	XXX
6. Estimated Medical Primary (4) - (5)	937,123	7,937,575	5,900,705	14,775,403
7. Primary for D-Ratios A & B = (5), C = Sum of (6)	1,702,659	7,937,575	14,775,403	XXX
8. Total Losses for D-Ratios A & B = (1), C = (2D)	20,203,556	15,563,631	32,935,585	68,702,772
9. First Report Partial D-Ratios (7) / (8)	.084	.510	.449	XXX
10. First Report Loss Distribution (8) / Sum of (8)	.294	.227	.479	1.000
11. Ultimate Report Loss Distribution ⁴	.406	.165	.429	1.000
12. Final D-Ratio Factors (9) x (10) / (11)	.061	.702	.501	XXX

¹Calculation adapted from NCCI workpapers concerning 5/1/90 proposed Nebraska filing.

²Source document is Grand Total NC-235 excluding stevedoring.

³Source document is loss study program.

⁴From pure premium exhibit checksheet adjusted by rate factors.

AVERAGE EXPERIENCE RATING MODIFICATIONS FOR RATABLE RISKS¹
(Excluding Self-Insured Risks 1987-1990)²

<u>STATE</u>	<u>1990</u>	<u>1989</u>	<u>1988</u>	<u>1987</u>	<u>1986</u>	<u>1985</u>	<u>1984</u>	<u>1983</u>
Alabama	1.041	1.059	1.001	1.011	1.039	1.037	1.031	1.005
Arizona	.987	.988	.965	.976	1.002	.992	.895	.870
Arkansas	1.091	1.063	1.056	1.037	1.047	1.022	1.000	.978
Colorado	1.026	1.014	1.029	1.003	.991	1.060	1.056	1.072
Connecticut	1.010	1.029	1.043	1.040	1.034	1.036	1.032	1.041
District of Columbia	1.066	1.033	1.050	1.106	1.103	1.095	1.114	1.039
Florida	.970	.935	.951	.972	.995	.987	.969	.961
Georgia	1.015	.953	.947	.993	1.007	1.016	.997	1.005
Idaho	.972	.969	.976	.975	1.035	1.021	.950	.964
Illinois	.980	.987	.990	1.015	1.020	.999	.973	1.027
Indiana	1.023	.998	.991	1.007	1.008	1.000	.991	.991
Iowa	1.056	1.077	1.071	1.050	1.028	1.023	1.021	1.009
Kansas	1.035	1.012	1.046	1.050	1.044	1.019	.990	.996
Kentucky	1.053	1.042	1.014	.991	.981	.960	1.018	.954
Louisiana	1.119	1.117	1.131	1.133	1.130	1.073	1.055	1.036
Maine	1.197	1.187	1.182	1.496	1.195	1.206	1.167	1.110
Maryland	.958	.936	.941	.965	1.015	1.040	1.011	1.010
Mississippi	1.035	1.027	1.002	1.047	1.022	1.004	.994	1.000
Missouri	1.056	1.063	1.033	1.015	1.032	1.013	.997	.951
Montana	.980	1.000	1.017	1.032	1.002	.995	.986	.980
Nebraska	1.089	1.048	1.025	1.020	1.016	1.012	1.013	1.023
New Hampshire	1.001	1.010	1.022	1.037	1.058	1.080	1.045	1.027
New Mexico	1.077	1.056	1.029	1.092	1.081	1.034	1.007	.973
Oklahoma	1.074	1.084	1.150	1.164	1.124	1.170	1.004	.922
Oregon	.940	.963	1.006	1.036	1.013	1.007	.970	.980
Rhode Island	1.058	1.056	1.067	1.118	1.093	1.062	1.049	1.056
South Carolina	1.039	1.035	1.028	1.035	1.030	.957	.960	.984
South Dakota	1.093	1.095	1.056	1.035	1.025	1.046	1.027	1.022
Tennessee	1.011	1.016	.993	1.006	.741	.808	.750	.774
Utah	.990	.977	.970	.975	.942	.958	.900	.989
Vermont	1.014	.996	1.042	1.051	1.019	1.013	1.021	.992
Virginia	.996	.983	.977	.979	1.021	1.021	1.024	XXX
Hawaii	1.039	.959	.955	.981	1.019	1.051	.996	.996
Alaska	.958	.971	.972	.936	.952	.956	.915	.873
Intrastate³	1.010	1.003	1.007	1.024	1.020	1.018	.995	.946
Interstate³	.989	.950	.978	.988				
Countrywide⁴	.997	.970	.989	1.002				

¹ Ratable risks are those risks with experience modification factors. Note that 1986 and prior may include self-insured risks; 1987 and subsequent exclude self-insured risks.

² Sheet 2 of this exhibit shows the average factors before excluding self-insured Risks for 1983 to 1989. Removal of Self-Insured risks had a big impact for Tennessee. For the remaining states, the impact appears to be minor relative to the normal year to year fluctuations.

³ 1987 and subsequent weighted by expected losses; 1986 and prior weighted by premiums.

⁴ Intrastate and Interstate weighted by expected losses.

AVERAGE EXPERIENCE RATING MODIFICATIONS FOR RATABLE RISKS¹
(Including Some Self-Insured Risks)

<u>STATE</u>	<u>1989</u>	<u>1988</u>	<u>1987</u>	<u>1986</u>	<u>1985</u>	<u>1984</u>	<u>1983</u>
Alabama	1.057	.999	1.011	1.039	1.037	1.031	1.005
Arizona	.988	.965	.976	1.002	.992	.895	.870
Arkansas	1.061	1.056	1.038	1.047	1.022	1.000	.978
Colorado	.975	1.021	1.012	.991	1.060	1.056	1.072
Connecticut	1.039	1.052	1.047	1.034	1.036	1.032	1.041
District of Columbia	1.033	1.050	1.106	1.103	1.095	1.114	1.039
Florida	.935	.954	.973	.995	.987	.969	.961
Georgia	.934	.937	.976	1.007	1.016	.997	1.005
Idaho	.969	.976	.975	1.035	1.021	.950	.964
Illinois	.990	.990	1.015	1.020	.999	.973	1.027
Indiana	.998	.991	1.007	1.008	1.000	.991	.991
Iowa	1.076	1.068	1.050	1.028	1.023	1.021	1.009
Kansas	1.019	1.052	1.053	1.044	1.019	.990	.996
Kentucky	1.024	.996	.977	.981	.960	1.018	.954
Louisiana	1.098	1.112	1.124	1.130	1.073	1.055	1.036
Maine	1.186	1.249	1.474	1.195	1.206	1.167	1.110
Maryland	.934	.941	.964	1.015	1.040	1.011	1.010
Mississippi	1.027	1.001	1.046	1.022	1.004	.994	1.000
Missouri	1.059	1.031	1.007	1.032	1.013	.997	.951
Montana	1.000	1.017	1.032	1.002	.995	.986	.980
Nebraska	1.049	1.025	1.020	1.016	1.012	1.013	1.023
New Hampshire	1.010	1.024	1.036	1.058	1.080	1.045	1.027
New Mexico	1.050	1.039	1.105	1.081	1.034	1.007	.973
Oklahoma	1.085	1.150	1.157	1.124	1.170	1.004	.922
Oregon	.963	1.004	1.036	1.013	1.007	.970	.980
Rhode Island	1.056	1.067	1.118	1.093	1.062	1.049	1.056
South Carolina	1.035	1.028	1.035	1.030	.957	.960	.984
South Dakota	1.090	1.056	1.035	1.025	1.046	1.027	1.022
Tennessee	.881	.841	.811	.741	.808	.750	.774
Utah	.962	.984	1.013	.942	.958	.900	.989
Vermont	.996	1.042	1.052	1.019	1.013	1.021	.992
Virginia	.983	.977	.979	1.021	1.021	1.024	XXX
Hawaii	.959	.953	.981	1.019	1.051	.996	.996
Alaska	.971	.975	.936	.952	.956	.915	.873
Intrastate²	1.000	1.003	1.018	1.020	1.018	.995	.946

¹ Ratable risks are those risks with experience modification factors.

² Weighted by premiums.

EXPERIENCE RATING PLAN - RISK SIZE RANGES

State	Size Range	# of Risks	Average E [Loss] Per Risk Per Year
Florida (3 Years)	1	2,504	2,955
	2	2,504	4,643
	3	2,504	7,106
	4	2,504	12,275
	5	2,504	48,539
	ALL	12,520	15,103
Colorado (3 Years)	1	2,130	2,022
	2	2,130	3,232
	3	2,130	4,863
	4	2,129	8,805
	5	2,129	57,159
	ALL	10,648	15,213
Nebraska (3 Years)	1	584	1,653
	2	584	2,409
	3	584	3,491
	4	585	5,655
	5	585	16,813
	ALL	2,922	6,008
Utah (3 Years)	1	606	2,039
	2	606	3,078
	3	606	4,375
	4	606	7,144
	5	606	29,438
	ALL	3,030	9,215
Maine (3 Years)	1	491	1,967
	2	491	3,151
	3	491	4,847
	4	491	8,700
	5	491	31,550
	ALL	2,455	10,043
Florida (5 Years)	1	1,455	2,890
	2	1,455	4,477
	3	1,455	6,776
	4	1,455	11,890
	5	1,455	48,172
	ALL	7,275	14,841

PERFORMANCE OF EXPERIENCE RATING PLANS
(By Loss Ratio)

Future Period - Manual Loss Ratios and Modified Loss Ratios ¹					
Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	0.684	0.852	0.931	0.960	1.027
Next 20%	0.780	0.902	0.951	0.968	0.984
Middle 20%	0.968	1.024	1.045	1.045	1.042
Next 20%	1.117	1.062	1.040	1.023	1.009
Last 20%	1.396	1.055	0.983	0.968	0.957
All Groups	1.000	0.995	0.995	0.993	0.997
Between Quintile-Squared Error of Average Loss Ratios ⁶					
Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	999	219	48	16	7
Next 20%	484	96	24	10	3
Middle 20%	10	6	20	20	18
Next 20%	137	38	16	5	1
Last 20%	1,568	30	3	10	18
Total	3,198	389	111	61	47
Within Quintile - Mean Squared Errors of Individual Risk Loss Ratios ⁷					
Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	3.493	3.401	3.391	3.388	3.385
Next 20%	2.667	2.620	2.614	2.614	2.610
Middle 20%	3.976	3.963	3.966	3.964	3.957
Next 20%	5.754	5.726	5.717	5.713	5.712
Last 20%	7.043	6.690	6.633	6.619	6.602
All Groups	4.637	4.527	4.511	4.506	4.499
Notes:					
<ol style="list-style-type: none"> Subsequent Period Loss ratios are shown on a manual basis and after application of the experience modification factors calculated with several different formulas. Quintiles are based on the loss ratios of the experience period at manual rates. Manual refers to the loss ratio of the subsequent period on a manual rate basis. This is the NCCI Revised Plan with the credibility formulas re-calculated to minimize the sum of squared differences between modified loss ratios and 1.000. This is the NCCI Revised Plan adjusted to apply a primary experience modification to expected excess losses in the rating formula. Credibilities have been optimized to reflect this new formula. The sum of squared differences between the quintile loss ratios (first table) and 1.000 multiplied by 10,000. The mean squared difference between an individual risk's subsequent loss ratio at manual rates and its experience modification factor. 					

PERFORMANCE OF EXPERIENCE RATING PLANS
(By State)

Future Period - Manual Loss Ratios and Modified Loss Ratios ¹					
State	Manual ²	PERP	RERP	Optimized RERP ³	Alternate Plan ⁴
Florida	1.000	1.008	1.005	1.005	1.007
Maine	1.000	0.965	0.977	0.972	0.977
Nebraska	0.999	0.989	0.985	0.983	0.988
Utah	0.996	0.982	0.976	0.973	0.980
All States	1.000	0.995	0.995	0.993	0.997
Between Hazard Groups - Squared Error of Average Loss Ratios ⁵					
State	Manual ²	PERP	RERP	Optimized RERP ³	Alternate Plan ⁴
Florida	0	1	0	0	0
Maine	0	12	5	8	5
Nebraska	0	1	2	3	1
Utah	0	3	6	7	4
Total	0	17	13	18	10
Within Hazard Group - Mean Squared Errors of Individual Risk Loss Ratios ⁶					
State	Manual ²	PERP	RERP	Optimized RERP ³	Alternate Plan ⁴
Florida	5.317	5.204	5.177	5.169	5.160
Maine	3.104	2.960	2.964	2.959	2.963
Nebraska	5.327	5.283	5.287	5.284	5.282
Utah	2.679	2.613	2.603	2.621	2.596
All States	4.637	4.527	4.511	4.506	4.499
Notes:					
<ol style="list-style-type: none"> Subsequent Period Loss ratios are shown on a manual basis and after application of the experience modification factors calculated with several different formulas. Manual refers to the loss ratio of the subsequent period on a manual rate basis. This is the NCCI Revised Plan with the credibility formulas re-calculated to minimize the sum of squared differences between modified loss ratios and 1.000. This is the NCCI Revised Plan adjusted to apply a primary experience modification to expected excess losses in the rating formula. Credibilities have been optimized to reflect this new formula. The sum of squared differences between the quintile loss ratios (first table) and 1.000, multiplied by 10,000. The mean squared difference between an individual risk's subsequent period loss ratio at manual rates and its experience modification factor. 					

PERFORMANCE OF EXPERIENCE RATING PLANS
(By Risk Size)

Future Period - Manual Loss Ratios and Modified Loss Ratios ¹					
Risk Size ⁷	Manual ²	PERP	RERP	Optimized RERP ³	Alternate Plan ⁴
2,501 to 5,000	0.932	0.927	0.922	0.918	0.924
5,001 to 10,000	0.995	0.993	0.989	0.985	0.987
10,001 to 20,000	1.008	1.005	1.002	1.001	1.003
20,001 to 50,000	1.042	1.032	1.027	1.026	1.026
50,001 to 100,000	0.996	0.984	0.983	0.981	0.982
100,001 to 250K	1.025	1.028	1.028	1.028	1.033
250,001 to 500K	0.908	0.931	0.934	0.936	0.945
Over 500,000	0.935	0.886	0.917	0.916	0.928
All Groups	1.000	0.995	0.995	0.993	0.997
Between Sizes - Squared Error of Average Loss Ratios ⁵					
Risk Size ⁷	Manual ²	PERP	RERP	Optimized RERP ³	Alternate Plan ⁴
2,501 to 5,000	46	53	61	67	58
5,001 to 10,000	0	0	1	2	2
10,001 to 20,000	1	0	0	0	0
20,001 to 50,000	18	10	7	7	7
50,001 to 100,000	0	3	3	4	3
100,001 to 250K	6	8	8	8	11
250,001 to 500K	85	48	44	41	30
Over 500,000	42	130	69	71	52
Total	198	252	193	200	163

PERFORMANCE OF EXPERIENCE RATING PLANS
(By Risk Size)

Within Sizes - Mean Squared Errors of Individual Risk Loss Ratios ⁶					
Risk Size ⁷	Manual ²	PERP	RERP	Optimized RERP ³	Alternate Plan ⁴
2,501 to 5,000	10.486	10.348	10.218	10.202	10.172
5,001 to 10,000	13.245	13.171	13.142	13.121	13.123
10,001 to 20,000	6.587	6.499	6.476	6.476	6.482
20,001 to 50,000	4.128	4.008	3.992	3.983	3.965
50,001 to 100,000	2.280	2.175	2.161	2.161	2.150
100,001 to 250K	3.858	3.775	3.767	3.768	3.767
250,001 to 500K	0.402	0.375	0.367	0.365	0.359
Over 500,000	0.555	0.129	0.154	0.131	0.134
All Groups	4.637	4.527	4.511	4.506	4.499

Notes:

1. Subsequent Period Loss ratios are shown on a manual basis and after application of the experience modification factors calculated with several different formulas.
2. Manual refers to the loss ratio of the subsequent period on a manual rate basis.
3. This is the NCCI Revised Plan with the credibility formulas re-calculated to minimize the sum of squared differences between modified loss ratios and 1.000.
4. This is the NCCI Revised Plan adjusted to apply a primary experience modification to expected excess losses in the rating formula. Credibilities have been optimized to reflect this new formula.
5. The sum of squared differences between the quintile loss ratios (first table) and 1.000, multiplied by 10,000.
6. The mean squared difference between an individual risk's subsequent period loss ratio at manual rates and its experience modification factor.
7. Risk size is measured by expected losses (three years).

**PERFORMANCE OF EXPERIENCE RATING PLANS
(By Loss Ratio)
EXPECTED LOSS SIZE GROUP \$2,501 TO \$5,000**

Future Period - Manual Loss Ratios and Modified Loss Ratios¹

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	.608	.650	.708	.783	.746
Next 20%	.622	.664	.721	.786	.755
Middle 20%	.667	.705	.754	.805	.776
Next 20%	1.310	1.328	1.346	1.336	1.334
Last 20%	1.421	1.162	.966	.839	.909
All Groups	.932	.927	.922	.918	.924

Between Quintile-Squared Error of Average Loss Ratios⁶

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	1,537	1,225	853	471	645
Next 20%	1,429	1,129	778	458	600
Middle 20%	1,109	870	605	380	502
Next 20%	961	1,076	1,197	1,129	1,116
Last 20%	1,772	262	12	259	83
Total	6,808	4,562	3,445	2,697	2,946

Within Quintile - Mean Squared Errors of Individual Risk Loss Ratios⁷

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	5.891	5.838	5.789	5.743	5.764
Next 20%	4.423	4.379	4.337	4.311	4.321
Middle 20%	7.225	7.190	7.156	7.146	7.149
Next 20%	14.042	14.035	14.031	14.012	14.013
Last 20%	20.670	20.116	19.590	19.611	19.424
All Groups	10.486	10.348	10.218	10.202	10.172

Notes:

1. Subsequent Period Loss ratios are shown on a manual basis and after application of the experience modification factors calculated with several different formulas.
2. Quintiles are based on the loss ratios of the experience period at manual rates.
3. Manual refers to the loss ratio of the subsequent period on a manual rate basis.
4. This is the NCCI Revised Plan with the credibility formulas re-calculated to minimize the sum of squared differences between modified loss ratios and 1.000.
5. This is the NCCI Revised Plan adjusted to apply a primary experience modification to expected excess losses in the rating formula. Credibilities have been optimized to reflect this new formula.
6. The sum of squared differences between the quintile loss ratios (first table) and 1.000 multiplied by 10,000.
7. The mean squared difference between an individual risk's subsequent loss ratio at manual rates and its experience modification factor.

**PERFORMANCE OF EXPERIENCE RATING PLANS
(By Loss Ratio)
EXPECTED LOSS SIZE GROUP \$5,001 TO \$10,000**

Future Period - Manual Loss Ratios and Modified Loss Ratios ¹					
Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	.767	.851	.955	1.034	1.012
Next 20%	.754	.832	.923	.988	.966
Middle 20%	.926	.994	1.069	1.109	1.090
Next 20%	1.161	1.152	1.130	1.087	1.090
Last 20%	1.336	1.071	.903	.838	.866
All Groups	.995	.993	.989	.985	.987
Between Quintile-Squared Error of Average Loss Ratios ⁶					
Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	543	222	20	12	1
Next 20%	605	282	59	1	12
Middle 20%	55	0	48	119	81
Next 20%	259	231	169	76	81
Last 20%	1,129	50	94	262	180
Total	2,591	785	390	470	355
Within Quintile - Mean Squared Errors of Individual Risk Loss Ratios ⁷					
Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	13.035	12.992	12.972	12.972	12.972
Next 20%	10.215	10.179	10.160	10.158	10.154
Middle 20%	11.937	11.935	11.943	11.952	11.946
Next 20%	15.347	15.331	15.322	15.310	15.304
Last 20%	15.480	15.219	15.117	15.024	15.048
All Groups	13.245	13.171	13.141	13.121	13.122
Notes:					
<ol style="list-style-type: none"> Subsequent Period Loss ratios are shown on a manual basis and after application of the experience modification factors calculated with several different formulas. Quintiles are based on the loss ratios of the experience period at manual rates. Manual refers to the loss ratio of the subsequent period on a manual rate basis. This is the NCCI Revised Plan with the credibility formulas re-calculated to minimize the sum of squared differences between modified loss ratios and 1.000. This is the NCCI Revised Plan adjusted to apply a primary experience modification to expected excess losses in the rating formula. Credibilities have been optimized to reflect this new formula. The sum of squared differences between the quintile loss ratios (first table) and 1.000 multiplied by 10,000. The mean squared difference between an individual risk's subsequent loss ratio at manual rates and its experience modification factor. 					

**PERFORMANCE OF EXPERIENCE RATING PLANS
(By Loss Ratio)
EXPECTED LOSS SIZE GROUP \$10,001 TO \$20,000**

Future Period - Manual Loss Ratios and Modified Loss Ratios¹

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	.712	.831	.946	.998	1.037
Next 20%	.772	.879	.976	1.011	1.035
Middle 20%	.959	1.031	1.084	1.087	1.092
Next 20%	1.124	1.068	1.014	.972	.955
Last 20%	1.437	1.126	.985	.971	.961
All Groups	1.008	1.005	1.002	1.001	1.003

Between Quintile-Squared Error of Average Loss Ratios⁶

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	829	286	29	0	14
Next 20%	520	146	6	1	12
Middle 20%	17	10	71	76	85
Next 20%	154	46	2	8	20
Last 20%	1,910	159	2	8	15
Total	3,430	647	110	93	146

Within Quintile - Mean Squared Errors of Individual Risk Loss Ratios⁷

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	5.354	5.298	5.279	5.276	5.276
Next 20%	4.509	4.470	4.461	4.465	4.460
Middle 20%	7.342	7.337	7.342	7.342	7.341
Next 20%	6.859	6.850	6.856	6.864	6.870
Last 20%	8.749	8.428	8.331	8.322	8.353
All Groups	6.587	6.499	6.476	6.476	6.482

Notes:

1. Subsequent Period Loss ratios are shown on a manual basis and after application of the experience modification factors calculated with several different formulas.
2. Quintiles are based on the loss ratios of the experience period at manual rates.
3. Manual refers to the loss ratio of the subsequent period on a manual rate basis.
4. This is the NCCI Revised Plan with the credibility formulas re-calculated to minimize the sum of squared differences between modified loss ratios and 1.000.
5. This is the NCCI Revised Plan adjusted to apply a primary experience modification to expected excess losses in the rating formula. Credibilities have been optimized to reflect this new formula.
6. The sum of squared differences between the quintile loss ratios (first table) and 1.000 multiplied by 10,000.
7. The mean squared difference between an individual risk's subsequent loss ratio at manual rates and its experience modification factor.

PERFORMANCE OF EXPERIENCE RATING PLANS
(By Loss Ratio)
EXPECTED LOSS SIZE GROUP \$20,001 TO \$50,000

Future Period - Manual Loss Ratios and Modified Loss Ratios¹

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	.627	.772	.872	.894	.998
Next 20%	.816	.943	1.013	1.015	1.064
Middle 20%	1.087	1.136	1.152	1.132	1.126
Next 20%	1.217	1.131	1.103	1.084	1.049
Last 20%	1.387	1.070	.966	.973	.940
All Groups	1.042	1.032	1.027	1.026	1.026

Between Quintile-Squared Error of Average Loss Ratios⁶

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	1,391	520	164	112	0
Next 20%	339	32	2	2	41
Middle 20%	76	185	231	174	159
Next 20%	471	172	106	71	24
Last 20%	1,498	49	12	7	36
Total	3,775	958	515	366	260

Within Quintile - Mean Squared Errors of Individual Risk Loss Ratios⁷

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	2.987	2.885	2.861	2.860	2.846
Next 20%	2.412	2.375	2.371	2.370	2.374
Middle 20%	3.789	3.793	3.797	3.794	3.790
Next 20%	5.269	5.200	5.173	5.161	5.143
Last 20%	5.849	5.475	5.442	5.421	5.363
All Groups	4.128	4.008	3.991	3.983	3.965

Notes:

1. Subsequent Period Loss ratios are shown on a manual basis and after application of the experience modification factors calculated with several different formulas.
2. Quintiles are based on the loss ratios of the experience period at manual rates.
3. Manual refers to the loss ratio of the subsequent period on a manual rate basis.
4. This is the NCCI Revised Plan with the credibility formulas re-calculated to minimize the sum of squared differences between modified loss ratios and 1.000.
5. This is the NCCI Revised Plan adjusted to apply a primary experience modification to expected excess losses in the rating formula. Credibilities have been optimized to reflect this new formula.
6. The sum of squared differences between the quintile loss ratios (first table) and 1.000 multiplied by 10,000.
7. The mean squared difference between an individual risk's subsequent loss ratio at manual rates and its experience modification factor.

PERFORMANCE OF EXPERIENCE RATING PLANS
(By Loss Ratio)
EXPECTED LOSS SIZE GROUP \$50,001 TO \$100,000

Future Period - Manual Loss Ratios and Modified Loss Ratios¹

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	.692	.878	.957	.958	1.086
Next 20%	.814	.915	.950	.937	.956
Middle 20%	.924	.940	.951	.941	.931
Next 20%	1.093	1.016	1.002	.999	.975
Last 20%	1.424	1.095	1.022	1.033	.992
All Groups	.996	.984	.983	.981	.982

Between Quintile-Squared Error of Average Loss Ratios⁶

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	949	149	18	18	74
Next 20%	346	72	25	40	19
Middle 20%	58	36	24	35	48
Next 20%	86	3	0	0	6
Last 20%	1,798	90	5	11	1
Total	3,237	350	72	104	148

Within Quintile - Mean Squared Errors of Individual Risk Loss Ratios⁷

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	1.005	.917	.912	.913	.899
Next 20%	1.038	1.003	1.000	1.003	1.002
Middle 20%	2.086	2.072	2.068	2.068	2.068
Next 20%	3.503	3.450	3.445	3.439	3.436
Last 20%	3.639	3.316	3.264	3.264	3.233
All Groups	2.280	2.175	2.161	2.160	2.150

Notes:

1. Subsequent Period Loss ratios are shown on a manual basis and after application of the experience modification factors calculated with several different formulas.
2. Quintiles are based on the loss ratios of the experience period at manual rates.
3. Manual refers to the loss ratio of the subsequent period on a manual rate basis.
4. This is the NCCI Revised Plan with the credibility formulas re-calculated to minimize the sum of squared differences between modified loss ratios and 1.000.
5. This is the NCCI Revised Plan adjusted to apply a primary experience modification to expected excess losses in the rating formula. Credibilities have been optimized to reflect this new formula.
6. The sum of squared differences between the quintile loss ratios (first table) and 1.000 multiplied by 10,000.
7. The mean squared difference between an individual risk's subsequent loss ratio at manual rates and its experience modification factor.

PERFORMANCE OF EXPERIENCE RATING PLANS
(By Loss Ratio)
EXPECTED LOSS SIZE GROUP \$100,001 TO \$250,000

Future Period - Manual Loss Ratios and Modified Loss Ratios¹

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	.798	1.042	1.109	1.108	1.207
Next 20%	.731	.849	.877	.873	.895
Middle 20%	1.025	1.068	1.080	1.077	1.078
Next 20%	1.126	1.071	1.057	1.058	1.053
Last 20%	1.423	1.072	1.020	1.024	.994
All Groups	1.025	1.028	1.028	1.028	1.033

Between Quintile-Squared Error of Average Loss Ratios⁶

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	408	18	119	117	428
Next 20%	724	228	151	161	110
Middle 20%	6	46	64	59	61
Next 20%	159	50	32	34	28
Last 20%	1,789	52	4	6	0
Total	3,086	394	370	377	627

Within Quintile - Mean Squared Errors of Individual Risk Loss Ratios⁷

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	1.004	.952	.959	.959	.972
Next 20%	.707	.647	.641	.641	.637
Middle 20%	1.163	1.127	1.131	1.124	1.093
Next 20%	5.604	5.604	5.594	5.594	5.607
Last 20%	10.622	10.347	10.315	10.328	10.332
All Groups	3.858	3.775	3.767	3.768	3.767

Notes:

1. Subsequent Period Loss ratios are shown on a manual basis and after application of the experience modification factors calculated with several different formulas.
2. Quintiles are based on the loss ratios of the experience period at manual rates.
3. Manual refers to the loss ratio of the subsequent period on a manual rate basis.
4. This is the NCCI Revised Plan with the credibility formulas re-calculated to minimize the sum of squared differences between modified loss ratios and 1.000.
5. This is the NCCI Revised Plan adjusted to apply a primary experience modification to expected excess losses in the rating formula. Credibilities have been optimized to reflect this new formula.
6. The sum of squared differences between the quintile loss ratios (first table) and 1.000 multiplied by 10,000.
7. The mean squared difference between an individual risk's subsequent loss ratio at manual rates and its experience modification factor.

PERFORMANCE OF EXPERIENCE RATING PLANS
(By Loss Ratio)
EXPECTED LOSS SIZE GROUP \$250,001 TO \$500,000

Future Period - Manual Loss Ratios and Modified Loss Ratios¹

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	.640	.897	.912	.932	.969
Next 20%	.871	1.031	1.032	1.043	1.039
Middle 20%	.920	1.011	1.015	1.024	1.037
Next 20%	.909	.886	.878	.877	.879
Last 20%	1.118	.873	.877	.869	.877
All Groups	.908	.931	.934	.936	.945

Between Quintile-Squared Error of Average Loss Ratios⁶

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	1,296	106	77	46	10
Next 20%	166	10	10	18	15
Middle 20%	64	1	2	6	14
Next 20%	83	130	149	151	146
Last 20%	139	161	151	172	151
Total	1,748	408	389	393	336

Within Quintile - Mean Squared Errors of Individual Risk Loss Ratios⁷

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	.405	.272	.265	.261	.263
Next 20%	.405	.368	.374	.371	.358
Middle 20%	.528	.519	.508	.505	.501
Next 20%	.250	.249	.251	.251	.253
Last 20%	.421	.445	.416	.417	.404
All Groups	.402	.375	.367	.365	.359

Notes:

1. Subsequent Period Loss ratios are shown on a manual basis and after application of the experience modification factors calculated with several different formulas.
2. Quintiles are based on the loss ratios of the experience period at manual rates.
3. Manual refers to the loss ratio of the subsequent period on a manual rate basis.
4. This is the NCCI Revised Plan with the credibility formulas re-calculated to minimize the sum of squared differences between modified loss ratios and 1.000.
5. This is the NCCI Revised Plan adjusted to apply a primary experience modification to expected excess losses in the rating formula. Credibilities have been optimized to reflect this new formula.
6. The sum of squared differences between the quintile loss ratios (first table) and 1.000 multiplied by 10,000.
7. The mean squared difference between an individual risk's subsequent loss ratio at manual rates and its experience modification factor.

PERFORMANCE OF EXPERIENCE RATING PLANS
(By Loss Ratio)
EXPECTED LOSS SIZE GROUP OVER \$500,000

Future Period - Manual Loss Ratios and Modified Loss Ratios ¹					
Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	.308	.506	.445	.477	.481
Next 20%	.688	.915	.889	.948	.929
Middle 20%	.690	.799	.755	.770	.778
Next 20%	.883	.859	.870	.867	.887
Last 20%	1.770	.979	1.134	1.067	1.100
All Groups	.935	.886	.917	.916	.928

Between Quintile-Squared Error of Average Loss Ratios ⁶					
Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	4,789	2,440	3,080	2,735	2,694
Next 20%	973	72	123	27	50
Middle 20%	961	404	600	529	493
Next 20%	137	199	169	177	128
Last 20%	5,929	4	180	45	100
Total	12,789	3,119	4,152	3,513	3,465

Within Quintile - Mean Squared Errors of Individual Risk Loss Ratios ⁷					
Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	.520	.115	.168	.134	.128
Next 20%	.178	.065	.069	.065	.051
Middle 20%	.198	.146	.174	.166	.171
Next 20%	.127	.132	.142	.142	.150
Last 20%	1.570	.197	.240	.173	.195
All Groups	.555	.129	.154	.131	.134

Notes:

1. Subsequent Period Loss ratios are shown on a manual basis and after application of the experience modification factors calculated with several different formulas.
2. Quintiles are based on the loss ratios of the experience period at manual rates.
3. Manual refers to the loss ratio of the subsequent period on a manual rate basis.
4. This is the NCCI Revised Plan with the credibility formulas re-calculated to minimize the sum of squared differences between modified loss ratios and 1.000.
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6. The sum of squared differences between the quintile loss ratios (first table) and 1.000 multiplied by 10,000.
7. The mean squared difference between an individual risk's subsequent loss ratio at manual rates and its experience modification factor.

PERFORMANCE OF EXPERIENCE RATING PLANS
(By Loss Ratio)
SAMPLE CALCULATION OF EXHIBIT 7a SHEET 1 VALUES

1. Calculation of between Quintile Squared Error of Average Loss Ratio

a. Average Loss Ratio for RERP - First 20% Quintile	.931
b. Target Average Loss Ratio	1.000
c. Squared Error (a-b) ²	0.004761
d. (c)x10,000	48

2. Hypothetical example of Within Quintile Mean Squared Errors of Individual Risk Loss Ratios - RERP First 20%

(a) Risk Name	(b) Subsequent Period Expected Losses	(c) Subsequent Period Actual to Expected Loss Ratio	(d) RERP Experience Modification Factor	(e) Squared Error ((c)-(d)) ²	(f) Weight (b)/SUM(b)	(g) Weighted Squared Error (e) x (f)
Risk 1	45,967	.885	.801	.007056	.309534	.002184
Risk 2	25,856	5.217	.857	19.009600	.174110	3.309757
Risk 3	30,855	1.120	.767	.124609	.207772	.025890
Risk 4	23,150	.305	.843	.289444	.155888	.045121
Risk 5	22,676	.556	.782	.051076	.152696	.007799
Total	148,504				Sum:	3.391

EXPERIENCE RATING PLAN

EXHIBITS

EXPERIENCE RATING PLAN

EXPERIENCE RATING PLAN

TABLE OF EXHIBITS

- Exhibit 1 - Sample Calculation of ELR Factors
- Exhibit 2 - Calculation of Loss Limitation Factor
- Exhibit 3 - PERP and RERP Loss Limitation Factors
- Exhibit 4 - Calculation of Discount Ratio Factors
- Exhibit 5
 - Sheet 1 - Average Experience Rating Modifications for Ratable Risks (Excluding Self-Insured Risks 1987 - 1990)
 - Sheet 2 - Average Experience Rating Modifications for Ratable Risks (Including Some Self-Insured Risks)
- Exhibit 6 - Experience Rating Plan - Risk Size Ranges
- Exhibit 7a
 - Sheet 1 - Performance of Experience Rating Plans (By Loss Ratio)
 - Sheet 2 - Performance of Experience Rating Plans (By State)
 - Sheet 3 - Performance of Experience Rating Plans (By Risk Size)
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Expected Loss Size Group \$2,501 to \$5,000
 - Sheet 6 - Performance of Experience Rating Plans (By Loss Ratio)
Expected Loss Size Group \$5,001 to \$10,000
 - Sheet 7 - Performance of Experience Rating Plans (By Loss Ratio)
Expected Loss Size Group \$10,001 to \$20,000
 - Sheet 8 - Performance of Experience Rating Plans (By Loss Ratio)
Expected Loss Size Group \$20,001 to \$50,000
 - Sheet 9 - Performance of Experience Rating Plans (By Loss Ratio)
Expected Loss Size Group \$50,001 to \$100,000
 - Sheet 10 - Performance of Experience Rating Plans (By Loss Ratio)
Expected Loss Size Group \$100,001 to \$250,000

EXPERIENCE RATING PLAN

- Sheet 11 - Performance of Experience Rating Plans (By Loss Ratio)
Expected Loss Size Group \$250,000 to \$500,000
- Sheet 12 - Performance of Experience Rating Plans (By Loss Ratio)
Expected Loss Size Group Over \$500,000
- Sheet 13 - Performance of Experience Rating Plans (By Loss Ratio)
Sample Calculation of Exhibit 7a Sheet 1 Values

- Exhibit 7b
 - Sheet 1 - Test of \$2,000 Single Split Point (By Loss Ratio)
 - Sheet 2 - Test of \$10,000 Single Split Point (By Loss Ratio)
 - Sheet 3 - Test of Five-Year Experience Period (By Loss Ratio)

- Exhibit 8
 - Sheet 1 - Relationship Between Primary and Excess Loss Ratios
 - Sheet 2 - Year 2 Excess Loss Ratio - Size Range 5
 - Sheet 3 - Year 2 Excess Loss Ratio - Size Range 4
 - Sheet 4 - Year 2 Excess Loss Ratio - Size Range 3
 - Sheet 5 - Year 2 Excess Loss Ratio - Size Range 2
 - Sheet 6 - Year 2 Excess Loss Ratio - Size Range 1

- Exhibit 9
 - Sheet 1 - Relationship Between Primary and Excess Loss Ratios
 - Sheet 2 - Year 2 Excess LR/Year 2 Primary LR - Size Range 5
 - Sheet 3 - Year 2 Excess LR/Year 2 Primary LR - Size Range 4
 - Sheet 4 - Year 2 Excess LR/Year 2 Primary LR - Size Range 3
 - Sheet 5 - Year 2 Excess LR/Year 2 Primary LR - Size Range 2
 - Sheet 6 - Year 2 Excess LR/Year 2 Primary LR - Size Range 1

- Exhibit 10 - Effect of Interval Between Years on Indicated Credibility

- Exhibit 11
 - Sheet 1 - Average Year 2 primary Loss Ratio - Florida Size Range 5
 - Sheet 2 - Regression Statistics and Indicated Credibilities - Colorado
 - Sheet 3 - Regression Statistics and Indicated Credibilities - Florida
 - Sheet 4 - Regression Statistics and Indicated Credibilities - Illinois
 - Sheet 5 - Regression Statistics and Indicated Credibilities - Maine
 - Sheet 6 - Regression Statistics and Indicated Credibilities - Nebraska

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- Sheet 7 - Regression Statistics and Indicated Credibilities - Utah
- Exhibit 12
 - Sheet 1 - Primary Credibility
 - Sheet 2 - Excess Credibility
- Exhibit 13 - Credit for Claim Free Experience for Small Risks
- Exhibit 14 - Characteristics of Risks Below Experience Rating Threshold
- Exhibit 15 - State Scale Factors
- Exhibit 16 - Trends in Experience Rating Off-Balance

EXPERIENCE RATING PLAN

SAMPLE CALCULATION OF ELR FACTORS¹

	Policy Periods			Total/ Average
	<u>5/86 - 4/87</u>	<u>5/87 - 4/88</u>	<u>5/88 - 4/89</u>	
1. Proposed Target Cost (Loss and LAE) Ratio				.723
2. Proposed Loss Adjustment Expense Factor				1.120
3. Expense and Profit Removal Factor (1) / (2)				.646
4. Financial Data Loss Ratio (midpoint 5/1/91) ²				.905
5. Statistical Plan Loss Ratio (at midpoint 2/1/86) ³				.657
6. Statistical Plan Loss Ratio Trend Factor from 2/1/86 to 5/1/88 ⁴				1.158
7. Trended Statistical Plan Loss Ratio				.761
8. Trend Removal Factor (7) / (4)				.841
9. Law Amendment Removal Factors ⁵	.988	.995	1.000	XXX
10. Loss Development Removal Factors ⁶	.907	.859	.783	XXX
11. Law Amendment and Development Removal Factors (9) x (10)	.896	.855	.783	.845 ⁷
12. Off Balance Adjustment				1.01
13. ELR Factor Before Loss Limitation ((3) x (8)) x ((11) / (12))				.455
	Hazard Groups			
	<u>I</u>	<u>II</u>	<u>III</u>	<u>IV</u>
14. Loss Limitation Factors ⁸	.852	.818	.735	.655
15. ELR Factors (13) x (14)	.387	.371	.334	.297

¹Calculation adapted from NCCI workpapers concerning 5/1/90 proposed Nebraska filing.

²Premiums adjusted to 9/1/89 rate level, losses adjusted to 7/1/88 benefit level, developed to ultimate and trended to midpoint of proposed rates. Includes offset for change in minimum premium multiplier.

³Premiums adjusted to 9/1/89 rate level, losses adjusted to 7/1/88 benefit level and developed to ultimate.

⁴Midpoint of experience rating plan experience period.

⁵Inverse of weighted average of law amendment factors. Losses by injury type used as weights.

⁶Inverse of weighted case incurred development factors to ultimate. Development factors are those used in pure premium exhibits excluding the adjustment to policy year aggregate level. Weights are losses by serious, non-serious, and medical, after adjustment to 7/1/88 benefit level.

⁷Unweighted Average.

⁸From Exhibit 2.

CALCULATION OF LOSS LIMITATION FACTOR¹

	Hazard Group			
	<u>I</u>	<u>II</u>	<u>III</u>	<u>IV</u>
1. 10% of Proposed State Reference Point (Loss Limitation)	49,000	49,000	49,000	49,000
2. Average Fatal Cost ²	119,737	141,392	168,856	191,139
3. Ratio to Average for Fatal (1) / (2)	.41	.35	.29	.26
4. Excess Ratio for Fatal ³ (From Harwayne tables)	.683	.742	.801	.830
5. Average Perm Total Cost ²	184,818	216,698	224,500	282,912
6. Ratio to Average for Perm Total (1) / (5)	.27	.23	.22	.17
7. Excess Ratio for Perm Total ³ (From Harwayne Tables)	.821	.859	.868	.911
8. Average Major Perm Partial Cost ²	59,877	61,996	69,415	75,375
9. Ratio to Average for Major Perm Partial (1) / (8)	.82	.79	.71	.65
10. Excess Ratio for Perm Partial ³ (From Harwayne Tables)	.320	.334	.376	.411
11. (A) Fatal Weight Factor	.019	.028	.059	.115
(B) Perm Total Weight Factor	.024	.034	.043	.060
(C) Major P.P. Weight Factor	.361	.396	.481	.475
12. Weighted Average Excess Ratio	.148	.182	.265	.345
13. Loss Limitation Factor 1.000 - (12)	.852	.818	.735	.655

¹Calculation adapted from NCCI workpapers concerning 5/1/90 proposed Nebraska rate filing.

²The state average cost per case for all hazard groups combined is adjusted for each hazard group using countrywide differentials based on the latest 1st, 2nd, and 3rd reports of Statistical Plan Data.

³Excess ratios are the proportion of total (indemnity and medical) losses in excess of the loss limitation (1).

PRIOR EXPERIENCE RATING PLAN - LOSS LIMITATION FACTORS ¹				
STATE	HAZARD GROUPS			
	I	II	III	IV
Predicted Loss Limitation Factors				
Florida	.963	.953	.934	.901
Maine	.965	.957	.938	.912
Nebraska	.976	.966	.944	.906
Utah	.978	.970	.946	.908
Actual Loss Limitation Factors				
Florida	.930	.921	.949	.776
Maine	1.00	.973	.930	.761
Nebraska	1.00	.970	.922	.855
Utah	1.00	.889	.936	.862
REVISED EXPERIENCE RATING PLAN - LOSS LIMITATION FACTORS				
STATE	HAZARD GROUPS			
	I	II	III	IV
Predicted Loss Limitation Factors				
Florida	.835	.812	.746	.684
Maine	.891	.876	.830	.782
Nebraska ²	.852	.818	.735	.655
Utah	.876	.851	.770	.693
Actual Loss Limitation Factors				
Florida	.866	.832	.836	.672
Maine	.984	.938	.858	.652
Nebraska	1.00	.874	.808	.621
Utah	.809	.812	.808	.683

¹ Loss limitation factors are the proportion of total losses that remain after the impact of loss limitations. They are used in the calculation of ELR factors (Exhibit 2).

² Exhibit 2.

CALCULATION OF DISCOUNT RATIO FACTORS¹

	(A) <u>Serious</u>	(B) <u>Non-Serious</u>	(C) <u>Medical</u>	(D) <u>Total</u>
1. Total Indemnity Losses ²	20,203,556	15,563,631	XXX	XXX
2. Total Medical Losses ²	11,128,455	15,578,048	6,229,082	32,935,585
3. Total Losses (1) + (2)	31,332,011	31,141,679	6,229,082	68,702,772
4. Total Primary Losses ³	2,639,782	15,875,150	5,900,705	XXX
5. Estimated Indemnity Primary (4) x ((1) / (3))	1,702,659	7,937,575	XXX	XXX
6. Estimated Medical Primary (4) - (5)	937,123	7,937,575	5,900,705	14,775,403
7. Primary for D-Ratios A & B = (5), C = Sum of (6)	1,702,659	7,937,575	14,775,403	XXX
8. Total Losses for D-Ratios A & B = (1), C = (2D)	20,203,556	15,563,631	32,935,585	68,702,772
9. First Report Partial D-Ratios (7) / (8)	.084	.510	.449	XXX
10. First Report Loss Distribution (8) / Sum of (8)	.294	.227	.479	1.000
11. Ultimate Report Loss Distribution ⁴	.406	.165	.429	1.000
12. Final D-Ratio Factors (9) x (10) / (11)	.061	.702	.501	XXX

¹Calculation adapted from NCCI workpapers concerning 5/1/90 proposed Nebraska filing.

²Source document is Grand Total NC-235 excluding stevedoring.

³Source document is loss study program.

⁴From pure premium exhibit checksheet adjusted by rate factors.

AVERAGE EXPERIENCE RATING MODIFICATIONS FOR RATABLE RISKS¹
(Excluding Self-Insured Risks 1987-1990)²

<u>STATE</u>	<u>1990</u>	<u>1989</u>	<u>1988</u>	<u>1987</u>	<u>1986</u>	<u>1985</u>	<u>1984</u>	<u>1983</u>
Alabama	1.041	1.059	1.001	1.011	1.039	1.037	1.031	1.005
Arizona	.987	.988	.965	.976	1.002	.992	.895	.870
Arkansas	1.091	1.063	1.056	1.037	1.047	1.022	1.000	.978
Colorado	1.026	1.014	1.029	1.003	.991	1.060	1.056	1.072
Connecticut	1.010	1.029	1.043	1.040	1.034	1.036	1.032	1.041
District of Columbia	1.066	1.033	1.050	1.106	1.103	1.095	1.114	1.039
Florida	.970	.935	.951	.972	.995	.987	.969	.961
Georgia	1.015	.953	.947	.993	1.007	1.016	.997	1.005
Idaho	.972	.969	.976	.975	1.035	1.021	.950	.964
Illinois	.980	.987	.990	1.015	1.020	.999	.973	1.027
Indiana	1.023	.998	.991	1.007	1.008	1.000	.991	.991
Iowa	1.056	1.077	1.071	1.050	1.028	1.023	1.021	1.009
Kansas	1.035	1.012	1.046	1.050	1.044	1.019	.990	.996
Kentucky	1.053	1.042	1.014	.991	.981	.960	1.018	.954
Louisiana	1.119	1.117	1.131	1.133	1.130	1.073	1.055	1.036
Maine	1.197	1.187	1.182	1.496	1.195	1.206	1.167	1.110
Maryland	.958	.936	.941	.965	1.015	1.040	1.011	1.010
Mississippi	1.035	1.027	1.002	1.047	1.022	1.004	.994	1.000
Missouri	1.056	1.063	1.033	1.015	1.032	1.013	.997	.951
Montana	.980	1.000	1.017	1.032	1.002	.995	.986	.980
Nebraska	1.089	1.048	1.025	1.020	1.016	1.012	1.013	1.023
New Hampshire	1.001	1.010	1.022	1.037	1.058	1.080	1.045	1.027
New Mexico	1.077	1.056	1.029	1.092	1.081	1.034	1.007	.973
Oklahoma	1.074	1.084	1.150	1.164	1.124	1.170	1.004	.922
Oregon	.940	.963	1.006	1.036	1.013	1.007	.970	.980
Rhode Island	1.058	1.056	1.067	1.118	1.093	1.062	1.049	1.056
South Carolina	1.039	1.035	1.028	1.035	1.030	.957	.960	.984
South Dakota	1.093	1.095	1.056	1.035	1.025	1.046	1.027	1.022
Tennessee	1.011	1.016	.993	1.006	.741	.808	.750	.774
Utah	.990	.977	.970	.975	.942	.958	.900	.989
Vermont	1.014	.996	1.042	1.051	1.019	1.013	1.021	.992
Virginia	.996	.983	.977	.979	1.021	1.021	1.024	XXX
Hawaii	1.039	.959	.955	.981	1.019	1.051	.996	.996
Alaska	.958	.971	.972	.936	.952	.956	.915	.873
Intrastate³	1.010	1.003	1.007	1.024	1.020	1.018	.995	.946
Interstate³	.989	.950	.978	.988				
Countrywide⁴	.997	.970	.989	1.002				

¹ Ratable risks are those risks with experience modification factors. Note that 1986 and prior may include self-insured risks; 1987 and subsequent exclude self-insured risks.

² Sheet 2 of this exhibit shows the average factors before excluding self-insured Risks for 1983 to 1989. Removal of Self-Insured risks had a big impact for Tennessee. For the remaining states, the impact appears to be minor relative to the normal year to year fluctuations.

³ 1987 and subsequent weighted by expected losses; 1986 and prior weighted by premiums.

⁴ Intrastate and Interstate weighted by expected losses.

AVERAGE EXPERIENCE RATING MODIFICATIONS FOR RATABLE RISKS¹
(Including Some Self-Insured Risks)

<u>STATE</u>	<u>1989</u>	<u>1988</u>	<u>1987</u>	<u>1986</u>	<u>1985</u>	<u>1984</u>	<u>1983</u>
Alabama	1.057	.999	1.011	1.039	1.037	1.031	1.005
Arizona	.988	.965	.976	1.002	.992	.895	.870
Arkansas	1.061	1.056	1.038	1.047	1.022	1.000	.978
Colorado	.975	1.021	1.012	.991	1.060	1.056	1.072
Connecticut	1.039	1.052	1.047	1.034	1.036	1.032	1.041
District of Columbia	1.033	1.050	1.106	1.103	1.095	1.114	1.039
Florida	.935	.954	.973	.995	.987	.969	.961
Georgia	.934	.937	.976	1.007	1.016	.997	1.005
Idaho	.969	.976	.975	1.035	1.021	.950	.964
Illinois	.990	.990	1.015	1.020	.999	.973	1.027
Indiana	.998	.991	1.007	1.008	1.000	.991	.991
Iowa	1.076	1.068	1.050	1.028	1.023	1.021	1.009
Kansas	1.019	1.052	1.053	1.044	1.019	.990	.996
Kentucky	1.024	.996	.977	.981	.960	1.018	.954
Louisiana	1.098	1.112	1.124	1.130	1.073	1.055	1.036
Maine	1.186	1.249	1.474	1.195	1.206	1.167	1.110
Maryland	.934	.941	.964	1.015	1.040	1.011	1.010
Mississippi	1.027	1.001	1.046	1.022	1.004	.994	1.000
Missouri	1.059	1.031	1.007	1.032	1.013	.997	.951
Montana	1.000	1.017	1.032	1.002	.995	.986	.980
Nebraska	1.049	1.025	1.020	1.016	1.012	1.013	1.023
New Hampshire	1.010	1.024	1.036	1.058	1.080	1.045	1.027
New Mexico	1.050	1.039	1.105	1.081	1.034	1.007	.973
Oklahoma	1.085	1.150	1.157	1.124	1.170	1.004	.922
Oregon	.963	1.004	1.036	1.013	1.007	.970	.980
Rhode Island	1.056	1.067	1.118	1.093	1.062	1.049	1.056
South Carolina	1.035	1.028	1.035	1.030	.957	.960	.984
South Dakota	1.090	1.056	1.035	1.025	1.046	1.027	1.022
Tennessee	.881	.841	.811	.741	.808	.750	.774
Utah	.962	.984	1.013	.942	.958	.900	.989
Vermont	.996	1.042	1.052	1.019	1.013	1.021	.992
Virginia	.983	.977	.979	1.021	1.021	1.024	XXX
Hawaii	.959	.953	.981	1.019	1.051	.996	.996
Alaska	.971	.975	.936	.952	.956	.915	.873
Intrastate²	1.000	1.003	1.018	1.020	1.018	.995	.946

¹ Ratable risks are those risks with experience modification factors.

² Weighted by premiums.

EXPERIENCE RATING PLAN - RISK SIZE RANGES

State	Size Range	# of Risks	Average E [Loss] Per Risk Per Year
Florida (3 Years)	1	2,504	2,955
	2	2,504	4,643
	3	2,504	7,106
	4	2,504	12,275
	5	2,504	48,539
	ALL	12,520	15,103
Colorado (3 Years)	1	2,130	2,022
	2	2,130	3,232
	3	2,130	4,863
	4	2,129	8,805
	5	2,129	57,159
	ALL	10,648	15,213
Nebraska (3 Years)	1	584	1,653
	2	584	2,409
	3	584	3,491
	4	585	5,655
	5	585	16,813
	ALL	2,922	6,008
Utah (3 Years)	1	606	2,039
	2	606	3,078
	3	606	4,375
	4	606	7,144
	5	606	29,438
	ALL	3,030	9,215
Maine (3 Years)	1	491	1,967
	2	491	3,151
	3	491	4,847
	4	491	8,700
	5	491	31,550
	ALL	2,455	10,043
Florida (5 Years)	1	1,455	2,890
	2	1,455	4,477
	3	1,455	6,776
	4	1,455	11,890
	5	1,455	48,172
	ALL	7,275	14,841

PERFORMANCE OF EXPERIENCE RATING PLANS
(By Loss Ratio)

Future Period - Manual Loss Ratios and Modified Loss Ratios ¹					
Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	0.684	0.852	0.931	0.960	1.027
Next 20%	0.780	0.902	0.951	0.968	0.984
Middle 20%	0.968	1.024	1.045	1.045	1.042
Next 20%	1.117	1.062	1.040	1.023	1.009
Last 20%	1.396	1.055	0.983	0.968	0.957
All Groups	1.000	0.995	0.995	0.993	0.997
Between Quintile-Squared Error of Average Loss Ratios ⁶					
Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	999	219	48	16	7
Next 20%	484	96	24	10	3
Middle 20%	10	6	20	20	18
Next 20%	137	38	16	5	1
Last 20%	1,568	30	3	10	18
Total	3,198	389	111	61	47
Within Quintile - Mean Squared Errors of Individual Risk Loss Ratios ⁷					
Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	3.493	3.401	3.391	3.388	3.385
Next 20%	2.667	2.620	2.614	2.614	2.610
Middle 20%	3.976	3.963	3.966	3.964	3.957
Next 20%	5.754	5.726	5.717	5.713	5.712
Last 20%	7.043	6.690	6.633	6.619	6.602
All Groups	4.637	4.527	4.511	4.506	4.499
Notes:					
<ol style="list-style-type: none"> Subsequent Period Loss ratios are shown on a manual basis and after application of the experience modification factors calculated with several different formulas. Quintiles are based on the loss ratios of the experience period at manual rates. Manual refers to the loss ratio of the subsequent period on a manual rate basis. This is the NCCI Revised Plan with the credibility formulas re-calculated to minimize the sum of squared differences between modified loss ratios and 1.000. This is the NCCI Revised Plan adjusted to apply a primary experience modification to expected excess losses in the rating formula. Credibilities have been optimized to reflect this new formula. The sum of squared differences between the quintile loss ratios (first table) and 1.000 multiplied by 10,000. The mean squared difference between an individual risk's subsequent loss ratio at manual rates and its experience modification factor. 					

PERFORMANCE OF EXPERIENCE RATING PLANS
(By State)

Future Period - Manual Loss Ratios and Modified Loss Ratios ¹					
State	Manual ²	PERP	RERP	Optimized RERP ³	Alternate Plan ⁴
Florida	1.000	1.008	1.005	1.005	1.007
Maine	1.000	0.965	0.977	0.972	0.977
Nebraska	0.999	0.989	0.985	0.983	0.988
Utah	0.996	0.982	0.976	0.973	0.980
All States	1.000	0.995	0.995	0.993	0.997
Between Hazard Groups - Squared Error of Average Loss Ratios ⁵					
State	Manual ²	PERP	RERP	Optimized RERP ³	Alternate Plan ⁴
Florida	0	1	0	0	0
Maine	0	12	5	8	5
Nebraska	0	1	2	3	1
Utah	0	3	6	7	4
Total	0	17	13	18	10
Within Hazard Group - Mean Squared Errors of Individual Risk Loss Ratios ⁶					
State	Manual ²	PERP	RERP	Optimized RERP ³	Alternate Plan ⁴
Florida	5.317	5.204	5.177	5.169	5.160
Maine	3.104	2.960	2.964	2.959	2.963
Nebraska	5.327	5.283	5.287	5.284	5.282
Utah	2.679	2.613	2.603	2.621	2.596
All States	4.637	4.527	4.511	4.506	4.499
Notes:					
<ol style="list-style-type: none"> 1. Subsequent Period Loss ratios are shown on a manual basis and after application of the experience modification factors calculated with several different formulas. 2. Manual refers to the loss ratio of the subsequent period on a manual rate basis. 3. This is the NCCI Revised Plan with the credibility formulas re-calculated to minimize the sum of squared differences between modified loss ratios and 1.000. 4. This is the NCCI Revised Plan adjusted to apply a primary experience modification to expected excess losses in the rating formula. Credibilities have been optimized to reflect this new formula. 5. The sum of squared differences between the quintile loss ratios (first table) and 1.000, multiplied by 10,000. 6. The mean squared difference between an individual risk's subsequent period loss ratio at manual rates and its experience modification factor. 					

PERFORMANCE OF EXPERIENCE RATING PLANS
(By Risk Size)

Future Period - Manual Loss Ratios and Modified Loss Ratios ¹					
Risk Size ⁷	Manual ²	PERP	RERP	Optimized RERP ³	Alternate Plan ⁴
2,501 to 5,000	0.932	0.927	0.922	0.918	0.924
5,001 to 10,000	0.995	0.993	0.989	0.985	0.987
10,001 to 20,000	1.008	1.005	1.002	1.001	1.003
20,001 to 50,000	1.042	1.032	1.027	1.026	1.026
50,001 to 100,000	0.996	0.984	0.983	0.981	0.982
100,001 to 250K	1.025	1.028	1.028	1.028	1.033
250,001 to 500K	0.908	0.931	0.934	0.936	0.945
Over 500,000	0.935	0.886	0.917	0.916	0.928
All Groups	1.000	0.995	0.995	0.993	0.997
Between Sizes - Squared Error of Average Loss Ratios ⁵					
Risk Size ⁷	Manual ²	PERP	RERP	Optimized RERP ³	Alternate Plan ⁴
2,501 to 5,000	46	53	61	67	58
5,001 to 10,000	0	0	1	2	2
10,001 to 20,000	1	0	0	0	0
20,001 to 50,000	18	10	7	7	7
50,001 to 100,000	0	3	3	4	3
100,001 to 250K	6	8	8	8	11
250,001 to 500K	85	48	44	41	30
Over 500,000	42	130	69	71	52
Total	198	252	193	200	163

**PERFORMANCE OF EXPERIENCE RATING PLANS
(By Risk Size)**

Within Sizes - Mean Squared Errors of Individual Risk Loss Ratios ⁶					
Risk Size ⁷	Manual ²	PERP	RERP	Optimized RERP ³	Alternate Plan ⁴
2,501 to 5,000	10.486	10.348	10.218	10.202	10.172
5,001 to 10,000	13.245	13.171	13.142	13.121	13.123
10,001 to 20,000	6.587	6.499	6.476	6.476	6.482
20,001 to 50,000	4.128	4.008	3.992	3.983	3.965
50,001 to 100,000	2.280	2.175	2.161	2.161	2.150
100,001 to 250K	3.858	3.775	3.767	3.768	3.767
250,001 to 500K	0.402	0.375	0.367	0.365	0.359
Over 500,000	0.555	0.129	0.154	0.131	0.134
All Groups	4.637	4.527	4.511	4.506	4.499

Notes:

1. Subsequent Period Loss ratios are shown on a manual basis and after application of the experience modification factors calculated with several different formulas.
2. Manual refers to the loss ratio of the subsequent period on a manual rate basis.
3. This is the NCCI Revised Plan with the credibility formulas re-calculated to minimize the sum of squared differences between modified loss ratios and 1.000.
4. This is the NCCI Revised Plan adjusted to apply a primary experience modification to expected excess losses in the rating formula. Credibilities have been optimized to reflect this new formula.
5. The sum of squared differences between the quintile loss ratios (first table) and 1.000, multiplied by 10,000.
6. The mean squared difference between an individual risk's subsequent period loss ratio at manual rates and its experience modification factor.
7. Risk size is measured by expected losses (three years).

PERFORMANCE OF EXPERIENCE RATING PLANS
(By Loss Ratio)
EXPECTED LOSS SIZE GROUP \$2,501 TO \$5,000

Future Period - Manual Loss Ratios and Modified Loss Ratios¹

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	.608	.650	.708	.783	.746
Next 20%	.622	.664	.721	.786	.755
Middle 20%	.667	.705	.754	.805	.776
Next 20%	1.310	1.328	1.346	1.336	1.334
Last 20%	1.421	1.162	.966	.839	.909
All Groups	.932	.927	.922	.918	.924

Between Quintile-Squared Error of Average Loss Ratios⁶

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	1,537	1,225	853	471	645
Next 20%	1,429	1,129	778	458	600
Middle 20%	1,109	870	605	380	502
Next 20%	961	1,076	1,197	1,129	1,116
Last 20%	1,772	262	12	259	83
Total	6,808	4,562	3,445	2,697	2,946

Within Quintile - Mean Squared Errors of Individual Risk Loss Ratios⁷

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	5.891	5.838	5.789	5.743	5.764
Next 20%	4.423	4.379	4.337	4.311	4.321
Middle 20%	7.225	7.190	7.156	7.146	7.149
Next 20%	14.042	14.035	14.031	14.012	14.013
Last 20%	20.670	20.116	19.590	19.611	19.424
All Groups	10.486	10.348	10.218	10.202	10.172

Notes:

1. Subsequent Period Loss ratios are shown on a manual basis and after application of the experience modification factors calculated with several different formulas.
2. Quintiles are based on the loss ratios of the experience period at manual rates.
3. Manual refers to the loss ratio of the subsequent period on a manual rate basis.
4. This is the NCCI Revised Plan with the credibility formulas re-calculated to minimize the sum of squared differences between modified loss ratios and 1.000.
5. This is the NCCI Revised Plan adjusted to apply a primary experience modification to expected excess losses in the rating formula. Credibilities have been optimized to reflect this new formula.
6. The sum of squared differences between the quintile loss ratios (first table) and 1.000 multiplied by 10,000.
7. The mean squared difference between an individual risk's subsequent loss ratio at manual rates and its experience modification factor.

**PERFORMANCE OF EXPERIENCE RATING PLANS
(By Loss Ratio)
EXPECTED LOSS SIZE GROUP \$5,001 TO \$10,000**

Future Period - Manual Loss Ratios and Modified Loss Ratios¹

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	.767	.851	.955	1.034	1.012
Next 20%	.754	.832	.923	.988	.966
Middle 20%	.926	.994	1.069	1.109	1.090
Next 20%	1.161	1.152	1.130	1.087	1.090
Last 20%	1.336	1.071	.903	.838	.866
All Groups	.995	.993	.989	.985	.987

Between Quintile-Squared Error of Average Loss Ratios⁶

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	543	222	20	12	1
Next 20%	605	282	59	1	12
Middle 20%	55	0	48	119	81
Next 20%	259	231	169	76	81
Last 20%	1,129	50	94	262	180
Total	2,591	785	390	470	355

Within Quintile - Mean Squared Errors of Individual Risk Loss Ratios⁷

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	13.035	12.992	12.972	12.972	12.972
Next 20%	10.215	10.179	10.160	10.158	10.154
Middle 20%	11.937	11.935	11.943	11.952	11.946
Next 20%	15.347	15.331	15.322	15.310	15.304
Last 20%	15.480	15.219	15.117	15.024	15.048
All Groups	13.245	13.171	13.141	13.121	13.122

Notes:

1. Subsequent Period Loss ratios are shown on a manual basis and after application of the experience modification factors calculated with several different formulas.
2. Quintiles are based on the loss ratios of the experience period at manual rates.
3. Manual refers to the loss ratio of the subsequent period on a manual rate basis.
4. This is the NCCI Revised Plan with the credibility formulas re-calculated to minimize the sum of squared differences between modified loss ratios and 1.000.
5. This is the NCCI Revised Plan adjusted to apply a primary experience modification to expected excess losses in the rating formula. Credibilities have been optimized to reflect this new formula.
6. The sum of squared differences between the quintile loss ratios (first table) and 1.000 multiplied by 10,000.
7. The mean squared difference between an individual risk's subsequent loss ratio at manual rates and its experience modification factor.

**PERFORMANCE OF EXPERIENCE RATING PLANS
(By Loss Ratio)
EXPECTED LOSS SIZE GROUP \$10,001 TO \$20,000**

Future Period - Manual Loss Ratios and Modified Loss Ratios¹

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	.712	.831	.946	.998	1.037
Next 20%	.772	.879	.976	1.011	1.035
Middle 20%	.959	1.031	1.084	1.087	1.092
Next 20%	1.124	1.068	1.014	.972	.955
Last 20%	1.437	1.126	.985	.971	.961
All Groups	1.008	1.005	1.002	1.001	1.003

Between Quintile-Squared Error of Average Loss Ratios⁶

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	829	286	29	0	14
Next 20%	520	146	6	1	12
Middle 20%	17	10	71	76	85
Next 20%	154	46	2	8	20
Last 20%	1,910	159	2	8	15
Total	3,430	647	110	93	146

Within Quintile - Mean Squared Errors of Individual Risk Loss Ratios⁷

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	5.354	5.298	5.279	5.276	5.276
Next 20%	4.509	4.470	4.461	4.465	4.460
Middle 20%	7.342	7.337	7.342	7.342	7.341
Next 20%	6.859	6.850	6.856	6.864	6.870
Last 20%	8.749	8.428	8.331	8.322	8.353
All Groups	6.587	6.499	6.476	6.476	6.482

Notes:

1. Subsequent Period Loss ratios are shown on a manual basis and after application of the experience modification factors calculated with several different formulas.
2. Quintiles are based on the loss ratios of the experience period at manual rates.
3. Manual refers to the loss ratio of the subsequent period on a manual rate basis.
4. This is the NCCI Revised Plan with the credibility formulas re-calculated to minimize the sum of squared differences between modified loss ratios and 1.000.
5. This is the NCCI Revised Plan adjusted to apply a primary experience modification to expected excess losses in the rating formula. Credibilities have been optimized to reflect this new formula.
6. The sum of squared differences between the quintile loss ratios (first table) and 1.000 multiplied by 10,000.
7. The mean squared difference between an individual risk's subsequent loss ratio at manual rates and its experience modification factor.

**PERFORMANCE OF EXPERIENCE RATING PLANS
(By Loss Ratio)
EXPECTED LOSS SIZE GROUP \$20,001 TO \$50,000**

Future Period - Manual Loss Ratios and Modified Loss Ratios¹

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	.627	.772	.872	.894	.998
Next 20%	.816	.943	1.013	1.015	1.064
Middle 20%	1.087	1.136	1.152	1.132	1.126
Next 20%	1.217	1.131	1.103	1.084	1.049
Last 20%	1.387	1.070	.966	.973	.940
All Groups	1.042	1.032	1.027	1.026	1.026

Between Quintile-Squared Error of Average Loss Ratios⁶

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	1,391	520	164	112	0
Next 20%	339	32	2	2	41
Middle 20%	76	185	231	174	159
Next 20%	471	172	106	71	24
Last 20%	1,498	49	12	7	36
Total	3,775	958	515	366	260

Within Quintile - Mean Squared Errors of Individual Risk Loss Ratios⁷

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	2.987	2.885	2.861	2.860	2.846
Next 20%	2.412	2.375	2.371	2.370	2.374
Middle 20%	3.789	3.793	3.797	3.794	3.790
Next 20%	5.269	5.200	5.173	5.161	5.143
Last 20%	5.849	5.475	5.442	5.421	5.363
All Groups	4.128	4.008	3.991	3.983	3.965

Notes:

1. Subsequent Period Loss ratios are shown on a manual basis and after application of the experience modification factors calculated with several different formulas.
2. Quintiles are based on the loss ratios of the experience period at manual rates.
3. Manual refers to the loss ratio of the subsequent period on a manual rate basis.
4. This is the NCCI Revised Plan with the credibility formulas re-calculated to minimize the sum of squared differences between modified loss ratios and 1.000.
5. This is the NCCI Revised Plan adjusted to apply a primary experience modification to expected excess losses in the rating formula. Credibilities have been optimized to reflect this new formula.
6. The sum of squared differences between the quintile loss ratios (first table) and 1.000 multiplied by 10,000.
7. The mean squared difference between an individual risk's subsequent loss ratio at manual rates and its experience modification factor.

PERFORMANCE OF EXPERIENCE RATING PLANS
(By Loss Ratio)
EXPECTED LOSS SIZE GROUP \$50,001 TO \$100,000

Future Period - Manual Loss Ratios and Modified Loss Ratios¹

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	.692	.878	.957	.958	1.086
Next 20%	.814	.915	.950	.937	.956
Middle 20%	.924	.940	.951	.941	.931
Next 20%	1.093	1.016	1.002	.999	.975
Last 20%	1.424	1.095	1.022	1.033	.992
All Groups	.996	.984	.983	.981	.982

Between Quintile-Squared Error of Average Loss Ratios⁶

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	949	149	18	18	74
Next 20%	346	72	25	40	19
Middle 20%	58	36	24	35	48
Next 20%	86	3	0	0	6
Last 20%	1,798	90	5	11	1
Total	3,237	350	72	104	148

Within Quintile - Mean Squared Errors of Individual Risk Loss Ratios⁷

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	1.005	.917	.912	.913	.899
Next 20%	1.038	1.003	1.000	1.003	1.002
Middle 20%	2.086	2.072	2.068	2.068	2.068
Next 20%	3.503	3.450	3.445	3.439	3.436
Last 20%	3.639	3.316	3.264	3.264	3.233
All Groups	2.280	2.175	2.161	2.160	2.150

Notes:

1. Subsequent Period Loss ratios are shown on a manual basis and after application of the experience modification factors calculated with several different formulas.
2. Quintiles are based on the loss ratios of the experience period at manual rates.
3. Manual refers to the loss ratio of the subsequent period on a manual rate basis.
4. This is the NCCI Revised Plan with the credibility formulas re-calculated to minimize the sum of squared differences between modified loss ratios and 1.000.
5. This is the NCCI Revised Plan adjusted to apply a primary experience modification to expected excess losses in the rating formula. Credibilities have been optimized to reflect this new formula.
6. The sum of squared differences between the quintile loss ratios (first table) and 1.000 multiplied by 10,000.
7. The mean squared difference between an individual risk's subsequent loss ratio at manual rates and its experience modification factor.

PERFORMANCE OF EXPERIENCE RATING PLANS
(By Loss Ratio)
EXPECTED LOSS SIZE GROUP \$100,001 TO \$250,000

Future Period - Manual Loss Ratios and Modified Loss Ratios¹

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	.798	1.042	1.109	1.108	1.207
Next 20%	.731	.849	.877	.873	.895
Middle 20%	1.025	1.068	1.080	1.077	1.078
Next 20%	1.126	1.071	1.057	1.058	1.053
Last 20%	1.423	1.072	1.020	1.024	.994
All Groups	1.025	1.028	1.028	1.028	1.033

Between Quintile-Squared Error of Average Loss Ratios⁶

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	408	18	119	117	428
Next 20%	724	228	151	161	110
Middle 20%	6	46	64	59	61
Next 20%	159	50	32	34	28
Last 20%	1,789	52	4	6	0
Total	3,086	394	370	377	627

Within Quintile - Mean Squared Errors of Individual Risk Loss Ratios⁷

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	1.004	.952	.959	.959	.972
Next 20%	.707	.647	.641	.641	.637
Middle 20%	1.163	1.127	1.131	1.124	1.093
Next 20%	5.604	5.604	5.594	5.594	5.607
Last 20%	10.622	10.347	10.315	10.328	10.332
All Groups	3.858	3.775	3.767	3.768	3.767

Notes:

1. Subsequent Period Loss ratios are shown on a manual basis and after application of the experience modification factors calculated with several different formulas.
2. Quintiles are based on the loss ratios of the experience period at manual rates.
3. Manual refers to the loss ratio of the subsequent period on a manual rate basis.
4. This is the NCCI Revised Plan with the credibility formulas re-calculated to minimize the sum of squared differences between modified loss ratios and 1.000.
5. This is the NCCI Revised Plan adjusted to apply a primary experience modification to expected excess losses in the rating formula. Credibilities have been optimized to reflect this new formula.
6. The sum of squared differences between the quintile loss ratios (first table) and 1.000 multiplied by 10,000.
7. The mean squared difference between an individual risk's subsequent loss ratio at manual rates and its experience modification factor.

**PERFORMANCE OF EXPERIENCE RATING PLANS
(By Loss Ratio)
EXPECTED LOSS SIZE GROUP \$250,001 TO \$500,000**

Future Period - Manual Loss Ratios and Modified Loss Ratios¹

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	.640	.897	.912	.932	.969
Next 20%	.871	1.031	1.032	1.043	1.039
Middle 20%	.920	1.011	1.015	1.024	1.037
Next 20%	.909	.886	.878	.877	.879
Last 20%	1.118	.873	.877	.869	.877
All Groups	.908	.931	.934	.936	.945

Between Quintile-Squared Error of Average Loss Ratios⁶

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	1,296	106	77	46	10
Next 20%	166	10	10	18	15
Middle 20%	64	1	2	6	14
Next 20%	83	130	149	151	146
Last 20%	139	161	151	172	151
Total	1,748	408	389	393	336

Within Quintile - Mean Squared Errors of Individual Risk Loss Ratios⁷

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	.405	.272	.265	.261	.263
Next 20%	.405	.368	.374	.371	.358
Middle 20%	.528	.519	.508	.505	.501
Next 20%	.250	.249	.251	.251	.253
Last 20%	.421	.445	.416	.417	.404
All Groups	.402	.375	.367	.365	.359

Notes:

1. Subsequent Period Loss ratios are shown on a manual basis and after application of the experience modification factors calculated with several different formulas.
2. Quintiles are based on the loss ratios of the experience period at manual rates.
3. Manual refers to the loss ratio of the subsequent period on a manual rate basis.
4. This is the NCCI Revised Plan with the credibility formulas re-calculated to minimize the sum of squared differences between modified loss ratios and 1.000.
5. This is the NCCI Revised Plan adjusted to apply a primary experience modification to expected excess losses in the rating formula. Credibilities have been optimized to reflect this new formula.
6. The sum of squared differences between the quintile loss ratios (first table) and 1.000 multiplied by 10,000.
7. The mean squared difference between an individual risk's subsequent loss ratio at manual rates and its experience modification factor.

PERFORMANCE OF EXPERIENCE RATING PLANS
(By Loss Ratio)
EXPECTED LOSS SIZE GROUP OVER \$500,000

Future Period - Manual Loss Ratios and Modified Loss Ratios¹

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	.308	.506	.445	.477	.481
Next 20%	.688	.915	.889	.948	.929
Middle 20%	.690	.799	.755	.770	.778
Next 20%	.883	.859	.870	.867	.887
Last 20%	1.770	.979	1.134	1.067	1.100
All Groups	.935	.886	.917	.916	.928

Between Quintile-Squared Error of Average Loss Ratios⁶

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	4,789	2,440	3,080	2,735	2,694
Next 20%	973	72	123	27	50
Middle 20%	961	404	600	529	493
Next 20%	137	199	169	177	128
Last 20%	5,929	4	180	45	100
Total	12,789	3,119	4,152	3,513	3,465

Within Quintile - Mean Squared Errors of Individual Risk Loss Ratios⁷

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	.520	.115	.168	.134	.128
Next 20%	.178	.065	.069	.065	.051
Middle 20%	.198	.146	.174	.166	.171
Next 20%	.127	.132	.142	.142	.150
Last 20%	1.570	.197	.240	.173	.195
All Groups	.555	.129	.154	.131	.134

Notes:

1. Subsequent Period Loss ratios are shown on a manual basis and after application of the experience modification factors calculated with several different formulas.
2. Quintiles are based on the loss ratios of the experience period at manual rates.
3. Manual refers to the loss ratio of the subsequent period on a manual rate basis.
4. This is the NCCI Revised Plan with the credibility formulas re-calculated to minimize the sum of squared differences between modified loss ratios and 1.000.
5. This is the NCCI Revised Plan adjusted to apply a primary experience modification to expected excess losses in the rating formula. Credibilities have been optimized to reflect this new formula.
6. The sum of squared differences between the quintile loss ratios (first table) and 1.000 multiplied by 10,000.
7. The mean squared difference between an individual risk's subsequent loss ratio at manual rates and its experience modification factor.

PERFORMANCE OF EXPERIENCE RATING PLANS
(By Loss Ratio)
SAMPLE CALCULATION OF EXHIBIT 7a SHEET 1 VALUES

1. Calculation of between Quintile Squared Error of Average Loss Ratio

a. Average Loss Ratio for RERP - First 20% Quintile	.931
b. Target Average Loss Ratio	1.000
c. Squared Error (a-b) ²	0.004761
d. (c)x10,000	48

2. Hypothetical example of Within Quintile Mean Squared Errors of Individual Risk Loss Ratios - RERP First 20%

(a) Risk Name	(b) Subsequent Period Expected Losses	(c) Subsequent Period Actual to Expected Loss Ratio	(d) RERP Experience Modification Factor	(e) Squared Error ((c)-(d)) ²	(f) Weight (b)/SUM(b)	(g) Weighted Squared Error (e) x (f)
Risk 1	45,967	.885	.801	.007056	.309534	.002184
Risk 2	25,856	5.217	.857	19.009600	.174110	3.309757
Risk 3	30,855	1.120	.767	.124609	.207772	.025890
Risk 4	23,150	.305	.843	.289444	.155888	.045121
Risk 5	22,676	.556	.782	.051076	.152696	.007799
Total	148,504				Sum:	3.391

EXPERIENCE RATING PLAN

EXHIBITS

EXPERIENCE RATING PLAN

EXPERIENCE RATING PLAN

TABLE OF EXHIBITS

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- Exhibit 2 - Calculation of Loss Limitation Factor
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- Exhibit 4 - Calculation of Discount Ratio Factors
- Exhibit 5
 - Sheet 1 - Average Experience Rating Modifications for Ratable Risks (Excluding Self-Insured Risks 1987 - 1990)
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 - Sheet 1 - Performance of Experience Rating Plans (By Loss Ratio)
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Expected Loss Size Group \$2,501 to \$5,000
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Expected Loss Size Group \$10,001 to \$20,000
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Expected Loss Size Group \$20,001 to \$50,000
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Expected Loss Size Group \$50,001 to \$100,000
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Expected Loss Size Group \$100,001 to \$250,000

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- Sheet 11 - Performance of Experience Rating Plans (By Loss Ratio)
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Sample Calculation of Exhibit 7a Sheet 1 Values

- Exhibit 7b
 - Sheet 1 - Test of \$2,000 Single Split Point (By Loss Ratio)
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 - Sheet 1 - Relationship Between Primary and Excess Loss Ratios
 - Sheet 2 - Year 2 Excess Loss Ratio - Size Range 5
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 - Sheet 4 - Year 2 Excess Loss Ratio - Size Range 3
 - Sheet 5 - Year 2 Excess Loss Ratio - Size Range 2
 - Sheet 6 - Year 2 Excess Loss Ratio - Size Range 1

- Exhibit 9
 - Sheet 1 - Relationship Between Primary and Excess Loss Ratios
 - Sheet 2 - Year 2 Excess LR/Year 2 Primary LR - Size Range 5
 - Sheet 3 - Year 2 Excess LR/Year 2 Primary LR - Size Range 4
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- Exhibit 10 - Effect of Interval Between Years on Indicated Credibility

- Exhibit 11
 - Sheet 1 - Average Year 2 primary Loss Ratio - Florida Size Range 5
 - Sheet 2 - Regression Statistics and Indicated Credibilities - Colorado
 - Sheet 3 - Regression Statistics and Indicated Credibilities - Florida
 - Sheet 4 - Regression Statistics and Indicated Credibilities - Illinois
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- Sheet 7 - Regression Statistics and Indicated Credibilities - Utah
- Exhibit 12
 - Sheet 1 - Primary Credibility
 - Sheet 2 - Excess Credibility
- Exhibit 13 - Credit for Claim Free Experience for Small Risks
- Exhibit 14 - Characteristics of Risks Below Experience Rating Threshold
- Exhibit 15 - State Scale Factors
- Exhibit 16 - Trends in Experience Rating Off-Balance

EXPERIENCE RATING PLAN

SAMPLE CALCULATION OF ELR FACTORS¹

	Policy Periods			Total/ Average
	<u>5/86 - 4/87</u>	<u>5/87 - 4/88</u>	<u>5/88 - 4/89</u>	
1. Proposed Target Cost (Loss and LAE) Ratio				.723
2. Proposed Loss Adjustment Expense Factor				1.120
3. Expense and Profit Removal Factor (1) / (2)				.646
4. Financial Data Loss Ratio (midpoint 5/1/91) ²				.905
5. Statistical Plan Loss Ratio (at midpoint 2/1/86) ³				.657
6. Statistical Plan Loss Ratio Trend Factor from 2/1/86 to 5/1/88 ⁴				1.158
7. Trended Statistical Plan Loss Ratio				.761
8. Trend Removal Factor (7) / (4)				.841
9. Law Amendment Removal Factors ⁵	.988	.995	1.000	XXX
10. Loss Development Removal Factors ⁶	.907	.859	.783	XXX
11. Law Amendment and Development Removal Factors (9) x (10)	.896	.855	.783	.845 ⁷
12. Off Balance Adjustment				1.01
13. ELR Factor Before Loss Limitation ((3) x (8)) x ((11) / (12))				.455
	Hazard Groups			
	<u>I</u>	<u>II</u>	<u>III</u>	<u>IV</u>
14. Loss Limitation Factors ⁸	.852	.818	.735	.655
15. ELR Factors (13) x (14)	.387	.371	.334	.297

¹Calculation adapted from NCCI workpapers concerning 5/1/90 proposed Nebraska filing.

²Premiums adjusted to 9/1/89 rate level, losses adjusted to 7/1/88 benefit level, developed to ultimate and trended to midpoint of proposed rates. Includes offset for change in minimum premium multiplier.

³Premiums adjusted to 9/1/89 rate level, losses adjusted to 7/1/88 benefit level and developed to ultimate.

⁴Midpoint of experience rating plan experience period.

⁵Inverse of weighted average of law amendment factors. Losses by injury type used as weights.

⁶Inverse of weighted case incurred development factors to ultimate. Development factors are those used in pure premium exhibits excluding the adjustment to policy year aggregate level. Weights are losses by serious, non-serious, and medical, after adjustment to 7/1/88 benefit level.

⁷Unweighted Average.

⁸From Exhibit 2.

CALCULATION OF LOSS LIMITATION FACTOR¹

	Hazard Group			
	<u>I</u>	<u>II</u>	<u>III</u>	<u>IV</u>
1. 10% of Proposed State Reference Point (Loss Limitation)	49,000	49,000	49,000	49,000
2. Average Fatal Cost ²	119,737	141,392	168,856	191,139
3. Ratio to Average for Fatal (1) / (2)	.41	.35	.29	.26
4. Excess Ratio for Fatal ³ (From Harwayne tables)	.683	.742	.801	.830
5. Average Perm Total Cost ²	184,818	216,698	224,500	282,912
6. Ratio to Average for Perm Total (1) / (5)	.27	.23	.22	.17
7. Excess Ratio for Perm Total ³ (From Harwayne Tables)	.821	.859	.868	.911
8. Average Major Perm Partial Cost ²	59,877	61,996	69,415	75,375
9. Ratio to Average for Major Perm Partial (1) / (8)	.82	.79	.71	.65
10. Excess Ratio for Perm Partial ³ (From Harwayne Tables)	.320	.334	.376	.411
11. (A) Fatal Weight Factor	.019	.028	.059	.115
(B) Perm Total Weight Factor	.024	.034	.043	.060
(C) Major P.P. Weight Factor	.361	.396	.481	.475
12. Weighted Average Excess Ratio	.148	.182	.265	.345
13. Loss Limitation Factor 1.000 - (12)	.852	.818	.735	.655

¹Calculation adapted from NCCI workpapers concerning 5/1/90 proposed Nebraska rate filing.

²The state average cost per case for all hazard groups combined is adjusted for each hazard group using countrywide differentials based on the latest 1st, 2nd, and 3rd reports of Statistical Plan Data.

³Excess ratios are the proportion of total (indemnity and medical) losses in excess of the loss limitation (1).

PRIOR EXPERIENCE RATING PLAN - LOSS LIMITATION FACTORS ¹				
STATE	HAZARD GROUPS			
	I	II	III	IV
Predicted Loss Limitation Factors				
Florida	.963	.953	.934	.901
Maine	.965	.957	.938	.912
Nebraska	.976	.966	.944	.906
Utah	.978	.970	.946	.908
Actual Loss Limitation Factors				
Florida	.930	.921	.949	.776
Maine	1.00	.973	.930	.761
Nebraska	1.00	.970	.922	.855
Utah	1.00	.889	.936	.862
REVISED EXPERIENCE RATING PLAN - LOSS LIMITATION FACTORS				
STATE	HAZARD GROUPS			
	I	II	III	IV
Predicted Loss Limitation Factors				
Florida	.835	.812	.746	.684
Maine	.891	.876	.830	.782
Nebraska ²	.852	.818	.735	.655
Utah	.876	.851	.770	.693
Actual Loss Limitation Factors				
Florida	.866	.832	.836	.672
Maine	.984	.938	.858	.652
Nebraska	1.00	.874	.808	.621
Utah	.809	.812	.808	.683

¹ Loss limitation factors are the proportion of total losses that remain after the impact of loss limitations. They are used in the calculation of ELR factors (Exhibit 2).

²Exhibit 2.

CALCULATION OF DISCOUNT RATIO FACTORS¹

	(A) <u>Serious</u>	(B) <u>Non-Serious</u>	(C) <u>Medical</u>	(D) <u>Total</u>
1. Total Indemnity Losses ²	20,203,556	15,563,631	XXX	XXX
2. Total Medical Losses ²	11,128,455	15,578,048	6,229,082	32,935,585
3. Total Losses (1) + (2)	31,332,011	31,141,679	6,229,082	68,702,772
4. Total Primary Losses ³	2,639,782	15,875,150	5,900,705	XXX
5. Estimated Indemnity Primary (4) x ((1) / (3))	1,702,659	7,937,575	XXX	XXX
6. Estimated Medical Primary (4) - (5)	937,123	7,937,575	5,900,705	14,775,403
7. Primary for D-Ratios A & B = (5), C = Sum of (6)	1,702,659	7,937,575	14,775,403	XXX
8. Total Losses for D-Ratios A & B = (1), C = (2D)	20,203,556	15,563,631	32,935,585	68,702,772
9. First Report Partial D-Ratios (7) / (8)	.084	.510	.449	XXX
10. First Report Loss Distribution (8) / Sum of (8)	.294	.227	.479	1.000
11. Ultimate Report Loss Distribution ⁴	.406	.165	.429	1.000
12. Final D-Ratio Factors (9) x (10) / (11)	.061	.702	.501	XXX

¹Calculation adapted from NCCI workpapers concerning 5/1/90 proposed Nebraska filing.

²Source document is Grand Total NC-235 excluding stevedoring.

³Source document is loss study program.

⁴From pure premium exhibit checksheet adjusted by rate factors.

AVERAGE EXPERIENCE RATING MODIFICATIONS FOR RATABLE RISKS¹
(Excluding Self-Insured Risks 1987-1990)²

STATE	1990	1989	1988	1987	1986	1985	1984	1983
Alabama	1.041	1.059	1.001	1.011	1.039	1.037	1.031	1.005
Arizona	.987	.988	.965	.976	1.002	.992	.895	.870
Arkansas	1.091	1.063	1.056	1.037	1.047	1.022	1.000	.978
Colorado	1.026	1.014	1.029	1.003	.991	1.060	1.056	1.072
Connecticut	1.010	1.029	1.043	1.040	1.034	1.036	1.032	1.041
District of Columbia	1.066	1.033	1.050	1.106	1.103	1.095	1.114	1.039
Florida	.970	.935	.951	.972	.995	.987	.969	.961
Georgia	1.015	.953	.947	.993	1.007	1.016	.997	1.005
Idaho	.972	.969	.976	.975	1.035	1.021	.950	.964
Illinois	.980	.987	.990	1.015	1.020	.999	.973	1.027
Indiana	1.023	.998	.991	1.007	1.008	1.000	.991	.991
Iowa	1.056	1.077	1.071	1.050	1.028	1.023	1.021	1.009
Kansas	1.035	1.012	1.046	1.050	1.044	1.019	.990	.996
Kentucky	1.053	1.042	1.014	.991	.981	.960	1.018	.954
Louisiana	1.119	1.117	1.131	1.133	1.130	1.073	1.055	1.036
Maine	1.197	1.187	1.182	1.496	1.195	1.206	1.167	1.110
Maryland	.958	.936	.941	.965	1.015	1.040	1.011	1.010
Mississippi	1.035	1.027	1.002	1.047	1.022	1.004	.994	1.000
Missouri	1.056	1.063	1.033	1.015	1.032	1.013	.997	.951
Montana	.980	1.000	1.017	1.032	1.002	.995	.986	.980
Nebraska	1.089	1.048	1.025	1.020	1.016	1.012	1.013	1.023
New Hampshire	1.001	1.010	1.022	1.037	1.058	1.080	1.045	1.027
New Mexico	1.077	1.056	1.029	1.092	1.081	1.034	1.007	.973
Oklahoma	1.074	1.084	1.150	1.164	1.124	1.170	1.004	.922
Oregon	.940	.963	1.006	1.036	1.013	1.007	.970	.980
Rhode Island	1.058	1.056	1.067	1.118	1.093	1.062	1.049	1.056
South Carolina	1.039	1.035	1.028	1.035	1.030	.957	.960	.984
South Dakota	1.093	1.095	1.056	1.035	1.025	1.046	1.027	1.022
Tennessee	1.011	1.016	.993	1.006	.741	.808	.750	.774
Utah	.990	.977	.970	.975	.942	.958	.900	.989
Vermont	1.014	.996	1.042	1.051	1.019	1.013	1.021	.992
Virginia	.996	.983	.977	.979	1.021	1.021	1.024	XXX
Hawaii	1.039	.959	.955	.981	1.019	1.051	.996	.996
Alaska	.958	.971	.972	.936	.952	.956	.915	.873
Intrastate³	1.010	1.003	1.007	1.024	1.020	1.018	.995	.946
Interstate³	.989	.950	.978	.988				
Countrywide⁴	.997	.970	.989	1.002				

¹ Ratable risks are those risks with experience modification factors. Note that 1986 and prior may include self-insured risks; 1987 and subsequent exclude self-insured risks.

² Sheet 2 of this exhibit shows the average factors before excluding self-insured Risks for 1983 to 1989. Removal of Self-Insured risks had a big impact for Tennessee. For the remaining states, the impact appears to be minor relative to the normal year to year fluctuations.

³ 1987 and subsequent weighted by expected losses; 1986 and prior weighted by premiums.

⁴ Intrastate and Interstate weighted by expected losses.

AVERAGE EXPERIENCE RATING MODIFICATIONS FOR RATABLE RISKS¹
(Including Some Self-Insured Risks)

<u>STATE</u>	<u>1989</u>	<u>1988</u>	<u>1987</u>	<u>1986</u>	<u>1985</u>	<u>1984</u>	<u>1983</u>
Alabama	1.057	.999	1.011	1.039	1.037	1.031	1.005
Arizona	.988	.965	.976	1.002	.992	.895	.870
Arkansas	1.061	1.056	1.038	1.047	1.022	1.000	.978
Colorado	.975	1.021	1.012	.991	1.060	1.056	1.072
Connecticut	1.039	1.052	1.047	1.034	1.036	1.032	1.041
District of Columbia	1.033	1.050	1.106	1.103	1.095	1.114	1.039
Florida	.935	.954	.973	.995	.987	.969	.961
Georgia	.934	.937	.976	1.007	1.016	.997	1.005
Idaho	.969	.976	.975	1.035	1.021	.950	.964
Illinois	.990	.990	1.015	1.020	.999	.973	1.027
Indiana	.998	.991	1.007	1.008	1.000	.991	.991
Iowa	1.076	1.068	1.050	1.028	1.023	1.021	1.009
Kansas	1.019	1.052	1.053	1.044	1.019	.990	.996
Kentucky	1.024	.996	.977	.981	.960	1.018	.954
Louisiana	1.098	1.112	1.124	1.130	1.073	1.055	1.036
Maine	1.186	1.249	1.474	1.195	1.206	1.167	1.110
Maryland	.934	.941	.964	1.015	1.040	1.011	1.010
Mississippi	1.027	1.001	1.046	1.022	1.004	.994	1.000
Missouri	1.059	1.031	1.007	1.032	1.013	.997	.951
Montana	1.000	1.017	1.032	1.002	.995	.986	.980
Nebraska	1.049	1.025	1.020	1.016	1.012	1.013	1.023
New Hampshire	1.010	1.024	1.036	1.058	1.080	1.045	1.027
New Mexico	1.050	1.039	1.105	1.081	1.034	1.007	.973
Oklahoma	1.085	1.150	1.157	1.124	1.170	1.004	.922
Oregon	.963	1.004	1.036	1.013	1.007	.970	.980
Rhode Island	1.056	1.067	1.118	1.093	1.062	1.049	1.056
South Carolina	1.035	1.028	1.035	1.030	.957	.960	.984
South Dakota	1.090	1.056	1.035	1.025	1.046	1.027	1.022
Tennessee	.881	.841	.811	.741	.808	.750	.774
Utah	.962	.984	1.013	.942	.958	.900	.989
Vermont	.996	1.042	1.052	1.019	1.013	1.021	.992
Virginia	.983	.977	.979	1.021	1.021	1.024	XXX
Hawaii	.959	.953	.981	1.019	1.051	.996	.996
Alaska	.971	.975	.936	.952	.956	.915	.873
Intrastate²	1.000	1.003	1.018	1.020	1.018	.995	.946

¹ Ratable risks are those risks with experience modification factors.

² Weighted by premiums.

EXPERIENCE RATING PLAN - RISK SIZE RANGES

State	Size Range	# of Risks	Average E [Loss] Per Risk Per Year
Florida (3 Years)	1	2,504	2,955
	2	2,504	4,643
	3	2,504	7,106
	4	2,504	12,275
	5	2,504	48,539
	ALL	12,520	15,103
Colorado (3 Years)	1	2,130	2,022
	2	2,130	3,232
	3	2,130	4,863
	4	2,129	8,805
	5	2,129	57,159
	ALL	10,648	15,213
Nebraska (3 Years)	1	584	1,653
	2	584	2,409
	3	584	3,491
	4	585	5,655
	5	585	16,813
	ALL	2,922	6,008
Utah (3 Years)	1	606	2,039
	2	606	3,078
	3	606	4,375
	4	606	7,144
	5	606	29,438
	ALL	3,030	9,215
Maine (3 Years)	1	491	1,967
	2	491	3,151
	3	491	4,847
	4	491	8,700
	5	491	31,550
	ALL	2,455	10,043
Florida (5 Years)	1	1,455	2,890
	2	1,455	4,477
	3	1,455	6,776
	4	1,455	11,890
	5	1,455	48,172
	ALL	7,275	14,841

PERFORMANCE OF EXPERIENCE RATING PLANS
(By Loss Ratio)

Future Period - Manual Loss Ratios and Modified Loss Ratios ¹					
Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	0.684	0.852	0.931	0.960	1.027
Next 20%	0.780	0.902	0.951	0.968	0.984
Middle 20%	0.968	1.024	1.045	1.045	1.042
Next 20%	1.117	1.062	1.040	1.023	1.009
Last 20%	1.396	1.055	0.983	0.968	0.957
All Groups	1.000	0.995	0.995	0.993	0.997
Between Quintile-Squared Error of Average Loss Ratios ⁶					
Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	999	219	48	16	7
Next 20%	484	96	24	10	3
Middle 20%	10	6	20	20	18
Next 20%	137	38	16	5	1
Last 20%	1,568	30	3	10	18
Total	3,198	389	111	61	47
Within Quintile - Mean Squared Errors of Individual Risk Loss Ratios ⁷					
Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	3.493	3.401	3.391	3.388	3.385
Next 20%	2.667	2.620	2.614	2.614	2.610
Middle 20%	3.976	3.963	3.966	3.964	3.957
Next 20%	5.754	5.726	5.717	5.713	5.712
Last 20%	7.043	6.690	6.633	6.619	6.602
All Groups	4.637	4.527	4.511	4.506	4.499
Notes:					
<ol style="list-style-type: none"> Subsequent Period Loss ratios are shown on a manual basis and after application of the experience modification factors calculated with several different formulas. Quintiles are based on the loss ratios of the experience period at manual rates. Manual refers to the loss ratio of the subsequent period on a manual rate basis. This is the NCCI Revised Plan with the credibility formulas re-calculated to minimize the sum of squared differences between modified loss ratios and 1.000. This is the NCCI Revised Plan adjusted to apply a primary experience modification to expected excess losses in the rating formula. Credibilities have been optimized to reflect this new formula. The sum of squared differences between the quintile loss ratios (first table) and 1.000 multiplied by 10,000. The mean squared difference between an individual risk's subsequent loss ratio at manual rates and its experience modification factor. 					

PERFORMANCE OF EXPERIENCE RATING PLANS
(By State)

Future Period - Manual Loss Ratios and Modified Loss Ratios ¹					
State	Manual ²	PERP	RERP	Optimized RERP ³	Alternate Plan ⁴
Florida	1.000	1.008	1.005	1.005	1.007
Maine	1.000	0.965	0.977	0.972	0.977
Nebraska	0.999	0.989	0.985	0.983	0.988
Utah	0.996	0.982	0.976	0.973	0.980
All States	1.000	0.995	0.995	0.993	0.997
Between Hazard Groups - Squared Error of Average Loss Ratios ⁵					
State	Manual ²	PERP	RERP	Optimized RERP ³	Alternate Plan ⁴
Florida	0	1	0	0	0
Maine	0	12	5	8	5
Nebraska	0	1	2	3	1
Utah	0	3	6	7	4
Total	0	17	13	18	10
Within Hazard Group - Mean Squared Errors of Individual Risk Loss Ratios ⁶					
State	Manual ²	PERP	RERP	Optimized RERP ³	Alternate Plan ⁴
Florida	5.317	5.204	5.177	5.169	5.160
Maine	3.104	2.960	2.964	2.959	2.963
Nebraska	5.327	5.283	5.287	5.284	5.282
Utah	2.679	2.613	2.603	2.621	2.596
All States	4.637	4.527	4.511	4.506	4.499
Notes:					
<ol style="list-style-type: none"> Subsequent Period Loss ratios are shown on a manual basis and after application of the experience modification factors calculated with several different formulas. Manual refers to the loss ratio of the subsequent period on a manual rate basis. This is the NCCI Revised Plan with the credibility formulas re-calculated to minimize the sum of squared differences between modified loss ratios and 1.000. This is the NCCI Revised Plan adjusted to apply a primary experience modification to expected excess losses in the rating formula. Credibilities have been optimized to reflect this new formula. The sum of squared differences between the quintile loss ratios (first table) and 1.000, multiplied by 10,000. The mean squared difference between an individual risk's subsequent period loss ratio at manual rates and its experience modification factor. 					

**PERFORMANCE OF EXPERIENCE RATING PLANS
(By Risk Size)**

Future Period - Manual Loss Ratios and Modified Loss Ratios ¹					
Risk Size ⁷	Manual ²	PERP	RERP	Optimized RERP ³	Alternate Plan ⁴
2,501 to 5,000	0.932	0.927	0.922	0.918	0.924
5,001 to 10,000	0.995	0.993	0.989	0.985	0.987
10,001 to 20,000	1.008	1.005	1.002	1.001	1.003
20,001 to 50,000	1.042	1.032	1.027	1.026	1.026
50,001 to 100,000	0.996	0.984	0.983	0.981	0.982
100,001 to 250K	1.025	1.028	1.028	1.028	1.033
250,001 to 500K	0.908	0.931	0.934	0.936	0.945
Over 500,000	0.935	0.886	0.917	0.916	0.928
All Groups	1.000	0.995	0.995	0.993	0.997
Between Sizes - Squared Error of Average Loss Ratios ⁵					
Risk Size ⁷	Manual ²	PERP	RERP	Optimized RERP ³	Alternate Plan ⁴
2,501 to 5,000	46	53	61	67	58
5,001 to 10,000	0	0	1	2	2
10,001 to 20,000	1	0	0	0	0
20,001 to 50,000	18	10	7	7	7
50,001 to 100,000	0	3	3	4	3
100,001 to 250K	6	8	8	8	11
250,001 to 500K	85	48	44	41	30
Over 500,000	42	130	69	71	52
Total	198	252	193	200	163

PERFORMANCE OF EXPERIENCE RATING PLANS
(By Risk Size)

Within Sizes - Mean Squared Errors of Individual Risk Loss Ratios ⁶					
Risk Size ⁷	Manual ²	PERP	RERP	Optimized RERP ³	Alternate Plan ⁴
2,501 to 5,000	10.486	10.348	10.218	10.202	10.172
5,001 to 10,000	13.245	13.171	13.142	13.121	13.123
10,001 to 20,000	6.587	6.499	6.476	6.476	6.482
20,001 to 50,000	4.128	4.008	3.992	3.983	3.965
50,001 to 100,000	2.280	2.175	2.161	2.161	2.150
100,001 to 250K	3.858	3.775	3.767	3.768	3.767
250,001 to 500K	0.402	0.375	0.367	0.365	0.359
Over 500,000	0.555	0.129	0.154	0.131	0.134
All Groups	4.637	4.527	4.511	4.506	4.499

Notes:

1. Subsequent Period Loss ratios are shown on a manual basis and after application of the experience modification factors calculated with several different formulas.
2. Manual refers to the loss ratio of the subsequent period on a manual rate basis.
3. This is the NCCI Revised Plan with the credibility formulas re-calculated to minimize the sum of squared differences between modified loss ratios and 1.000.
4. This is the NCCI Revised Plan adjusted to apply a primary experience modification to expected excess losses in the rating formula. Credibilities have been optimized to reflect this new formula.
5. The sum of squared differences between the quintile loss ratios (first table) and 1.000, multiplied by 10,000.
6. The mean squared difference between an individual risk's subsequent period loss ratio at manual rates and its experience modification factor.
7. Risk size is measured by expected losses (three years).

PERFORMANCE OF EXPERIENCE RATING PLANS
(By Loss Ratio)
EXPECTED LOSS SIZE GROUP \$2,501 TO \$5,000

Future Period - Manual Loss Ratios and Modified Loss Ratios¹

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	.608	.650	.708	.783	.746
Next 20%	.622	.664	.721	.786	.755
Middle 20%	.667	.705	.754	.805	.776
Next 20%	1.310	1.328	1.346	1.336	1.334
Last 20%	1.421	1.162	.966	.839	.909
All Groups	.932	.927	.922	.918	.924

Between Quintile-Squared Error of Average Loss Ratios⁶

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	1,537	1,225	853	471	645
Next 20%	1,429	1,129	778	458	600
Middle 20%	1,109	870	605	380	502
Next 20%	961	1,076	1,197	1,129	1,116
Last 20%	1,772	262	12	259	83
Total	6,808	4,562	3,445	2,697	2,946

Within Quintile - Mean Squared Errors of Individual Risk Loss Ratios⁷

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	5.891	5.838	5.789	5.743	5.764
Next 20%	4.423	4.379	4.337	4.311	4.321
Middle 20%	7.225	7.190	7.156	7.146	7.149
Next 20%	14.042	14.035	14.031	14.012	14.013
Last 20%	20.670	20.116	19.590	19.611	19.424
All Groups	10.486	10.348	10.218	10.202	10.172

Notes:

1. Subsequent Period Loss ratios are shown on a manual basis and after application of the experience modification factors calculated with several different formulas.
2. Quintiles are based on the loss ratios of the experience period at manual rates.
3. Manual refers to the loss ratio of the subsequent period on a manual rate basis.
4. This is the NCCI Revised Plan with the credibility formulas re-calculated to minimize the sum of squared differences between modified loss ratios and 1.000.
5. This is the NCCI Revised Plan adjusted to apply a primary experience modification to expected excess losses in the rating formula. Credibilities have been optimized to reflect this new formula.
6. The sum of squared differences between the quintile loss ratios (first table) and 1.000 multiplied by 10,000.
7. The mean squared difference between an individual risk's subsequent loss ratio at manual rates and its experience modification factor.

**PERFORMANCE OF EXPERIENCE RATING PLANS
(By Loss Ratio)
EXPECTED LOSS SIZE GROUP \$5,001 TO \$10,000**

Future Period - Manual Loss Ratios and Modified Loss Ratios ¹					
Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	.767	.851	.955	1.034	1.012
Next 20%	.754	.832	.923	.988	.966
Middle 20%	.926	.994	1.069	1.109	1.090
Next 20%	1.161	1.152	1.130	1.087	1.090
Last 20%	1.336	1.071	.903	.838	.866
All Groups	.995	.993	.989	.985	.987
Between Quintile-Squared Error of Average Loss Ratios ⁶					
Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	543	222	20	12	1
Next 20%	605	282	59	1	12
Middle 20%	55	0	48	119	81
Next 20%	259	231	169	76	81
Last 20%	1,129	50	94	262	180
Total	2,591	785	390	470	355
Within Quintile - Mean Squared Errors of Individual Risk Loss Ratios ⁷					
Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	13.035	12.992	12.972	12.972	12.972
Next 20%	10.215	10.179	10.160	10.158	10.154
Middle 20%	11.937	11.935	11.943	11.952	11.946
Next 20%	15.347	15.331	15.322	15.310	15.304
Last 20%	15.480	15.219	15.117	15.024	15.048
All Groups	13.245	13.171	13.141	13.121	13.122
Notes:					
<ol style="list-style-type: none"> Subsequent Period Loss ratios are shown on a manual basis and after application of the experience modification factors calculated with several different formulas. Quintiles are based on the loss ratios of the experience period at manual rates. Manual refers to the loss ratio of the subsequent period on a manual rate basis. This is the NCCI Revised Plan with the credibility formulas re-calculated to minimize the sum of squared differences between modified loss ratios and 1.000. This is the NCCI Revised Plan adjusted to apply a primary experience modification to expected excess losses in the rating formula. Credibilities have been optimized to reflect this new formula. The sum of squared differences between the quintile loss ratios (first table) and 1.000 multiplied by 10,000. The mean squared difference between an individual risk's subsequent loss ratio at manual rates and its experience modification factor. 					

**PERFORMANCE OF EXPERIENCE RATING PLANS
(By Loss Ratio)
EXPECTED LOSS SIZE GROUP \$10,001 TO \$20,000**

Future Period - Manual Loss Ratios and Modified Loss Ratios¹

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	.712	.831	.946	.998	1.037
Next 20%	.772	.879	.976	1.011	1.035
Middle 20%	.959	1.031	1.084	1.087	1.092
Next 20%	1.124	1.068	1.014	.972	.955
Last 20%	1.437	1.126	.985	.971	.961
All Groups	1.008	1.005	1.002	1.001	1.003

Between Quintile-Squared Error of Average Loss Ratios⁶

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	829	286	29	0	14
Next 20%	520	146	6	1	12
Middle 20%	17	10	71	76	85
Next 20%	154	46	2	8	20
Last 20%	1,910	159	2	8	15
Total	3,430	647	110	93	146

Within Quintile - Mean Squared Errors of Individual Risk Loss Ratios⁷

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	5.354	5.298	5.279	5.276	5.276
Next 20%	4.509	4.470	4.461	4.465	4.460
Middle 20%	7.342	7.337	7.342	7.342	7.341
Next 20%	6.859	6.850	6.856	6.864	6.870
Last 20%	8.749	8.428	8.331	8.322	8.353
All Groups	6.587	6.499	6.476	6.476	6.482

Notes:

1. Subsequent Period Loss ratios are shown on a manual basis and after application of the experience modification factors calculated with several different formulas.
2. Quintiles are based on the loss ratios of the experience period at manual rates.
3. Manual refers to the loss ratio of the subsequent period on a manual rate basis.
4. This is the NCCI Revised Plan with the credibility formulas re-calculated to minimize the sum of squared differences between modified loss ratios and 1.000.
5. This is the NCCI Revised Plan adjusted to apply a primary experience modification to expected excess losses in the rating formula. Credibilities have been optimized to reflect this new formula.
6. The sum of squared differences between the quintile loss ratios (first table) and 1.000 multiplied by 10,000.
7. The mean squared difference between an individual risk's subsequent loss ratio at manual rates and its experience modification factor.

PERFORMANCE OF EXPERIENCE RATING PLANS
(By Loss Ratio)
EXPECTED LOSS SIZE GROUP \$20,001 TO \$50,000

Future Period - Manual Loss Ratios and Modified Loss Ratios¹

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	.627	.772	.872	.894	.998
Next 20%	.816	.943	1.013	1.015	1.064
Middle 20%	1.087	1.136	1.152	1.132	1.126
Next 20%	1.217	1.131	1.103	1.084	1.049
Last 20%	1.387	1.070	.966	.973	.940
All Groups	1.042	1.032	1.027	1.026	1.026

Between Quintile-Squared Error of Average Loss Ratios⁶

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	1,391	520	164	112	0
Next 20%	339	32	2	2	41
Middle 20%	76	185	231	174	159
Next 20%	471	172	106	71	24
Last 20%	1,498	49	12	7	36
Total	3,775	958	515	366	260

Within Quintile - Mean Squared Errors of Individual Risk Loss Ratios⁷

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	2.987	2.885	2.861	2.860	2.846
Next 20%	2.412	2.375	2.371	2.370	2.374
Middle 20%	3.789	3.793	3.797	3.794	3.790
Next 20%	5.269	5.200	5.173	5.161	5.143
Last 20%	5.849	5.475	5.442	5.421	5.363
All Groups	4.128	4.008	3.991	3.983	3.965

Notes:

1. Subsequent Period Loss ratios are shown on a manual basis and after application of the experience modification factors calculated with several different formulas.
2. Quintiles are based on the loss ratios of the experience period at manual rates.
3. Manual refers to the loss ratio of the subsequent period on a manual rate basis.
4. This is the NCCI Revised Plan with the credibility formulas re-calculated to minimize the sum of squared differences between modified loss ratios and 1.000.
5. This is the NCCI Revised Plan adjusted to apply a primary experience modification to expected excess losses in the rating formula. Credibilities have been optimized to reflect this new formula.
6. The sum of squared differences between the quintile loss ratios (first table) and 1.000 multiplied by 10,000.
7. The mean squared difference between an individual risk's subsequent loss ratio at manual rates and its experience modification factor.

PERFORMANCE OF EXPERIENCE RATING PLANS
(By Loss Ratio)
EXPECTED LOSS SIZE GROUP \$50,001 TO \$100,000

Future Period - Manual Loss Ratios and Modified Loss Ratios¹

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	.692	.878	.957	.958	1.086
Next 20%	.814	.915	.950	.937	.956
Middle 20%	.924	.940	.951	.941	.931
Next 20%	1.093	1.016	1.002	.999	.975
Last 20%	1.424	1.095	1.022	1.033	.992
All Groups	.996	.984	.983	.981	.982

Between Quintile-Squared Error of Average Loss Ratios⁶

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	949	149	18	18	74
Next 20%	346	72	25	40	19
Middle 20%	58	36	24	35	48
Next 20%	86	3	0	0	6
Last 20%	1,798	90	5	11	1
Total	3,237	350	72	104	148

Within Quintile - Mean Squared Errors of Individual Risk Loss Ratios⁷

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	1.005	.917	.912	.913	.899
Next 20%	1.038	1.003	1.000	1.003	1.002
Middle 20%	2.086	2.072	2.068	2.068	2.068
Next 20%	3.503	3.450	3.445	3.439	3.436
Last 20%	3.639	3.316	3.264	3.264	3.233
All Groups	2.280	2.175	2.161	2.160	2.150

Notes:

1. Subsequent Period Loss ratios are shown on a manual basis and after application of the experience modification factors calculated with several different formulas.
2. Quintiles are based on the loss ratios of the experience period at manual rates.
3. Manual refers to the loss ratio of the subsequent period on a manual rate basis.
4. This is the NCCI Revised Plan with the credibility formulas re-calculated to minimize the sum of squared differences between modified loss ratios and 1.000.
5. This is the NCCI Revised Plan adjusted to apply a primary experience modification to expected excess losses in the rating formula. Credibilities have been optimized to reflect this new formula.
6. The sum of squared differences between the quintile loss ratios (first table) and 1.000 multiplied by 10,000.
7. The mean squared difference between an individual risk's subsequent loss ratio at manual rates and its experience modification factor.

**PERFORMANCE OF EXPERIENCE RATING PLANS
(By Loss Ratio)
EXPECTED LOSS SIZE GROUP \$100,001 TO \$250,000**

Future Period - Manual Loss Ratios and Modified Loss Ratios¹

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	.798	1.042	1.109	1.108	1.207
Next 20%	.731	.849	.877	.873	.895
Middle 20%	1.025	1.068	1.080	1.077	1.078
Next 20%	1.126	1.071	1.057	1.058	1.053
Last 20%	1.423	1.072	1.020	1.024	.994
All Groups	1.025	1.028	1.028	1.028	1.033

Between Quintile-Squared Error of Average Loss Ratios⁶

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	408	18	119	117	428
Next 20%	724	228	151	161	110
Middle 20%	6	46	64	59	61
Next 20%	159	50	32	34	28
Last 20%	1,789	52	4	6	0
Total	3,086	394	370	377	627

Within Quintile - Mean Squared Errors of Individual Risk Loss Ratios⁷

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	1.004	.952	.959	.959	.972
Next 20%	.707	.647	.641	.641	.637
Middle 20%	1.163	1.127	1.131	1.124	1.093
Next 20%	5.604	5.604	5.594	5.594	5.607
Last 20%	10.622	10.347	10.315	10.328	10.332
All Groups	3.858	3.775	3.767	3.768	3.767

Notes:

1. Subsequent Period Loss ratios are shown on a manual basis and after application of the experience modification factors calculated with several different formulas.
2. Quintiles are based on the loss ratios of the experience period at manual rates.
3. Manual refers to the loss ratio of the subsequent period on a manual rate basis.
4. This is the NCCI Revised Plan with the credibility formulas re-calculated to minimize the sum of squared differences between modified loss ratios and 1.000.
5. This is the NCCI Revised Plan adjusted to apply a primary experience modification to expected excess losses in the rating formula. Credibilities have been optimized to reflect this new formula.
6. The sum of squared differences between the quintile loss ratios (first table) and 1.000 multiplied by 10,000.
7. The mean squared difference between an individual risk's subsequent loss ratio at manual rates and its experience modification factor.

PERFORMANCE OF EXPERIENCE RATING PLANS
(By Loss Ratio)
EXPECTED LOSS SIZE GROUP \$250,001 TO \$500,000

Future Period - Manual Loss Ratios and Modified Loss Ratios¹

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	.640	.897	.912	.932	.969
Next 20%	.871	1.031	1.032	1.043	1.039
Middle 20%	.920	1.011	1.015	1.024	1.037
Next 20%	.909	.886	.878	.877	.879
Last 20%	1.118	.873	.877	.869	.877
All Groups	.908	.931	.934	.936	.945

Between Quintile-Squared Error of Average Loss Ratios⁶

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	1,296	106	77	46	10
Next 20%	166	10	10	18	15
Middle 20%	64	1	2	6	14
Next 20%	83	130	149	151	146
Last 20%	139	161	151	172	151
Total	1,748	408	389	393	336

Within Quintile - Mean Squared Errors of Individual Risk Loss Ratios⁷

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	.405	.272	.265	.261	.263
Next 20%	.405	.368	.374	.371	.358
Middle 20%	.528	.519	.508	.505	.501
Next 20%	.250	.249	.251	.251	.253
Last 20%	.421	.445	.416	.417	.404
All Groups	.402	.375	.367	.365	.359

Notes:

1. Subsequent Period Loss ratios are shown on a manual basis and after application of the experience modification factors calculated with several different formulas.
2. Quintiles are based on the loss ratios of the experience period at manual rates.
3. Manual refers to the loss ratio of the subsequent period on a manual rate basis.
4. This is the NCCI Revised Plan with the credibility formulas re-calculated to minimize the sum of squared differences between modified loss ratios and 1.000.
5. This is the NCCI Revised Plan adjusted to apply a primary experience modification to expected excess losses in the rating formula. Credibilities have been optimized to reflect this new formula.
6. The sum of squared differences between the quintile loss ratios (first table) and 1.000 multiplied by 10,000.
7. The mean squared difference between an individual risk's subsequent loss ratio at manual rates and its experience modification factor.

PERFORMANCE OF EXPERIENCE RATING PLANS
(By Loss Ratio)
EXPECTED LOSS SIZE GROUP OVER \$500,000

Future Period - Manual Loss Ratios and Modified Loss Ratios¹

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	.308	.506	.445	.477	.481
Next 20%	.688	.915	.889	.948	.929
Middle 20%	.690	.799	.755	.770	.778
Next 20%	.883	.859	.870	.867	.887
Last 20%	1.770	.979	1.134	1.067	1.100
All Groups	.935	.886	.917	.916	.928

Between Quintile-Squared Error of Average Loss Ratios⁶

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	4,789	2,440	3,080	2,735	2,694
Next 20%	973	72	123	27	50
Middle 20%	961	404	600	529	493
Next 20%	137	199	169	177	128
Last 20%	5,929	4	180	45	100
Total	12,789	3,119	4,152	3,513	3,465

Within Quintile - Mean Squared Errors of Individual Risk Loss Ratios⁷

Loss Ratio Quintile ²	Manual ³	PERP	RERP	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	.520	.115	.168	.134	.128
Next 20%	.178	.065	.069	.065	.051
Middle 20%	.198	.146	.174	.166	.171
Next 20%	.127	.132	.142	.142	.150
Last 20%	1.570	.197	.240	.173	.195
All Groups	.555	.129	.154	.131	.134

Notes:

1. Subsequent Period Loss ratios are shown on a manual basis and after application of the experience modification factors calculated with several different formulas.
2. Quintiles are based on the loss ratios of the experience period at manual rates.
3. Manual refers to the loss ratio of the subsequent period on a manual rate basis.
4. This is the NCCI Revised Plan with the credibility formulas re-calculated to minimize the sum of squared differences between modified loss ratios and 1.000.
5. This is the NCCI Revised Plan adjusted to apply a primary experience modification to expected excess losses in the rating formula. Credibilities have been optimized to reflect this new formula.
6. The sum of squared differences between the quintile loss ratios (first table) and 1.000 multiplied by 10,000.
7. The mean squared difference between an individual risk's subsequent loss ratio at manual rates and its experience modification factor.

**PERFORMANCE OF EXPERIENCE RATING PLANS
(By Loss Ratio)
SAMPLE CALCULATION OF EXHIBIT 7a SHEET 1 VALUES**

1. Calculation of between Quintile Squared Error of Average Loss Ratio

a. Average Loss Ratio for RERP - First 20% Quintile	.931
b. Target Average Loss Ratio	1.000
c. Squared Error (a-b) ²	0.004761
d. (c)x10,000	48

2. Hypothetical example of Within Quintile Mean Squared Errors of Individual Risk Loss Ratios - RERP First 20%

(a) Risk Name	(b) Subsequent Period Expected Losses	(c) Subsequent Period Actual to Expected Loss Ratio	(d) RERP Experience Modification Factor	(e) Squared Error ((c)-(d)) ²	(f) Weight (b)/SUM(b)	(g) Weighted Squared Error (e) x (f)
Risk 1	45,967	.885	.801	.007056	.309534	.002184
Risk 2	25,856	5.217	.857	19.009600	.174110	3.309757
Risk 3	30,855	1.120	.767	.124609	.207772	.025890
Risk 4	23,150	.305	.843	.289444	.155888	.045121
Risk 5	22,676	.556	.782	.051076	.152696	.007799
Total	148,504				Sum:	3.391

TEST OF \$2,000 SINGLE SPLIT POINT
(By Loss Ratio)

Future Period - Manual Loss Ratios and Modified Loss Ratios ¹					
Loss Ratio Quintile ²	Manual ³	5,000 Split Point		2,000 Split Point	
		Optimized RERP ⁴	Alternate Plan ⁵	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	0.684	0.960	1.027	0.937	1.123
Next 20%	0.780	0.968	0.984	0.951	1.008
Middle 20%	0.968	1.045	1.042	1.038	1.032
Next 20%	1.117	1.023	1.009	1.035	0.987
Last 20%	1.396	0.968	0.957	0.984	0.928
All Groups	1.000	0.993	0.997	0.993	0.995
Between Quintile-Squared Error of Average Loss Ratios ⁶					
Loss Ratio Quintile ²	Manual ³	5,000 Split Point		2,000 Split Point	
		Optimized RERP ⁴	Alternate Plan ⁵	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	999	16	7	40	151
Next 20%	484	10	3	24	1
Middle 20%	10	20	18	14	10
Next 20%	137	5	1	12	2
Last 20%	1,568	10	18	3	52
Total	3,198	61	47	93	216
Within Quintile - Mean Squared Errors of Individual Risk Loss Ratios ⁷					
Loss Ratio Quintile ²	Manual ³	5,000 Split Point		2,000 Split Point	
		Optimized RERP ⁴	Alternate Plan ⁵	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	3.493	3.388	3.385	3.388	3.386
Next 20%	2.667	2.614	2.610	2.613	2.608
Middle 20%	3.976	3.964	3.957	3.967	3.961
Next 20%	5.754	5.713	5.712	5.716	5.719
Last 20%	7.043	6.619	6.602	6.631	6.606
All Groups	4.637	4.506	4.499	4.510	4.502

Notes:

1. Subsequent Period Loss ratios are shown on a manual basis and after application of the experience modification factors calculated with several different formulas.
2. Quintiles are based on the loss ratios of the experience period at manual rates.
3. Manual refers to the loss ratio of the subsequent period on a manual rate basis.
4. This is the NCCI Revised Plan with the credibility formulas re-calculated to minimize the sum of squared differences between modified loss ratios and 1.000.
5. This is the NCCI Revised Plan adjusted to apply a primary experience modification to expected excess losses in the rating formula. Credibilities have been optimized to reflect this new formula.
6. The sum of squared differences between the quintile loss ratios (first table) and 1.000, multiplied by 10,000.
7. The mean squared difference between an individual risk's subsequent period loss ratio at manual rates and its experience modification factor.

TEST OF \$10,000 SINGLE SPLIT POINT
(By Loss Ratio)

Future Period - Manual Loss Ratios and Modified Loss Ratios ¹					
Loss Ratio Quintile ²	Manual ³	5,000 Split Point		10,000 Split Point	
		Optimized RERP ⁴	Alternate Plan ⁵	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	0.684	0.960	1.027	0.972	1.001
Next 20%	0.780	0.968	0.984	0.982	0.987
Middle 20%	0.968	1.045	1.042	1.059	1.056
Next 20%	1.117	1.023	1.009	1.031	1.026
Last 20%	1.396	0.968	0.957	0.947	0.948
All Groups	1.000	0.993	0.997	0.994	0.998

Between Quintile-Squared Error of Average Loss Ratios ⁶					
Loss Ratio Quintile ²	Manual ³	5,000 Split Point		10,000 Split Point	
		Optimized RERP ⁴	Alternate Plan ⁵	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	999	16	7	8	0
Next 20%	484	10	3	3	2
Middle 20%	10	20	18	35	31
Next 20%	137	5	1	10	7
Last 20%	1,568	10	18	28	27
Total	3,198	61	47	84	67

Within Quintile - Mean Squared Errors of Individual Risk Loss Ratios ⁷					
Loss Ratio Quintile ²	Manual ³	5,000 Split Point		10,000 Split Point	
		Optimized RERP ⁴	Alternate RERP ⁵	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	3.493	3.388	3.385	3.392	3.387
Next 20%	2.667	2.614	2.610	2.616	2.612
Middle 20%	3.976	3.964	3.957	3.967	3.963
Next 20%	5.754	5.713	5.712	5.723	5.725
Last 20%	7.043	6.619	6.602	6.644	6.630
All Groups	4.637	4.506	4.499	4.515	4.510

- Notes:
1. Subsequent Period Loss ratios are shown on a manual basis and after application of the experience modification factors calculated with several different formulas.
 2. Quintiles are based on the loss ratios of the experience period at manual rates.
 3. Manual refers to the loss ratio of the subsequent period on a manual rates basis.
 4. This is the NCCI Revised Plan with the credibility formulas re-calculated to minimize the sum of squared differences between modified loss ratios and 1.000.
 5. This is the NCCI Revised Plan adjusted to apply a primary experience modification to expected excess losses in the rating formula. Credibilities have been optimized to reflect this new formula.
 6. The sum of squared differences between the quintile loss ratios (first table) and 1.000, multiplied by 10,000.
 7. The mean squared difference between an individual risk's subsequent period loss ratio at manual rates and its experience modification factor.

TEST OF FIVE-YEAR EXPERIENCE PERIOD
(By Loss Ratio)

Future Period - Manual Loss Ratios and Modified Loss Ratios ¹					
Loss Ratio Quintile ²	Manual ³	3 Year		5 Year	
		Optimized RERP ⁴	Alternate Plan ⁵	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	0.684	0.960	1.027	0.950	1.011
Next 20%	0.780	0.968	0.984	0.989	1.004
Middle 20%	0.968	1.045	1.042	1.011	1.006
Next 20%	1.117	1.023	1.009	1.019	1.002
Last 20%	1.396	0.968	0.957	0.978	0.968
All Groups	1.000	0.993	0.997	0.991	0.994
Between Quintile-Squared Error of Average Loss Ratios ⁶					
Loss Ratio Quintile ²	Manual ³	3 Year		5 Year	
		Optimized RERP ⁴	Alternate Plan ⁵	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	999	16	7	25	1
Next 20%	484	10	3	1	0
Middle 20%	10	20	18	1	0
Next 20%	137	5	1	4	0
Last 20%	1,568	10	18	5	10
Total	3,198	61	47	36	11
Within Quintile - Mean Squared Errors of Individual Risk Loss Ratios ⁷					
Loss Ratio Quintile ²	Manual ³	3 Year		5 Year	
		Optimized RERP ⁴	Alternate Plan ⁵	Optimized RERP ⁴	Alternate Plan ⁵
First 20%	3.493	3.388	3.385	3.163	3.155
Next 20%	2.667	2.614	2.610	3.010	3.005
Middle 20%	3.976	3.964	3.957	3.549	3.545
Next 20%	5.754	5.713	5.712	5.888	5.893
Last 20%	7.043	6.619	6.602	6.644	6.619
All Groups	4.637	4.506	4.499	4.496	4.489

Notes:

1. Subsequent Period Loss ratios are shown on a manual basis and after application of the experience modification factors calculated with several different formulas.
2. Quintiles are based on the loss ratios of the experience period at manual rates.
3. Manual refers to the loss ratio of the subsequent period on a manual rate basis.
4. This is the NCCI Revised Plan with the credibility formulas re-calculated to minimize the sum of squared differences between modified loss ratios and 1.000.
5. This is the NCCI Revised Plan adjusted to apply a primary experience modification to expected excess losses in the rating formula. Credibilities have been optimized to reflect this new formula.
6. The sum of squared differences between the quintile loss ratios (first table) and 1.000, multiplied by 10,000.
7. The mean squared difference between an individual risk's subsequent period loss ratio at manual rates and its experience modification factor.

RELATIONSHIP BETWEEN PRIMARY AND EXCESS LOSS RATIOS

STATE: FLORIDA

Results of Regression

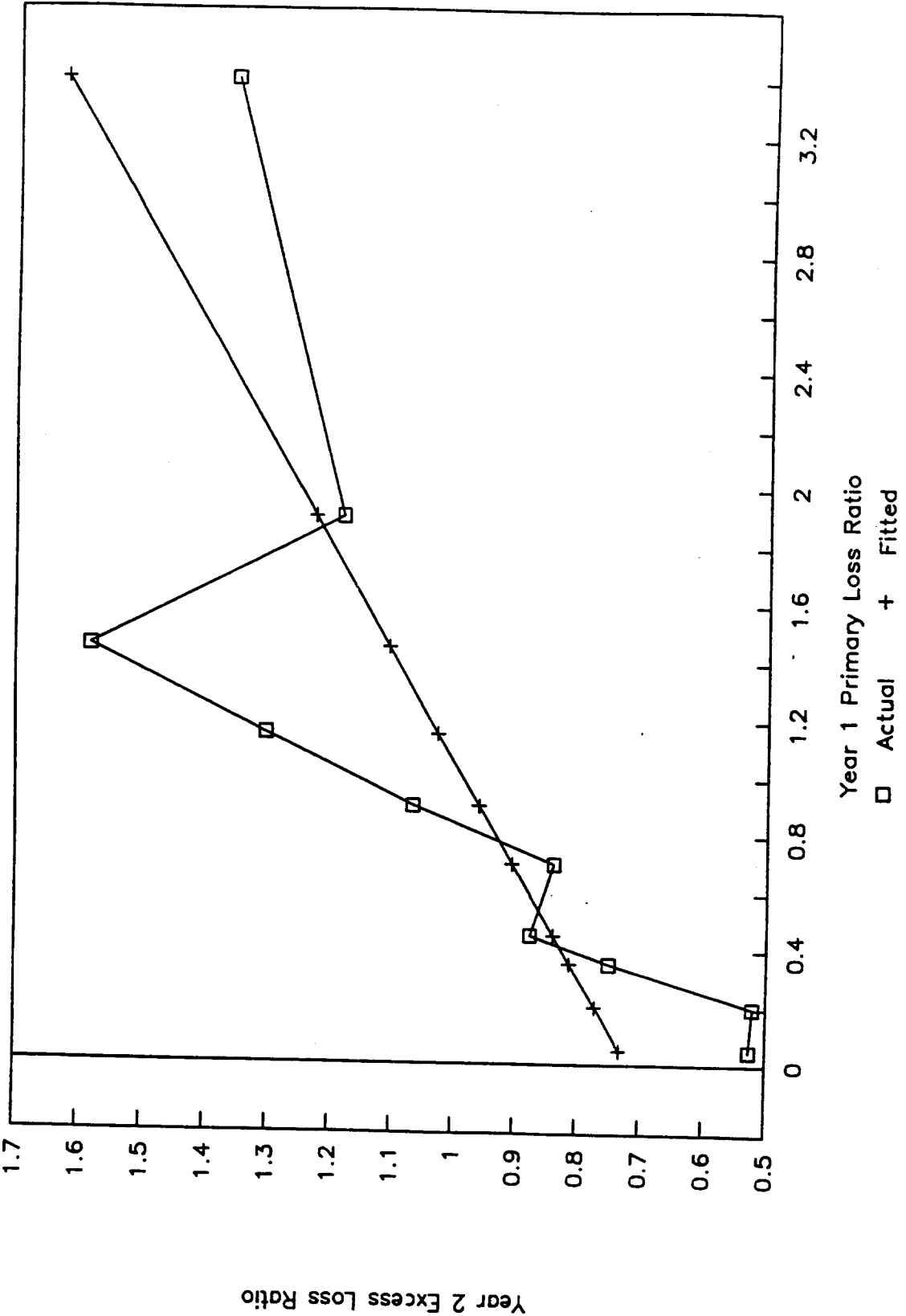
X = Primary Loss Ratio in Year 1

Y = Excess Loss Ratio in Year 2

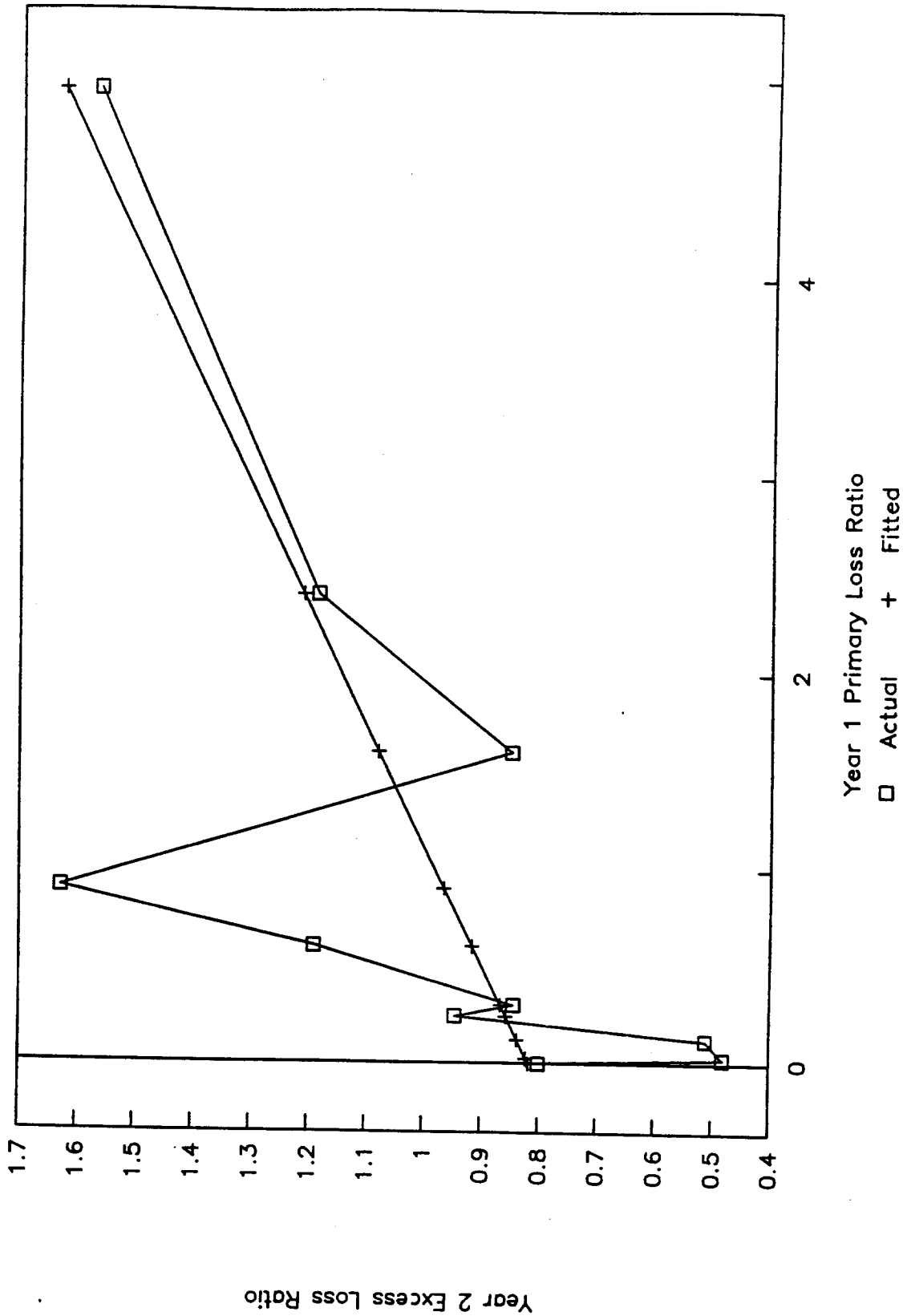
Risk Size Range	Constant	Slope	Standard Error of Slope	R-Squared	T-Statistic	Significance
1	0.862	0.126	0.083	0.224	1.518	*
2	0.848	0.161	0.033	0.752	4.879	0.005
3	0.740	0.235	0.052	0.722	4.519	0.005
4	0.818	0.163	0.068	0.420	2.397	0.025
5	0.718	0.267	0.083	0.563	3.217	0.010

* Not significant at the 0.050 level.

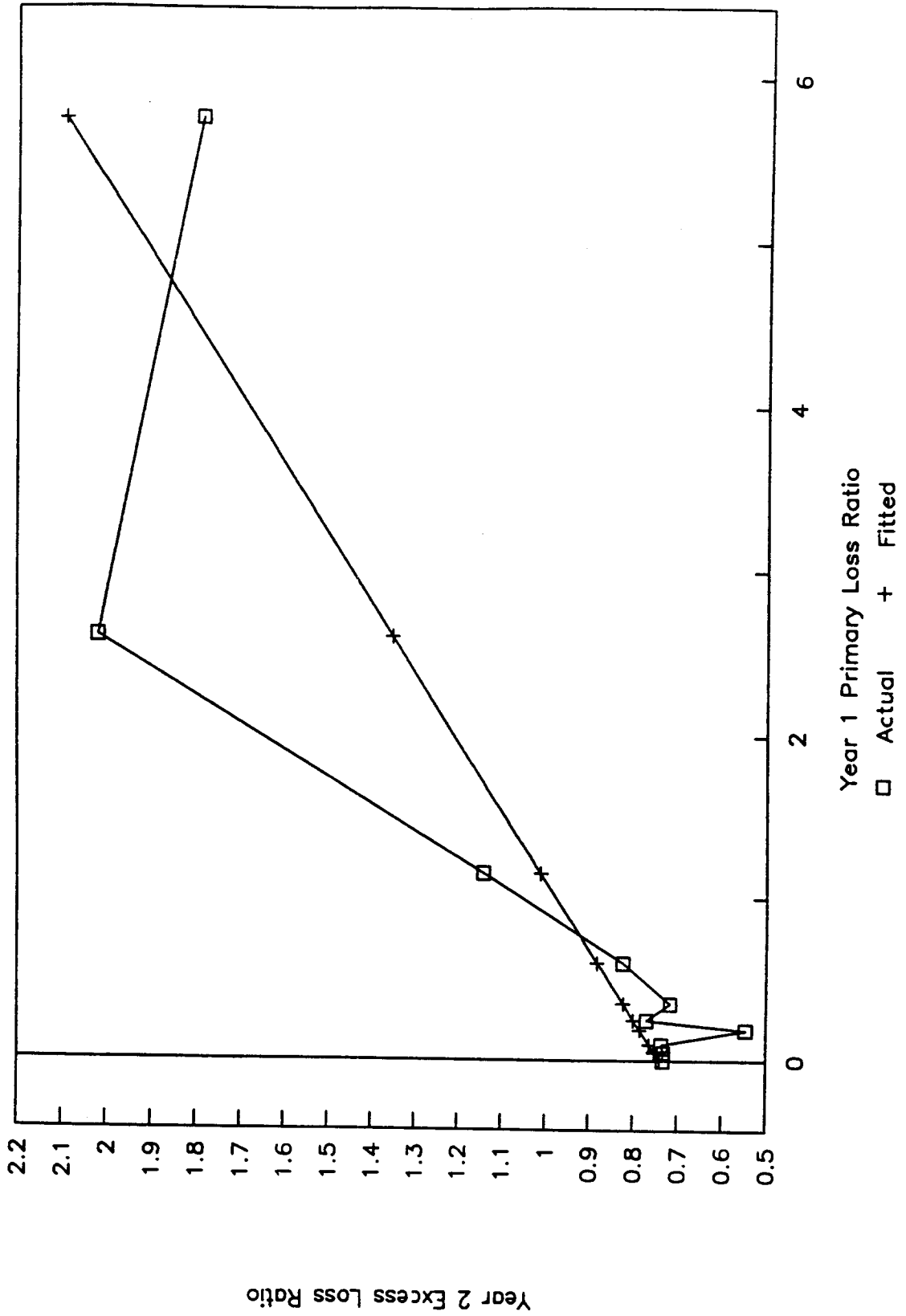
Size Range 5



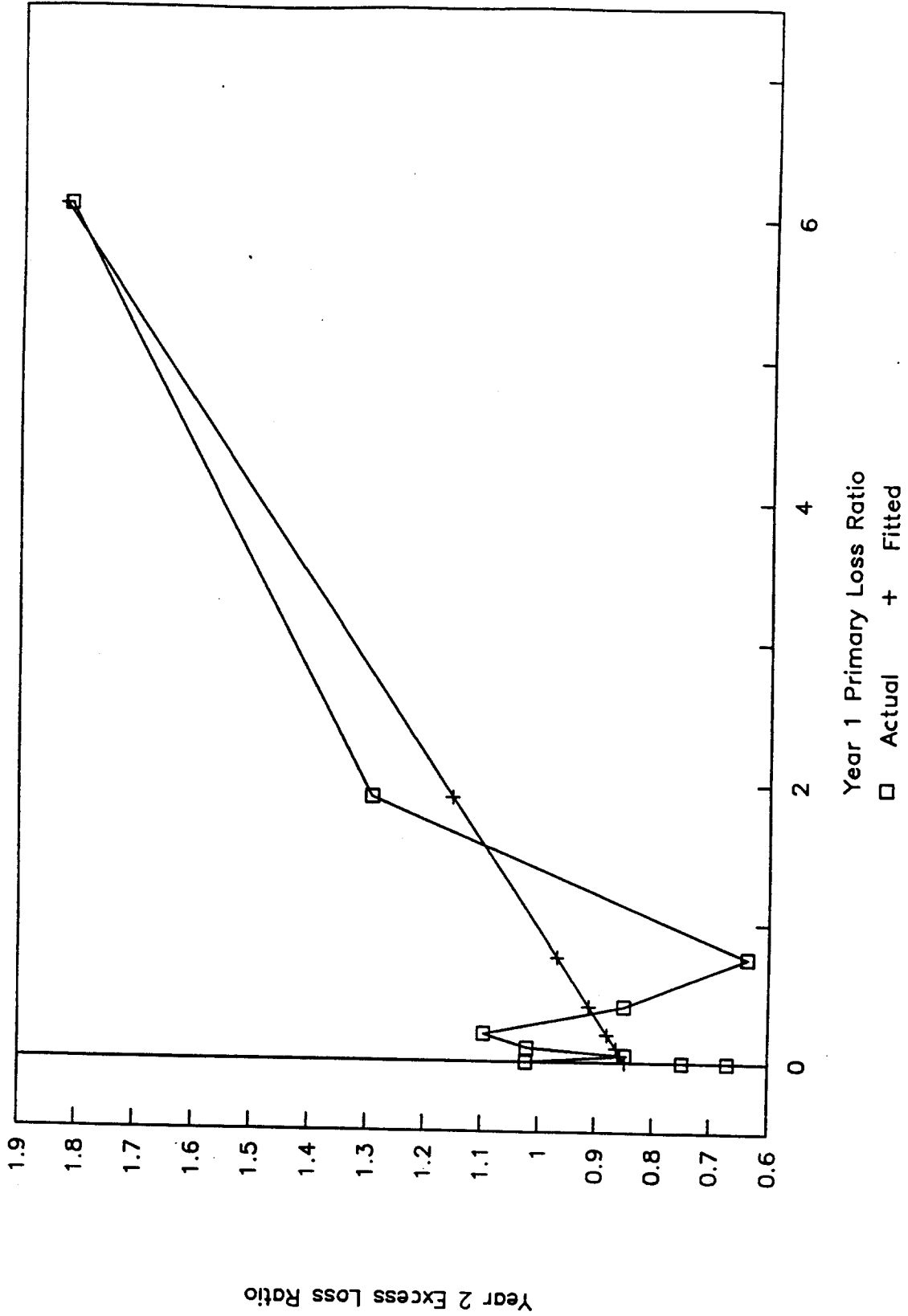
Size Range 4



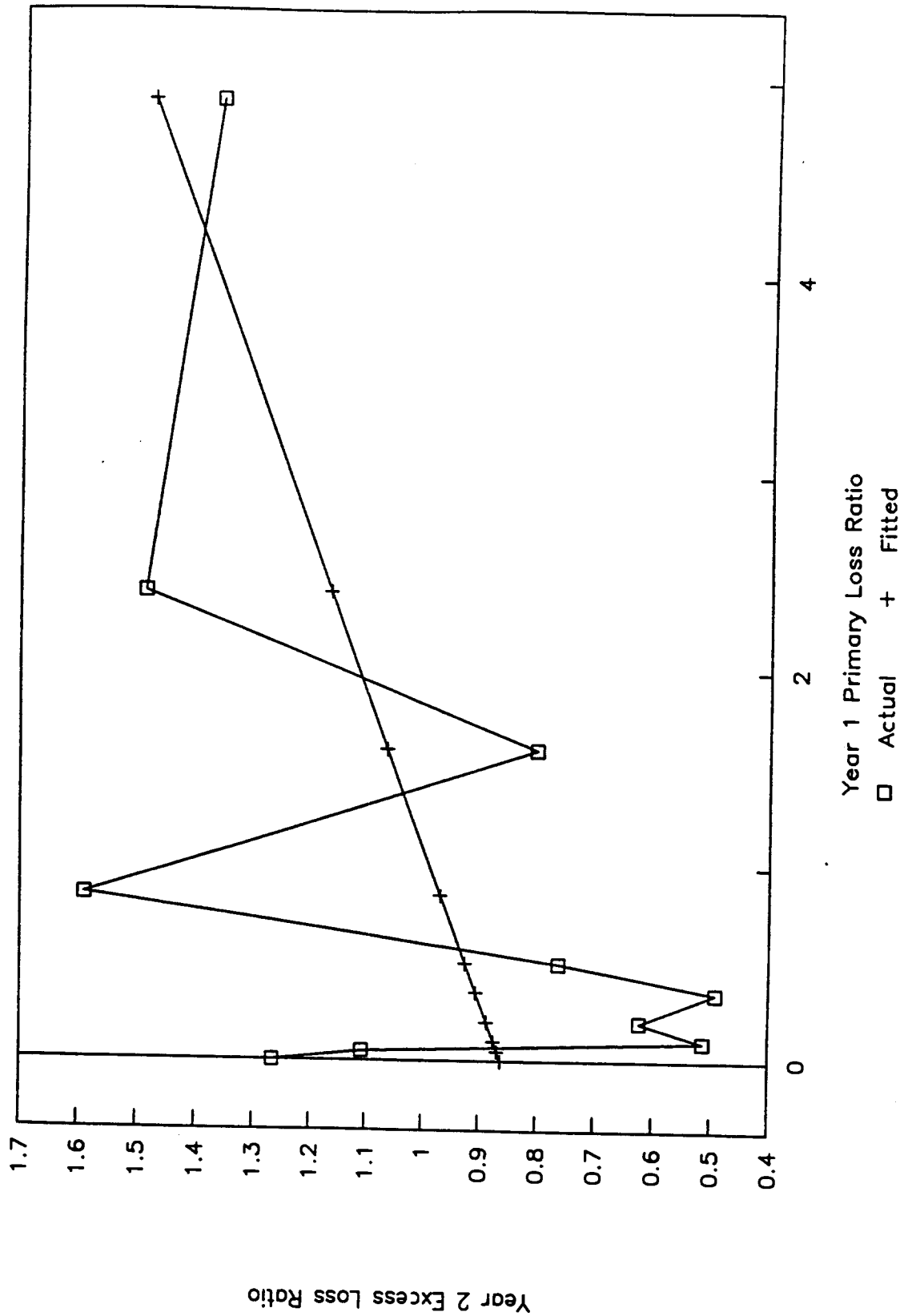
Size Range 3



Size Range 2



Size Range 1



RELATIONSHIP BETWEEN PRIMARY AND EXCESS LOSS RATIOS

STATE: FLORIDA

Results of Regression

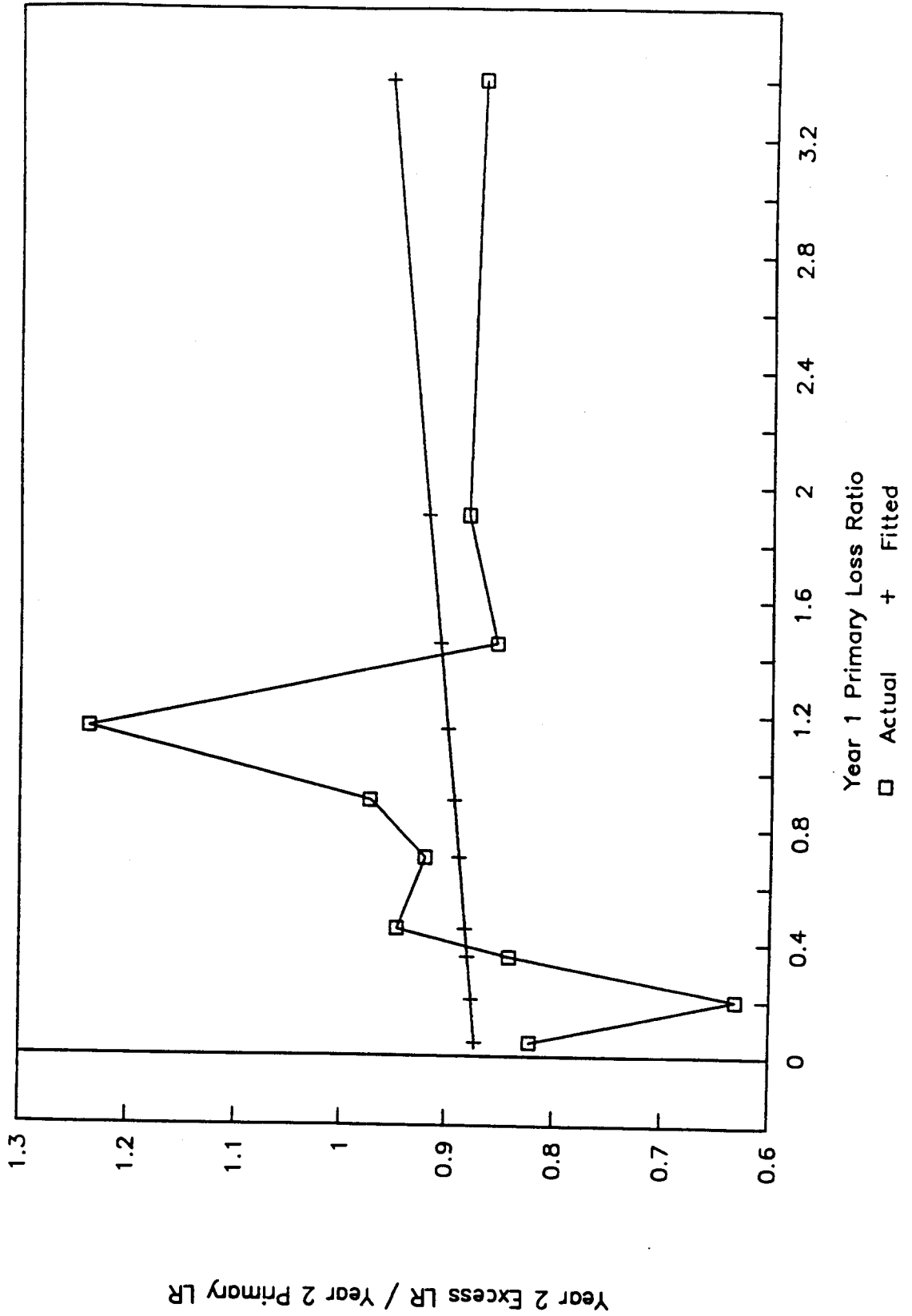
X = Primary Loss Ratio in Year 1

Y = Excess LR in Yr 2 / Primary LR in Yr 2

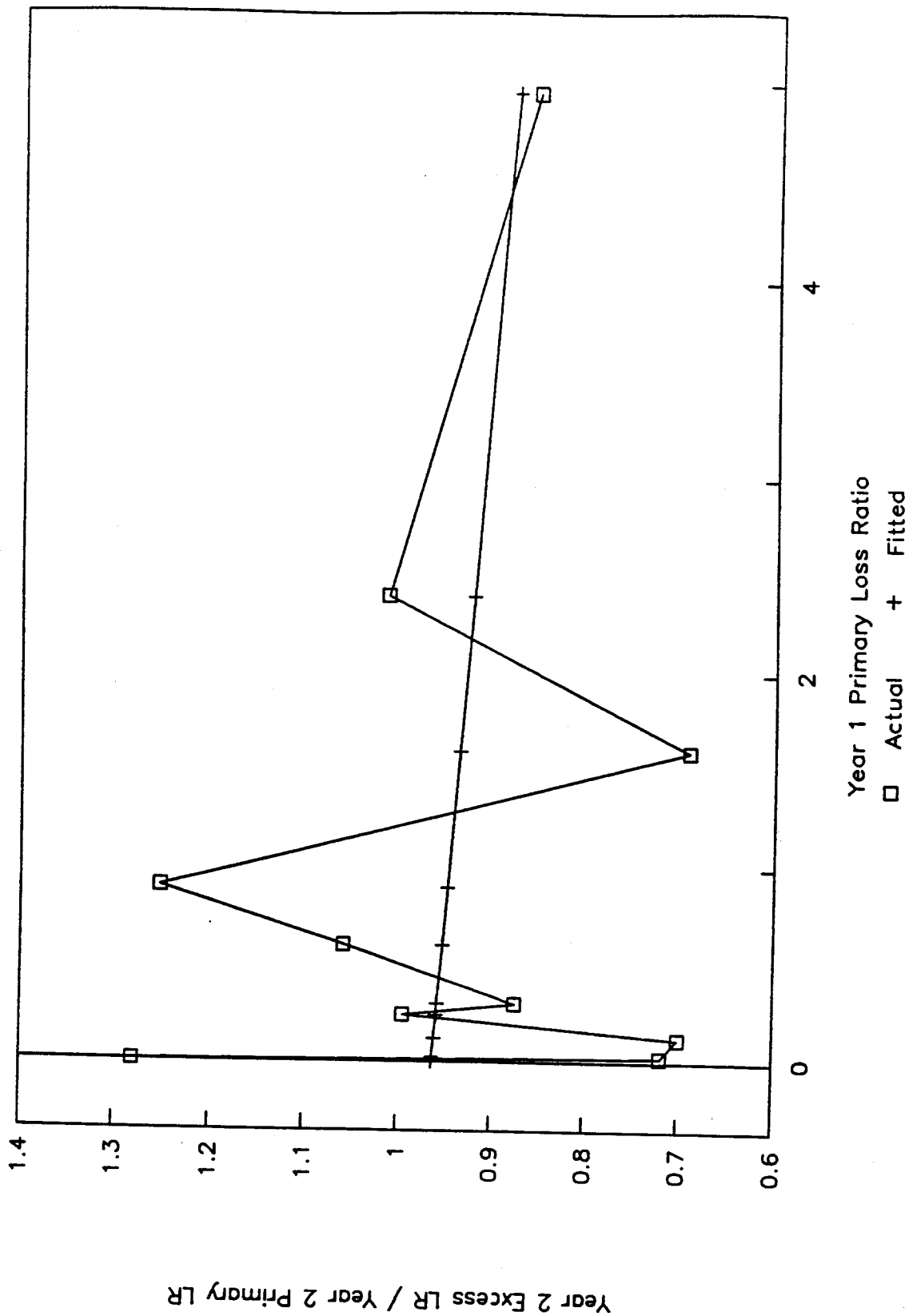
Risk Size Range	Constant	Slope	Standard Error of Slope	R-Squared	T-Statistic	Significance
1	0.951	-0.016	0.037	0.023	-0.432	*
2	1.060	-0.002	0.050	0.000	-0.040	*
3	0.904	0.039	0.042	0.098	0.929	*
4	0.963	-0.017	0.048	0.015	-0.354	*
5	0.872	0.025	0.052	0.027	0.481	*

* Not significant at the 0.050 level.

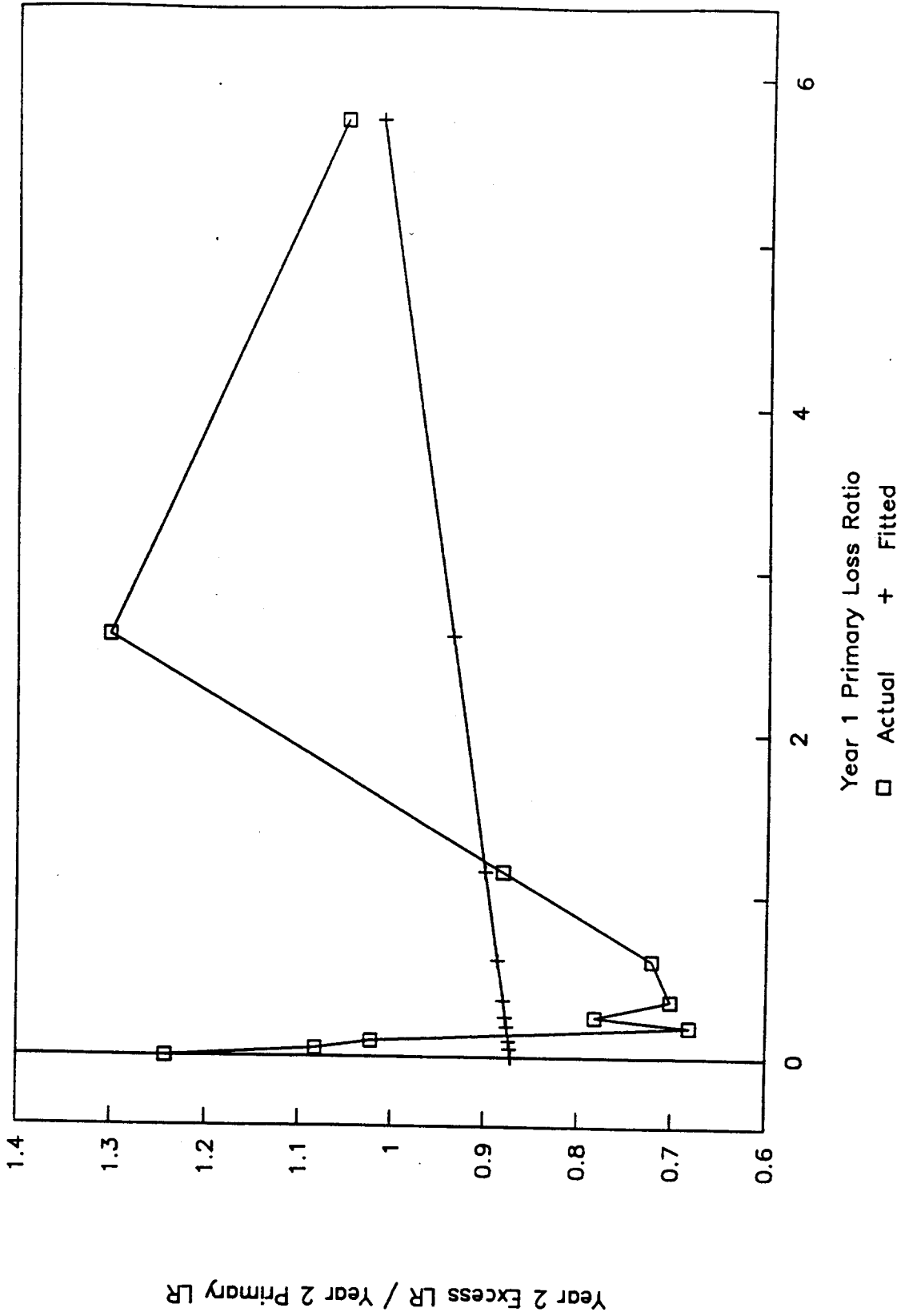
Size Range 5



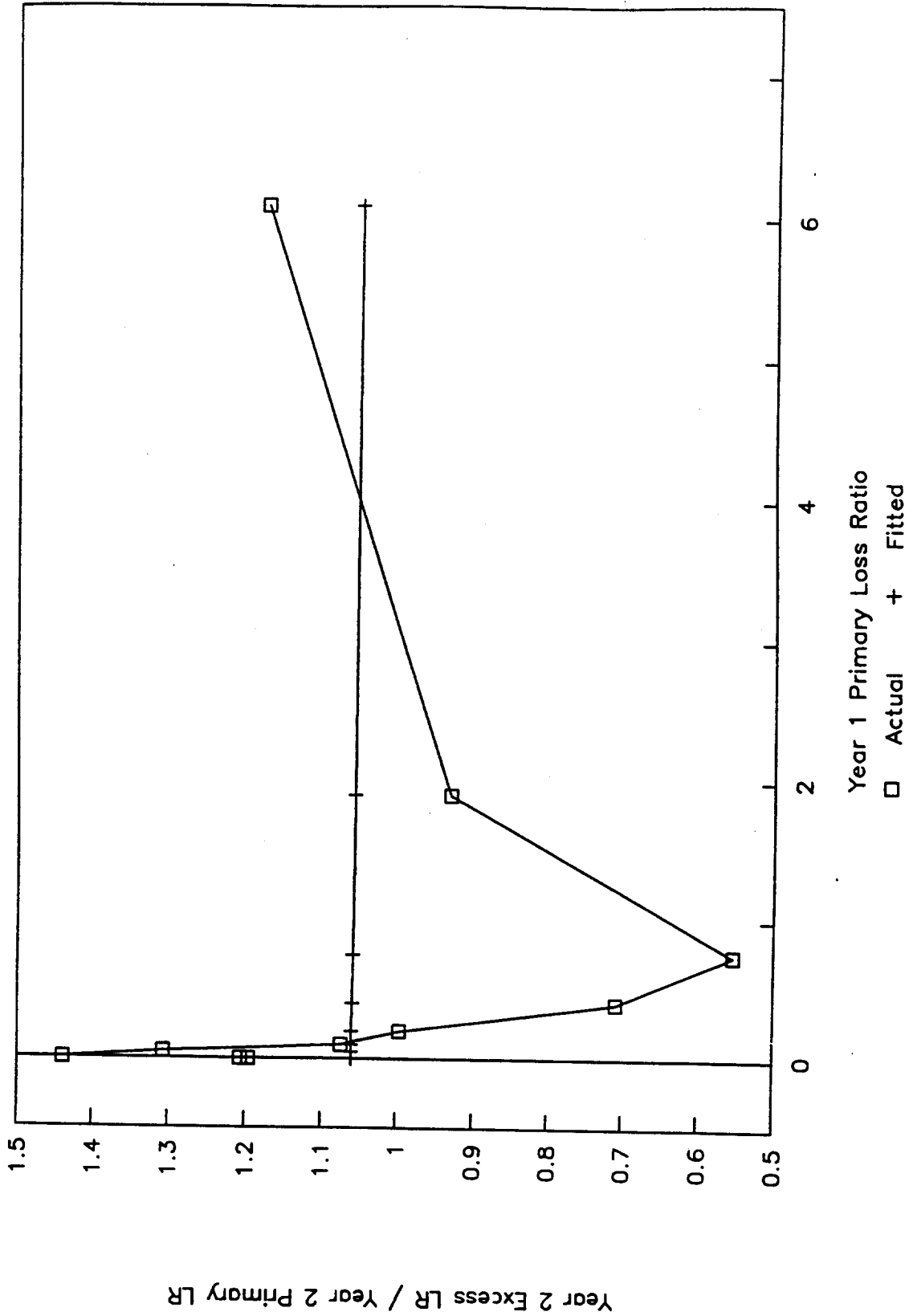
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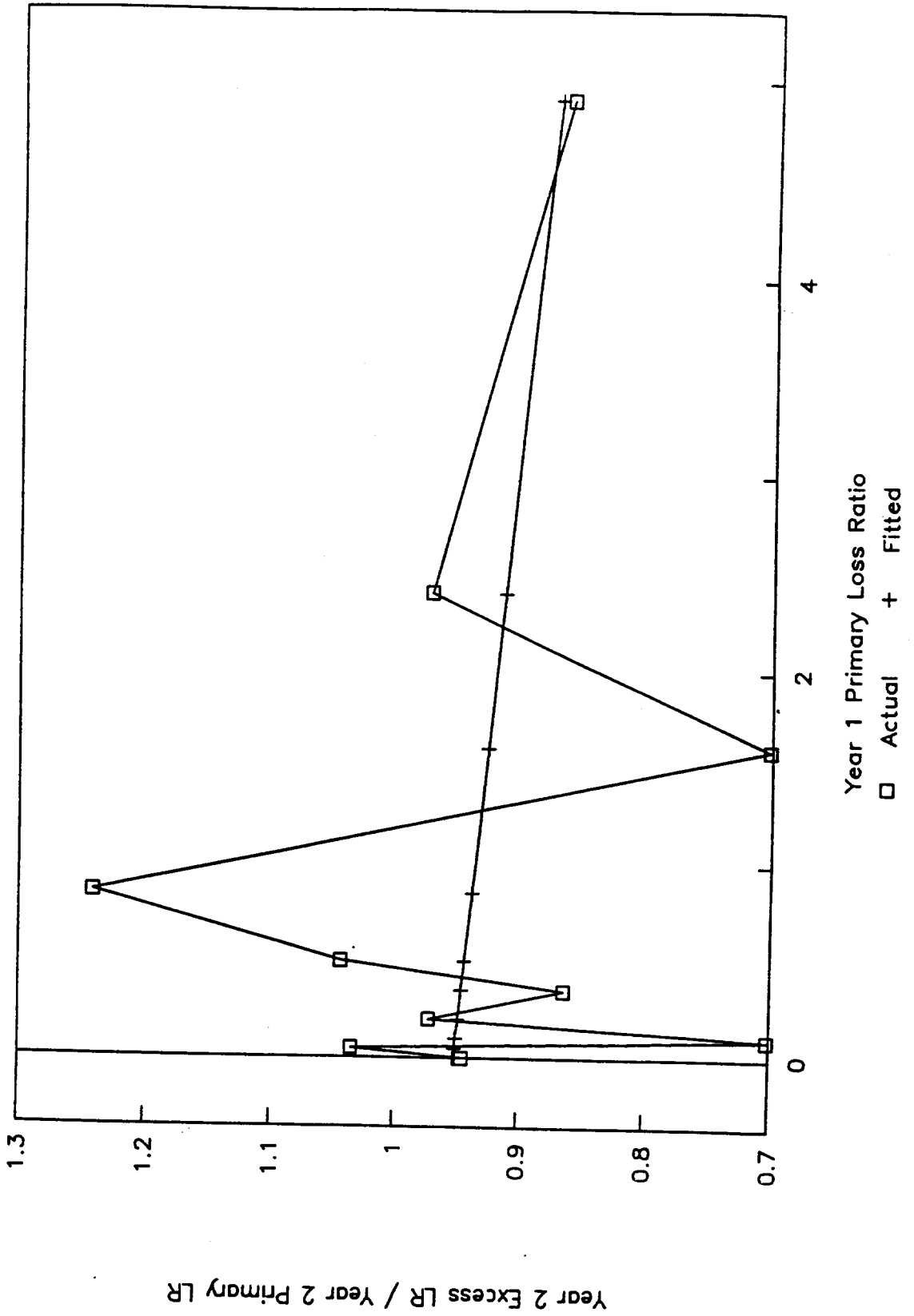
Size Range 3



Size Range 2



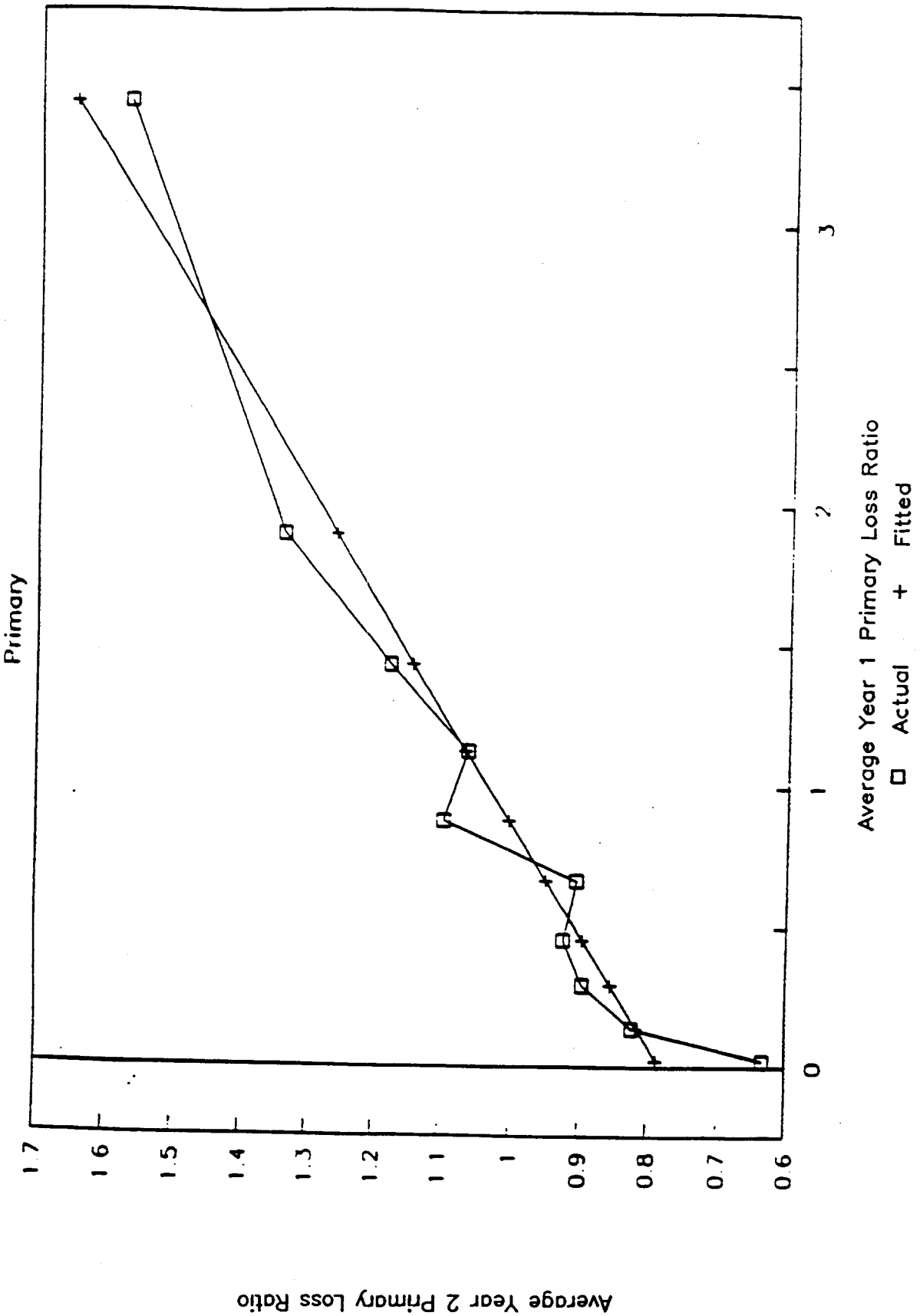
Size Range 1



EFFECT OF INTERVAL BETWEEN YEARS ON INDICATED CREDIBILITY

Risk Size Range	Primary Three Year Credibility Indicated By			
	Florida 3 Year Data		Florida 5 Year Data	
	YR 1 vs. YR 2	YR 1 vs. YR 3	YR 1 vs. YR 4	YR 1 vs. YR 5
1	0.265	0.210	0.380	0.144
2	0.319	0.313	0.275	0.085
3	0.382	0.272	0.275	0.135
4	0.437	0.364	0.286	0.125
5	0.505	0.524	0.445	0.217

FLORIDA Size Range 5 Primary



MCCI EXAMINATION
 EXPERIENCE RATING PLAN

Regression Statistics and Indicated Credibilities

STATE: COLORADO

RISK SIZE RANGE	REGRESSION METHOD	PRIMARY			CREDIBILITY			EXCESS			CREDIBILITY		
		(1) CONSTANT	(2) SLOPE	(3) K	(4) 1 YEAR	(5) 2 YEAR	(6) 3 YEAR	(7) CONSTANT	(8) SLOPE	(9) K	(10) 1 YEAR	(11) 2 YEAR	(12) 3 YEAR
1	1	1.379	0.019	51.710	0.019	0.037	0.055	0.810	0.058	16.240	0.058	0.110	0.156
	2	1.227	0.021	47.350	0.021	0.041	0.060	1.748	0.041	23.180	0.041	0.079	0.115
	3	1.050	0.173	9.540	0.095	0.173	0.239	1.718	0.074	25.170	0.038	0.074	0.106
2	1	0.955	0.130	6.690	0.130	0.230	0.309	1.191	-0.022	-46.960	-0.022	-0.044	-0.068
	2	0.921	0.093	9.760	0.093	0.170	0.235	1.245	0.022	44.700	0.022	0.043	0.063
	3	0.838	0.176	9.390	0.096	0.176	0.242	1.299	-0.027	-76.780	-0.013	-0.027	-0.041
3	1	0.834	0.322	2.110	0.322	0.487	0.587	0.905	0.158	5.330	0.158	0.273	0.360
	2	0.936	0.166	5.040	0.166	0.284	0.373	1.018	0.065	14.380	0.065	0.122	0.173
	3	0.824	0.262	5.640	0.151	0.262	0.347	1.000	0.086	21.210	0.045	0.086	0.124
4	1	0.926	0.175	4.710	0.175	0.298	0.389	1.104	-0.009	-109.720	-0.009	-0.019	-0.028
	2	0.835	0.264	2.780	0.264	0.418	0.519	0.895	0.034	27.990	0.034	0.067	0.097
	3	0.476	0.600	1.330	0.429	0.600	0.693	0.850	0.077	23.950	0.040	0.077	0.111
5	1	0.771	0.272	2.680	0.272	0.428	0.528	1.078	0.118	7.440	0.118	0.212	0.287
	2	0.887	0.218	3.590	0.218	0.358	0.455	1.218	0.029	33.430	0.029	0.056	0.082
	3	0.673	0.424	2.720	0.269	0.424	0.525	1.094	0.135	12.860	0.072	0.135	0.189

Footnote: Regression Methods

- 1) X = Year 1, Y = Year 2
- 2) X = Year 1, Y = Year 3
- 3) X = Years 1 + 2, Y = Year 3

Risk Size Range are defined on Exhibit 6.

NCCI EXAMINATION
EXPERIENCE RATING PLAN
Regression Statistics and Indicated Credibilities

STATE: FLORIDA

RISK SIZE RANGE	REGRESSION METHOD	PRIMARY				CREDIBILITY				EXCESS				CREDIBILITY		
		(1) CONSTANT	(2) SLOPE	(3) K	(4) 1 YEAR	(5) 2 YEAR	(6) 3 YEAR	(7) CONSTANT	(8) SLOPE	(9) K	(10) 1 YEAR	(11) 2 YEAR	(12) 3 YEAR			
1	1	0.962	0.107	8.346	0.107	0.193	0.264	0.986	0.151	5.623	0.151	0.262	0.348			
	2	0.994	0.082	11.195	0.082	0.152	0.211	1.104	-0.003	-334.333	-0.003	-0.006	-0.009			
	3	0.992	0.152	11.158	0.082	0.152	0.212	1.067	0.039	49.282	0.020	0.039	0.057			
	4	0.949	0.175	4.714	0.175	0.298	0.389	1.291	-0.173	-6.780	-0.173	-0.418	-0.794			
2	1	0.862	0.135	6.407	0.135	0.238	0.319	0.788	0.172	4.814	0.172	0.294	0.384			
	2	0.822	0.132	6.576	0.132	0.233	0.313	0.809	0.189	4.291	0.189	0.318	0.411			
	3	0.720	0.235	6.511	0.133	0.235	0.315	0.909	0.100	18.000	0.053	0.100	0.143			
	4	0.788	0.167	4.995	0.167	0.286	0.375	0.481	0.521	0.919	0.521	0.685	0.765			
3	1	0.864	0.171	4.848	0.171	0.292	0.382	0.849	0.065	14.385	0.065	0.122	0.173			
	2	0.922	0.111	8.009	0.111	0.200	0.273	0.964	0.027	36.037	0.027	0.053	0.077			
	3	0.782	0.251	5.968	0.144	0.251	0.335	0.908	0.085	21.529	0.044	0.085	0.122			
	4	0.856	0.177	4.161	0.177	0.300	0.392	1.002	-0.002	-408.605	-0.002	-0.005	-0.007			
4	1	0.837	0.206	3.854	0.206	0.342	0.438	1.025	0.131	6.634	0.131	0.232	0.311			
	2	0.850	0.160	5.250	0.160	0.276	0.364	0.991	0.012	82.333	0.012	0.024	0.035			
	3	0.691	0.317	4.309	0.188	0.317	0.410	0.938	0.058	32.483	0.030	0.058	0.085			
	4	0.776	0.233	3.295	0.233	0.378	0.477	0.886	0.101	8.892	0.101	0.184	0.252			
5	1	0.781	0.253	2.953	0.253	0.404	0.504	0.962	0.091	9.989	0.091	0.167	0.231			
	2	0.756	0.268	2.731	0.268	0.423	0.523	0.982	0.066	14.152	0.066	0.124	0.175			
	3	0.545	0.474	2.219	0.311	0.474	0.575	0.959	0.086	21.256	0.045	0.086	0.124			
	4	0.675	0.343	1.194	0.343	0.511	0.611	0.564	0.459	1.179	0.459	0.629	0.718			

Footnote: Regression Methods

- 1) X = Year 1, Y = Year 2
- 2) X = Year 1, Y = Year 3
- 3) X = Years 1 + 2, Y = Year 3
- 4) X = Year 1, Y = Year 4

NCCI EXAMINATION
EXPERIENCE RATING PLAN
Regression Statistics and Indicated Credibilities
STATE: ILLINOIS

RISK SIZE RANGE	REGRESSION METHOD	PRIMARY			CREDIBILITY			EXCESS			CREDIBILITY		
		(1) CONSTANT	(2) SLOPE	(3) K	(4) 1 YEAR	(5) 2 YEAR	(6) 3 YEAR	(7) CONSTANT	(8) SLOPE	(9) K	(10) 1 YEAR	(11) 2 YEAR	(12) 3 YEAR
1	1	0.931	0.141	6.092	0.141	0.247	0.330	1.235	0.035	27.571	0.035	0.068	0.098
	2	0.872	0.134	6.463	0.134	0.236	0.317	0.870	0.125	7.000	0.125	0.222	0.300
	3	0.716	0.284	5.042	0.166	0.284	0.373	0.804	0.169	9.834	0.092	0.169	0.234
2	1	0.785	0.177	4.650	0.177	0.301	0.392	0.783	0.120	7.333	0.120	0.214	0.290
	2	0.857	0.144	5.944	0.144	0.252	0.335	1.032	0.043	22.256	0.043	0.082	0.119
	3	0.738	0.276	5.246	0.160	0.276	0.364	0.979	0.107	16.692	0.057	0.107	0.152
3	1	0.825	0.190	4.263	0.190	0.319	0.413	0.867	0.123	7.130	0.123	0.219	0.296
	2	0.805	0.162	5.173	0.162	0.279	0.367	0.781	0.037	26.027	0.037	0.071	0.103
	3	0.682	0.290	4.897	0.170	0.290	0.380	0.778	0.042	45.619	0.021	0.042	0.062
4	1	0.730	0.292	2.425	0.292	0.452	0.553	0.966	0.090	10.111	0.090	0.165	0.229
	2	0.776	0.229	3.367	0.229	0.373	0.471	0.936	0.035	27.571	0.035	0.068	0.098
	3	0.579	0.428	2.673	0.272	0.428	0.529	0.832	0.149	11.423	0.080	0.149	0.208
5	1	0.575	0.417	1.398	0.417	0.589	0.682	0.941	0.089	10.236	0.089	0.163	0.227
	2	0.663	0.343	1.915	0.343	0.511	0.610	0.939	0.125	7.000	0.125	0.222	0.300
	3	0.444	0.574	1.484	0.403	0.574	0.669	0.860	0.191	8.471	0.106	0.191	0.262

Footnote: Regression Methods

- 1) X = Year 1, Y = Year 2
- 2) X = Year 1, Y = Year 3
- 3) X = Years 1 + 2, Y = Year 3

MCCI EXAMINATION
EXPERIENCE RATING PLAN

Regression Statistics and Indicated Credibilities

STATE: MAINE

RISK SIZE RANGE	REGRESSION METHOD	PRIMARY						EXCESS					
		(1) CONSTANT	(2) SLOPE	(3) K	(4) 1 YEAR	(5) 2 YEAR	(6) 3 YEAR	(7) CONSTANT	(8) SLOPE	(9) K	(10) 1 YEAR	(11) 2 YEAR	(12) 3 YEAR
1	1	0.955	0.803	0.245	0.803	0.891	0.924	2.227	-0.324	-4.086	-0.324	-0.960	-2.772
	2	1.236	-0.042	-24.810	-0.042	-0.087	-0.137	1.009	-0.035	-29.571	-0.035	-0.073	-0.113
	3	1.067	0.096	18.833	0.050	0.096	0.137	1.013	-0.015	-135.333	-0.008	-0.015	-0.023
2	1	0.864	0.262	2.817	0.262	0.415	0.516	0.707	0.471	1.123	0.471	0.641	0.728
	2	0.900	0.091	9.989	0.091	0.168	0.231	1.086	-0.166	-7.024	-0.166	-0.398	-0.746
	3	0.829	0.155	10.903	0.084	0.155	0.216	0.993	-0.013	-155.846	-0.006	-0.013	-0.020
3	1	0.653	0.168	4.952	0.168	0.288	0.377	0.507	0.120	7.333	0.120	0.215	0.290
	2	0.882	0.094	9.638	0.094	0.172	0.237	0.634	-0.018	-56.556	-0.018	-0.037	-0.056
	3	0.783	0.214	7.346	0.120	0.214	0.290	0.638	-0.026	-78.923	-0.013	-0.026	-0.040
4	1	0.828	0.132	6.576	0.132	0.234	0.314	1.017	0.023	42.478	0.023	0.045	0.067
	2	0.836	0.084	10.905	0.084	0.154	0.215	1.137	0.140	6.143	0.140	0.246	0.329
	3	0.738	0.184	8.870	0.102	0.184	0.253	1.202	0.047	40.553	0.024	0.047	0.068
5	1	0.760	0.234	3.274	0.234	0.379	0.478	0.958	0.078	11.821	0.078	0.144	0.202
	2	0.876	0.197	4.076	0.197	0.329	0.424	0.967	0.058	16.241	0.058	0.109	0.155
	3	0.674	0.413	2.843	0.260	0.413	0.513	0.815	0.200	8.000	0.111	0.200	0.273

Footnote: Regression Methods

- 1) X = Year 1, Y = Year 2
- 2) X = Year 1, Y = Year 3
- 3) X = Years 1 + 2, Y = Year 3

NCCI EXAMINATION
EXPERIENCE RATING PLAN

Regression Statistics and Indicated Credibilities

STATE: NEBRASKA

RISK SIZE RANGE	REGRESSION METHOD	PRIMARY						EXCESS					
		(1) CONSTANT	(2) SLOPE	(3) K	(4) 1 YEAR	(5) 2 YEAR	(6) 3 YEAR	(7) CONSTANT	(8) SLOPE	(9) K	(10) 1 YEAR	(11) 2 YEAR	(12) 3 YEAR
1	1	0.731	0.089	10.236	0.089	0.164	0.227	0.142	0.591	0.692	0.591	0.743	0.812
	2	0.972	0.121	7.264	0.121	0.216	0.292	0.204	-0.401	-3.494	-0.401	-1.340	-6.089
	3	0.919	0.147	11.605	0.079	0.147	0.205	0.140	-0.046	-45.478	-0.022	-0.046	-0.071
2	1	1.057	0.006	165.667	0.006	0.012	0.018	0.469	-0.087	-12.494	-0.087	-0.191	-0.317
	2	0.831	0.109	8.174	0.109	0.197	0.268	0.340	0.500	1.000	0.500	0.667	0.750
	3	0.731	0.206	7.709	0.115	0.206	0.280	0.242	0.630	1.175	0.460	0.630	0.719
3	1	0.918	0.058	16.241	0.058	0.110	0.157	0.818	-0.196	-6.102	-0.196	-0.487	-0.966
	2	0.822	0.115	7.696	0.115	0.206	0.280	0.556	0.256	2.906	0.256	0.408	0.508
	3	0.729	0.209	7.569	0.117	0.209	0.284	0.139	0.381	3.249	0.235	0.381	0.480
4	1	0.876	0.217	3.608	0.217	0.357	0.454	1.078	0.029	33.483	0.029	0.057	0.082
	2	0.959	0.161	5.211	0.161	0.278	0.365	0.897	0.331	2.021	0.331	0.497	0.597
	3	0.781	0.321	4.231	0.191	0.321	0.415	0.587	0.589	1.396	0.418	0.589	0.683
5	1	0.848	0.236	3.237	0.236	0.382	0.481	2.010	-0.040	-26.000	-0.040	-0.083	-0.130
	2	1.274	0.077	11.987	0.077	0.143	0.200	2.024	0.535	0.869	0.535	0.697	0.775
	3	1.087	0.246	6.130	0.140	0.246	0.329	2.382	0.285	5.018	0.166	0.285	0.374

Footnote: Regression Methods

- 1) X = Year 1, Y = Year 2
- 2) X = Year 1, Y = Year 3
- 3) X = Years 1 + 2, Y = Year 3

NCCI EXAMINATION
EXPERIENCE RATING PLAN
Regression Statistics and Indicated Credibilities

STATE: UTAH

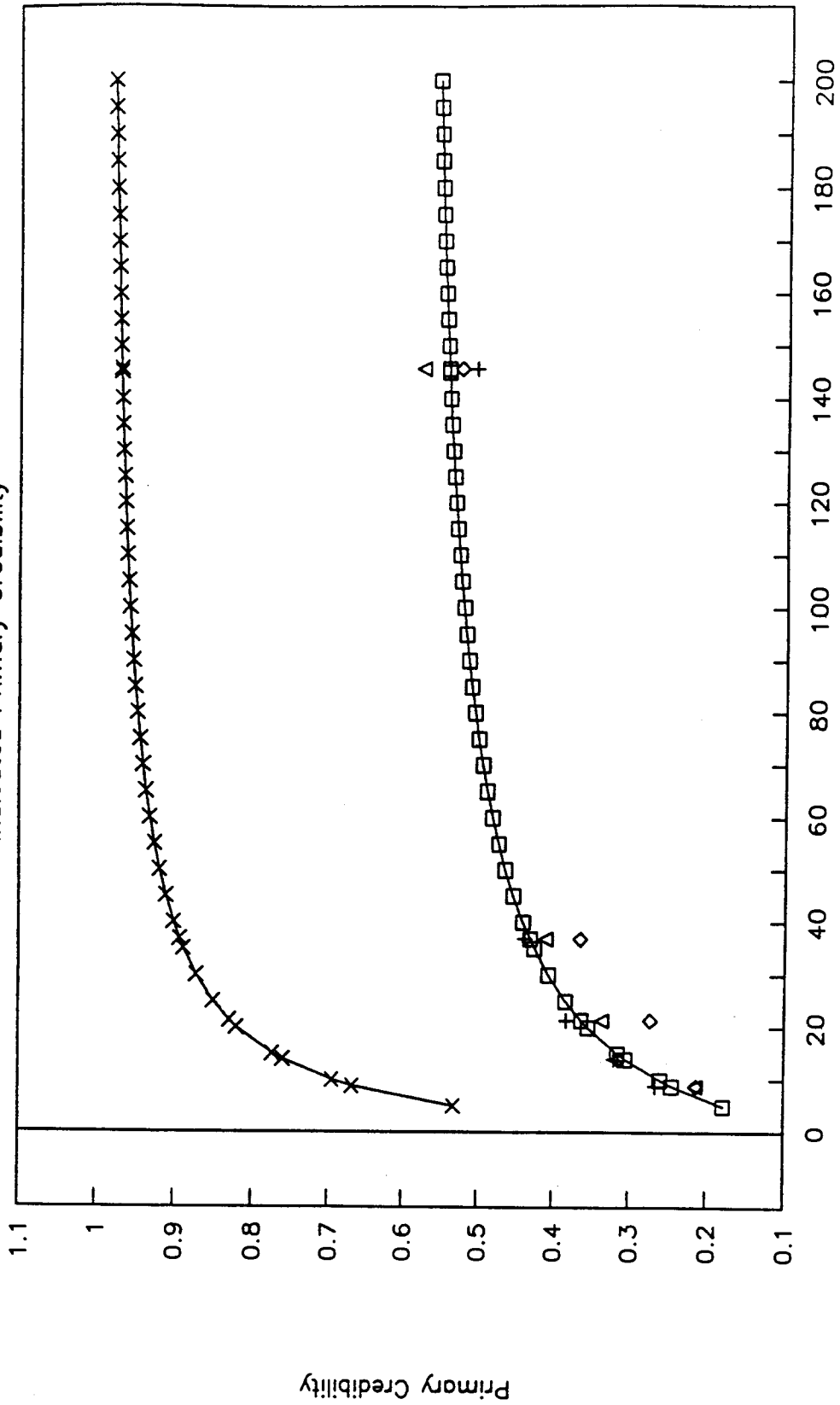
RISK SIZE RANGE	REGRESSION METHOD	PRIMARY					EXCESS					CREDIBILITY		
		(1) CONSTANT	(2) SLOPE	(3) K	(4) 1 YEAR	(5) 2 YEAR	(6) 3 YEAR	(7) CONSTANT	(8) SLOPE	(9) K	(10) 1 YEAR	(11) 2 YEAR	(12) 3 YEAR	
1	1	1.086	0.188	4.319	0.188	0.316	1.381	-0.117	-9.547	-0.117	-0.266	-0.461		
	2	0.942	0.083	11.048	0.083	0.154	1.111	-0.090	-12.111	-0.090	-0.197	-0.327		
	3	0.796	0.192	8.417	0.106	0.192	0.896	0.097	18.619	0.051	0.097	0.138		
2	1	0.851	0.115	7.696	0.115	0.206	1.634	-0.184	-6.435	-0.184	-0.452	-0.873		
	2	1.020	0.045	21.222	0.045	0.085	0.603	0.285	2.509	0.285	0.444	0.545		
	3	0.912	0.150	11.333	0.081	0.150	0.545	0.201	7.950	0.112	0.201	0.274		
3	1	0.870	0.128	6.813	0.128	0.226	1.012	0.116	7.621	0.116	0.209	0.282		
	2	0.831	0.075	12.333	0.075	0.139	0.945	-0.076	-14.158	-0.076	-0.165	-0.269		
	3	0.735	0.170	9.765	0.093	0.170	0.919	-0.055	-38.364	-0.027	-0.055	-0.085		
4	1	0.875	0.133	6.519	0.133	0.235	1.198	-0.023	-44.478	-0.023	-0.046	-0.072		
	2	0.921	0.162	5.173	0.162	0.279	1.049	0.029	33.483	0.029	0.057	0.082		
	3	0.644	0.447	2.474	0.288	0.447	1.005	0.062	30.258	0.032	0.062	0.090		
5	1	0.642	0.368	1.717	0.368	0.538	1.010	0.001	999.000	0.001	0.002	0.002		
	2	0.696	0.273	2.663	0.273	0.429	0.979	-0.015	-67.667	-0.015	-0.029	-0.045		
	3	0.535	0.432	2.630	0.275	0.432	0.959	0.011	179.818	0.006	0.011	0.017		

Footnote: Regression Methods

- 1) X = Year 1, Y = Year 2
- 2) X = Year 1, Y = Year 3
- 3) X = Years 1 + 2, Y = Year 3

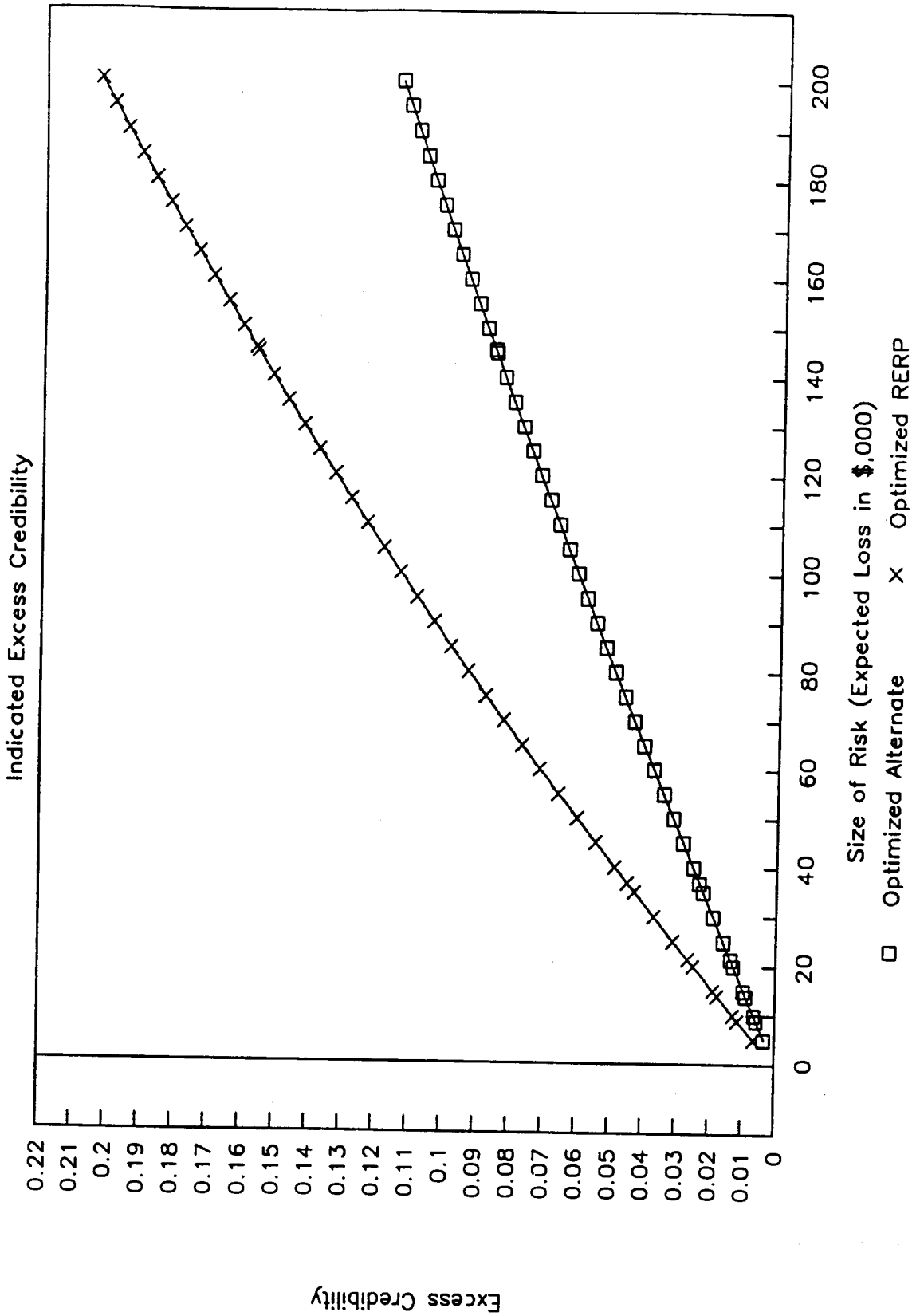
NCCI Examination

Indicated Primary Credibility



Optimized Alternate
 Flor. Yr.1 to Yr.2
 Flor. Yr.2 to Yr.3
 Flor. Yr.1+2 to Yr.3
 Optimized RERP

NCCI Examination



Excess Credibility

Indicated Excess Credibility

Size of Risk (Expected Loss in \$,000)

□ Optimized Alternate x Optimized RERP

CREDIT FOR CLAIM FREE EXPERIENCE FOR SMALL RISKS

(1) Average Annual Premium	\$963
(2) Approximate Average ELR Factors	0.30
(3) Average Three Year Expected Losses	\$867
(4) Average "G"-Ratio	2.98
(5) Primary Credibility = Claim Free Credit	7.1%
(6) Probability of 0 Claims in 3 Years	74.2%
(7) Percentage of Small Risk Expected Loss Corresponding to Risks Receiving a Credit	65.0%
(8) Indicated Debit for > 0 Claims in 3 Years	13.2%

Notes

- Row (1) : Exhibit 14, Sheet 2.
- Row (2) : $(1) \times (2) \times 3.0$.
- Row (4) : Exhibit 15.
- Row (5) : Based on the optimized Alternate Formula.
- Row (6) : Discussed in section XI of the text.
- Row (7) : Discussed in section XI of the text.
- Row (8) : $[(5) \times (7)] / [1.0 - (7)]$.

CHARACTERISTICS OF RISKS BELOW EXPERIENCE RATING THRESHOLD¹

<u>STATE</u>	<u>EXPERIENCE RATING THRESHOLD</u>	<u>NUMBER OF RISKS BELOW THRESHOLD</u>	<u>TOTAL NUMBER OF RISKS</u>	<u>PERCENT OF RISKS BELOW THRESHOLD</u>
ALABAMA	4,500	30,489	41,140	74.1%
ARIZONA	4,000	42,637	59,396	71.8%
ARKANSAS	3,500	21,051	28,742	73.2%
COLORADO	4,500	51,858	68,971	75.2%
CONNECTICUT	5,000	57,122	74,803	76.4%
DIST. OF COL.	3,500	12,726	17,505	72.7%
FLORIDA	4,500	148,992	181,885	81.9%
GEORGIA	4,500	58,186	80,139	72.6%
IDAHO	5,000	18,499	22,262	83.1%
ILLINOIS	4,500	133,408	177,165	75.3%
INDIANA	2,500	75,551	93,766	80.6%
IOWA	4,000	50,259	59,636	84.3%
KANSAS	2,000	30,833	46,276	66.6%
KENTUCKY	4,500	44,028	52,698	83.5%
LOUISIANA	6,000	45,018	54,074	83.3%
MAINE	4,000	21,061	28,349	74.3%
MARYLAND	5,000	53,282	66,765	79.8%
MISSISSIPPI	4,500	18,087	25,011	72.3%
MISSOURI	3,500	48,820	67,263	72.6%
MONTANA	2,500	21,747	28,104	77.4%
NEBRASKA	3,000	29,581	35,195	84.0%
NEW HAMPSHIRE	5,000	24,311	30,492	79.7%
NEW MEXICO	4,000	12,732	18,966	67.1%
NORTH CAROLINA	2,000	51,354	80,469	63.8%
OKLAHOMA	5,000	38,022	46,745	81.3%
OREGON	2,500	40,221	65,495	61.4%
RHODE ISLAND	3,500	9,196	15,308	60.1%
SOUTH CAROLINA	4,500	26,972	35,877	75.2%
SOUTH DAKOTA	3,250	11,900	14,845	80.2%
TENNESSEE	3,500	42,190	58,989	71.5%
UTAH	3,500	24,246	28,675	84.6%
VERMONT	3,500	13,999	17,172	81.5%
VIRGINIA	3,500	71,118	91,700	77.6%
WISCONSIN	3,000	70,422	94,350	74.6%
HAWAII	2,500	13,483	21,933	61.5%
ALASKA	2,500	6,596	11,361	58.1%
COUNTRYWIDE TOTAL		1,469,997	1,941,522	75.7%

¹ Based on Experience Rating Eligibility Effective 4/1/90 and the latest 1st report WCSP data as of 4/9/91

CHARACTERISTICS OF RISKS BELOW EXPERIENCE RATING THRESHOLD¹

<u>STATE</u>	<u>EXPERIENCE RATING THRESHOLD</u>	<u>PREMIUM BELOW THRESHOLD</u>	<u>NUMBER OF RISKS BELOW THRESHOLD</u>	<u>AVERAGE RISK SIZE BELOW THRESHOLD</u>
ALABAMA	4,500	37,466,835	30,489	1,229
ARIZONA	4,000	45,046,477	42,637	1,057
ARKANSAS	3,500	21,010,240	21,051	998
COLORADO	4,500	59,399,605	51,858	1,145
CONNECTICUT	5,000	66,104,475	57,122	1,157
DIST. OF COL.	3,500	11,771,926	12,726	.925
FLORIDA	4,500	155,503,000	148,992	1,044
GEORGIA	4,500	74,160,175	58,186	1,275
IDAHO	5,000	18,573,158	18,499	1,004
ILLINOIS	4,500	145,266,697	133,408	1,089
INDIANA	2,500	43,439,283	75,551	575
IOWA	4,000	38,370,303	50,259	763
KANSAS	2,000	17,701,236	30,833	574
KENTUCKY	4,500	41,676,265	44,028	947
LOUISIANA	6,000	54,731,076	45,018	1,216
MAINE	4,000	22,468,350	21,061	1,067
MARYLAND	5,000	55,863,607	53,282	1,048
MISSISSIPPI	4,500	22,764,726	18,087	1,259
MISSOURI	3,500	49,486,156	48,820	1,014
MONTANA	2,500	13,421,348	21,747	617
NEBRASKA	3,000	18,751,479	29,581	634
NEW HAMPSHIRE	5,000	28,085,232	24,311	1,155
NEW MEXICO	4,000	15,239,856	12,732	1,197
NORTH CAROLINA	2,000	30,719,245	51,354	598
OKLAHOMA	5,000	43,207,779	38,022	1,136
OREGON	2,500	29,459,770	40,221	732
RHODE ISLAND	3,500	10,255,316	9,196	1,115
SOUTH CAROLINA	4,500	33,665,019	26,972	1,248
SOUTH DAKOTA	3,250	9,540,945	11,900	802
TENNESSEE	3,500	42,617,321	42,190	1,010
UTAH	3,500	16,947,923	24,246	699
VERMONT	3,500	11,503,623	13,999	822
VIRGINIA	3,500	64,159,286	71,118	902
WISCONSIN	3,000	51,909,621	70,422	737
HAWAII	2,500	10,831,262	13,483	803
ALASKA	2,500	5,145,157	6,596	780
COUNTRYWIDE TOTAL		1,416,263,772	1,469,997	963

¹ Based on Experience Rating Eligibility Effective 4/1/90 and the latest 1st report WCSP data as of 4/9/91. Premiums are on manual basis.

STATE SCALE FACTORS

<u>STATE</u>	<u>STATE SCALE FACTOR (G-RATIO)</u>	<u>TOTAL PREMIUM¹</u>
ALABAMA	2.45	304,750,219
ALASKA	6.40	209,796,921
ARIZONA	2.40	552,999,426
ARKANSAS	2.30	217,102,293
COLORADO	3.35	618,017,664
CONNECTICUT	3.60	786,173,717
DIST. OF COL.	4.35	138,427,844
FLORIDA	2.80	1,354,650,999
GEORGIA	2.50	746,318,718
IOWA	2.50	289,080,622
ILLINOIS	3.50	2,487,024,980
INDIANA	1.25	377,454,308
KANSAS	2.65	254,245,726
LOUISIANA	4.95	459,224,620
MARYLAND	2.95	656,808,393
MAINE	4.45	272,624,784
MISSOURI	2.40	525,437,303
MONTANA	5.20	143,535,624
NEBRASKA	1.95	121,315,637
NORTH CAROLINA	1.55	517,389,304
NEW HAMPSHIRE	2.90	215,532,368
OKLAHOMA	3.50	332,946,440
OREGON	3.75	799,065,742
RHODE ISLAND	4.40	187,171,089
SOUTH CAROLINA	2.20	310,600,709
SOUTH DAKOTA	2.35	59,690,273
TENNESSEE	1.80	526,339,071
UTAH	1.55	113,967,635
VIRGINIA	2.25	568,227,496
VERMONT	2.20	71,377,902
WISCONSIN	2.00	741,458,000
COUNTRYWIDE AVERAGE	2.98	

¹ Manual premiums from the latest 1st report WCSP data as of 4/9/91.

Trends in Experience Rating Off-Balance¹

State	From 1983 to 1987				From 1986 to 1990			
	Annual Trend	R Squared	|T| Statistic	Significance	Annual Trend	R Squared	|T| Statistic	Significance
Alabama	0.2%	.048	.389		0.4%	.122	.645	
Arizona	3.2%	.706	2.683		-0.2%	.043	.366	
Arkansas	1.5%	.867	4.420	>.05	1.0%	.781	3.267	>.05
Colorado	-1.8%	.761	3.087		0.7%	.653	2.374	
Connecticut	0.0%	.000	.001		-0.5%	.493	1.710	
District of Columbia	1.1%	.415	1.460		-1.2%	.522	1.808	
Florida	0.5%	.309	1.158		-0.8%	.368	1.323	
Georgia	-0.1%	.068	.468		-0.2%	.013	.202	
Idaho	1.0%	.216	.910		-1.2%	.563	1.966	
Illinois	0.2%	.032	.313		-1.0%	.919	5.841	>.05
Indiana	0.4%	.876	4.593	>.05	0.2%	.071	.478	
Iowa	0.8%	.871	4.497	>.05	0.7%	.469	1.628	
Kansas	1.5%	.894	5.021	>.05	-0.5%	.326	1.205	
Kentucky	0.3%	.051	.402		1.7%	.974	10.707	>.05
Louisiana	2.2%	.933	6.474	>.05	-0.3%	.637	2.294	
Maine	6.0%	.727	2.823		-2.1%	.123	.650	
Maryland	-0.8%	.257	1.019		-1.3%	.510	1.767	
Mississippi	1.1%	.815	3.633	>.05	0.1%	.004	.112	
Missouri	1.5%	.700	2.649		0.8%	.611	2.173	
Montana	1.1%	.879	4.673	>.05	-0.7%	.388	1.379	
Nebraska	0.0%	.013	.197		1.4%	.825	3.754	>.05
New Hampshire	0.3%	.066	.459		-1.2%	.976	11.145	>.05
New Mexico	2.8%	.976	10.969	>.05	-0.4%	.078	.503	
Oklahoma	5.2%	.768	3.150		-1.4%	.524	1.816	
Oregon	1.5%	.847	4.078	>.05	-2.1%	.781	3.271	>.05
Rhode Island	1.5%	.841	3.979	>.05	-1.2%	.621	2.215	
South Carolina	1.5%	.520	1.803		0.2%	.420	1.474	
South Dakota	0.2%	.146	.717		1.6%	.918	5.812	>.05
Tennessee					5.9%	.528	1.832	
Utah	0.1%	.005	.127		0.9%	.759	3.070	
Vermont	1.0%	.747	2.979		-0.5%	.215	.906	
Virginia					-0.4%	.163	.765	
Hawaii	-0.1%	.002	.069		0.2%	.005	.119	
Alaska	1.7%	.575	2.015		0.5%	.250	1.000	
Average²	1.7%	.775	3.213	>.05	-0.4%	.524	1.816	

¹ Average interstate experience modifications are assumed to be equal to average intrastate experience modifications in each state.

² Reflects trends in average experience modifications as opposed to average trends.

**RATEMAKING PROCEDURES
EVALUATION OF RATEMAKING METHODOLOGIES**

**NCCI EXAMINATION
VOLUME X - SECTION IIB - PART 8
MISCELLANEOUS**

December 6, 1991

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I. INTRODUCTION

As part of its examination of NCCI, the NAIC has requested that we review four miscellaneous areas.

- I. Objective (8a) - Compare the expected loss and expense ratios of minimum premium insureds to those for all classes of insureds combined. (Loss and Expense Ratios of Minimum Premium Insureds)
- II. Objective (8b) - What recognition does NCCI give to additional premium expected to be collected from surcharges imposed on policyholders in residual markets? As these markets increase or decrease, is this expected change in revenue recognized? (Residual Market Surcharges)
- III. Objective (8c) - Does the NCCI ratemaking formula accurately account for any off-balance due to the experience rating plan? Does NCCI adequately adjust expected loss rates (ELR) and "D" ratios to maintain off-balance at a reasonable level? What improvements could be made in NCCI's procedures? (Experience Rating Plan Off-Balance)
- IV. Objective (8d) - Test for any consistent tendency of the calendar/accident year loss ratio used in a rate filing to be higher or lower than the corresponding policy year loss ratio, after adjusting for trend. This objective was approved by the NAIC's Examination Oversight Group as an additional area of research. (Calendar/Accident Year vs. Policy Year Loss Ratios)

At the request of the Examination Oversight Group, the topic of Experience Rating Plan Off-Balance has been added to our report in Section IIB, Part 7 - Experience Rating. The other three topics will be covered here.

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II. SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

Objective (8a) - Loss and Expense Ratios of Minimum Premium Insureds

1. Minimum premium risks appear to have consistently worse loss ratios than all other risks. These results are based on a comparison of losses to standard premiums excluding the expense constant. Due to the relatively small premium contribution from minimum premium risks and the size of the loss ratio differential, their effect on overall loss ratios is small. It is not clear what loss ratios will ultimately result from NCCI's current program of minimum premium multipliers. NCCI should continue to study the loss ratio experience of small risks. (Page 11)
2. Adequate data to study the expense experience of minimum premium risks is not available. However, based on data from the 1982 study of expenses by size of risk, the expense provisions for very small risks appear to be slightly greater than their expense needs. (Page 11)
3. If premium levels for minimum premium risks were increased, either through increasing the minimum premium multipliers or adding a loss constant, insurers might be more willing to provide voluntary coverage to these risks. On the other hand, there are a significant number of minimum premium risks and there is likely to be some dissatisfaction after a price increase targeted at minimum premium risks. Due to the low impact of minimum premium risks on the overall loss ratio, we believe that the policy of whether or not to change the pricing of minimum premium risks should be governed by its practical effects rather than its actuarial significance. (Page 11)
4. If the decision is made to adjust multipliers and maximum minimum premiums to the point that average rate levels for minimum premium risks contemplate reasonable profitability, then these factors, particularly the multipliers, will need to be determined by an analysis of loss experience for risks of minimum premium size. While countrywide experience would be appropriate to determine average multipliers for minimum premium risks, it must be noted that the amount of experience by state for minimum premium risks is often significant and the credibility of such experience would need to be explored. While we have compared the amount of minimum experience by state to the amount of experience available for classification ratemaking, it may well be the case that the credibility due minimum premium experience by state will be different from the indicated credibility due a comparable volume of classification ratemaking experience. (Pages 11-12)

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Objective (8b) - Residual Market Surcharges

In general, we believe that the standard NCCI procedures to reflect additional revenue from residual market policies are reasonable. However, we have a number of concerns regarding some related issues. These include: the potential future problem of double-counting adverse experience through a single set of experience modification plan parameters applied to both voluntary business and assigned risk business; the need to improve explanatory material in the rate filing; the need to reflect net premium programs in all states as a standard methodology; and, when data becomes available as to the collectability of ARRP premium surcharges, the need to replace the assumed 85% collectable percentage with a figure based on actual experience. (Pages 20-21)

Objective (8c) - Experience Rating Plan Off-Balance

At the request of the Examination Oversight Group, we have included the response to this objective in our report entitled Section IIB, Part 7 - Experience Rating.

Objective (8d) - Calendar/Accident Year vs. Policy Year Loss Ratios

In general, the policy year and accident year loss ratios used in recent rate filings appear to be reasonably consistent with each other. Calendar/Accident Year 1988 appears to be an exception. The difference appears to be caused by inconsistencies between policy years 1987 and 1988 and calendar year 1988 premiums. NCCI could not identify all of the causes of the apparent premium anomaly. This does not appear to be a problem with respect to 1991 filings which are based on calendar year 1989 and policy year 1988. However, we recommend that NCCI continue to investigate the reasons for the premium differences in those states where they are most pronounced. We also recommend that NCCI strengthen the process for editing carriers' calendar and policy year premium reports for consistency. (Pages 29-30)

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III. LOSS AND EXPENSE RATIOS OF MINIMUM PREMIUM INSUREDS

A. Background

NCCI calculates a minimum premium amount for each class in states where NCCI produces full manual rates. The minimum premium formula is:

$$\text{Minimum Premium} = \text{Rate} \times \text{Multiplier} + \text{Expense Constant}$$

In addition, there is a maximum minimum premium, which varies by state. Finally, the change in the multiplier is limited to 10 per revision (e.g., the multiplier can move from 35 to 45). The multiplier in the formula is targeted to be the annual payroll (in hundreds of dollars) of a single employee at the statewide average weekly wage. When the multiplier is increased, NCCI estimates the additional premium and offsets the manual rates to implement the change on a balanced basis. Exhibit 1 displays the historical minimum premium multiplier by state, as well as the maximum minimum premium and the expense constant.

B. Loss Ratios of Minimum Premium Insureds

1. Data Available

In order to research the loss experience of minimum premium risks, NCCI provided us with the following data for each state separately for minimum premium risks and all other risks:

- standard premium, excluding expense constants;
- risk count;
- losses (split by Medical and Indemnity).

This data was available for three separate policy years, but only at first report.

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2. Analysis

Based on data for the states we analyzed, minimum premium risks comprise approximately 0.3% of total standard premium for all states combined. Only two states, Iowa and South Dakota, had a percentage of premium greater than 1% over the three year period (see Exhibit 2). No state showed a percentage of premium greater than 2% in any year. This would imply that the credibility of minimum premium risk experience should be relatively small. However, later we will show that the relative premium volume of minimum premium risks is comparable to the premium volume of a large number of rate classifications.

On a risk count basis, minimum premium risks are more significant (see Exhibit 3). For policy years 10/1/85 and 10/1/86 minimum premium risks were approximately 8% of the total, while for policy year 10/1/84 minimum premium risks were 6% of the total for all states combined. (Note that these percentages are slightly understated on a countrywide basis. NCCI indicated that for a non-minimum premium risk, each state with premium was counted as one risk. Therefore, a two-state risk would register two policy counts, one in each state.)

For policy year 10/1/86, the percentage of policy counts varies from a low of 0.34% for Montana to a high of 22.22% for Utah. Most states are in the 6-10% range.

3. Loss Ratios

The minimum premium risks have higher loss ratios than all other risks. Table 1 shows the countrywide loss ratios at first report for minimum premium risks compared to all other risks:

Table 1

(1) <u>Policy Year</u>	(2) <u>Minimum Premium Loss Ratio</u>	(3) <u>All Other Loss Ratio</u>	(4) <u>Relativity (2)/(3)</u>
10/1/84	.620	.552	1.123
10/1/85	.751	.514	1.461
10/1/86	.783	.531	1.475

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The loss ratios are based on standard premium excluding the expense constant. This was done so that all risks, both minimum premium risks and all other risks have the same target cost ratio in each state. This table is derived from data in Exhibit 4.

However, the loss ratio relativities of minimum premium risks compared to all other risks vary substantially from state to state. For example, Iowa has a three year average relativity below the countrywide relativity while Alabama has a three year average relativity above the countrywide relativity (See Exhibit 4, Sheet 7).

In addition, the loss ratio relativities within state can vary substantially from year to year. For example, the District of Columbia shows two years where the minimum premium loss ratio relativities are less than 1.0 and one year with a loss ratio relativity well in excess of 1.0.

Table 1 indicated that the loss ratios of minimum premium risks are higher than all other risks on a countrywide basis. However, the effect of the minimum premium risks on the overall loss ratio is not significant, as demonstrated by Table 2:

Table 2

(1) <u>Policy Year</u>	(2) <u>Minimum Premium Loss Ratio</u>	(3) <u>All Other Loss Ratio</u>	(4) <u>Combined Loss Ratio</u>
10/1/84	.620	.552	.553
10/1/85	.751	.514	.515
10/1/86	.783	.531	.532

Our analysis here and in the following subsection is based on a comparison of premiums and losses at first report for minimum premium risks and all other risks. Therefore, an underlying assumption of this analysis is that the premiums are at comparable levels of accuracy including the effects of audits, and that losses for minimum premium risks will develop at rates similar to those of other risks. To the extent that these assumptions are not met, our conclusions would vary. This may represent a consideration for policy makers in making decisions that relate to pricing for small and minimum premium sized risks.

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C. Expected Loss Ratios of Minimum Premium Insureds

The premiums used in the analysis in III.B were earned premiums at collected levels. For both the minimum premium risks and the other risks, they reflect the manual rates in effect at the time the policy was written. For the minimum premium risks, they also reflect the minimum premium multipliers and maximum minimum premiums in effect at the time the policy was written. The minimum premium multipliers in the experience period were less than those based on the average weekly wage formula for all states.

To analyze the overall equity of the minimum premium, it would be appropriate to estimate loss ratio relativities for minimum premium risks if the minimum premium multipliers were at the level indicated by the formula. This is a complex task, since as multipliers are increased, small risks that were previously not minimum premium risks would become minimum premium risks. In addition, as the multiplier is increased, more risks would be subject to the maximum minimum premium. The maximum minimum premium is not tied directly to any index. Therefore, adjusting minimum premiums on level becomes a complex task.

As a first step in analyzing the equity of the current minimum premium program, we adjusted the minimum premiums at collected level by the ratio of the indicated multiplier (based on the statewide average weekly wage) and the actual multiplier in effect during the policy period. The results of this analysis for the policy year 10/1/86 to 9/30/87 appear in Exhibit 5.

It is important to realize that we have not reflected the impact of the maximum minimum premiums. This would make the adjusted minimum premiums smaller and the loss ratios larger. Exhibit 5 demonstrates that after our adjustments, the loss ratios of minimum premium risks are less than the loss ratios of all other risks. Note that both the minimum premium rates and the other than minimum premium rates are based on the manual rate level in effect when the policy was written. From Exhibit 5, we see that the adjusted minimum premium countrywide loss ratio is below the all other loss ratio. This, by itself does not mean that the current minimum premium program overcharges these risks. The actual minimum premium rates are the result of the total program which includes an indicated multiplier based on the average weekly wage, a maximum change in multiplier (currently 10), the maximum minimum premium and the change in maximum minimum premium (currently \$50 per revision, until a maximum of \$750 is reached). Limitations on changes in multipliers will restrict the movement towards the indicated multiplier. For example, we compared the last multiplier in effect for the policy year starting 10/86 with

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the indicated multiplier based on the average weekly wage. Then we assumed that multipliers would increase by 10 annually, while the average weekly wage would increase by 3% annually. Based on this scenario, after 10 years 3 out of 37 states had reached the indicated multiplier. After 15 years 6 out of 37 had reached the indicated multiplier. If we assumed a wage increase of 4% per year, then after 10 years and 15 years, only one state had reached the indicated multiplier.

The loss ratio experience of minimum premium insureds is worse than that of other insureds. However, determining the exact extent of the difference is a complex task. The use of a multiplier based on the annual wage of one average employee may over-react to the poorer loss ratio experience of minimum premium insureds. We recommend that NCCI continue the analysis of the relative loss ratio experience of small risks to ensure the reasonableness of the minimum premium program.

D. State Credibility of Minimum Premium Loss Experience

In order to examine the credibility of individual state minimum premium experience, we did not directly attempt to measure the credibility of the loss experience, due to the lack of extensive historical experience. Instead, we attempted to compare the statewide relative premium volume of all minimum premium risks combined to that of various rate classifications.

We proceeded as follows:

1. In our study of classification (Section IIB-Part 4), we obtained payroll information by class, for a number of states.
2. Using this payroll, we calculated a premium at present rates for each class.
3. For each state with data available, we sorted the classes by size of premium.
4. For each class, we calculated the percentage of total statewide premium volume which that class formed.
5. We then calculated the aggregate premium for all classes with individual premium less than a certain percentage of the statewide total. For example, in Connecticut, minimum premium risks formed .19% of the statewide total premium (see Exhibit 2, three

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year total). Thus, for Connecticut, we accumulated the aggregate premium for all classes that had premium less than .19% of the statewide total. We also counted the number of classes with non-zero premium that had less than .19% of the statewide total premium. Similar calculations were performed for the other states.

The results of this analysis appear in Exhibit 6. This exhibit shows, at least on an aggregate basis, that minimum premium risks have volumes comparable to a large number of classes. The aggregate premium volume of these classes is significant.

Therefore, at least on a premium volume basis, there appears to be no reason not to examine minimum premium experience on a statewide basis along with the classification review. However, the credibility resulting from a given volume of minimum premium experience may differ from the credibility due to a comparable volume of classification experience.

E. Expense Experience of Minimum Premium Insureds

1. Data Available

NCCI has not performed an analysis of expenses by size of risk since the 1982 study. (This study and the issue of expenses by size is discussed in Section IIB, Part 2 of our report.)

In the 1982 study, data was not separately categorized for minimum premium risks. However, based on the size categories that were analyzed, we have prepared an exhibit which shows the required general expenses by size and compares it to the general expense dollars generated by the provision in manual rates and the expense constant (see Exhibit 7). Although data for other acquisition expense was also collected, the manual rate provision does not separately isolate other acquisition expense from total production expense. Therefore, a comparison of required other acquisition with generated other acquisition is not possible. In the analysis that follows, we are treating risks less than \$300 in premium size in 1982 as a proxy for minimum premium risks. Assuming a 10% per year premium change, a \$300 policy in 1982 is equivalent to a \$400 policy in 1985, and a \$640 policy in 1990.

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2. Analysis

Based on the 1982 experience of all policies less than \$300, insurers incurred \$64.60 in general expenses per policy. The recommended general expense provision for those policies was \$70.12. This indicates a slight redundancy.

For the premium size interval \$200 - \$299, the 1982 experience indicates an expense deficiency, while for the two smaller premium size intervals (\$0 - \$99, and \$100 - \$199), the 1982 experience shows a redundancy. (See Exhibit 7).

F. Conclusions and Recommendations

1. Minimum premium risks appear to have consistently worse loss ratios than all other risks. Due to the relatively small premium contribution from minimum premium risks and the size of the loss ratio differential, their effect on overall loss ratios is small. It is not clear what loss ratios will ultimately result from NCCI's current program of minimum premium multipliers. NCCI should continue to study the loss ratio experience of small risks to ensure the reasonableness of the minimum premium program.
2. Adequate data to study the expense experience of minimum premium risks is not available. However, based on data from the 1982 study of expenses by size of risk, the general expense provision in the rates for very small risks appears to be slightly greater than the insurance companies' expenses necessary to handle these small risks.
3. If premium levels for minimum premium risks were increased, either through increasing the minimum premium multipliers or adding a loss constant, these minimum premium risks would be more desirable to insurers. On the other hand, there are a significant number of minimum premium risks and there is likely to be some dissatisfaction after a price increase targeted at minimum premium risks. Due to the low impact of minimum premium risks on the overall loss ratio, we believe that the policy of whether or not to change the pricing of minimum premium risks should be governed by its practical effects rather than its actuarial significance.
4. If the decision is made to adjust multipliers and maximum minimum premiums to the point that average rate levels for minimum premium risks contemplate reasonable profitability, then these factors, particularly the multipliers, will need to be determined by an analysis of loss experience for risks of minimum premium size. While countrywide



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experience would be appropriate to determine average multipliers for minimum premium risks, it must be noted that the amount of experience by state for minimum premium risks is often significant and the credibility of such experience would need to be explored. While we have compared the amount of minimum experience by state to the amount of experience available for classification ratemaking, it may well be the case that the credibility due minimum premium experience by state will be different from the indicated credibility due a comparable volume of classification ratemaking experience.

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IV. RESIDUAL MARKET SURCHARGES

A. Background

The residual market for workers compensation has been growing in most states. As residual market risks form a greater and greater percentage of the total market, increased attention has been focussed on how prices are determined for these risks. In addition, over the past several years, NCCI has introduced a number of new programs that serve to increase premium charges for some or all residual market risks.

However, programs to charge residual market risks rates that are different from voluntary risks are not new. According to NCCI, the first such program was introduced in Alaska on 1/1/82 when premium discounts were removed for risks in the residual market. Alaska then added a rate differential in 1984. Starting in 1987, NCCI began expanding these residual market programs with removal or reductions in premium discounts for residual market risks approved in Iowa and Kentucky, and a rate differential for a segment of the residual market introduced in Maine. In 1988, these programs began spreading more rapidly. Today, various programs have been filed and approved in virtually all NCCI states.

This Section will review following items:

- Identification of Residual Market Surcharge Programs;
- Ratemaking Adjustments for Residual Market Surcharge Programs;
- Estimating Rate Level Effects of Various Surcharge Programs;
- NCCI Concerns Regarding Net Premium Programs;
- Conclusions and Recommendations.

B. Identification of Residual Market Surcharge Programs

Exhibit 8 summarizes state residual market surcharge programs such as:

1. Removal of premium discount.

In states with this program, risks in the residual market receive no premium discount. However, a number of states have approved variations to this program, so that the discount

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will be reinstated in full for certain risks. For example, in Missouri, a residual market risk with an experience modification factor of 1.05 or less is entitled to premium discount. In Maine, only risks in the "Accident Prevention Account", (which is a subset of the residual market), lose their premium discount.

2. Reduction in premium discount.

The standard premium discount offered to residual market risks (that are eligible) is based on the stock discount table. However, a number of states have approved the use of non-stock discounts (which are lower) for residual market risks.

3. Rate or pure premium differentials.

In states with these programs, the rate charged to a residual market risk is higher than the voluntary market rate. The differentials vary by state, but range up to a current high of 29% over the voluntary rate. Some states apply this surcharge only to risks above a certain minimum size. Note that standard NCCI practice is to use the same rating values (i.e., the components used to calculate the experience modification factor) for both the voluntary and assigned risk markets. Thus, a risk will have the same experience modification whether it is insured in the voluntary market or the assigned risk market.

In a situation where the rate level indications are determined on a combined (voluntary and residual market basis) and the rating values are also based on combined experience, then the combined total premium generated should be reasonable (assuming proper ratemaking techniques).

In this situation, if the residual market loss experience is worse than the voluntary market loss experience, the residual market will tend to have above average mods while the voluntary market will have below average mods.

Now consider a situation, where based on the adverse loss experience of the residual market, a rate surcharge is applied to the residual market risks, but the experience mods are calculated in the same fashion as described above.

In this case, there is a risk of double-counting the residual market adverse experience, once in the rate level and once in the experience mod calculation.

Problems with potential double-counting are discussed further later in this subsection.

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4. Flat dollar surcharge.

As a variation on the rate differential program, in Florida, risks in the assigned risk plan are charged a flat fixed dollar amount surcharge on a per risk basis.

5. Assigned Risk Adjustment Program (ARAP).

This program adjusts the premium upward for assigned risks that are experience rated, based on their actual historical loss experience (i.e., it is a prospective adjustment). This program, like all the other residual market programs, was created to respond to the fact that the residual market loss ratio experience was worse than the voluntary market experience. However, the ARAP, does not target all risks, but only surcharges those risks with adverse historical loss experience.

6. Assigned Risk Rating Program (ARRP).

This program adjusts the premium upward based on actual losses during the experience period. In other words, it acts somewhat like a retrospective rating plan. This program is only applied to larger sized risks, with the actual cutoff varying by state.

C. Ratemaking Adjustments for Residual Market Surcharge Programs

NCCI classifies the premium adjustment programs into two types, standard premium programs and net premium programs. The standard premium programs are all those programs where the premium adjustment affects a risk's standard premium. This would include the programs mentioned in items 3, 4, and 5, above. (That is, the rate differential, the rate surcharge, and the ARAP.) The net premium programs are those where the risk's net premium is modified, but the standard premium remains unchanged. This would include the programs mentioned in items 1, 2, and 6, above. (That is, the adjustments of premium discount, and the ARRP program.)

For the standard premium programs, NCCI practice is to always include the additional revenue in the premium base (since it is reported with the Designated Statistical Reporting Level (DSR) standard premiums and is not readily separable), and to adjust the on level calculations to reflect the current level of the various surcharges. The exact details on how these adjustments are made can be complex. They are discussed in more detail below.

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For the net premium programs, the additional revenue must be estimated since it is not included in the reported standard premiums. NCCI chooses whether or not to reflect this additional revenue based on their assessment of the situation in the particular state. If the additional revenue is reflected, adjustments are also made to the premium on level factors.

NCCI has indicated that they have four different methods to reflect standard premium programs in their on level factor calculations. Originally, there were only two methods, but these methods are being replaced by two additional methods. The original two methods performed adequately when adjusting premiums to current level for the purpose of determining the overall rate level indication. However, NCCI states that they introduced distortions in trend factors when the relative size of the assigned risk market was changing. Therefore, NCCI introduced the second two methods to adjust for this distortion. All four methods are described below.

In addition, we describe the kinds of adjustments NCCI makes to estimate the effects of the net premium programs.

1. Standard Premium Method 1.

In some states, assigned risk surcharge programs are introduced on a revenue neutral basis. That is, all rates are reduced to reflect the additional revenue from the assigned risk plan. When this happens, and the assigned risk market share is constant, there may be no need to reflect the surcharge program in the on level factor calculation, since there is no additional revenue created by the program on a total market basis. We have not included an example demonstrating this method simply because the on level calculation would be identical to that in a state with no residual market premium programs.

2. Standard Premium Method 2.

In this method, separate on level factor calculations are performed for the voluntary market and for the assigned risk market. The two on level factors are weighted together using the current policy period's respective market shares as weights. Several examples of this method are attached as Exhibit 9. In Alaska, the on level factor is a weighted average of the voluntary and assigned risk on level factors. Use of this factor will put voluntary premiums on the latest voluntary rate level and assigned risk premiums on the latest assigned risk rate level assuming the voluntary and assigned risk market shares are constant. In other words, the on level factor represents the average rate level change for voluntary and assigned risks, combined. For Arizona, the assigned risk on level factor is first divided

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by the current assigned risk rate deviation factor, before it is weighted with the voluntary on level factor. This, in effect, will put all premiums on the current voluntary rate level.

3. Standard Premium Method 3.

In this method separate indications are calculated for voluntary and assigned risks and the experience is combined. Therefore, there is no explicit consideration of the voluntary and assigned risk market share. An example of this method is attached as Exhibit 10 (Louisiana).

4. Standard Premium Method 4.

In this method, separate on level calculations are performed for the voluntary and assigned risk premiums. The weighting methodology has been revised by use of a "market share adjustment factor". The purpose of this factor is to make adjustments when the assigned risk market share is changing. Thus, historical premiums are brought to the current rate levels and the current market share level. Examples of this method are attached as Exhibit 11. The market share adjustment factor is .999 for Iowa and .997 for Indiana and is applied to the combined voluntary and assigned risk on level factor that is calculated via method 2. Documentation on the derivation of the market share adjustment factor is not included along with the standard rate filing materials. NCCI provided us with a sample calculation of a market share adjustment factor for Florida, which resulted in a factor of 1.000 for Calendar Year 1989 and a factor of .999 for Policy Year 1989 (Exhibit 12).

After rearranging the terms in the formula used by NCCI, the market share adjustment is calculated by dividing two on level factors. The formula for the numerator is :

$$\frac{\text{Voluntary Rate} \times \text{Current AR \%} + \text{Current Voluntary \%}}{\text{AR Rate}}$$

This factor converts premium at current rate level and current market share to the voluntary rate level.

The denominator is:

$$\frac{\text{Voluntary Rate} \times \text{Projected AR \%} + \text{Projected Voluntary \%}}{\text{AR Rate}}$$

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This factor converts premium at current rate level and projected market share to the voluntary rate level.

If the assigned risk market share is projected to increase, this would result in a market share adjustment of greater than 1.00. This, in turn, would increase the on level premiums and decrease the rate level change, all other things being equal.

D. Estimating Rate Level Effects of Various Surcharge Programs

The rate effect of the various surcharge programs are required for calculating on level factors. This section will highlight the techniques and data sources used by NCCI to accomplish this task.

1. Rate surcharges

If the surcharge applies on a flat percentage basis to all assigned risks, then the rate level calculation is straightforward. Several states have rate surcharges applying to risks above a certain premium size. Exhibit 13 shows the calculation of the rate level effect and the corresponding voluntary offset based on a 25% surcharge on the amount of premium over \$2,000.

Assigned risk policy size information is determined from the PICS (Policy Issue and Capture System). The market share data is determined from the financial calls (for total market data) and Quarterly Assigned Risk Financial Data (for assigned risk data).

2. ARAP

NCCI estimates the projected cost of the ARAP by re-rating historical experience on a risk by risk basis as if the ARAP were in effect. Exhibit 14 shows the supporting data for a Georgia filing.

3. ARR

Based on data from the PICS system, NCCI generates a distribution of premiums by size. Next, NCCI estimates an expected loss ratio for assigned risks starting with the target cost ratio from a rate filing and eliminating loss adjustment expense and any loss based assessments. This is further adjusted for the assigned risk loss ratio differential net of any

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assigned risk rate programs that modify the standard premium. Then, based on the expected loss ratio and Table M, an average surcharge amount is calculated based on the loss ratio distribution underlying Table M, the expected loss ratio, and the surcharge formulas of the ARR. (Table M is a tool used in the construction of the retrospective rating plan. With Table M, one can estimate the distribution of risks by loss ratio for each premium size group.) Finally, it is assumed that only 85% of the additional ARR premium will be collectable.

A sample of these calculations appears in Exhibit 15.

4. Adjustments to premium discount.

From a distribution of risks by size, NCCI calculates premium before and after the change in discount program. The ratio of these two amounts is the rate level change for assigned risks. Exhibit 16 shows a sample calculation.

E. NCCI Concerns Regarding Net Premium Programs

According to NCCI, they have a number of concerns regarding their methods for estimating the impact of the net premium programs. However, they claim that most of their filings do reflect the impact of these programs in their on level factor calculations.

Difficulties with the ARR program (the surcharge program based on actual current policy period loss experience) cited by NCCI are as follows:

1. NCCI does not use actual loss experience. Instead, they project the distribution of risks by loss ratio by using the Table of Insurance Charges (also known as "Table M").
2. The final ARR premium is based on loss experience as of 18 months past the effective date of the policy. NCCI is concerned that this premium may not be collected, and therefore on level premiums may be overstated. (Current NCCI procedure assumes that 15% of the surcharge premium will not be collectable.) This issue has some important regulatory repercussions. If an individual carrier is unable to collect premium that is due under the residual market rating mechanism, is it equitable to charge all policyholders in the state for this revenue shortfall?

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3. According to NCCI, if the ARRP succeeds in its aims, it will cause large risks in the assigned risk plan to seek coverage in the voluntary market. If this happens, the net premium impact may be smaller than estimated under the above methodology.

F. Conclusions and Recommendations

In general, we believe that the standard NCCI procedures to reflect additional revenue from residual market policies are reasonable. However, we have a number of concerns regarding some related issues. These are presented below.

1. Potential problem of double-counting adverse experience.

There are two areas where this problem may arise.

- a. The use of a single set of experience modification plan parameters for voluntary and residual market risks in states that have rate differential programs. The experience rating parameters (i.e. expected loss rates) are the same whether a risk is paying the lower voluntary rate level or the higher assigned risk rate level. Under certain situations, this could serve to double-count the adverse experience of risks in the assigned risk plan. On the other hand, a uniform set of rating values makes administration of the experience rating plan easier. There are three elements that could interact to cause double-counting of residual market adverse experience; higher residual market rates, experience rating values, and ARAP.

NCCI could test whether double-counting exists by adding some additional calculations to their estimates of the impact of ARAP. These additional calculations should include an estimation of loss ratios of assigned risk business and voluntary business after the impact of ARAP, higher residual market rates, and experience modification factors. The goal of all three programs is to have risks pay an equitable price. Double-counting would be a problem if the combined effect of more than one rating program reduced the loss ratio for an identifiable group of residual market risks below that of a similar group of voluntary risks.

At the present time, we would characterize the issue of potential double counting as a design consideration for future surcharge programs rather than as something likely to be a problem with current plans. Based on a review of several states, the overall

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impact of the current assigned risk plans was quite a bit less than the current assigned risk revenue shortfalls.

b. The application of a single offset for assigned risk rate differentials applied to all classes results in a larger than necessary offset for some classes and a smaller than necessary offset for others. Classes that are heavily written in the assigned risk market will not have their manual rates lowered enough to fully offset surcharge income. This may or may not result in assigned risk insureds being overcharged, depending on the magnitude of the surcharge program, and the concentration of the class in the assigned risk market. NCCI should study this situation to see if a practical equitable solution can be devised.

2. Improve explanatory material in the rate filing.

The standard rate filing does not contain sufficient information to review the calculations underlying the derivation of all the assigned risk plan premium adjustment factors. NCCI should improve the supporting materials.

3. Net premium programs contemplating additional revenue for assigned risk policyholders should be reflected in all states as a standard methodology.

We believe the filing should measure the impact of all premium revenue sources in calculating rate level indications as a standard procedure. If there are compelling reasons to modify or exclude the calculated effect of the assigned risk plan net premium programs, NCCI could treat this like any other data anomaly.

4. When data becomes available as to the collectability of ARRPs premium surcharges, NCCI should replace the assumed 85% collectable percentage with a figure based on actual experience.

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V. EXPERIENCE RATING PLAN OFF-BALANCE

At the request of the Examination Oversight Group, we have included the response to this objective in our report entitled Section IIB, Part 7 - Experience Rating.

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VI. CALENDAR/ACCIDENT YEAR VS. POLICY YEAR LOSS RATIOS

A. Background

This section of the report was requested by the NAIC in June, 1991 as additional research. The objective of the analysis was to test for any consistent tendency of the calendar/accident year loss ratio used in a rate filing to be higher or lower than the corresponding policy year loss ratio, after adjusting for trend.

B. Description of Tests

1. Loss Ratio Tests

Our loss ratio tests compared the following pairs of calendar/accident year and policy year loss ratios:

Policy Year 1986 and Calendar/Accident Year 1987 ("PY86 & AY87")

Policy Year 1987 and Calendar/Accident Year 1988 ("PY87 & AY88")

Policy Year 1988 and Calendar/Accident Year 1989 ("PY88 & AY89")

These are the pairs of ratios which, for most states, were used in developing the rate indications for filings effective in 1989, 1990 and 1991 respectively.

NCCI provided us with the premium and loss data for each of the years. This information was adjusted as follows:

- policy year premiums were developed to ultimate;
- losses were developed to ultimate;
- losses were adjusted to a common benefit level;
- premiums were adjusted to a common rate level.

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NCCI also provided us with medical and indemnity trend factors. The trend factors provided were derived from the 1989 through 1991 filings, by adjusting each actual factor used in the filings to an average annual basis.

From this data, we calculated the loss ratios as follows:

$$\frac{\text{Adjusted Losses}}{\text{Adjusted Standard Earned Premium}}$$

The calendar/accident year loss ratio was then divided by:

$$(1 + \text{Trend Factor})^{6.7/12}$$

to reflect a common claim cost level as is reflected in the policy year loss ratio. (Based on NCCI's countrywide distribution of premium written by month, the average accident date for the calendar/accident year is approximately 6.7 months after the average accident date for the previous policy year.)

The resulting loss ratios are shown on Exhibit 17.

In our report on premium and loss development factors (Section IIB, Part 1), we concluded that the adjustment of calendar year premium to current rate level does not consider the contributions to calendar year premiums arising from audit adjustments to older policy years. The magnitude of the error varies by state based on rate level changes, growth in exposures, and premium earning patterns. We estimated that, for most states, the theoretically correct value of adjusted calendar year premiums would be less than two percent higher than that resulting from NCCI's current calculations.

Based on this conclusion, a tendency for the calendar/accident year loss ratio to be higher than the policy year loss ratio is not unexpected. The next step of our analysis was to adjust the calendar year premiums for this estimated understatement in the current rate level adjustment. The purpose of our adjustment was not to derive a precise estimate of the current rate level factor for each state and for each calendar/accident year. Rather, the purpose was to calculate an average adjustment factor to apply to the NCCI current rate level factor.

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Thus, for each state we calculated the average adjustment factor taking into account:

- Average annual increase in premium levels (over the period 1985 - 1989);
- Average annual change in rate levels (over the same period);
- Policy year premium earning pattern.

The adjustment factors were derived using the approach described in Section IIB, Part 1, "Premium and Loss Development Factors". The factors resulting from this approach are summarized on Exhibit 18.

We adjusted each of the calendar year premiums by the factor, and recalculated the loss ratios. The resulting loss ratios are shown on Exhibit 19.

On Exhibit 20, we have calculated the ratio of the calendar/accident year loss ratio to the policy year loss ratio for each state and each pair of years. Exhibit 21 provides a summary of the results for each policy year and calendar/accident year combination. We observe that the PY86 & AY87 (Exhibit 21, Sheet 1) and the PY88 & AY89 (Exhibit 21, Sheet 3) loss ratios are reasonably consistent. On average, the calendar/accident year loss ratio is less than one percent higher than the policy year loss ratio, and approximately half of the states have policy year loss ratios which are greater than the calendar/accident year loss ratio. We conclude that, for these years, there is not a significant difference between the accident year and policy year loss ratios.

For PY87 & AY88 (Exhibit 21, Sheet 2), the results are different. The calendar/accident year loss ratio is consistently (nearly 75% of the states) and materially (2% to 7% on average) higher than the policy year loss ratio. To further explore possible reasons for these differences, we have compared the underlying premiums.

2. Premium Tests

NCCI provided us with premium data for policy years 1987 and 1988, and calendar year 1988. We would expect that, after adjusting the premium data to reflect:

- Policy year development to ultimate;
- Adjustment to common rate levels; and,

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- Matching companies,

the calendar year premium would usually be between the two policy years' premiums, and would generally be close to the average of the two policy years' premiums.

Exhibit 22 compares the premium values. On the exhibit, we have ranked the three premium values for each state. We would expect the calendar year premium to have a ranking of 2, indicating that it is between the two policy year values. Exhibit 22 shows that this occurs in fewer than half of the states (fourteen of thirty-five). Further, we note that for eighteen of the remaining twenty-one states, the calendar year premium was the lowest of the three. This suggests that the calendar year premiums are understated or the policy year premiums are overstated.

This can also be seen in the thirty-five state totals. The calendar year premium (\$17.1 billion) is less than the surrounding policy year premiums (\$17.5 billion and \$17.9 billion).

As with the loss ratios, we have recalculated the calendar year premiums to reflect the current rate level adjustment described above. The results of this calculation are shown on Exhibit 22, Sheet 2. While the adjustment does bring a few states closer to our expectation, the results still suggest an inconsistency in the two premium bases.

We requested that NCCI investigate the causes for these inconsistencies and determine whether they are evident in the other years. Exhibits 23 and 24 present the comparisons for two other calendar year/policy year combinations. Exhibit 23 shows the premiums for policy years 1986 and 1987 and calendar year 1987. (Sheet 1 shows the unadjusted calendar year premiums; Sheet 2 shows the calendar year premiums after reflecting the current rate level adjustment.) Exhibit 24 shows the premium rankings for policy years 1988 and 1989 and calendar year 1989. (NCCI indicated that individual states' premium data cannot be shown since the information was not yet used in state rate filings. The premiums used in Exhibit 24 do not reflect the current rate level adjustment.) While there are some states for which the premiums exhibit inconsistencies (for example, Michigan and Oklahoma for calendar year 1987), the totals are in line with our expectations. For these years, calendar year premiums are between the policy year premiums for approximately two-thirds of the states, and the countrywide totals are reasonable.

These exhibits suggest that, while there appear to be some inconsistencies in the policy year and calendar year premiums in all three years, the differences are most pronounced in calendar year 1988.

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This observation is consistent with the results of NCCI's investigation. In reporting on their investigation, NCCI stated:

"There appear to have been some data problems in the past causing possible distortions in the calendar year premiums. We found that the policy year 1/2 / 1st development factors (12 months to 24 months) seem to be inconsistent from year to year for a few carriers. This suggests that companies may have changed the way in which they code their policy year premium for the half report (12 months). This can cause a one time shift in the calendar year premium."

NCCI further stated:

"When we investigated individual carrier data as mentioned above, we noticed that the identified problems were more concentrated in calendar year 1988."

Finally, NCCI indicated that:

"...given the time constraints, we were unable to account for all of the differences."

The premium comparisons above, and the results of NCCI's investigations, lead us to conclude that the differences between the policy year and calendar/accident year loss ratios observed above are likely to be due largely to inaccuracies or inconsistencies in the premium data underlying the loss ratios.

We recommend that NCCI continue to investigate the reasons for the premium differences in those states where they are most pronounced. We also recommend that NCCI strengthen the process for editing carriers' calendar and policy year premium reports for consistency.

C. Conclusions and Recommendations

Our tests focused on:

Policy Year 1986 and Calendar/Accident Year 1987 ("PY86 & AY87")
Policy Year 1987 and Calendar/Accident Year 1988 ("PY87 & AY88")
Policy Year 1988 and Calendar/Accident Year 1989 ("PY88 & AY89")

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For each state, and for each pair of years, we calculated the following ratio:

$$\frac{\text{Calendar/Accident Year Loss Ratio}}{\text{Policy Year Loss Ratio}}$$

after making appropriate adjustments to put the loss ratios on a common level with regard to rates, benefits and trend.

For PY86 & AY87 and PY88 & AY89, the average ratios are less than 1.01. That is, the calendar/accident year loss ratio is less than one percent higher than the policy year loss ratio. For these two pairs of years, approximately half of the states have policy year loss ratios which are less than the calendar/accident year loss ratios and for half of the states the relationship is reversed.

However, for PY87 & AY88, nearly 75 percent of the states have calendar/accident year loss ratios exceeding the policy year loss ratio, and the average ratio is 1.049. These results suggest that the calendar/accident year 1988 loss ratio is overstated and/or the policy year 1987 loss ratio is understated.

The comparative exhibits presented in this report, coupled with NCCI's investigation into some observed premium differences, suggest that the PY87 & AY88 loss ratio inconsistencies are attributable largely, or entirely, to premium data problems. Further, NCCI's investigation suggests that the problem is concentrated mostly heavily in calendar year 1988.

In general, the policy year and calendar/accident year loss ratios used in recent rate filings appear to be reasonably consistent with each other. Calendar/Accident Year 1988 appears to be an exception. The difference appears to be caused by inconsistencies between policy years 1987 and 1988 and calendar year 1988 premiums. NCCI could not identify all of the causes of the apparent premium anomaly. This does not appear to be a problem with respect to 1991 filings which are based on calendar year 1989 and policy year 1988. However, we recommend that NCCI continue to investigate the reasons for the premium differences in those states where they are most pronounced. We also recommend that NCCI strengthen the process for editing carriers' calendar and policy year premium reports for consistency.

MISCELLANEOUS

EXHIBITS

MISCELLANEOUS

[REDACTED]

MISCELLANEOUS

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	<u>MINIMUM PREMIUM MULTIPLIER</u>	<u>EXPENSE CONSTANT</u>	<u>MAXIMUM MINIMUM PREMIUM</u>
<u>ALABAMA</u>			
4/1/84	85	\$85	\$650
4/1/85	95	85	700
5/1/86	105	120	750
6/1/87	115	120	750
10/1/88	125	120	750
3/1/90	135	120	750
4/1/91	145	140	750
<u>ALASKA</u>			
1/1/84	70	\$85	\$1,500
1/1/87	75	120	1,500
<u>ARIZONA</u>			
10/1/84	25	\$60	\$750
10/1/85	25	60	750
10/1/86	25	60	750
10/1/87	25	60	750
10/1/88	25	60	750
10/1/89	25	60	750
10/1/90	25	60	750
10/1/91	25	60	750
<u>ARKANSAS</u>			
8/1/84	65	\$75	\$550
9/1/85	75	85	600
1/1/86	75	120	600
12/10/86	85	120	650
4/1/88	95	120	700
1/1/90	105	120	750
3/1/91	115	140	750
<u>COLORADO</u>			
12/1/83	55	\$75	\$550
12/1/84	65	85	600
12/1/85	75	85	650
1/1/86	75	120	650
12/1/86	85	120	700
12/1/87	95	120	750
1/1/89	105	120	750
6/1/90	115	140	750

	<u>MINIMUM PREMIUM MULTIPLIER</u>	<u>EXPENSE CONSTANT</u>	<u>MAXIMUM MINIMUM PREMIUM</u>
<u>CONNECTICUT*</u>			
10/1/84	55	\$85	\$500
10/1/85	65	85	500
10/1/86	75	100	550
10/1/87	85	120	600
1/1/89	95	120	650
<u>DC</u>			
8/1/83	45	\$85	\$500
1/1/86	55	120	550
1/1/87	65	120	600
1/1/88	75	120	650
3/1/89	85	140	700
5/15/90	95	140	750
4/1/91	105	140	750
<u>FLORIDA</u>			
3/1/84	35	\$35	\$500
1/1/85	45	35	550
1/1/86	45	85	600
1/1/87	45	85	600
1/1/88	45	85	500
1/1/89	45	85	500
1/1/90	45	140	550
9/1/90	45	140	550
<u>GEORGIA</u>			
4/1/84	65	\$75	\$550
4/1/85	75	85	600
1/1/86	75	120	600
7/1/86	85	120	650
1/1/87	95	120	700
9/15/87	95	120	700
8/1/88	105	120	650
7/1/89	115	140	700
3/1/91	125	140	750
<u>HAWAII</u>			
1/1/83	55	\$75	\$500
2/1/85	55	75	500
10/1/86	55	75	500
10/1/87	55	100	500
10/1/88	55	100	500
10/1/89	55	120	500

	<u>MINIMUM PREMIUM MULTIPLIER</u>	<u>EXPENSE CONSTANT</u>	<u>MAXIMUM MINIMUM PREMIUM</u>
<u>IDAHO</u>			
1/1/84	75	\$75	\$550
1/1/85	85	85	600
1/1/86	85	120	600
2/1/86	95	120	650
1/1/87	105	120	700
1/1/88	115	120	750
1/1/90	115	140	750
1/1/91	125	140	750
<u>ILLINOIS</u>			
1/1/83	45	\$15	\$500
1/1/87	65	60	600
1/1/88	75	60	650
1/1/89	85	60	700
1/1/90	95	60	750
1/1/91	105	75	750
<u>INDIANA</u>			
8/1/84	95	\$85	\$650
8/1/85	105	85	700
1/1/86	105	120	700
9/1/86	115	120	750
9/1/87	125	120	750
1/1/90	125	140	750
1/1/91	135	140	750
<u>IOWA</u>			
12/1/83	85	\$85	\$600
12/7/84	95	85	650
1/1/86	95	120	650
4/1/86	105	120	700
4/1/90	115	140	750
4/1/91	125	140	750
<u>KANSAS</u>			
12/1/83	75	\$60	\$600
5/1/85	85	85	650
7/1/86	95	85	700
10/1/87	105	120	750
12/1/88	115	120	750
5/1/90	125	140	750
6/1/91	135	140	750

	<u>MINIMUM PREMIUM MULTIPLIER</u>	<u>EXPENSE CONSTANT</u>	<u>MAXIMUM MINIMUM PREMIUM</u>
<u>LOUISIANA*</u>			
9/1/82	55	\$60	\$500
1/1/86	65	85	550
7/1/87	75	120	600
<u>MAINE</u>			
3/2/81	65	\$15	\$500
4/27/88	75	90	550
3/20/89	85	90	600
4/17/90	95	90	650
7/1/91	105	120	700
<u>MARYLAND*</u>			
1/1/84	65	\$85	\$600
1/1/86	75	120	650
1/1/87	85	120	700
<u>MISSISSIPPI</u>			
9/1/84	85	\$85	\$600
12/1/85	95	85	650
1/1/86	95	120	650
10/1/86	105	120	700
4/1/88	115	120	750
6/1/90	125	140	750
7/1/91	135	140	750
<u>MISSOURI</u>			
10/1/84	75	\$75	\$650
1/1/86	85	75	700
1/1/87	95	75	750
1/1/88	105	75	750
7/1/89	115	120	750
9/1/90	125	125	750
2/1/91	125	125	750
9/1/91	135	125	750

	<u>MINIMUM PREMIUM MULTIPLIER</u>	<u>EXPENSE CONSTANT</u>	<u>MAXIMUM MINIMUM PREMIUM</u>
<u>MONTANA</u>			
7/1/84	85	\$85	\$650
7/1/85	95	85	700
1/1/86	95	120	700
7/1/86	105	120	750
7/1/87	115	120	750
7/1/88	125	120	750
7/1/89	135	140	750
7/1/90	145	140	750
7/1/91	155	140	750
<u>NEBRASKA</u>			
2/1/84	65	\$85	\$600
1/1/85	75	85	650
5/15/86	85	120	700
5/1/87	85	120	750
11/1/88	95	120	750
9/1/89	105	120	750
10/1/90	115	140	750
7/1/91	125	140	750
<u>NEW HAMPSHIRE</u>			
5/1/84	35	\$35	\$500
5/1/86	35	35	550
5/1/87	45	45	600
1/1/89	55	60	650
7/1/90	65	85	700
9/1/91	75	85	750
<u>NEW MEXICO*</u>			
1/1/84	85	\$85	\$600
1/1/85	95	85	650
10/1/87	105	85	700
<u>NORTH CAROLINA</u>			
8/1/85	75	\$85	\$600
1/1/86	85	120	650
1/1/87	95	120	700
1/1/88	105	120	750
1/1/90	115	140	750
1/1/91	125	140	750

	<u>MINIMUM PREMIUM MULTIPLIER</u>	<u>EXPENSE CONSTANT</u>	<u>MAXIMUM MINIMUM PREMIUM</u>
<u>OKLAHOMA</u>			
5/1/84	45	\$60	\$500
3/1/85	55	75	550
7/1/88	65	100	600
7/1/89	75	120	650
12/1/90	75	120	650
7/1/91	85	140	700
<u>RHODE ISLAND</u>			
9/11/82	45	\$35	\$500
11/15/85	55	60	550
4/15/88	65	85	600
6/22/89	75	100	650
<u>SOUTH CAROLINA*</u>			
2/1/84	85	\$85	\$550
2/1/85	95	85	600
2/6/86	105	120	650
2/6/87	115	120	700
2/6/88	125	120	750
<u>SOUTH DAKOTA</u>			
7/1/84	95	\$85	\$650
1/1/86	95	120	650
1/15/86	105	120	700
1/1/87	115	120	750
6/1/90	115	140	750
<u>TENNESSEE</u>			
9/1/84	95	\$85	\$600
9/1/85	95	85	600
4/1/86	105	120	650
9/1/86	105	120	650
10/1/87	115	120	700
7/1/88	115	120	700
1/1/89	115	120	700
7/1/89	115	120	700
1/1/90	125	140	750
7/1/90	125	140	750
7/1/91	135	140	750

	<u>MINIMUM PREMIUM MULTIPLIER</u>	<u>EXPENSE CONSTANT</u>	<u>MAXIMUM MINIMUM PREMIUM</u>
<u>UTAH</u>			
1/1/84	85	\$85	\$600
1/1/85	95	85	650
1/1/86	105	120	700
1/1/87	115	120	750
1/1/88	115	120	750
7/1/88	115	120	750
1/1/89	125	120	750
1/1/90	135	140	750
1/1/91	145	140	750
 <u>VERMONT</u>			
6/1/84	45	\$85	\$600
7/1/84	45	85	600
7/1/85	45	85	650
1/1/86	45	120	650
7/1/86	45	120	700
7/1/87	45	120	750
7/1/88	45	120	750
7/1/89	55	140	750
7/1/90	65	140	750
 <u>WISCONSIN</u>			
7/1/84	35	\$85	\$600
7/1/85	45	85	650
1/1/86	45	105	650
7/1/86	55	120	700
7/1/87	65	120	750
7/1/88	70	120	750
7/1/89	80	140	750
7/1/90	90	140	750
7/1/91	100	140	750

* REPRESENTS STATES THAT HAVE SINCE CONVERTED TO A LOSS COSTS BASIS AND THEREFORE ARE NO LONGER SUBJECT TO NCCI MINIMUM PREMIUM PROGRAM IN THE VOLUNTARY MARKET.

MINIMUM PREMIUM POLICY PREMIUM
AS A PERCENT OF SUMMARIZED PREMIUM

State	Policy Year			Total
	10/1/86	10/1/85	10/1/84	
Alabama	0.20%	0.16%		0.18%
Alaska	0.28%	0.28%	0.23%	0.27%
Arizona		0.02%	0.02%	0.02%
Arkansas	0.26%	0.25%	0.14%	0.22%
Colorado	0.23%	0.22%	0.17%	0.20%
Connecticut	0.20%	0.21%	0.14%	0.19%
District of Columbia	0.13%	0.15%	0.09%	0.12%
Florida	0.43%	0.42%		0.42%
Georgia	0.14%	0.11%	0.09%	0.11%
Hawaii	0.07%		0.10%	0.08%
Idaho	1.01%	0.94%	0.75%	0.92%
Illinois	0.24%	0.25%		0.24%
Indiana	0.91%	0.81%	0.85%	0.86%
Iowa	0.94%	1.17%	1.12%	1.06%
Kansas	0.69%	0.75%	0.57%	0.68%
Kentucky	0.40%	0.42%	0.39%	0.40%
Louisiana	0.36%	0.39%	0.17%	0.32%
Maine	0.28%	0.32%	0.19%	0.27%
Maryland	0.25%	0.25%	0.17%	0.23%
Michigan	0.33%	0.45%		0.39%
Mississippi	0.30%	0.26%	0.24%	0.27%
Missouri		0.34%	0.28%	0.32%
Montana	0.02%	0.04%	0.07%	0.04%
Nebraska	0.93%	0.97%	0.76%	0.89%
New Hampshire	0.21%	0.17%	0.12%	0.18%
New Mexico	0.26%	0.28%	0.28%	0.27%
North Carolina		0.31%	0.26%	0.29%
Oklahoma	0.32%	0.37%		0.34%
Oregon	0.03%	0.03%		0.03%
Rhode Island	0.06%	0.06%	0.05%	0.06%
South Carolina	0.26%	0.25%	0.24%	0.25%
South Dakota	1.72%	1.63%	1.59%	1.65%
Tennessee	0.26%	0.27%		0.26%
Utah	0.96%	0.65%		0.82%
Vermont	0.26%	0.34%	0.30%	0.30%
Virginia	0.23%	0.23%		0.23%
Wisconsin	0.33%	0.32%	0.28%	0.31%
TOTAL	0.31%	0.31%	0.26%	0.30%

MINIMUM PREMIUM POLICY COUNT
AS A PERCENT OF SUMMARIZED POLICIES

State	Policy Year			Total
	10/1/86	10/1/85	10/1/84	
Alabama	4.57%	4.02%		4.21%
Alaska	9.13%	9.16%	5.17%	7.46%
Arizona		0.74%	0.57%	0.65%
Arkansas	5.29%	5.15%	2.69%	4.29%
Colorado	7.32%	8.03%	4.91%	6.56%
Connecticut	6.72%	6.72%	3.73%	5.62%
District of Columbia	3.27%	3.47%	1.87%	2.83%
Florida	8.60%	8.72%		8.31%
Georgia	3.40%	3.18%	2.21%	2.91%
Hawaii	4.01%		4.03%	4.02%
Idaho	18.00%	19.59%	10.40%	14.89%
Illinois	8.02%	8.46%		7.91%
Indiana	14.87%	13.88%	12.53%	13.20%
Iowa	14.10%	18.72%	12.72%	14.19%
Kansas	9.55%	10.49%	7.00%	8.68%
Kentucky	8.97%	9.98%	7.67%	8.57%
Louisiana	8.93%	9.61%	4.31%	7.27%
Maine	8.93%	9.51%	4.44%	7.44%
Maryland	7.18%	7.23%	3.64%	5.84%
Michigan	9.91%	12.27%		10.42%
Mississippi	6.76%	5.96%	6.06%	6.15%
Missouri		6.59%	5.07%	5.63%
Montana	0.34%	0.43%	0.66%	0.48%
Nebraska	14.42%	15.83%	9.87%	12.64%
New Hampshire	5.77%	5.46%	3.57%	4.89%
New Mexico	5.71%	5.89%	5.76%	5.67%
North Carolina		5.82%	4.38%	4.95%
Oklahoma	6.81%	7.35%		6.83%
Oregon	1.63%	1.65%		1.63%
Rhode Island	2.23%	2.33%	1.58%	2.03%
South Carolina	5.45%	5.57%	4.11%	4.96%
South Dakota	17.34%	19.69%	13.15%	15.63%
Tennessee	5.94%	6.80%		6.15%
Utah	22.22%	24.42%		21.08%
Vermont	5.87%	6.34%	4.56%	5.47%
Virginia	5.25%	5.04%		5.03%
Wisconsin	9.37%	9.34%	7.50%	8.54%
TOTAL	8.16%	8.15%	5.72%	7.33%

MINIMUM PREMIUM RISKS FOR POLICIES EFFECTIVE
10/1/84 THRU 9/30/85

State	(1) Premium	(2) Risks	(3) Medical	(4) Indemnity	(5) Loss Ratio [(3)+(4)]/(1)	(6) Average Premium (1)/(2)
Alabama						
Alaska	314,130	705	28,371	42,228	0.225	446
Arizona	47,663	334	97,642	66,379	3.441	143
Arkansas	197,277	839	70,461	79,466	0.760	235
Colorado	611,769	3,615	246,606	324,848	0.934	169
Connecticut	557,317	2,495	96,359	177,111	0.491	223
District of Columbia	72,363	368	9,166	18,153	0.378	197
Florida						
Georgia	416,127	1,795	147,203	145,691	0.704	232
Hawaii	218,048	873	54,563	108,911	0.750	250
Idaho	607,147	2,417	80,877	77,219	0.260	251
Illinois						
Indiana	1,599,972	11,464	518,951	365,274	0.553	140
Iowa	1,528,633	7,975	221,655	158,726	0.249	192
Kansas	993,451	3,574	233,654	330,937	0.568	278
Kentucky	796,953	4,266	308,568	328,108	0.799	187
Louisiana	568,278	2,740	376,999	444,609	1.446	207
Maine	265,675	1,152	40,900	92,819	0.503	231
Maryland	629,198	2,619	67,690	99,566	0.266	240
Michigan						
Mississippi	311,007	1,361	250,999	111,243	1.165	229
Missouri	825,656	3,557	453,976	430,154	1.071	232
Montana	62,271	193	7,944	10,591	0.298	323
Nebraska	663,887	3,635	75,212	49,299	0.188	183
New Hampshire	159,627	1,004	7,758	8,889	0.104	159
New Mexico	358,716	976	92,815	219,597	0.871	368
North Carolina	601,996	3,333	271,265	351,542	1.035	181
Oklahoma						
Oregon						
Rhode Island	49,379	238	4,034	46,682	1.027	207
South Carolina	411,350	1,471	172,637	231,494	0.982	280
South Dakota	520,776	2,089	93,958	109,123	0.390	249
Tennessee						
Utah						
Vermont	125,494	756	64,557	52,478	0.933	166
Virginia						
Wisconsin	841,822	5,856	170,353	159,836	0.392	144
TOTAL	14,355,982	71,700	4,265,173	4,640,973	0.620	200

NOTE:

1. Premium excludes expense constants and premium discount but includes experience rating modification.

OTHER RISKS FOR POLICIES EFFECTIVE
10/1/84 THRU 9/30/85

State	(1) Premium	(2) Risks	(3) Medical	(4) Indemnity	(5) Loss Ratio [(3)+(4)]/(1)	(6) Average Premium (1)/(2)
Alabama	133,863,834	12,943	24,460,636	37,142,039	0.460	10,343
Alaska	314,342,256	58,208	77,041,373	62,147,963	0.443	5,400
Arizona	139,066,902	30,295	37,161,544	36,529,758	0.530	4,590
Arkansas	369,854,191	70,044	80,638,332	124,886,098	0.556	5,280
Colorado	389,874,116	64,473	62,617,754	105,829,257	0.432	6,047
Connecticut	82,536,474	19,284	11,761,410	20,208,601	0.387	4,280
District of Columbia						
Florida	485,654,460	79,386	141,728,624	125,633,365	0.551	6,118
Georgia	222,559,017	20,769	20,945,442	32,788,754	0.241	10,716
Hawaii	80,765,214	20,821	19,277,413	23,960,797	0.535	3,879
Idaho						
Illinois	187,033,968	80,030	73,957,935	50,987,383	0.668	2,337
Indiana	134,666,737	54,708	38,278,493	60,130,120	0.731	2,462
Iowa	171,832,891	47,478	47,630,846	69,540,955	0.682	3,619
Kansas	201,251,465	51,347	52,219,793	64,306,601	0.579	3,919
Kentucky	333,518,016	60,893	115,362,542	139,630,626	0.765	5,477
Louisiana	140,677,579	24,801	26,006,047	67,346,416	0.664	5,672
Maine	377,084,389	69,281	51,174,298	83,933,596	0.358	5,443
Maryland						
Michigan	129,569,509	21,108	34,876,671	29,322,404	0.495	6,138
Mississippi	289,919,299	66,591	87,931,106	113,021,967	0.693	4,354
Missouri	86,343,635	29,070	19,280,776	42,706,813	0.718	2,970
Montana	86,962,392	33,207	24,432,588	28,547,878	0.609	2,619
Nebraska	129,347,435	27,085	23,716,438	38,648,957	0.482	4,776
New Hampshire	128,769,448	15,973	27,878,585	44,092,768	0.559	8,062
New Mexico	235,239,929	72,745	70,771,204	91,896,539	0.691	3,234
North Carolina						
Oklahoma						
Oregon	106,884,176	14,811	18,059,897	47,789,273	0.616	7,217
Rhode Island	173,302,085	34,331	39,960,464	59,407,063	0.573	5,048
South Carolina	32,321,196	13,798	9,251,835	11,848,615	0.653	2,342
South Dakota						
Tennessee						
Texas	41,102,340	15,835	8,670,667	14,515,593	0.564	2,596
Utah						
Vermont	302,184,929	72,182	76,289,265	94,132,558	0.564	4,186
Virginia						
Wisconsin	5,506,527,882	1,181,497	1,321,381,978	1,720,932,757	0.552	4,661
TOTAL						

NOTE:
1. Premium excludes expense constants and premium discount but includes experience rating modification.

MINIMUM PREMIUM RISKS FOR POLICIES EFFECTIVE
10/1/85 THRU 9/30/86

State	(1) Premium	(2) Risks	(3) Medical	(4) Indemnity	(5) Loss Ratio [(3)+(4)]/(1)	(6) Average Premium (1)/(2)
Alabama	517,757	1,653	1,748,842	175,768	3.717	313
Alaska	423,340	1,041	42,963	154,162	0.466	407
Arizona	75,967	435	52,187	33,679	1.130	175
Arkansas	419,207	1,528	229,882	155,758	0.920	274
Colorado	961,473	5,461	299,899	938,474	1.288	176
Connecticut	1,070,248	4,295	385,085	698,203	1.012	249
District of Columbia	159,680	654	5,118	9,788	0.093	244
Florida	4,387,273	14,815	1,612,619	1,806,273	0.779	296
Georgia	700,188	2,580	409,791	367,452	1.110	271
Hawaii						
Idaho	954,962	3,644	249,118	348,422	0.626	262
Illinois	2,906,238	13,397	504,910	704,368	0.416	217
Indiana	1,897,018	11,190	919,683	771,788	0.892	170
Iowa	2,150,704	9,738	407,173	375,059	0.364	221
Kansas	1,503,745	4,862	355,282	485,168	0.559	309
Kentucky	1,034,407	5,003	373,818	534,849	0.878	207
Louisiana	1,537,973	5,367	915,656	804,508	1.118	287
Maine	541,227	2,386	154,547	372,273	0.973	227
Maryland	1,169,560	4,739	145,417	159,999	0.261	247
Michigan	3,512,214	16,005	410,037	559,336	0.276	219
Mississippi	446,392	1,552	372,485	284,360	1.471	288
Missouri	1,339,076	4,472	641,063	511,618	0.861	299
Montana	47,603	125	0	0	0.000	381
Nebraska	985,139	4,940	316,123	303,076	0.629	199
New Hampshire	288,169	1,554	7,438	43,979	0.178	185
New Mexico	427,533	1,138	113,051	137,913	0.587	376
North Carolina	1,009,022	4,345	225,779	222,901	0.445	232
Oklahoma	1,137,121	3,438	258,348	420,073	0.597	331
Oregon	163,667	1,042	16,073	59,361	0.461	157
Rhode Island	94,177	351	13,061	45,445	0.621	268
South Carolina	627,356	1,975	296,588	526,313	1.312	318
South Dakota	708,489	2,584	120,313	89,555	0.296	274
Tennessee	1,058,011	3,787	481,551	687,115	1.105	279
Utah	599,390	4,188	344,293	308,404	1.089	143
Vermont	182,498	1,013	83,883	160,278	1.338	180
Virginia	1,072,693	4,092	293,252	348,104	0.598	262
Wisconsin	1,445,790	8,224	899,420	902,113	1.246	176
TOTAL	37,555,307	157,613	13,704,748	14,505,935	0.751	238

NOTE:
1. Premium excludes expense constants and premium discount but includes experience rating modification.

OTHER RISKS FOR POLICIES EFFECTIVE
10/1/85 THRU 9/30/86

State	(1) Premium	(2) Risks	(3) Medical	(4) Indemnity	(5) Loss Ratio [(3)+(4)]/(1)	(6) Average Premium (1)/(2)
Alabama	322,735,648	41,140	83,525,800	77,302,610	0.498	7,845
Alaska	148,130,210	11,367	26,435,338	39,659,258	0.446	13,032
Arizona	428,263,652	58,922	90,974,162	71,894,774	0.380	7,268
Arkansas	170,508,012	29,656	47,506,488	47,710,197	0.558	5,750
Colorado	445,618,260	67,970	94,897,669	153,147,147	0.557	6,556
Connecticut	505,543,884	63,875	75,924,206	131,555,500	0.410	7,915
District of Columbia	108,411,245	18,870	14,522,851	23,721,994	0.353	5,745
Florida	1,047,003,161	169,990	246,593,212	250,288,529	0.475	6,159
Georgia	622,258,695	81,046	184,714,489	162,596,723	0.558	7,678
Hawaii						
Idaho	100,927,226	18,600	29,944,807	36,616,829	0.660	5,426
Illinois	1,183,229,704	158,433	236,317,686	404,923,274	0.542	7,468
Indiana	232,765,556	80,637	93,122,006	64,371,293	0.677	2,887
Iowa	181,056,617	52,009	52,082,160	78,865,974	0.723	3,481
Kansas	199,530,085	46,346	60,409,559	84,883,612	0.728	4,305
Kentucky	246,009,846	50,151	60,542,431	70,567,198	0.533	4,905
Louisiana	397,780,448	55,831	122,718,179	137,956,936	0.655	7,125
Maine	168,559,013	25,082	35,025,246	84,263,931	0.708	6,720
Maryland	467,351,133	65,546	61,194,064	100,706,204	0.346	7,130
Michigan	779,109,989	130,411	142,861,583	199,813,580	0.440	5,974
Mississippi	169,886,839	26,029	53,524,590	46,860,061	0.591	6,527
Missouri	395,002,105	67,899	109,927,369	136,866,927	0.625	5,817
Montana	118,572,169	29,240	21,908,946	48,559,923	0.594	4,055
Nebraska	100,945,773	31,198	28,680,293	30,433,755	0.586	3,236
New Hampshire	167,032,359	28,473	28,591,886	42,910,664	0.428	5,866
New Mexico	154,905,946	19,330	36,288,757	54,581,458	0.587	8,014
North Carolina	323,877,867	74,705	78,192,299	82,553,479	0.496	4,335
Oklahoma	306,743,682	46,791	69,220,000	109,972,237	0.584	6,556
Oregon	516,389,455	63,168	61,611,881	79,486,611	0.273	8,175
Rhode Island	151,743,666	15,085	27,353,884	82,310,512	0.723	10,059
South Carolina	245,489,013	35,458	56,660,743	76,901,099	0.544	6,923
South Dakota	42,885,931	13,121	12,723,189	14,054,638	0.624	3,268
Tennessee	387,498,494	55,667	108,475,381	114,982,171	0.577	6,961
Utah	91,324,943	17,152	25,737,678	20,801,120	0.510	5,324
Vermont	54,036,246	15,986	13,009,047	17,706,591	0.568	3,580
Virginia	459,510,110	81,140	100,529,584	95,853,255	0.427	5,663
Wisconsin	455,331,567	88,009	111,089,354	135,243,189	0.541	5,174
TOTAL	11,895,968,549	1,934,333	2,702,836,817	3,410,923,253	0.514	6,150

NOTE:

1. Premium excludes expense constants and premium discount but includes experience rating modification.

MINIMUM PREMIUM RISKS FOR POLICIES EFFECTIVE
10/1/86 THRU 9/30/87

State	(1) Premium	(2) Risks	(3) Medical	(4) Indemnity	(5) Loss Ratio [(3)+(4)]/(1)	(6) Average Premium (1)/(2)
Alabama	689,013	1,950	248,165	141,941	0.566	353
Alaska	459,867	1,079	80,825	95,383	0.383	426
Arizona						
Arkansas	529,960	1,615	286,236	266,768	1.043	328
Colorado	1,121,527	5,492	389,051	470,046	0.766	204
Connecticut	1,338,456	4,923	239,119	320,360	0.418	272
District of Columbia	182,936	669	33,405	61,425	0.518	273
Florida	4,955,964	15,804	2,045,136	2,710,215	0.960	314
Georgia	983,940	2,868	544,376	655,699	1.220	343
Hawaii	225,038	876	773,880	116,428	3.956	257
Idaho	1,232,671	4,115	287,037	366,773	0.530	300
Illinois	3,493,280	14,251	964,879	1,392,266	0.675	245
Indiana	2,633,903	13,850	1,176,555	688,091	0.708	190
Iowa	2,211,646	8,757	820,205	782,720	0.725	253
Kansas	1,545,864	4,860	486,715	678,871	0.754	318
Kentucky	1,168,674	4,885	727,287	414,765	0.977	239
Louisiana	1,626,827	5,191	1,163,063	1,288,279	1.507	313
Maine	614,984	2,602	254,771	438,076	1.127	236
Maryland	1,276,766	5,074	120,976	179,816	0.236	252
Michigan	3,175,286	14,723	483,529	584,107	0.336	216
Mississippi	597,820	1,827	541,585	305,518	1.417	327
Missouri						
Montana	32,742	98	121	0	0.004	334
Nebraska	1,127,556	5,246	459,755	269,990	0.647	215
New Hampshire	437,436	1,833	65,043	107,350	0.394	239
New Mexico	431,884	1,155	270,159	369,652	1.481	374
North Carolina						
Oklahoma	1,067,590	3,356	363,475	587,644	0.891	318
Oregon	183,216	1,070	236,823	267,130	2.751	171
Rhode Island	102,392	352	24,639	45,736	0.687	291
South Carolina	756,294	2,079	186,683	275,809	0.612	364
South Dakota	845,317	2,685	319,373	254,404	0.679	315
Tennessee	1,114,151	3,624	413,614	509,345	0.828	307
Utah	1,012,743	6,020	464,202	394,902	0.848	168
Vermont	180,903	1,040	31,047	79,857	0.613	174
Virginia	1,379,575	4,739	533,363	662,791	0.867	291
Wisconsin	1,925,129	9,158	490,084	515,405	0.522	210
TOTAL	40,661,350	157,866	15,525,176	16,297,562	0.783	258

NOTE:

1. Premium excludes expense constants and premium discount but includes experience rating modification.

OTHER RISKS FOR POLICIES EFFECTIVE
10/1/86 THRU 9/30/87

State	(1) Premium	(2) Risks	(3) Medical	(4) Indemnity	(5) Loss Ratio [(3)+(4)]/(1)	(6) Average Premium (1)/(2)
Alabama	347,809,106	40,747	99,430,289	87,978,172	0.539	8,536
Alaska	165,774,067	10,740	29,824,406	42,320,293	0.435	15,435
Arizona	201,754,010	28,940	63,928,400	59,635,060	0.612	6,971
Arkansas	496,798,829	69,485	96,607,843	157,237,345	0.511	7,150
Colorado	654,730,513	68,315	107,065,908	189,100,641	0.452	9,584
Connecticut	140,988,791	19,807	14,915,706	25,609,363	0.287	7,118
District of Columbia	1,143,979,876	167,975	299,848,642	343,777,963	0.563	6,810
Florida	724,614,874	81,540	226,257,778	203,872,640	0.594	8,887
Georgia	327,099,173	20,943	38,984,166	53,185,132	0.282	15,619
Hawaii	120,554,838	18,742	31,158,536	34,668,794	0.546	6,432
Idaho	1,430,144,679	163,418	300,837,744	481,134,708	0.547	8,751
Illinois	286,911,275	79,292	125,790,924	85,365,081	0.736	3,618
Indiana	233,885,202	53,369	66,171,924	101,521,820	0.717	4,382
Iowa	222,131,649	46,038	68,623,460	86,253,931	0.697	4,825
Kansas	293,947,468	49,600	74,475,260	84,911,951	0.542	5,926
Kentucky	445,863,477	52,965	142,649,446	167,970,757	0.697	8,418
Louisiana	216,745,381	26,540	49,280,676	102,085,759	0.698	8,167
Maine	501,928,490	65,589	77,542,737	117,053,279	0.388	7,653
Maryland	945,822,058	133,820	190,311,866	242,380,783	0.457	7,068
Michigan	201,967,554	25,196	63,305,252	50,900,760	0.565	8,016
Mississippi						
Missouri						
Montana	137,870,792	28,726	23,070,033	37,901,794	0.442	4,800
Nebraska	120,111,594	31,134	39,455,712	41,552,281	0.674	3,858
New Hampshire	206,907,992	29,930	40,384,151	57,967,217	0.475	6,913
New Mexico	163,949,768	19,070	47,539,040	64,449,229	0.683	8,597
North Carolina						
Oklahoma	332,080,343	45,938	77,422,892	119,520,892	0.593	7,229
Oregon	662,256,000	64,572	99,721,692	113,789,320	0.322	10,256
Rhode Island	167,233,015	15,420	32,479,390	88,490,099	0.723	10,845
South Carolina	294,879,559	36,076	67,962,250	94,538,766	0.551	8,174
South Dakota	48,174,007	12,795	15,405,861	15,988,534	0.652	3,765
Tennessee	430,598,347	57,345	172,397,257	148,525,164	0.745	7,509
Utah	104,477,854	21,067	29,505,344	22,161,304	0.495	4,959
Vermont	69,167,683	16,679	16,120,632	20,918,039	0.535	4,147
Virginia	585,876,308	85,531	131,069,631	124,089,964	0.436	6,850
Wisconsin	583,682,366	88,545	136,083,332	144,717,878	0.481	6,592
TOTAL	13,010,716,938	1,775,889	3,095,628,180	3,811,574,713	0.531	7,326

NOTE:
1. Premium excludes expense constants and premium discount but includes experience rating modification.

COMPARISON OF MINIMUM PREMIUM RISKS TO ALL OTHER RISKS

STATE	(1) MINIMUM PREMIUM LOSS RATIO 10/84	(2) MINIMUM PREMIUM LOSS RATIO 10/85	(3) MINIMUM PREMIUM LOSS RATIO 10/86	(4) TOTAL 3 YEAR LOSS RATIO	(5) 10/84 MIN PREM/ ALL OTHER RELATIVITY	(6) 10/85 MIN PREM/ ALL OTHER RELATIVITY	(7) 10/86 MIN PREM/ ALL OTHER RELATIVITY	(8) TOTAL MIN PREM/ ALL OTHER RELATIVITY
Alabama		3.717	0.566	1.918		7.464	1.050	3.696
Alaska	0.225	0.466	0.383	0.371	0.489	1.045	0.880	0.832
Arizona	3.441	1.130		2.021	7.767	2.974		4.966
Arkansas	0.960	0.920	1.043	0.950	1.434	1.649	1.704	1.661
Colorado	0.934	1.288	0.766	0.990	1.680	2.312	1.499	1.837
Connecticut	0.491	1.012	0.418	0.646	1.137	2.468	0.925	1.488
District of Columbia	0.378	0.093	0.518	0.330	0.977	0.263	1.805	0.988
Florida		0.779	0.960	0.875		1.640	1.705	1.679
Georgia	0.704	1.110	1.220	1.081	1.278	1.989	2.054	1.896
Hawaii	0.750		3.956	2.378	3.112		14.028	8.974
Idaho	0.260	0.626	0.530	0.504	0.486	0.948	0.971	0.867
Illinois		0.416	0.675	0.557		0.768	1.234	1.022
Indiana	0.553	0.892	0.708	0.724	0.828	1.318	0.962	1.037
Iowa	0.249	0.364	0.725	0.469	0.341	0.503	1.011	0.650
Kansas	0.568	0.559	0.754	0.636	0.833	0.768	1.082	0.905
Kentucky	0.799	0.878	0.977	0.896	1.380	1.647	1.803	1.632
Louisiana	1.446	1.118	1.507	1.338	1.890	1.707	2.162	1.906
Maine	0.503	0.973	1.127	0.952	0.758	1.374	1.615	1.376
Maryland	0.266	0.261	0.236	0.251	0.743	0.754	0.608	0.688
Michigan		0.276	0.336	0.305		0.627	0.735	0.678
Mississippi	1.165	1.471	1.417	1.377	2.354	2.489	2.508	2.477
Missouri	1.071	0.861		0.941	1.545	1.378		1.439
Montana	0.298	0.000	0.004	0.131	0.415		0.009	0.232
Nebraska	0.188	0.629	0.647	0.531	0.309	1.073	0.960	0.847
New Hampshire	0.104	0.178	0.394	0.272	0.216	0.416	0.829	0.590
New Mexico	0.871	0.587	1.481	0.988	1.558	1.000	2.168	1.609
North Carolina	1.035	0.445		0.665	1.498	0.897		1.151
Oklahoma		0.597	0.891	0.739		1.022	1.503	1.255
Oregon		0.461	2.751	1.670		1.689	8.543	5.548
Rhode Island	1.027	0.621	0.687	0.730	1.667	0.859	0.950	1.049
South Carolina	0.982	1.312	0.612	0.941	1.714	2.412	1.111	1.699
South Dakota	0.390	0.296	0.679	0.476	0.597	0.474	1.041	0.740
Tennessee		1.105	0.828	0.963		1.915	1.111	1.448
Utah		1.089	0.848	0.938		2.135	1.713	1.869
Vermont	0.933	1.338	0.613	0.966	1.654	2.356	1.146	1.747
Virginia		0.598	0.867	0.749		1.400	1.989	1.734
Wisconsin	0.392	1.246	0.522	0.745	0.695	2.303	1.085	1.433
TOTAL	0.620	0.751	0.783	0.745	1.123	1.461	1.475	1.411

COMPARISON OF MINIMUM PREMIUM RISKS TO ALL OTHER RISKS

STATE	(1) 3 YEAR MINIMUM PREMIUM LOSS RATIO	(2) 3 YEAR ALL OTHER RISKS LOSS RATIO	(3) LOSS RATIO RELATIVITY (1)/(2)	(4) DIFFERENTIAL TO COUNTRYWIDE RELATIVITY (3)/(3) TOTAL
Alabama	1.918	0.519	3.696	2.619
Alaska	0.371	0.446	0.832	0.590
Arizona	2.021	0.407	4.966	3.519
Arkansas	0.950	0.572	1.661	1.177
Colorado	0.990	0.539	1.837	1.302
Connecticut	0.646	0.434	1.488	1.055
District of Columbia	0.330	0.334	0.988	0.700
Florida	0.875	0.521	1.679	1.190
Georgia	1.081	0.570	1.896	1.344
Hawaii	2.378	0.265	8.974	6.360
Idaho	0.504	0.581	0.867	0.615
Illinois	0.557	0.545	1.022	0.724
Indiana	0.724	0.698	1.037	0.735
Iowa	0.469	0.722	0.650	0.460
Kansas	0.636	0.703	0.905	0.641
Kentucky	0.896	0.549	1.632	1.157
Louisiana	1.338	0.702	1.906	1.351
Maine	0.932	0.692	1.376	0.975
Maryland	0.251	0.365	0.688	0.487
Michigan	0.305	0.450	0.678	0.480
Mississippi	1.377	0.556	2.477	1.755
Missouri	0.941	0.654	1.439	1.020
Montana	0.131	0.564	0.232	0.165
Nebraska	0.531	0.627	0.847	0.600
New Hampshire	0.272	0.461	0.590	0.418
New Mexico	0.988	0.614	1.609	1.140
North Carolina	0.665	0.578	1.151	0.815
Oklahoma	0.739	0.589	1.255	0.889
Oregon	1.670	0.301	5.548	3.932
Rhode Island	0.730	0.696	1.049	0.743
South Carolina	0.941	0.554	1.699	1.204
South Dakota	0.476	0.643	0.740	0.525
Tennessee	0.963	0.665	1.448	1.026
Utah	0.938	0.502	1.869	1.324
Vermont	0.966	0.553	1.747	1.238
Virginia	0.749	0.432	1.734	1.229
Wisconsin	0.745	0.520	1.433	1.015
TOTAL	0.745	0.528	1.411	1.000

"ON LEVEL" LOSS RATIOS
 MINIMUM PREMIUM RISKS FOR POLICIES EFFECTIVE
 10/1/86 THRU 9/30/87

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
State	Premium	Medical + Indem Loss	Average MP Multiplier	1987 Average Weekly Wage	Indicated MP Multiplier	Actual Loss Ratio	Adjusted Loss Ratio	Other Than MP Loss Ratio	Adj Loss Ratio Differential =(7)/(8)
Alabama	689,013	390,106	108	305	159	0.566	0.385	0.539	0.714
Alaska	459,867	176,208	74	544	283	0.383	0.100	0.435	0.230
Arizona									
Arkansas	529,960	553,004	83	297	154	1.043	0.561	0.612	0.917
Colorado	1,121,527	859,097	83	390	203	0.766	0.314	0.511	0.614
Connecticut	1,338,456	559,479	75	429	223	0.418	0.141	0.452	0.311
District of C	182,936	94,830	63	398	207	0.518	0.158	0.287	0.549
Florida	4,955,964	4,755,351	45	342	178	0.960	0.243	0.563	0.431
Georgia	983,940	1,200,075	93	354	184	1.220	0.616	0.594	1.038
Hawaii	225,038	890,308	55	355	185	3.956	1.179	0.282	4.180
Idaho	1,232,671	653,810	103	303	158	0.530	0.346	0.546	0.635
Illinois	3,493,280	2,357,145	60	388	202	0.675	0.201	0.547	0.367
Indiana	2,633,903	1,864,646	116	337	175	0.708	0.469	0.736	0.637
Iowa	2,211,646	1,602,925	105	315	164	0.725	0.464	0.717	0.648
Kansas	1,545,864	1,165,586	95	356	185	0.754	0.386	0.697	0.554
Kentucky									
Louisiana	1,626,827	2,451,342	68	347	180	1.507	0.568	0.697	0.815
Maine	614,984	692,847	65	318	165	1.127	0.443	0.698	0.635
Maryland	1,276,766	300,792	83	387	201	0.236	0.097	0.388	0.251
Michigan									
Mississippi	597,820	847,103	105	298	155	1.417	0.960	0.565	1.699
Missouri									
Montana	32,742	121	108	302	157	0.004	0.003	0.442	0.006
Nebraska	1,127,556	729,745	85	312	162	0.647	0.339	0.674	0.503
New Hampshire	437,436	172,393	39	394	205	0.394	0.075	0.475	0.158
New Mexico	431,884	639,811	95	321	167	1.481	0.842	0.683	1.232
North Carolina									
Oklahoma	1,067,590	951,119	55	354	184	0.891	0.267	0.593	0.450
Oregon									
Rhode Island	102,392	70,375	55	347	180	0.687	0.210	0.723	0.290
South Carolin	756,294	462,492	112	319	166	0.612	0.414	0.551	0.751
South Dakota	845,317	573,777	113	275	143	0.679	0.537	0.652	0.824
Tennessee	1,114,151	922,959	105	304	158	0.828	0.549	0.745	0.737
Utah	1,012,743	859,104	113	337	175	0.848	0.548	0.495	1.106
Vermont	180,903	110,904	45	333	173	0.613	0.159	0.535	0.297
Virginia	1,379,575	1,196,154	75	368	191	0.867	0.340	0.436	0.780
Wisconsin	1,925,129	1,005,489	58	333	173	0.522	0.175	0.481	0.363
TOTAL	36,134,174	29,109,097				0.806	0.317	0.549	0.577

NOTE:

1. Premium excludes expense constants and premium discount but includes experience rating modification.
 (7) = (6) X ((3)/(5))

COMPARISON OF RELATIVE PREMIUM VOLUMES OF MINIMUM PREMIUM RISKS
VERSUS INDIVIDUAL CLASSIFICATIONS

(1)	(2)	(3)	(4)	(5)	(6)	(7)
STATE	NUMBER OF CLASSES	NUMBER OF CLASSES WITH NON-ZERO PREMIUM	Three Year Premium At Present Rates	CUTOFF PERCENTAGE	PERCENTAGE OF CLASSES WITH PREMIUM NON-ZERO < THAN CUTOFF PREMIUM	PERCENTAGE OF PREMIUM LESS THAN CUTOFF PERMIUM
OR	520	457	610,134,747	0.03%	41.58%	1.66%
CT	546	464	715,199,752	0.19%	76.08%	16.41%
CO	553	484	643,344,495	0.20%	77.89%	16.36%
IL	546	523	1,606,412,413	0.24%	81.64%	22.11%
ME	542	404	523,985,027	0.27%	80.94%	19.59%
NC	550	500	432,178,755	0.29%	83.60%	24.36%
WI	555	493	682,370,973	0.31%	83.16%	25.06%
LA	559	490	431,849,004	0.32%	85.51%	26.20%
MI	445	428	697,519,459	0.39%	85.75%	33.91%
FL	563	519	2,105,709,462	0.42%	88.05%	31.64%
UT	540	335	51,060,782	0.82%	89.85%	41.51%
NE	539	430	134,816,256	0.89%	93.49%	46.54%

Notes: (5) is based on three year average percentage minimum premium risks versus all other risks. See Exhibit 2.

All other columns based on premium at present rates calculations using using data supplied for classification analysis, Section II.b.4.

INCI EXPENSE PROVISION ANALYSIS

Analysis of Workers Compensation Expenses by Policy Size, Calendar Year 1982
Expenses Ratios for all Stock Companies

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Average Policy Size	Other Acquisition	Payroll Audit	Inspection	Other General	Boards & Bureaus Incurred	Total General (3)+(4)+(5)+(6)	Per Policy (7)*(1)	General Expense Provided in Rates	Difference (9)-(8)	Ratio of Difference to Average Policy Size
\$0 -- \$99	0.677	0.127	0.022	0.988	0.008	1.145	45.80	62.93 *	17.13	0.428
\$100 -- \$199	0.265	0.066	0.012	0.389	0.008	0.475	69.35	70.88 *	1.53	0.010
\$200 -- \$299	0.183	0.052	0.012	0.265	0.008	0.337	82.57	78.31 *	(4.26)	-0.017
Subtotal <\$300	0.267	0.065	0.013	0.389	0.008	0.475	64.60	70.12 **	5.52	0.041
\$300 -- \$499	0.121	0.039	0.010	0.178	0.008	0.235	91.65	89.18 *	(2.47)	-0.006
\$500 -- \$999	0.085	0.029	0.011	0.121	0.008	0.169	120.50	113.41 *	(7.09)	-0.010
\$1,000 -- \$2,999	0.050	0.020	0.011	0.074	0.008	0.113	199.56	192.38 *	(7.18)	-0.004
\$3,000 -- \$4,999	0.038	0.016	0.010	0.057	0.008	0.091	354.35	351.98 *	(2.37)	-0.001
\$5,000 -- \$9,999	0.032	0.014	0.010	0.047	0.008	0.079	559.72	537.37 *	(22.35)	-0.003
\$10,000 -- \$24,999	0.025	0.009	0.010	0.039	0.008	0.066	1,036.99	960.46 *	(76.53)	-0.005
\$25,000 -- \$49,999	0.021	0.007	0.009	0.034	0.008	0.058	2,040.85	1,914.90 *	(125.95)	-0.004
\$50,000 -- \$99,999	0.019	0.005	0.009	0.032	0.008	0.054	3,839.40	3,674.70 *	(164.70)	-0.002
\$100,000 -- \$249,999	0.018	0.004	0.008	0.030	0.008	0.050	7,774.10	7,698.52 *	(75.58)	-0.000
\$250,000 -- \$499,999	0.016	0.003	0.006	0.029	0.008	0.046	16,045.44	16,785.16 *	739.72	0.002
\$500,000 -- \$999,999	0.015	0.002	0.006	0.029	0.008	0.045	32,113.89	30,514.00 *	(1,599.89)	-0.002
\$1,000,000 -- \$2,499,999	0.012	0.001	0.005	0.025	0.008	0.039	59,686.29	55,842.21 *	(3,854.08)	-0.003
\$2,500,000 and over	0.009	0.001	0.003	0.022	0.008	0.034	205,953.33	196,172.45 *	(9,780.88)	-0.002
Subtotal >\$300	0.023	0.007	0.008	0.039	0.008	0.062	496.62	472.17 **	(24.45)	-0.003
TOTAL	0.025	0.008	0.008	0.041	0.008	0.065	356.46	343.20 **	(13.26)	-0.002

Note: Data based on 1982 Special Call for distribution of Expenses by Size of Risk for Stock Companies

Predicted Expenses based on the following formula:

(Avg Policy Size - Avg Expense Constant in 1982) x (General Expense Indication used in 1982) + (Portion of Proposed Expense Constant for General Expense)

where: Avg Expense Constant in 1982 = 36.00

General Expense Provision = 7.5%, 4.9%, 4.7%, and 3.1%
Expense Constant Portion for General Expense = 62.63

Predicted Expenses based on Individually calculated expenses weighted by number of policies

Average of all Policies: 0.024

EXPLANATORY NOTES

The following items should be noted in this exhibit:

- 1) ARAP represents the Assigned Risk Adjustment Program, a pricing mechanism for experience rated assigned risks to share in the underwriting losses generated by the residual market.
- 2) ARRP represents the Assigned Risk Rating Program, a loss sensitive rating program for assigned risks developing annual standard premium in excess of a specified amount. This amount is specified in this exhibit for the affected states.
- 3) APA represents the Accident Prevention Account in Maine.
- 4) Mod represents the experience modification, a value sometimes used in determining subjectivity to residual market programs.
- 5) Differential implies assigned risk rates which are a specified percentage over voluntary or advisory rates.
- 6) Pure Premium Differential implies assigned risk pure premiums which are a specified percentage over voluntary or statewide pure premiums.
- 7) Reduction of Premium Discounts represents the application of non-stock premium discounts in lieu of stock premium discounts for assigned risk insureds.
- 8) Programs with two dates are those no longer in effect, where the second date represents the elimination date.

STATE	RESIDUAL MARKET PROGRAM	EFF. DATE
Alabama	Removal of Premium Discounts	3-1-90
Alaska	25% Surcharge for Premium > \$3,000	7-1-88
	20% Differential	11-1-86/6-30-88
	10% Differential	1-1-84/10-31-86
	Removal of Premium Discounts	1-1-82
Arizona	20% Differential	10-1-86
Arkansas	ARAP	9-1-90
D.C.	9% Differential	5-15-90
	6% Differential	1-1-88/5-14-90
Florida	15% Surcharge for Policies >= \$4,000	1-1-90
	\$267 Flat Charge	1-1-90
	ARRP for Policies >= \$50,000	1-1-89
	Removal of Premium Discounts	1-1-88
Georgia	25% Differential	3-1-91
	Removal of Premium Discounts	7-1-89
	22.1% Differential	7-1-89/2-28-91

Illinois	Removal of Premium Discounts	1-1-90
	20% Differential	1-1-90
	21.4% Differential	7-1-89/12-31-89
	3.8% Differential	1-1-88/6-30-89
	Reduction of Premium Discounts	1-1-87/12-31-89
Indiana	25% Surcharge for Policies >= \$2,000	1-1-90
	No Premium Discounts	
Iowa	ARRP for Policies >= \$100,000	4-1-90
	20% Differential	4-1-89
	9% Differential	4-13-88/3-31-89
	Removal of Premium Discounts	4-16-87
Kansas	ARAP	8-1-90
	Reduction of Premium Discounts	6-1-90
Kentucky	Pure Premium Differential 34.8%	7-1-89
	Change in Premium Discounts	1-1-89
	Lower Premium Discounts	7-1-87/12-31-88
Louisiana	59.8% Pure Premium Differential	1-1-91

29% Pure Premium Differential	5-1-90
25% Surcharge for Premium > \$5,000 With Debit & Unity Mods Only	5-1-90
20% Surcharge for Premium > \$3,000	2-1-89/4-30-90
12.6% Differential, APA only	4-17-90
7.2% Differential, APA only	3-20-89/4-16-90
0-20% Surcharge, APA only	1-1-89
Removal of Premium Discounts, APA only	4-27-88
4% Differential, APA only	4-27-88/3-19-89
5-10% Surcharge, APA only	11-20-87/12-31-88
ARRP	8-15-90
ARAP	8-15-90
20% Differential	1-1-88
7.4% Pure Premium Differential	1-1-91
3.4% Pure Premium Differential	1-1-90/12-31-90
12.1% Pure Premium Differential	1-1-89/12-31-89
20% Differential	11-1-90
Removal of Premium Discounts	4-1-88

Maine

Maryland

Michigan

Mississippi

Missouri	ARAP	9-1-90
	Premium Discounts Reinstated for Mod \leq 1.05	9-1-90
	Removal of Premium Discounts	8-1-89
Nebraska	ARAP	12-1-90
	15% Differential Exception: 71 Target Classes	10-1-90
	15% Differential Exception: 16 Target Classes	9-1-89/9-30-90
	Reduction of Premium Discounts Exception: 16 Target Classes	9-1-89
New Mexico	10% Surcharge	1-1-91
	ARAP	3-1-91
	Lower Premium Discounts	6-1-89
	23.5% Pure Premium Differential	6-1-89
North Carolina	ARAP	1-1-91
	Removal of Premium Discounts	1-1-91
Oregon	15% Pure Premium Differential	1-1-90
	Reduction of Premium Discounts	1-1-90

	0-20% E. Surcharge (Safety Program)	1-1-86/12-31-87
	10% Differential	7-1-82/12-31-85
Rhode Island	32% Differential	6-22-89
South Carolina	ARAP	1-1-91
South Dakota	15% Surcharge for Premium > \$5,000	2-1-89
	Premium Discounts Reinstated for Mod <= .85	2-1-89
	Removal of Premium Discounts	2-1-88
Tennessee	Premium Discounts Reinstated	1-1-90
	10% Surcharge on Debit Risks	1-1-90
	Removal of Premium Discounts	1-1-89/12-31-89
Texas	15% Differential	1-1-90
	ARRP	1-1-90
	Change in Experience Rating	1-1-90
	Up to 19.6% Experience Rated	1-1-88/12-31-89
	Removal of Premium Discounts	1-1-88
Virginia	ARAP	5-1-91
Wisconsin	Removal of Premium Discounts	1-1-90



ALASKA

APPENDIX A-I

CALCULATION OF 1986 POLICY YEAR ON LEVEL FACTORS

SECTION A - Factor Adjusting 1986 Policy Year Assigned Risk Premium to Present Assigned Risk Premium Level

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Date	Premium Level Change	Cumulative Index	Weight	Product (2)x(3)	Adj. Factor Pres.Index/ Sum Col.(4)	Adj. For Exp.Const. Removal**	Prem.Adj. Factor (5)x(6)
5-1-85	Base	1.000	.271	.271	1.431	.986	1.411
NR 3-1-86	1.000	1.000	.729	<u>.729</u>			
NR 1-1-87	1.254	1.254		1.000			
NR 1-1-88	1.251	1.569					
* 7-1-88	.912	1.431					

SECTION B - Factor Adjusting 1986 Policy Year Voluntary Premium to Present Premium Level

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Date	Premium Level Change	Cumulative Index	Weight	Product (2)x(3)	Adj. Factor Pres.Index/ Sum Col.(4)	Adj. For Exp.Const. Removal**	Prem.Adj. Factor (5)x(6)
5-1-85	Base	1.000	.271	.271	1.355	.986	1.336
NR 3-1-86	1.000	1.000	.729	<u>.729</u>			
NR 1-1-87	1.149	1.149		1.000			
NR 1-1-88	1.251	1.437					
* 7-1-88	.943	1.355					

SECTION C - Factor Adjusting 1986 Policy Year Assigned Risk Premium and Voluntary Premium to Present Premium Level

(1)	Assigned Risk Market Share	.158
(2)	Voluntary Market Share	.842
(3)	Assigned Risk Premium Adjustment Factor (Sec. A)	1.411
(4)	Voluntary Premium Adjustment Factor (Sec. B)	1.336
(5)	Premium Adjustment Factor - (1)x(3)+(2)x(4)	1.348
(6)	Premium Adjustment Factor excluding trend+	1.248

NR - New and renewal business

* Applicable to "all outstanding" as well as "new and renewal" business.

** Eliminates premium derived from expense constant.

+ Trend Factor in current rates (effective 1-1-88) is 1.080 (1.248 - 1.348 / 1.080).

APPENDIX A-I-C

COMBINED

CALCULATION OF POLICY YEAR ON LEVEL FACTORS

SECTION A - Factor Adjusting 1985 Policy Year Assigned Risk Premium to Present Assigned Risk Premium Level

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Date	Premium Level Change	Cumulative Index	Weight	Product (2)x(3)	Adj. Factor Pres.Index/ Sum Col.(4)	Adj. For Exp.Const. Removal*	Prem. Adj. Factor (5)x(6)
10-1-84	Base	1.000	.426	.426	1.308	.990	1.295
10-1-85	1.046	(1.046)	.412	.431			
10-1-85	1.164	1.164	.162	<u>.189</u>			
10-1-86	1.175	1.368		1.046			

SECTION B - Factor Adjusting 1985 Policy Year Voluntary Premium to Present Premium Level

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Date	Premium Level Change	Cumulative Index	Weight	Product (2)x(3)	Adj. Factor Pres.Index/ Sum Col.(4)	Adj. For Exp.Const. Removal*	Prem. Adj. Factor (5)x(6)
10-1-84	Base	1.000	.426	.426	1.178	.990	1.166
10-1-85	1.046	(1.046)	.412	.431			
10-1-85	1.164	1.164	.162	<u>.189</u>			
10-1-86	1.058	1.232		1.046			

SECTION C - Factor Adjusting 1985 Policy Year Assigned Risk Premium and Voluntary Premium to Present Premium Level

) Assigned Risk Market Share	.018
) Voluntary Market Share	.982
) Assigned Risk Premium Adjustment Factor (Sec. A)	1.295
) Voluntary Premium Adjustment Factor (Sec. B)	1.166
) Cumulative Assigned Risk Premium Level Change since 1-1-71	2.362
) Cumulative Voluntary Premium Level Change since 1-1-71	1.969
) Differential in Voluntary Premium Level Change and Assigned Risk Premium Level Change since 1-1-71 = (5)/(6)	1.200
) Premium Adjustment Factor = (2)x(4) + (1)x[(3)/(7)] =	1.164
) Premium Adjustment Factor excluding Trend+	1.111

= All Outstanding Business

= New and Renewal Business

Eliminates premium derived from expense constants.

Trend Factor in current rates (effective 10-1-86) is 1.048 (1.111 = 1.164/1.048).



APPENDIX A-I

CALCULATION OF POLICY YEAR ON LEVEL FACTORS

SECTION A - Factor Adjusting 1988 Policy Year Pure Premium to Present Pure Premium Level

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Date	Premium Level Change	Cumulative Index	Weight	Product (2)x(3)	Adj. Factor Pres. Index/ Sum Col.(4)	Adj. For Exp. Const. Removal**	Prem. Adj. Factor (5)x(6)	Prem. Adj. Factor Excl. Trend+
7-1-87	Base	1.000	1.000	1.000				
NR 4-1-89	.734	.734			.734	.983	.722	.658
				1.000				

SECTION B - Factor Adjusting 1988 Policy Year Indemnity Losses to Present Benefit Level

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Date	Benefit Level Change	Cumulative Index	Weight	Product (2)x(3)	Adj. Factor Pres. Index/ Sum Col.(4)	Assessment	Final Adj. Factor (5)x(6)
9-1-87	Base	1.000	.299	.299			
9-1-88	1.009	1.009	.668	.674	1.007	1.010	1.017
1-89	1.004	1.013	.033	.033			
				1.006			

SECTION C - Factor Adjusting 1988 Policy Year Medical Losses to Present Benefit Level

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Date	Benefit Level Change	Cumulative Index	Weight	Product (2)x(3)	Adj. Factor Pres. Index/ Sum Col.(4)	Assessment	Final Adj. Factor (5)x(6)
1-1-87	Base	1.000	.299	.299			
1-1-88	1.000	1.000	.668	.668	1.000	1.010	1.010
1-1-89	1.000	1.000	.033	.033			
				1.000			

R = New and renewal business

** Eliminates premium derived from expense constants.

Trend Factor in current loss costs (effective 4-1-89) is 1.098 (.658 = .722 / 1.098)



APPENDIX A-I

CALCULATION OF POLICY YEAR ON LEVEL FACTORS

SECTION A - Factor Adjusting 1988 Policy Year Premium to Present Premium Level

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Date	Premium Level Change	Cumulative Index	Weight	Product (2)x(3)	Adj. Factor Pres.Index/ Sum Col.(4)	Adj. For Exp.Const. Removal**	Prem.Adj. Factor (5)x(6)	Prem.Adj. Factor Excl. Trend+
7-1-87	Base	1.000	1.000	1.000	1.554	.983	1.528	1.344
NR 2-1-89	1.373	1.373		-----				
NR 5-1-90	1.132	1.554		1.000				

SECTION B - Factor Adjusting 1988 Policy Year Losses to Present Benefit Level

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Date	Benefit Level Change	Cumulative Index	Weight	Product (2)x(3)	Adj. Factor Pres.Index/ Sum Col.(4)	Assess- ment	Final Adj. Factor (5)x(6)
9-1-87	Base	1.000	.299	.299	1.005	1.010	1.015
9-1-88	1.005	1.005	.668	.671			
9-1-89	1.003	1.008	.033	.033			

				1.003			

NR - New and renewal business

** Eliminates premium derived from expense constants.

+ Trend Factor in current rates (effective 5-1-90) is 1.137 (1.344 - 1.528 / 1.137).



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APPENDIX A-I

EXHIBIT 11
SHEET 1

CALCULATION OF POLICY YEAR ON LEVEL FACTORS

SECTION A - Factor Adjusting 1988 Policy Year Assigned Risk Premium to Present Assigned Risk Premium Level

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Date	Premium Level Change	Cumulative Index	Weight	Product (2)x(3)	Adj. Factor Pres.Index/ Sum Col.(4)	Adj. For Exp.Const. Removal**	Prem.Adj. Factor (5)x(6)
4-1-86	Base	1.000	.408	.408	1.345	.983	1.322
NR 4-13-88	1.126	1.227	.258	.317			
NR 7-27-88	1.050	1.288	.334	<u>.430</u>			
NR 4-1-89	1.095	1.418		1.155			
NR 4-1-90	1.095	1.553					

SECTION B - Factor Adjusting 1988 Policy Year Voluntary Premium to Present Voluntary Premium Level

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Date	Premium Level Change	Cumulative Index	Weight	Product (2)x(3)	Adj. Factor Pres.Index/ Sum Col.(4)	Adj. For Exp.Const. Removal**	Prem.Adj. Factor (5)x(6)
4-1-86	Base	1.000	.408	.408	1.183	.983	1.163
R 4-13-88	1.126	1.126	.258	.291			
R 7-27-88	1.050	1.182	.334	<u>.395</u>			
R 4-1-90	1.095	1.294		1.094			

SECTION C - Factor Adjusting 1988 Policy Year Assigned Risk Premium and Voluntary Premium to Present Premium Level

1)	Assigned Risk Market Share FY 1988	.163
2)	Voluntary Market Share FY 1988	.837
3)	Assigned Risk Premium Adjustment Factor (Sec. A)	1.322
4)	Voluntary Premium Adjustment Factor (Sec. B)	1.163
5)	Premium Adjustment Factor - ((1)x(3)+(2)x(4)) x .999#	1.187
6)	Premium Adjustment Factor Excluding Trend - (5)/1.115+	1.065
7)	Adjustment for additional premium from net premium programs	1.031
8)	Final Premium Adjustment Factor - (6)x(7)	1.098

- New and renewal business
- Eliminates premium derived from expense constants
- Market share adjustment factor
- Trend Factor in current rates (effective 4/1/90) is 1.115



APPENDIX A-I

CALCULATION OF POLICY YEAR ON LEVEL FACTORS

SECTION A - Factor Adjusting 1988 Policy Year Assigned Risk Premium to Present Assigned Risk Premium Level

Date	(1) Std. Premium Level Change	(2) Cumulative Index	(3) Weight	(4) Product (2)x(3)	(5) Adj. Factor Pres. Index/ Sum Col. (4)	(6) Adj. For Exp. Const. Removal@	(7) Prem. Adj. Factor (5)x(6)
9-01-87	Base	1.000	.299	.299	1.715	.983	1.686
AO 9-01-88	1.097	(1.097)	.424	.465			
NR 9-01-88	1.274	1.274	.277	.353			
AO 1-01-90	1.025	(1.306)					
NR 1-01-90	1.504	1.916		1.117			

SECTION B - Factor Adjusting 1988 Policy Year Voluntary Premium to Present Voluntary Premium Level

Date	(1) Std. Premium Level Change	(2) Cumulative Index	(3) Weight	(4) Product (2)x(3)	(5) Adj. Factor Pres. Index/ Sum Col. (4)	(6) Adj. For Exp. Const. Removal@	(7) Prem. Adj. Factor (5)x(6)
9-01-87	Base	1.000	.299	.299	1.402	.983	1.378
O 9-01-88	1.097	(1.097)	.424	.465			
R 9-01-88	1.274	1.274	.277	.353			
O 1-01-90	1.025	(1.306)					
R 1-01-90	1.229	1.566		1.117			

SECTION C - Factor Adjusting 1988 Policy Year Assigned Risk Premium and Voluntary Premium to Present Level

(1)	Assigned Risk Market Share PY 1988	.208
(2)	Voluntary Market Share PY 1988	.792
(3)	Assigned Risk Std. Premium Adjustment Factor (Sec.A)	1.686
(4)	Voluntary Premium Adjustment Factor (Sec.B)	1.378
(5)	Prem. Adj. Factor - ((1)x(3)+(2)x(4)) x .997 #	1.438
(6)	Premium Adjustment Factor Excluding Trend = (5) / 1.185	1.214
(7)	Adjustment for additional premium from net premium programs	1.016
(8)	Final Premium Adjustment Factor = (6)x(7)	1.233

AO - All outstanding business

NR - New and renewal business

* - Applicable to "all outstanding" as well as "new and renewal" business.

@ - Eliminates premium derived from expense constants.

- Market share adjustment factor

CALCULATION OF 1989 CALENDAR YEAR ON-LEVEL FACTORS

SECTION A - Factor Adjusting 1989 Calendar Year Assigned Risk Premium to Present Assigned Risk Premium Level

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Std. Premium Level Change	Cumulative Index	Weight	Product (2)x(3)	Adj.Fac: Present Indx/Sum Col(4)	Adj. For Expense Constant Removal@	Premium Adjustm. Factor (5)x(6)
1/1/88	Base	1.000	.405	.405	1.671	.989	1.653
NR 1/1/89	1.262	1.262	.595	.751			
NR 1/1/90	1.531	1.932		1.156			

SECTION B - Factor Adjusting 1989 Calendar Year Voluntary Premium to Present Voluntary Premium Level

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Std. Premium Level Change	Cumulative Index	Weight	Product (2)x(3)	Adj.Fac: Present Indx/Sum Col(4)	Adj. For Expense Constant Removal@	Premium Adjustm. Factor (5)x(6)
1/1/88	Base	1.000	.405	.405	1.412	.989	1.396
NR 1/1/89	1.262	1.262	.595	.751			
NR 1/1/90	1.293	1.632		1.156			

SECTION C - Factor Adjusting 1989 Calendar Year Assigned Risk Premium and Voluntary Premium to Present Level

(1) Assigned Risk Standard Premium Market Share CY 1989	.213
(2) Voluntary Standard Premium Market Share CY 1989	.787
(3) Assigned Risk Premium Adjustment Factor (Sec.A)	1.653
(4) Voluntary Premium Adjustment Factor (Sec.B)	1.396
(5) Prem. Adj. Factor - [(1)x(3)+(2)x(4)] x 1.000 #	1.451
(6) Premium Adjustment Factor Excluding Trend - (5)/1.121	1.294
(7) Adjustment for additional premium from ARRP and removal of Assigned Risk premium discounts	1.059
(8) Final Premium Adjustment Factor - (6)x(7)	1.370

NR = New and renewal business

@ = Eliminates premium derived from expense constants

= = Market share adjustment factor

FLORIDA-Preliminary

PROJECTED MARKET SHARE

(a) After on-leveling the data, the AR market share for CY 89 becomes: $[(1) \times (3)] / [(1) \times (3) + (2) \times (4)]$	<u>.243</u>
(b) Projected Assigned Risk market share	<u>.243</u>

FLORIDA-Preliminary

CALENDAR YEAR 1989 MARKET SHARE ADJUSTMENT FACTOR

(a) After on-leveling the data, the AR market share for CY 89 becomes: $[(1) \times (3)] / [(1) \times (3) + (2) \times (4)]$	<u>.243</u>
(b) Projected Assigned Risk market share	<u>.243</u>
(c) Current premium index AR to VOL [1.531 / 1.293]	<u>1.184</u>
(d) Average premium index to VOL using on-level CY 89 market mix: $1 / [(a)/(c) + 1-(a)]$	<u>1.039</u>
(e) Average premium index to VOL using projected market mix $1 / [(b)/(c) + 1-(b)]$	<u>1.039</u>
(f) Market share adjustment factor for CY 89 : (e)/(d)	<u>1.000</u>

FLORIDA-Preliminary

IMPACT OF ASSIGNED RISK NET PREMIUM PROGRAMS

(a) Impact of ARRP on Assigned Risk Net Premium	<u>1.170</u>
(b) Impact of removal of Assigned Risk premium discounts on Assigned Risk Net Premium	<u>1.063</u>
(c) Total Impact of Net Premium Programs on Assigned Risk Net Premium: (a)x(b)	<u>1.244</u>
(d) Projected Assigned Risk Market Share	<u>.243</u>
(e) Overall Impact of Net Premium Programs: (c)x(d) + 1-(d)	<u>1.059</u>

FLORIDA-Preliminary

CALCULATION OF 1988 POLICY YEAR ON-LEVEL FACTORS

SECTION A - Factor Adjusting 1988 Policy Year Assigned Risk Premium to Present Assigned Risk Premium Level

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Std.	Premium Cumula-		Product	Adj.Fac: Present	Adj. For Expense Constant	Premium Adjustm. Factor
<u>Date</u>	<u>Change</u>	<u>Index</u>	<u>Weight</u>	<u>(2)x(3)</u>	<u>Col(4)</u>	<u>Removal@</u>	<u>(5)x(6)</u>
1/1/88	Base	1.000	1.000	1.000	1.932	.988	1.909
NR 1/1/89	1.262	1.262		1.000			
NR 1/1/90	1.531	1.932					

SECTION B - Factor Adjusting 1988 Policy Year Voluntary Premium to Present Voluntary Premium Level

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Std.	Premium Cumula-		Product	Adj.Fac: Present	Adj. For Expense Constant	Premium Adjustm. Factor
<u>Date</u>	<u>Change</u>	<u>Index</u>	<u>Weight</u>	<u>(2)x(3)</u>	<u>Col(4)</u>	<u>Removal@</u>	<u>(5)x(6)</u>
1/1/88	Base	1.000	1.000	1.000	1.632	.988	1.612
NR 1/1/89	1.262	1.262		1.000			
NR 1/1/90	1.293	1.632					

SECTION C - Factor Adjusting 1988 Policy Year Assigned Risk Premium and Voluntary Premium to Present Level

(1) Assigned Risk Standard Premium Market Share PY 1988	.220
(2) Voluntary Standard Premium Market Share PY 1988	.780
(3) Assigned Risk Premium Adjustment Factor (Sec.A)	1.909
(4) Voluntary Premium Adjustment Factor (Sec.B)	1.612
(5) Prem. Adj. Factor = [(1)x(3)+(2)x(4)] x .999 =	1.675
(6) Premium Adjustment Factor Excluding Trend = (5)/1.121	1.494
(7) Adjustment for additional premium from ARRP and removal of Assigned Risk premium discounts	1.059
(8) Final Premium Adjustment Factor = (6)x(7)	1.582

NR = New and renewal business

@ = Eliminates premium derived from expense constants

= = Market share adjustment factor

FLORIDA-Preliminary

POLICY YEAR 1988 MARKET SHARE ADJUSTMENT FACTOR

(a) After on-leveling the data, the AR market share for PY 88 becomes: $[(1) \times (3)] / [(1) \times (3) + (2) \times (4)]$	<u>.250</u>
(b) Projected Assigned Risk market share	<u>.243</u>
(c) Current premium index AR to VOL [1.531 / 1.293]	<u>1.184</u>
(d) Average premium index to VOL using on-level PY 88 market mix: $1 / [(a)/(c) + 1-(a)]$	<u>1.040</u>
(e) Average premium index to VOL using projected market mix $1 / [(b)/(c) + 1-(b)]$	<u>1.039</u>
(f) Market share adjustment factor for PY 88: (e)/(d)	<u>.999</u>

FLORIDA-Preliminary

CALCULATION OF 1987 POLICY YEAR ON-LEVEL FACTORS

SECTION A - Factor Adjusting 1987 Policy Year Assigned Risk Premium to Present Assigned Risk Premium Level

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Std.	Cumula-		Product	Adj.Fac:	Adj. For	Premium
	Premium	tive	Weight	Indx/Sum	Present	Expense	Adjustm.
<u>Date</u>	<u>Change</u>	<u>Index</u>		<u>(2)x(3)</u>	<u>Col(4)</u>	<u>Removal@</u>	<u>(5)x(6)</u>
	Base	1.000	1.000	1.000	2.182	.988	2.156
NR 1/1/87				1.000			
NR 1/1/88	1.129	1.129					
NR 1/1/89	1.262	1.425					
NR 1/1/90	1.531	2.182					

SECTION B - Factor Adjusting 1987 Policy Year Voluntary Premium to Present Voluntary Premium Level

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Std.	Cumula-		Product	Adj.Fac:	Adj. For	Premium
	Premium	tive	Weight	Indx/Sum	Present	Expense	Adjustm.
<u>Date</u>	<u>Change</u>	<u>Index</u>		<u>(2)x(3)</u>	<u>Col(4)</u>	<u>Removal@</u>	<u>(5)x(6)</u>
	Base	1.000	1.000	1.000	1.843	.988	1.821
NR 1/1/87				1.000			
NR 1/1/88	1.129	1.129					
NR 1/1/89	1.262	1.425					
NR 1/1/90	1.293	1.843					

SECTION C - Factor Adjusting 1987 Policy Year Assigned Risk Premium and Voluntary Premium to Present Level

(1) Assigned Risk Standard Premium Market Share PY 1987	.215
(2) Voluntary Standard Premium Market Share PY 1987	.785
(3) Assigned Risk Premium Adjustment Factor (Sec.A)	2.156
(4) Voluntary Premium Adjustment Factor (Sec.B)	1.821
(5) Prem. Adj. Factor - [(1)x(3)+(2)x(4)] x .999 =	1.891
(6) Premium Adjustment Factor Excluding Trend - (5)/1.121	1.687
(7) Adjustment for additional premium from ARRP and removal of Assigned Risk premium discounts	1.059
(8) Final Premium Adjustment Factor - (6)x(7)	1.787

NR = New and renewal business

@ = Eliminates premium derived from expense constants

= = Market share adjustment factor

FLORIDA-Preliminary

POLICY YEAR 1987 MARKET SHARE ADJUSTMENT FACTOR

(a) After on-leveling the data, the AR market share for PY 87 becomes: $[(1) \times (3)] / [(1) \times (3) + (2) \times (4)]$	<u>.245</u>
(b) Projected Assigned Risk market share	<u>.243</u>
(c) Current premium index AR to VOL { 1.531 / 1.293 }	<u>1.184</u>
(d) Average premium index to VOL using on-level PY 87 market mix: $1 / [(a)/(c) + 1 - (a)]$	<u>1.040</u>
(e) Average premium index to VOL using projected market mix $1 / [(b)/(c) + 1 - (b)]$	<u>1.039</u>
(f) Market share adjustment factor for PY 87: (e)/(d)	<u>.999</u>

INDIANA

I. EFFECT OF A 25% SURCHARGE ON ASSIGNED RISK PREMIUMS OVER \$2000 *

$$= 1 + \frac{.25[(A/R \text{ Prem for Policies} > \$2000) - (\# \text{ Policies} > \$2000)(\$2000)]}{(A/R \text{ Prem for Policies} > \$2000) + (A/R \text{ Prem for Policies} < \$2000)}$$

$$= 1 + \frac{.25 [(\$59,478,479) - (3827)(\$2000)]}{(\$59,478,479) + (\$7,391,012)}$$

$$= 1.194$$

* Source: Policy Issue Capture System.

Note: Size of policy information not available for all policies.

II. CALCULATION OF MANUAL RATE OFFSET

$$\text{Residual Market Share} = \frac{\text{NEP Residual Market 1987} \quad \text{\$65,435,815}}{\text{NEP Statewide 1987} \quad \text{\$297,447,091}} = .220$$

Formula: $R \times V \times D + (1-R) \times V = 1.000$

where R = residual market share

V = rate offset

D = effect on net premium of applying surcharge
to assigned risk premium over \$2000

$$(.220) V (1.194) + (1-.220) V = 1.000$$

$$.263 V + .780 V = 1.000$$

$$1.043 V = 1.000$$

$$V = .959$$

** Source: Quarterly Assigned Risk Financial Data as submitted by servicing carriers.

**ASSIGNED RISK
ADJUSTMENT PROGRAM
(ARAP)**



ASSIGNED RISK ADJUSTMENT PROGRAM

Purpose

The purpose of this filing is to provide a revised pricing mechanism for experience rated assigned risks to share in the underwriting losses generated by the assigned risk market. This proposal will surcharge risks with a record of losses greater than expected under the experience rating plan.

Background

The residual market is intended to serve as the market of last resort to ensure the availability of workers compensation and employers liability insurance to all employers required by law to provide this coverage but unable to obtain it through the voluntary market.

Between 1984 and 1988, the residual market suffered an operating loss exceeding 4.4 billion dollars. Carriers writing voluntary insurance continue to absorb the increased burden being placed on them by the rapid expansion of the residual market. In NCCI jurisdictions, the subsidy for both 1987 and 1988, amounted to just over 12%. This means that for every dollar of voluntary market premium, 12¢ must be used to subsidize the increased loss experience in the residual market. These subsidies are causing severe financial hardships to insurance carriers. As a result, competition among voluntary carriers has diminished.

The residual market has evolved into more than a market of last resort. Nineteen-eighty-eight (1988) data shows that the number of risks and the amount of premium have grown significantly in the past five years. In 1984, assigned risk plans administered by NCCI provided coverage for 253,000 risks. During 1988, there were approximately 580,000 risks covered by plans administered by NCCI. The written premium for these risks accounts for approximately 2.9 billion dollars, representing 19.3% of the total written premium in those jurisdictions.

The residual market has become the largest segment of the total workers compensation insurance market. Its premium volume now more than doubles that of the largest single private writer of workers compensation and employers liability insurance.

Proposal

It is proposed that the attached Assigned Risk Adjustment Program (ARAP) be implemented six months from the approval of this program or from the latest rate filing effective date whichever is later.



Impact

The proposed surcharge will range from 0 to a maximum of +49% of standard premium. The average surcharge will vary between 10% to 15% of standard premium, depending largely on the distribution of risks by size in the assigned risk pool and the extent of the rate level deficiency of assigned risk pool business in a given state.

Implementation

In order to implement this proposal, the attached exhibit illustrates the changes required in the Experience Rating Plan Manual.



ASSIGNED RISK ADJUSTMENT PROGRAM (ARAP)

Administration Rules and Procedures

1. **Eligibility** - A risk shall be eligible for the Assigned Risk Adjustment Program if it is eligible for an experience rating modification. The application of this program is mandatory for all eligible insureds and shall apply to all assigned risk policies written for such insureds.

2. **ARAP Surcharge Formula** -
 - (a) After the calculation of the experience modification factor "M" for a particular risk, the weighted test ratio "R" is calculated

$$R = \frac{(0.5 - 0.5W) A_p}{M \cdot E_p} + \frac{(0.5 + 0.5W) A}{M \cdot E}$$

where:

- W is the weighting value
- A is the actual losses, as limited on a per accident basis
- A_p is the actual primary losses
- E is the total expected losses
- E_p is the expected primary losses
- M is the experience modification

All values are those used in the experience modification calculation.

- (b) If "R" is greater than 1.0, a surcharge factor "S" will be calculated using the following formula:

$$S = 1 + \frac{(0.08) E (R-1)^{1.25}}{(E + 3)^{0.5}}$$

where:

- E is the total expected losses of the particular insured shown in thousands. "E" shall not exceed 40.
R is the weighted test ratio calculated in 2(a). "R" shall not exceed 2.0.

- (c) The surcharge factor "S" will appear on all rating forms. This surcharge factor will be applied to the standard premium developed in the state(s) where effective.

3. The surcharge is limited to a maximum of 49% of standard premium. Only insureds with expected losses equal to or greater than \$40,000 will be subject to the maximum surcharge. The following table shows sample maximum surcharges by risk expected loss size.

<u>Risk Expected Losses</u>	<u>Maximum Surcharge</u>
2,500	9%
5,000	14%
10,000	22%
25,000	38%
40,000 and over	49%

4. Definitions

For the purposes of this program, the following definitions apply:

- (a) Weighted Test Ratio - A comparison of the risk's actual losses to the modified expected losses. A ratio greater than 1.00 is subject to the ARAP surcharge. This test ratio is limited to 2.00.
- (b) ARAP Surcharge Factor - The factor is applied to the normal standard premium when the insured is an assigned risk. This factor is determined by a formula using the weighted test ratio.

5. Experience rated risks with multi-state operations shall be subject to the Assigned Risk Adjustment Program in states that have approved it. For risks with interstate exposure, the "R" (test ratio) and the "S" (surcharge) values will be computed on a full interstate basis. In ARAP states, "S" will be used to develop the surcharged premium in those states only.

GEORGIA

CALCULATION OF ARAP SURCHARGE FACTOR

The impact of ARAP on Georgia Assigned Risk premium is 13.3%.

NCCI uses experience rating data files to calculate an ARAP surcharge factor for every assigned risk policyholder (risk) which was experience rated during 1986, and had a risk identification number available in NCCI's PICS database. The formula used and a sample calculation can be found in Exhibit 1, Page 3. After all individual calculations are completed, we obtain a weighted average using the latest available year's expected loss as weights. This average is our estimate of the effect of introducing the ARAP program.

It can reasonably be assumed that results in the prospective rating year will not differ substantially from what would have been developed in the historical rating year (as if the plan were in effect at that time).

Exhibit 1, Page 2 summarizes the results by size of modification and size of expected loss. The top part of the exhibit show how the ARAP surcharge impacts insureds grouped by size of experience rated modification (Mod) in ascending Mod order. The bottom part illustrates this same comparison by expected loss range. On both parts, the last column is the distribution of the latest historical year's expected loss for each category. NCCI has also estimated the proportion of risks not experience rated using the standard premium found in the PICS database.

An interpretation of the ARAP formula can be found in Exhibit 1, Page 4.



ARAP IMPACT
GEORGIA - ASSIGNED RISK
RATING YEAR 1986 *

<u>RANGE OF MOD</u>	<u>NUMBER OF RISKS</u>	<u>AVERAGE MOD</u>	<u>AVERAGE SURCHARGE FACTOR</u>	<u>EXP. LOSS (%) 1986</u>
BELOW .60	1	0.550	1.000	0.34%
0.60 - 0.69	1	0.640	1.000	0.23%
0.70 - 0.79	25	0.764	1.000	3.27%
0.80 - 0.84	51	0.824	1.000	4.14%
0.85 - 0.89	137	0.872	1.000	6.85%
0.90 - 0.94	233	0.917	1.000	9.43%
0.95 - 0.99	165	0.967	1.007	8.51%
# BELOW 1.00	613	0.888	1.002	32.78%
1.00	23	1.000	1.002	2.01%
1.01 - 1.05	105	1.028	1.009	5.17%
1.06 - 1.10	101	1.082	1.039	6.37%
1.11 - 1.15	94	1.131	1.111	5.69%
1.16 - 1.20	98	1.177	1.126	5.30%
1.21 - 1.30	181	1.251	1.174	10.93%
1.31 - 1.40	124	1.356	1.229	6.95%
1.41 - 1.60	126	1.480	1.268	8.89%
1.60 - 1.80	66	1.692	1.361	4.48%
1.80 - 2.00	25	1.869	1.328	2.15%
OVER 2.00	17	2.167	1.395	1.68%
# OVER 1.00	937	1.326	1.201	57.62%
TOTAL RATED RISKS	1573	1.163	1.144	92.41%
NON RATED RISKS	xx	xxx	xxx	7.59%
TOTAL RATED AND NON RATED			1.133	100.00%

<u>EXPECTED LOSS RANGE</u>	<u>NUMBER OF RISKS</u>	<u>AVERAGE MOD</u>	<u>AVERAGE SURCHARGE FACTOR</u>	<u>EXP. LOSS (%)</u>
2,500 - 5,000	214	1.082	1.050	3.25%
5,000 - 10,000	505	1.126	1.092	12.27%
10,000 - 25,000	548	1.142	1.145	27.16%
25,000 - 50,000	201	1.194	1.202	20.50%
50,000 - 100,000	74	1.215	1.183	14.37%
OVER 100,000	31	1.160	1.078	14.87%
TOTAL RATED RISKS	1573	1.163	1.144	92.41%
NON RATED RISKS	xx	xx	xx	7.59%
TOTAL RATED AND NON RATED			1.133	100.00%



FORMULAS USED TO CALCULATE THE ARAP SURCHARGE
AND INTERPRETATION

The surcharge(s) is calculated for each risk using the following formula:

$$S = 1 + \frac{(.08) \cdot \bar{E} \cdot (R-1)^{1.25}}{(\bar{E} + 3)^{.25}}$$

where $R = \frac{(.5 - .5W)A_p}{E_p \cdot M} + \frac{(.5 + .5W)A}{E \cdot M}$ and capped between 1 and 2

M = Experience Rating Modification (Mod)

and from the rating sheet as contained in NCCI Experience Rating files:

A_p = Actual Primary Losses

E_p = Expected Primary Losses

A = Actual Total Losses

E = Expected Total Losses

W = Weight from Mod Calculation

\bar{E} = Expected Total Losses In Thousand Dollar Units Limited to 40

Sample Calculation:

Assume: $M = .99$ $A = 50,000$
 $A_p = 9,000$ $E = 30,000$
 $E_p = 12,000$ $W = .11$ (Revised Experience Rating Plan)

$$R = \frac{(.5 - .5(.11)) 9,000}{12,000 (.99)} + \frac{(.5 + .5(.11)) 50,000}{30,000 (.99)}$$

$$= \frac{4,005}{11,880} + \frac{27,750}{29,700} = 1.27$$

$$S = 1 + \frac{(.08) 30 (.27)^{1.25}}{(30 + 3)^{.25}} = 1 + \frac{.4671}{3.7445} = 1.12$$



Explanation of ARAP Formulas

The experience rating formula is designed to use a risk's past loss experience (actual losses (A) versus expected losses (E)) to predict the risk's future experience. The formula relies more on the risk's primary losses (A_p) rather than their excess losses, i.e. the prediction is based more on loss frequency than on loss severity. In depending more on frequency, the effect of a "one-time" catastrophe is significantly diminished.

To make the residual market more self-supporting, the ARAP formula relies more on total losses (A) when calculating a surcharge factor. However, for smaller risks, the ARAP formula only goes halfway towards recognizing the full total losses by giving half weight (W) to primary losses (A_p). This once again minimizes the impact of a single catastrophe loss.

As risk size increases, the ARAP formula goes more than halfway toward relying on total losses (A) to calculate the risk's surcharge.

The "R" formula is the first step in determining the ARAP surcharge. If the result of the "R" formula is greater than 1.0 a surcharge is calculated by substituting the result of the "R" formula (limited to a maximum of 2.0) into the "S" equation. The ARAP surcharge determined in the "S" equation depends not only on actual versus expected losses, but also on the magnitude of expected losses (expected losses in the "S" formula are limited to \$40,000).

The surcharge as calculated in the "S" equation will limit automatically at the maximum surcharge for each expected loss size. The smallest risks just eligible for experience rating will have a maximum surcharge of +9%, where risks over \$40,000 in expected losses can be surcharged up to +49%.

ASSIGNED RISK RATING PROGRAM

1. State: Georgia
2. Effective Date: 11/20/90
3. Assigned Risk Rating Plan Eligibility Level: \$50,000
4. Average Surcharge Amount: +8.1%
5. Expense Constant: \$140
6. Loss Conversion Factor: 1.120
7. Tax Multiplier: 1.102 State
1.223 "F" Class Only
8. Expense and Development Ratio: 0.469

NOTE: These factors are based on the expenses and loss development factors proposed in the latest rate filing.

IMPORTANT NOTICE TO

Workers Compensation Assigned Risk Policyholders

Your Policy Is Written through the Assigned Risk Plan

All workers compensation assigned risk policyholders with audited standard premium equal to or greater than the Assigned Risk Rating Program eligibility level are subject to the Assigned Risk Rating Program. This is effective for new and renewal policies in the following states:

The Assigned Risk Rating Program (ARRP) will adjust your premium, based on your actual loss experience, valued eighteen months after the effective date of the policy. You will then be required to submit any additional premium. Depending on your premium size and amount of losses, this additional premium could range from 0% to 100% of your audited premium. Please see the Assigned Risk Rating Program Endorsement for details. This form is attached to your policy.

Applicable effective date of policy: _____

Please read carefully, sign below and return a copy to:

[Servicing Carrier Name]
[Servicing Carrier Address]

This notice must be returned with ten (10) working days to maintain the requested effective date.

Signature of Officer, Sole Proprietor or
Partner.

I understand the above Notice and am unable to obtain coverage in the voluntary market.

DUPLICATE

Note: The size and style of type can be changed at the carrier's discretion.

GEORGIA
ASSIGNED RISK PROGRAM

Assigned Risk Rating Program (ARRP)

Summary

(1) Calculated average Surcharge due to operation of loss-sensitive formula (See Exhibit 2B)	0.095
(2) Amount assumed uncollectible	0.150
(3) Adjusted average Surcharge = (1) x [1.000 - (2)]	0.081

GEORGIA

Calculation of the Impact of the
Assigned Risk Rating Program (ARRP)

(1) Premium Range	(2) 1988 Total Premium ↔	(3) 1988 # of Risks ↔	(4) Average Premium (2)/(3)	(5) Projected Pure Loss Ratio for Pool Risks *	(6) Projected Average Loss Dollars for Pool Risks (4)x(5)	(7) Average Maximum Surcharge Factor **	(8) Average Surcharge †
0 - 24,999	60,331,840	15,758	3,829	0.730	2,795	1.00	0.000
25,000 - 49,999	25,977,846	748	34,730	0.730	25,353	1.00	0.000
50,000 - 99,999	26,073,564	384	67,900	0.730	49,567	1.43	0.107
100,000 - 249,999	34,162,415	228	149,835	0.730	109,380	1.64	0.163
250,000 - 499,999	20,397,532	58	351,682	0.730	256,728	1.85	0.207
500,000 - 999,999	13,503,554	20	675,178	0.730	492,880	2.00	0.221
over 1,000,000	11,679,134	6	1,946,522	0.730	1,420,961	2.00	0.227
Total	192,125,885	17,202	11,169	0.730			0.095

Other Underlying Assumptions:

9. Minimum Surcharge Factor	1.000
10. Loss Adjustment Expense Factor	1.120
11. Tax Multiplier	1.104
12. Basic Premium (From Exhibit 2E)	0.241

* From Exhibit 2C.

** From Table of Maximum Surcharge Factor Using Average Premium in Column 4.

† From Exhibit 2D page 3.

** Source: PICS Database.

GEORGIA
ASSIGNED RISK PROGRAM

Calculation of Overall Expected Pure Loss Ratio for Assigned Risks

(1) Expected Overall Loss Ratio (Vol. & A/R From Exhibit 2E)	0.594
(2) Expected Loss Ratio differential of Assigned Risks to all risks assuming overall rate adequacy and implementation of ARAP. See Exhibit 3A	1.229
(3) Expected Overall Loss Ratio for Assigned Risks (1) x (2)	0.730

GEORGIA
ASSIGNED RISK PROGRAM

Calculation of Average Surcharges by Premium Range for ARR

Definition of Terms and Formulas #

-
- R - Retrospective premium
 - TM - Tax multiplier = $1 / [1 - \text{tax provision (including assessment)}]$
 - b - Basic premium
 - c - Loss conversion factor (in this case, LAE)
 - L - Actual losses
 - E - Expected losses
 - r - L / E - Ratio of actual to expected losses
 - Table M (or "Table of Insurance Charges") entry ratio
 - R - $(b + cL) \times TM = (b + crE) \times TM$
 - G - Maximum premium
 - $(b + cR_G E) \times TM$, where R_G is the maximum entry ratio

$$\longrightarrow R_G = \frac{G / TM - b}{cE}$$

- H - Minimum premium
- $(b + cR_H E) \times TM$, where R_H is the minimum entry ratio

$$\longrightarrow R_H = \frac{H / TM - b}{cE}$$

- X_G - Table M charge at entry ratio R_G
- requires the knowledge of R_G and the Expected Loss Group , which depends on
- expected average loss dollars.

- X_H - Table M charge at entry ratio R_H
- S_H - Savings at entry ratio R_H , where $S_H = X_H + R_H - 1$

Thus,

$$\text{Average Surcharge} = \left[\left(b + (L \times LAE) \right) \times TM \right] - 1$$

Where $L = \text{ARRP formula loss ratio} = \text{Expected loss ratio} \times (1 - X_G + S_H)$

since losses over the maximum (X_G) will not enter surcharge formula, while the insured receives no credit for having losses below the level which generate the minimum surcharge (S_H).

Note that this last formula differs from those found in Snader because ARRP is not a "balanced" plan.

Note: For the average surcharge estimate formula, loss development is included in the losses for presentational purposes and is not included in the expense (b) development ratio. Since the ultimate sum is assumed to be the same, this has no effect on the estimated average surcharge.

The definitions and formulas (except for L) can be found or derived from Snader, Richard H., "Fundamentals of Individual Risk Rating", published by the Casualty Actuarial Society.

GEORGIA
ASSIGNED RISK PROGRAM

CALCULATION OF THE AVERAGE SURCHARGE BY RANGE

(1) Premium Range	(2) R _G	(3) R _H	(4) Expected Loss Group *	(5) X _G	(6) X _H	(7) S _H	(8) Average Surcharge
0 - 24,999			84				0.000
25,000 - 49,999			62				0.000
50,000 - 99,999	1.29	0.81	53	0.463	0.584	0.394	0.107
100,000 - 249,999	1.52	0.81	42	0.301	0.484	0.294	0.163
250,000 - 499,999	1.75	0.81	34	0.181	0.413	0.223	0.207
500,000 - 999,999	1.92	0.81	30	0.129	0.376	0.186	0.221
Over 1,000,000	1.92	0.81	23	0.061	0.315	0.125	0.227

* Uses ELG's of R-1257.

Example for the 100,000 - 249,000 Range :

$$G = 1.64$$

$$H = 1.00$$

$$R_G = 1.52$$

$$R_H = 0.81$$

Expected Losses - \$ 109,380

$$\longrightarrow \text{E. L. G.} = 42$$

Given $R_G = 1.52$ and E. L. G. = 42

$$\longrightarrow X_G = 0.301$$

Given $R_H = 0.81$ and E. L. G. = 42

$$\longrightarrow X_H = 0.484$$

$$S_H = X_H + R_H - 1 = 0.294$$

$$* \quad L = (\text{ELR}) \times (1 - X_G + S_H) = 0.730 \times (1.000 - 0.301 + 0.294) = 0.725$$

$$\begin{aligned} \text{Average Surcharge} &= ([\text{Basic Premium Factor} + (L \times \text{LAE})] \times \text{TM}) - 1.000 \\ &= ([0.241 + (0.725 \times 1.120)] \times 1.104) - 1.000 = 0.163 \end{aligned}$$

GEORGIA
ASSIGNED RISK PROGRAM

Calculation of Basic Premium Factor

(1a) Loss Adjustment Expense (From NCCI Rate Filing)	1.120
(1b) Subsequent Inj. Trust Fund (Related to Losses) (From NCCI Rate Filing)	1.029
(2) Target Cost Ratio (Voluntary & Assigned Risk) (From NCCI Rate Filing)	0.6843
(3) Expected Loss Ratio ((2) / [(1a) x (1b)])	0.594
(4) Tax Multiplier (From NCCI Rate Filing)	1.104
(5) Expenses ([1.000/(4)] - (3))	0.312
(6) Basic Premium Factor ((5) - ([(1a)-1.000]x(3)))	0.241

GEORGIA
ASSIGNED RISK PROGRAM

Summary of Loss Ratio Differentials

(1) Loss ratio differential in the absence of any surcharge programs (See Exhibit 3B)	1.462
(2) Estimated impact of ARAP (See Exhibit 1)	1.133
(3) Loss ratio differential assuming ARAP (Std. premium basis) = (1) / (2)	1.290
(4) Assumed Assigned Risk market share	0.168
(5) Differential of A/R ELR to (Voluntary plus A/R ELR) (Std. premium basis) :	

$$V \times (0.832) + P \times (0.168) = 1.000$$

$$V \times (0.832) + V \times (1.290) (0.168) = 1.000$$

$$0.832 V + 0.217 V = 1.000$$

$$1.049 V = 1.000$$

$$\implies V = 0.953$$

$$\implies P = 1.229$$



GEORGIA

Policy Year	Standard* Premium	Losses**	Loss Ratio	Differential (Std. Basis)	Differential (Net Basis)**
I. Statewide Experience Valued as of 12-31-88					
83	\$634,941,582	\$300,268,859	0.473		
84	\$746,634,239	\$372,278,214	0.499		
85	\$823,675,650	\$474,467,708	0.576		
86	\$929,396,018	\$570,698,174	0.614		
87	\$968,925,693	\$639,412,524	0.660		
TOTAL	\$4,103,573,182	\$2,357,125,479	0.574		
II. Residual Market Experience Valued as of 12-31-88					
83	\$16,035,217	\$12,531,038	0.781	1.665	1.540
84	\$23,584,318	\$18,473,276	0.783	1.582	1.463
85	\$104,991,761	\$73,480,091	0.700	1.248	1.154
86	\$181,494,951	\$136,051,297	0.750	1.298	1.201
87	\$181,031,338	\$163,553,987	0.903	1.490	1.378
TOTAL	\$507,137,585	\$404,089,689	0.797	1.462	1.352
III. Voluntary Market Experience Valued as of 12-31-88					
83	\$611,088,221	\$286,791,069	0.469		
84	\$713,466,878	\$352,870,999	0.495		
85	\$710,890,683	\$398,682,274	0.561		
86	\$745,504,845	\$431,115,230	0.578		
87	\$784,123,101	\$475,217,741	0.606		
TOTAL	\$3,565,073,728	\$1,944,677,313	0.545		

* Developed to a fifth report and brought to 7/1/89 premium level.

** Developed to an ultimate report using paid losses to a fourth report, ex-bulk losses from a fourth to eighth report and including IBNR losses from an eighth to ultimate report.

*** Adjusted for effect on assigned risk net premium of 1.081 due to (1) removal of assigned risk premium discounts.

Note also that the Voluntary and the Assigned Risk do not sum to the statewide. This is because the methodology used in the calculation of the statewide on-level factors and rounding problems involved in separate Voluntary and Assigned Risk loss development factors, where the Assigned Risk factors are for indemnity and medical combined.



GEORGIA (STATEWIDE)

Policy Year	Standard Premium	Dev.* Factor	On Level Factor	Standard Premium
83	\$349,637,435	1.000	1.816	\$634,941,582
84	\$409,563,488	1.004	1.816	\$746,634,239
85	\$508,128,100	1.008	1.608	\$823,675,650
86	\$655,889,921	1.010	1.403	\$929,396,018
87	\$774,520,938	1.074	1.165	\$968,925,693

Policy Year	Ind. Losses	Dev.** Factor	On Level Factor	Ind. Losses On Level
83	\$128,529,776	1.067	1.190	\$163,232,816
84	\$153,512,056	1.100	1.183	\$199,719,185
85	\$159,364,132	1.458	1.119	\$260,082,263
86	\$162,297,351	1.839	1.044	\$311,610,914
87	\$106,596,232	3.159	1.029	\$346,544,350

Policy Year	Med. Losses	Dev.** Factor	On Level Factor	Med. Losses On Level
83	\$124,014,519	1.074	1.029	\$137,036,043
84	\$153,249,582	1.094	1.029	\$172,559,029
85	\$165,038,834	1.262	1.029	\$214,385,445
86	\$180,422,883	1.396	1.029	\$259,087,260
87	\$158,392,739	1.797	1.029	\$292,868,174

* To a Fifth Report

** To an Ultimate Report using paid losses to a fourth report, ex-bulk losses from a fourth to eighth report, and including IBNR losses from an eighth to ultimate report.



GEORGIA (ASSIGNED RISK)

<u>Policy Year</u>	<u>Standard Premium</u>	<u>Dev.* Factor</u>	<u>On Level Factor</u>	<u>Standard Premium</u>
83	\$9,008,549	1.000	1.780	\$16,035,217
84	\$12,972,672	1.002	1.814	\$23,584,318
85	\$61,869,040	1.002	1.694	\$104,991,761
86	\$119,169,370	0.991	1.537	\$181,494,951
87	\$140,117,135	1.006	1.284	\$181,031,338

<u>Policy Year</u>	<u>Losses</u>	<u>Dev.** Factor</u>	<u>On Level Factor</u>	<u>Losses On Level</u>
83	\$10,212,745	1.095	1.121	\$12,531,038
84	\$15,031,144	1.100	1.117	\$18,473,276
85	\$51,169,980	1.326	1.083	\$73,480,091
86	\$82,505,335	1.589	1.038	\$136,051,297
87	\$64,189,163	2.476	1.029	\$163,553,987

* To a Fifth Report

** To an Ultimate Report using paid losses to a fourth report, ex-bulk losses from a fourth to eighth report, and including IBNR losses from an eighth to ultimate report.



GEORGIA (VOLUNTARY)

<u>Policy Year</u>	<u>Standard Premium</u>	<u>Dev.* Factor</u>	<u>On Level Factor</u>	<u>Standard Premium</u>
83	\$340,628,886	1.000	1.794	\$611,088,221
84	\$396,590,816	1.004	1.792	\$713,466,878
85	\$446,259,060	1.008	1.580	\$710,890,683
86	\$536,720,551	1.011	1.374	\$745,504,845
87	\$634,403,803	1.085	1.139	\$784,123,101
<u>Policy Year</u>	<u>Ind. Losses</u>	<u>Dev.** Factor</u>	<u>On Level Factor</u>	<u>Ind. Losses On Level</u>
83	\$123,331,489	1.062	1.190	\$155,891,002
84	\$145,996,484	1.096	1.183	\$189,357,440
85	\$134,239,672	1.454	1.119	\$218,407,946
86	\$123,189,822	1.829	1.044	\$235,169,370
87	\$80,792,188	3.096	1.029	\$257,403,911
<u>Policy Year</u>	<u>Med. Losses</u>	<u>Dev.** Factor</u>	<u>On Level Factor</u>	<u>Med. Losses On Level</u>
83	\$119,000,061	1.069	1.029	\$130,900,067
84	\$145,734,010	1.090	1.029	\$163,513,559
85	\$138,993,314	1.260	1.029	\$180,274,328
86	\$137,025,077	1.390	1.029	\$195,945,860
87	\$120,007,620	1.764	1.029	\$217,813,830

* To a Fifth Report

** To an Ultimate Report using paid losses to a fourth report, ex-bulk losses from a fourth to eighth report, and including IBNR losses from an eighth to ultimate report.

**FLORIDA**

(A)	(B)	(C)	(D)	(E)
<u>Risk Size by Stock Standard Premium</u>	<u>Number of Risks</u>	<u>Average Standard Premium</u>	<u>Average Stock Discounted Premium</u>	<u>0% Discounted Premium</u>
Less Than \$5,000	49,772	1,007	1,007	1,007
\$5,000 - \$100,000	4,024	15,608	14,451	15,608
\$100,000 - \$500,000	102	191,064	169,235	191,064
Over \$500,000	10	1,256,897	1,087,149	1,256,897
Total (Weighted Avg.)		2,689	2,530	2,689

Effect on Net Premium by going from proposed Stock Premium Discounts to 0% Premium Discounts $[(\text{Total (E)}/\text{Total (D)})-1]$ 6.3%

(D) Voluntary Discounts proposed to be in effect are 0.0%, 10.9%, 12.6%, 14.4%

(E) The Assigned Risk Discounts to become effective are 0.0%, 0.0%, 0.0%, 0.0%

NATIONAL COUNCIL ON COMPENSATION INSURANCE
COMPARISON OF LOSS RATIOS
Policy Year vs. Accident Year

Filing Effective	Policy Year	Policy Year Data			Accident Year	Accident Year Data		
		Medical Loss Ratio	Indemnity Loss Ratio	Combined Loss Ratio		Trended Medical Loss Ratio*	Trended Indemnity Loss Ratio*	Trended Combined Loss Ratio*
ALABAMA								
N/A	1986				1987			
03-01-90	1987	0.473	0.415	0.888	1988	0.521	0.435	0.956
04-01-91	1988	0.539	0.421	0.960	1989	0.527	0.405	0.932
ALASKA								
01-01-89	1986	0.231	0.473	0.704	1987	0.245	0.491	0.736
01-01-90	1987	0.247	0.438	0.685	1988	0.296	0.457	0.753
01-01-91	1988	0.274	0.376	0.650	1989	0.270	0.367	0.637
ARIZONA								
10-01-88	1986	0.350	0.328	0.678	1987	0.359	0.325	0.684
10-01-89	1987	0.379	0.335	0.714	1988	0.408	0.361	0.769
10-01-90	1988	0.379	0.333	0.712	1989	0.362	0.310	0.672
ARKANSAS								
01-01-90	1986	0.355	0.396	0.751	1987	0.391	0.436	0.827
03-01-91	1987	0.368	0.422	0.790	1988	0.367	0.418	0.785
N/A	1988				1989			
COLORADO								
01-01-89	1986	0.257	0.474	0.731	1987	0.245	0.444	0.689
06-01-90	1987	0.266	0.480	0.746	1988	0.303	0.497	0.800
08-01-91	1988	0.391	0.678	1.069	1989	0.456	0.764	1.220
CONNECTICUT								
01-01-89	1986	0.242	0.590	0.832	1987	0.244	0.638	0.882
01-01-90	1987	0.339	0.835	1.174	1988	0.363	0.822	1.185
01-01-91	1988	0.310	0.686	0.996	1989	0.314	0.657	0.971
DIST. OF COL.								
03-01-89	1986	0.275	0.586	0.861	1987	0.196	0.605	0.801
05-15-90	1987	0.258	0.544	0.802	1988	0.214	0.414	0.628
04-01-91	1988	0.277	0.420	0.697	1989	0.290	0.424	0.714
FLORIDA								
01-01-89	1986	0.360	0.561	0.921	1987	0.346	0.530	0.876
01-01-90	1987	0.373	0.605	0.978	1988	0.415	0.649	1.064
N/A	1988				1989			
GEORGIA								
07-01-89	1986	0.363	0.409	0.772	1987	0.374	0.398	0.772
07-01-90	1987	0.339	0.400	0.739	1988	0.372	0.432	0.804
03-01-91	1988	0.353	0.494	0.847	1989	0.365	0.495	0.860
HAWAII								
10-01-88	1986	0.280	0.438	0.718	1987	0.265	0.418	0.683
10-01-89	1987	0.260	0.400	0.660	1988	0.261	0.408	0.669
01-01-91	1988	0.429	0.674	1.103	1989	0.445	0.653	1.098

* AY L/R's adjusted to common cost level of PY L/R's.

NATIONAL COUNCIL ON COMPENSATION INSURANCE
COMPARISON OF LOSS RATIOS
Policy Year vs. Accident Year

Filing Effective	Policy Year	Policy Year Data			Accident Year	Accident Year Data		
		Medical Loss Ratio	Indemnity Loss Ratio	Combined Loss Ratio		Trended Medical Loss Ratio*	Trended Indemnity Loss Ratio*	Trended Combined Loss Ratio*
IDAHO								
01-01-89	1986	0.296	0.405	0.701	1987	0.274	0.417	0.691
01-01-90	1987	0.313	0.433	0.746	1988	0.347	0.428	0.775
01-01-91	1988	0.341	0.440	0.781	1989	0.335	0.443	0.778
ILLINOIS								
01-01-89	1986	0.236	0.507	0.743	1987	0.228	0.491	0.719
01-01-90	1987	0.251	0.519	0.770	1988	0.255	0.528	0.783
01-01-91	1988	0.246	0.513	0.759	1989	0.251	0.532	0.783
INDIANA								
09-01-88	1986	0.452	0.333	0.785	1987	0.466	0.347	0.813
01-01-90	1987	0.442	0.360	0.802	1988	0.480	0.364	0.844
01-01-91	1988	0.410	0.322	0.732	1989	0.421	0.309	0.730
IOWA								
04-01-89	1986	0.274	0.414	0.688	1987	0.308	0.461	0.769
04-01-90	1987	0.291	0.426	0.717	1988	0.322	0.455	0.777
04-01-91	1988	0.327	0.461	0.788	1989	0.321	0.466	0.787
KANSAS								
N/A	1986				1987			
05-01-90	1987	0.359	0.471	0.830	1988	0.413	0.537	0.950
06-01-91	1988	0.402	0.509	0.911	1989	0.394	0.521	0.915
KENTUCKY								
07-01-89	1986	0.518	0.553	1.071	1987	0.527	0.554	1.081
N/A	1987				1988			
08-01-91	1988	0.644	0.549	1.193	1989	0.611	0.497	1.108
LOUISIANA								
01-01-89	1986	0.654	0.937	1.591	1987	0.644	1.079	1.723
01-01-90	1987	0.476	0.790	1.266	1988	0.537	0.854	1.391
05-01-91	1988	0.521	0.695	1.216	1989	0.558	0.776	1.334
MAINE								
03-20-89	1986	0.263	0.685	0.948	1987	0.256	0.713	0.969
04-17-90	1987	0.226	0.572	0.798	1988	0.244	0.600	0.844
01-01-91	1988	0.255	0.578	0.833	1989	0.261	0.654	0.915
MARYLAND								
01-01-89	1986	0.384	0.598	0.982	1987	0.334	0.568	0.902
01-01-90	1987	0.372	0.642	1.014	1988	0.358	0.621	0.979
01-01-91	1988	0.431	0.623	1.054	1989	0.423	0.617	1.040
MICHIGAN								
01-01-89	1986	0.305	0.618	0.923	1987	0.316	0.630	0.946
01-01-90	1987	0.402	0.835	1.237	1988	0.408	0.819	1.227
01-01-91	1988	0.298	0.651	0.949	1989	0.300	0.674	0.974

* AY L/R's adjusted to common cost level of PY L/R's.

NATIONAL COUNCIL ON COMPENSATION INSURANCE
COMPARISON OF LOSS RATIOS
Policy Year vs. Accident Year

Filing Effective	Policy Year	Policy Year Data			Accident Year	Accident Year Data		
		Medical Loss Ratio	Indemnity Loss Ratio	Combined Loss Ratio		Trended Medical Loss Ratio*	Trended Indemnity Loss Ratio*	Trended Combined Loss Ratio*
MISSISSIPPI								
06-01-90	1986	0.430	0.445	0.875	1987	0.434	0.422	0.856
N/A	1987				1988			
07-01-91	1988	0.476	0.414	0.890	1989	0.479	0.419	0.898
MISSOURI								
07-01-89	1986	0.298	0.449	0.747	1987	0.313	0.472	0.785
09-01-90	1987	0.344	0.480	0.824	1988	0.363	0.479	0.842
09-01-91	1988	0.343	0.456	0.799	1989	0.352	0.462	0.814
MONTANA								
07-01-89	1986	0.239	0.551	0.790	1987	0.196	0.525	0.721
07-01-90	1987	0.263	0.514	0.777	1988	0.320	0.465	0.785
07-01-91	1988	0.276	0.483	0.759	1989	0.288	0.458	0.746
NEBRASKA								
09-01-89	1986	0.353	0.476	0.829	1987	0.365	0.433	0.798
10-01-90	1987	0.378	0.487	0.865	1988	0.414	0.522	0.936
07-01-91	1988	0.346	0.431	0.777	1989	0.361	0.443	0.804
NEW HAMPSHIRE								
N/A	1986				1987			
07-01-90	1987	0.277	0.541	0.818	1988	0.269	0.519	0.788
01-01-91	1988	0.294	0.523	0.817	1989	0.289	0.515	0.804
NEW MEXICO								
04-01-89	1986	0.367	0.612	0.979	1987	0.414	0.665	1.079
01-01-90	1987	0.539	0.747	1.286	1988	0.574	0.688	1.262
02-15-91	1988	0.605	0.795	1.400	1989	0.589	0.742	1.331
NORTH CAROLINA								
N/A	1986				1987			
01-01-90	1987	0.389	0.409	0.798	1988	0.412	0.430	0.842
01-01-91	1988	0.391	0.452	0.843	1989	0.410	0.457	0.867
OKLAHOMA								
07-01-89	1986	0.275	0.487	0.762	1987	0.250	0.501	0.751
07-01-90	1987	0.316	0.483	0.799	1988	0.371	0.530	0.901
07-01-91	1988	0.346	0.598	0.944	1989	0.333	0.593	0.926
OREGON								
01-01-89	1986	0.514	0.551	1.065	1987	0.535	0.600	1.135
01-01-90	1987	0.444	0.540	0.984	1988	0.443	0.547	0.990
01-01-91	1988	0.434	0.478	0.912	1989	0.420	0.483	0.903
RHODE ISLAND								
06-22-89	1986	0.248	0.983	1.231	1987	0.263	1.016	1.279
02-01-90	1987	0.300	1.122	1.422	1988	0.313	1.095	1.408
N/A	1988				1989			

* AY L/R's adjusted to common cost level of PY L/R's.

NATIONAL COUNCIL ON COMPENSATION INSURANCE
COMPARISON OF LOSS RATIOS
Policy Year vs. Accident Year

Policy Year Data						Accident Year Data		
Filing Effective	Policy Year	Medical Loss Ratio	Indemnity Loss Ratio	Combined Loss Ratio	Accident Year	Trended Medical Loss Ratio*	Trended Indemnity Loss Ratio*	Trended Combined Loss Ratio*
SOUTH CAROLINA								
02-06-89	1986	0.270	0.459	0.729	1987	0.287	0.490	0.777
07-01-90	1987	0.391	0.604	0.995	1988	0.407	0.630	1.037
07-01-91	1988	0.352	0.578	0.930	1989	0.428	0.634	1.062
SOUTH DAKOTA								
02-01-89	1986	0.334	0.548	0.882	1987	0.380	0.566	0.946
06-01-90	1987	0.311	0.535	0.846	1988	0.348	0.554	0.902
05-01-91	1988	0.329	0.447	0.776	1989	0.323	0.470	0.793
TENNESSEE								
N/A	1986				1987			
01-01-90	1987	0.409	0.489	0.898	1988	0.433	0.518	0.951
01-01-91	1988	0.373	0.481	0.854	1989	0.362	0.458	0.820
TEXAS								
01-01-89	1986	0.380	0.570	0.950	1987	0.399	0.588	0.987
01-01-90	1987	0.441	0.592	1.033	1988	0.498	0.657	1.155
01-01-91	1988	0.424	0.538	0.962	1989	0.425	0.543	0.968
UTAH pc								
01-01-89	1986	0.317	0.279	0.596	1987	0.316	0.250	0.566
01-01-90	1987	0.357	0.287	0.644	1988	0.441	0.367	0.808
01-01-91	1988	0.508	0.359	0.867	1989	0.546	0.341	0.887
VERMONT								
07-01-89	1986	0.330	0.508	0.838	1987	0.339	0.557	0.896
07-01-90	1987	0.279	0.460	0.739	1988	0.277	0.504	0.781
07-01-91	1988	0.279	0.470	0.749	1989	0.286	0.419	0.705
VIRGINIA								
11-01-88	1986	0.419	0.508	0.927	1987	0.404	0.505	0.909
N/A	1987				1988			
11-01-90	1988	0.444	0.467	0.911	1989	0.448	0.448	0.896
WISCONSIN								
07-01-88	1986	0.328	0.477	0.805	1987	0.360	0.463	0.823
07-01-88	1986	0.304	0.427	0.731	1987	0.319	0.424	0.743
07-01-89	1987	0.311	0.442	0.753	1988	0.337	0.445	0.782
07-01-90	1988	0.313	0.392	0.705	1989	0.327	0.413	0.740

* AY L/R's adjusted to common cost level of PY L/R's.

NATIONAL COUNCIL ON COMPENSATION INSURANCE

State -----	Estimated Correction Factor for Calendar Year Current Rate Level Adjustment -----
ALABAMA	1.010
ALASKA	1.002
ARIZONA	1.004
ARKANSAS	1.007
COLORADO	1.004
CONNECTICUT	1.011
DIST. OF COL.	1.006
FLORIDA	1.010
GEORGIA	1.019
HAWAII	1.009
IDAHO	1.004
ILLINOIS	1.004
INDIANA	1.008
IOWA	1.005
KANSAS	1.009
KENTUCKY	1.011
LOUISIANA	1.009
MAINE	1.010
MARYLAND	0.998
MICHIGAN	1.003
MISSISSIPPI	1.008
MISSOURI	1.012
MONTANA	1.005
NEBRASKA	1.006
NEW HAMPSHIRE	1.010
NEW MEXICO	1.001
NORTH CAROLINA	1.012
OKLAHOMA	1.001
OREGON	1.009
RHODE ISLAND	1.009
SOUTH CAROLINA	1.014
SOUTH DAKOTA	1.007
TENNESSEE	1.010
TEXAS	1.010
UTAH	1.002
VERMONT	1.009
VIRGINIA	1.010
WISCONSIN	1.005
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Average:	1.007

Note: The basis for the correction factor was discussed in Section V.F. of our report on Premium and Loss Development Factors (Section IIB - Part 1 of NCCI Examination)

NATIONAL COUNCIL ON COMPENSATION INSURANCE
COMPARISON OF LOSS RATIOS
Policy Year vs. Accident Year
Calendar Year EP Adjusted for Estimated Difference in Earning Patterns

Filing Effective	Policy Year	Policy Year Data			Accident Year	Accident Year Data		
		Medical Loss Ratio	Indemnity Loss Ratio	Combined Loss Ratio		Trended Medical Loss Ratio*	Trended Indemnity Loss Ratio*	Trended Combined Loss Ratio*
ALABAMA								
N/A	1986				1987			
03-01-90	1987	0.473	0.415	0.888	1988	0.516	0.430	0.946
04-01-91	1988	0.539	0.421	0.960	1989	0.522	0.401	0.923
ALASKA								
01-01-89	1986	0.231	0.473	0.704	1987	0.245	0.490	0.735
01-01-90	1987	0.247	0.438	0.685	1988	0.295	0.456	0.751
01-01-91	1988	0.274	0.376	0.650	1989	0.269	0.366	0.635
ARIZONA								
10-01-88	1986	0.350	0.328	0.678	1987	0.357	0.323	0.680
10-01-89	1987	0.379	0.335	0.714	1988	0.407	0.359	0.766
10-01-90	1988	0.379	0.333	0.712	1989	0.361	0.309	0.670
ARKANSAS								
01-01-90	1986	0.355	0.396	0.751	1987	0.388	0.433	0.821
03-01-91	1987	0.368	0.422	0.790	1988	0.364	0.416	0.780
N/A	1988				1989			
COLORADO								
01-01-89	1986	0.257	0.474	0.731	1987	0.244	0.443	0.687
06-01-90	1987	0.266	0.480	0.746	1988	0.302	0.495	0.797
08-01-91	1988	0.391	0.678	1.069	1989	0.454	0.761	1.215
CONNECTICUT								
01-01-89	1986	0.242	0.590	0.832	1987	0.241	0.631	0.872
01-01-90	1987	0.339	0.835	1.174	1988	0.359	0.813	1.172
01-01-91	1988	0.310	0.686	0.996	1989	0.310	0.650	0.960
DIST. OF COL.								
03-01-89	1986	0.275	0.586	0.861	1987	0.195	0.601	0.796
05-15-90	1987	0.258	0.544	0.802	1988	0.213	0.412	0.625
04-01-91	1988	0.277	0.420	0.697	1989	0.288	0.421	0.709
FLORIDA								
01-01-89	1986	0.360	0.561	0.921	1987	0.343	0.525	0.868
01-01-90	1987	0.373	0.605	0.978	1988	0.411	0.643	1.054
N/A	1988				1989			
GEORGIA								
07-01-89	1986	0.363	0.409	0.772	1987	0.367	0.391	0.758
07-01-90	1987	0.339	0.400	0.739	1988	0.365	0.424	0.789
03-01-91	1988	0.353	0.494	0.847	1989	0.358	0.486	0.844
HAWAII								
10-01-88	1986	0.280	0.438	0.718	1987	0.263	0.414	0.677
10-01-89	1987	0.260	0.400	0.660	1988	0.259	0.405	0.664
01-01-91	1988	0.429	0.674	1.103	1989	0.441	0.647	1.088

* AY L/R's adjusted to common cost level of PY L/R's.

NATIONAL COUNCIL ON COMPENSATION INSURANCE
COMPARISON OF LOSS RATIOS
Policy Year vs. Accident Year
Calendar Year EP Adjusted for Estimated Difference in Earning Patterns

Policy Year Data					Accident Year Data			
Filing Effective	Policy Year	Medical Loss Ratio	Indemnity Loss Ratio	Combined Loss Ratio	Accident Year	Trended Medical Loss Ratio*	Trended Indemnity Loss Ratio*	Trended Combined Loss Ratio*
IDAHO								
01-01-89	1986	0.296	0.405	0.701	1987	0.273	0.415	0.688
01-01-90	1987	0.313	0.433	0.746	1988	0.345	0.426	0.771
01-01-91	1988	0.341	0.440	0.781	1989	0.333	0.441	0.774
ILLINOIS								
01-01-89	1986	0.236	0.507	0.743	1987	0.227	0.489	0.716
01-01-90	1987	0.251	0.519	0.770	1988	0.254	0.526	0.780
01-01-91	1988	0.246	0.513	0.759	1989	0.250	0.530	0.780
INDIANA								
09-01-88	1986	0.452	0.333	0.785	1987	0.462	0.344	0.806
01-01-90	1987	0.442	0.360	0.802	1988	0.476	0.362	0.838
01-01-91	1988	0.410	0.322	0.732	1989	0.418	0.307	0.725
IOWA								
04-01-89	1986	0.274	0.414	0.688	1987	0.306	0.459	0.765
04-01-90	1987	0.291	0.426	0.717	1988	0.321	0.453	0.774
04-01-91	1988	0.327	0.461	0.788	1989	0.319	0.464	0.783
KANSAS								
N/A	1986				1987			
05-01-90	1987	0.359	0.471	0.830	1988	0.410	0.532	0.942
06-01-91	1988	0.402	0.509	0.911	1989	0.391	0.517	0.908
KENTUCKY								
07-01-89	1986	0.518	0.553	1.071	1987	0.522	0.548	1.070
N/A	1987				1988			
08-01-91	1988	0.644	0.549	1.193	1989	0.604	0.491	1.095
LOUISIANA								
01-01-89	1986	0.654	0.937	1.591	1987	0.638	1.070	1.708
01-01-90	1987	0.476	0.790	1.266	1988	0.532	0.846	1.378
05-01-91	1988	0.521	0.695	1.216	1989	0.553	0.769	1.322
MAINE								
03-20-89	1986	0.263	0.685	0.948	1987	0.253	0.706	0.959
04-17-90	1987	0.226	0.572	0.798	1988	0.241	0.594	0.835
01-01-91	1988	0.255	0.578	0.833	1989	0.258	0.647	0.905
MARYLAND								
01-01-89	1986	0.384	0.598	0.982	1987	0.334	0.569	0.903
01-01-90	1987	0.372	0.642	1.014	1988	0.358	0.622	0.980
01-01-91	1988	0.431	0.623	1.054	1989	0.423	0.618	1.041
MICHIGAN								
01-01-89	1986	0.305	0.618	0.923	1987	0.315	0.628	0.943
01-01-90	1987	0.402	0.835	1.237	1988	0.407	0.816	1.223
01-01-91	1988	0.298	0.651	0.949	1989	0.299	0.672	0.971

* AY L/R's adjusted to common cost level of PY L/R's.

NATIONAL COUNCIL ON COMPENSATION INSURANCE
COMPARISON OF LOSS RATIOS
Policy Year vs. Accident Year
Calendar Year EP Adjusted for Estimated Difference in Earning Patterns

Filing Effective	Policy Year	Policy Year Data			Accident Year	Accident Year Data		
		Medical Loss Ratio	Indemnity Loss Ratio	Combined Loss Ratio		Trended Medical Loss Ratio*	Trended Indemnity Loss Ratio*	Trended Combined Loss Ratio*
MISSISSIPPI								
06-01-90	1986	0.430	0.445	0.875	1987	0.431	0.419	0.850
N/A	1987				1988			
07-01-91	1988	0.476	0.414	0.890	1989	0.475	0.415	0.890
MISSOURI								
07-01-89	1986	0.298	0.449	0.747	1987	0.309	0.467	0.776
09-01-90	1987	0.344	0.480	0.824	1988	0.359	0.473	0.832
09-01-91	1988	0.343	0.456	0.799	1989	0.348	0.457	0.805
MONTANA								
07-01-89	1986	0.239	0.551	0.790	1987	0.195	0.522	0.717
07-01-90	1987	0.263	0.514	0.777	1988	0.319	0.462	0.781
07-01-91	1988	0.276	0.483	0.759	1989	0.287	0.456	0.743
NEBRASKA								
09-01-89	1986	0.353	0.476	0.829	1987	0.363	0.431	0.794
10-01-90	1987	0.378	0.487	0.865	1988	0.412	0.519	0.931
07-01-91	1988	0.346	0.431	0.777	1989	0.359	0.441	0.800
NEW HAMPSHIRE								
N/A	1986				1987			
07-01-90	1987	0.277	0.541	0.818	1988	0.266	0.514	0.780
01-01-91	1988	0.294	0.523	0.817	1989	0.286	0.510	0.796
NEW MEXICO								
04-01-89	1986	0.367	0.612	0.979	1987	0.413	0.664	1.077
01-01-90	1987	0.539	0.747	1.286	1988	0.573	0.687	1.260
02-15-91	1988	0.605	0.795	1.400	1989	0.589	0.741	1.330
NORTH CAROLINA								
N/A	1986				1987			
01-01-90	1987	0.389	0.409	0.798	1988	0.407	0.425	0.832
01-01-91	1988	0.391	0.452	0.843	1989	0.405	0.452	0.857
OKLAHOMA								
07-01-89	1986	0.275	0.487	0.762	1987	0.250	0.501	0.751
07-01-90	1987	0.316	0.483	0.799	1988	0.371	0.530	0.901
07-01-91	1988	0.346	0.598	0.944	1989	0.333	0.592	0.925
OREGON								
01-01-89	1986	0.514	0.551	1.065	1987	0.530	0.594	1.124
01-01-90	1987	0.444	0.540	0.984	1988	0.439	0.542	0.981
01-01-91	1988	0.434	0.478	0.912	1989	0.416	0.478	0.894
RHODE ISLAND								
06-22-89	1986	0.248	0.983	1.231	1987	0.260	1.007	1.267
02-01-90	1987	0.300	1.122	1.422	1988	0.310	1.086	1.396
N/A	1988				1989			

* AY L/R's adjusted to common cost level of PY L/R's.

NATIONAL COUNCIL ON COMPENSATION INSURANCE
COMPARISON OF LOSS RATIOS
Policy Year vs. Accident Year
Calendar Year EP Adjusted for Estimated Difference in Earning Patterns

Policy Year Data					Accident Year Data			
Filing Effective	Policy Year	Medical Loss Ratio	Indemnity Loss Ratio	Combined Loss Ratio	Accident Year	Trended Medical Loss Ratio*	Trended Indemnity Loss Ratio*	Trended Combined Loss Ratio*
SOUTH CAROLINA								
02-06-89	1986	0.270	0.459	0.729	1987	0.283	0.483	0.766
07-01-90	1987	0.391	0.604	0.995	1988	0.401	0.621	1.022
07-01-91	1988	0.352	0.578	0.930	1989	0.422	0.625	1.047
SOUTH DAKOTA								
02-01-89	1986	0.334	0.548	0.882	1987	0.378	0.562	0.940
06-01-90	1987	0.311	0.535	0.846	1988	0.346	0.551	0.897
05-01-91	1988	0.329	0.447	0.776	1989	0.320	0.467	0.787
TENNESSEE								
N/A	1986				1987			
01-01-90	1987	0.409	0.489	0.898	1988	0.429	0.513	0.942
01-01-91	1988	0.373	0.481	0.854	1989	0.359	0.454	0.813
TEXAS								
01-01-89	1986	0.380	0.570	0.950	1987	0.395	0.582	0.977
01-01-90	1987	0.441	0.592	1.033	1988	0.493	0.650	1.143
01-01-91	1988	0.424	0.538	0.962	1989	0.421	0.538	0.959
UTAH pc								
01-01-89	1986	0.317	0.279	0.596	1987	0.315	0.249	0.564
01-01-90	1987	0.357	0.287	0.644	1988	0.440	0.366	0.806
01-01-91	1988	0.508	0.359	0.867	1989	0.545	0.340	0.885
VERMONT								
07-01-89	1986	0.330	0.508	0.838	1987	0.336	0.552	0.888
07-01-90	1987	0.279	0.460	0.739	1988	0.275	0.500	0.775
07-01-91	1988	0.279	0.470	0.749	1989	0.283	0.415	0.698
VIRGINIA								
11-01-88	1986	0.419	0.508	0.927	1987	0.400	0.500	0.900
N/A	1987				1988			
11-01-90	1988	0.444	0.467	0.911	1989	0.444	0.443	0.887
WISCONSIN								
07-01-88	1986	0.328	0.477	0.805	1987	0.358	0.461	0.819
07-01-88	1986	0.304	0.427	0.731	1987	0.318	0.422	0.740
07-01-89	1987	0.311	0.442	0.753	1988	0.335	0.443	0.778
07-01-90	1988	0.313	0.392	0.705	1989	0.326	0.411	0.737

* AY L/R's adjusted to common cost level of PY L/R's.

**NATIONAL COUNCIL ON COMPENSATION INSURANCE
COMPARISON OF LOSS RATIOS
Policy Year vs. Accident Year
Calendar Year EP Adjusted for Estimated Difference in Earning Patterns**

Filing Effective	Year = N	Trended AY N L/R Ratioed to PY N-1 L/R		
		Medical	Indemnity	Combined
ALABAMA				
N/A	1987			
03-01-90	1988	1.091	1.036	1.065
04-01-91	1989	0.968	0.952	0.961
ALASKA				
01-01-89	1987	1.061	1.036	1.044
01-01-90	1988	1.194	1.041	1.096
01-01-91	1989	0.982	0.973	0.977
ARIZONA				
10-01-88	1987	1.020	0.985	1.003
10-01-89	1988	1.074	1.072	1.073
10-01-90	1989	0.953	0.928	0.941
ARKANSAS				
01-01-90	1987	1.093	1.093	1.093
03-01-91	1988	0.989	0.986	0.987
N/A	1989			
COLORADO				
01-01-89	1987	0.949	0.935	0.940
06-01-90	1988	1.135	1.031	1.068
08-01-91	1989	1.161	1.122	1.137
CONNECTICUT				
01-01-89	1987	0.996	1.069	1.048
01-01-90	1988	1.059	0.974	0.998
01-01-91	1989	1.000	0.948	0.964
DIST. OF COL.				
03-01-89	1987	0.709	1.026	0.925
05-15-90	1988	0.826	0.757	0.779
04-01-91	1989	1.040	1.002	1.017
FLORIDA				
01-01-89	1987	0.953	0.936	0.942
01-01-90	1988	1.102	1.063	1.078
N/A	1989			
GEORGIA				
07-01-89	1987	1.011	0.956	0.982
07-01-90	1988	1.077	1.060	1.068
03-01-91	1989	1.014	0.984	0.996
HAWAII				
10-01-88	1987	0.939	0.945	0.943
10-01-89	1988	0.996	1.013	1.006
01-01-91	1989	1.028	0.960	0.986

* AY L/R's adjusted to common cost level of PY L/R's.

**NATIONAL COUNCIL ON COMPENSATION INSURANCE
COMPARISON OF LOSS RATIOS
Policy Year vs. Accident Year
Calendar Year EP Adjusted for Estimated Difference in Earning Patterns**

Filing Effective	Year = N	Trended AY N L/R Ratioed to PY N-1 L/R		
		Medical	Indemnity	Combined
IDAHO				
01-01-89	1987	0.922	1.025	0.981
01-01-90	1988	1.102	0.984	1.034
01-01-91	1989	0.977	1.002	0.991
ILLINOIS				
01-01-89	1987	0.962	0.964	0.964
01-01-90	1988	1.012	1.013	1.013
01-01-91	1989	1.016	1.033	1.028
INDIANA				
09-01-88	1987	1.022	1.033	1.027
01-01-90	1988	1.077	1.006	1.045
01-01-91	1989	1.020	0.953	0.990
IOWA				
04-01-89	1987	1.117	1.109	1.112
04-01-90	1988	1.103	1.063	1.079
04-01-91	1989	0.976	1.007	0.994
KANSAS				
N/A	1987			
05-01-90	1988	1.142	1.130	1.135
06-01-91	1989	0.973	1.016	0.997
KENTUCKY				
07-01-89	1987	1.008	0.991	0.999
N/A	1988			
08-01-91	1989	0.938	0.894	0.918
LOUISIANA				
01-01-89	1987	0.976	1.142	1.074
01-01-90	1988	1.118	1.071	1.088
05-01-91	1989	1.061	1.106	1.087
MAINE				
03-20-89	1987	0.962	1.031	1.012
04-17-90	1988	1.066	1.038	1.046
01-01-91	1989	1.012	1.119	1.086
MARYLAND				
01-01-89	1987	0.870	0.952	0.920
01-01-90	1988	0.962	0.969	0.966
01-01-91	1989	0.981	0.992	0.988
MICHIGAN				
01-01-89	1987	1.033	1.016	1.022
01-01-90	1988	1.012	0.977	0.989
01-01-91	1989	1.003	1.032	1.023

* AY L/R's adjusted to common cost level of PY L/R's.

**NATIONAL COUNCIL ON COMPENSATION INSURANCE
COMPARISON OF LOSS RATIOS
Policy Year vs. Accident Year
Calendar Year EP Adjusted for Estimated Difference in Earning Patterns**

Filing Effective	Year = N	Trended AY N L/R Ratioed to PY N-1 L/R		
		Medical	Indemnity	Combined
MISSISSIPPI				
06-01-90	1987	1.002	0.942	0.971
N/A	1988			
07-01-91	1989	0.998	1.002	1.000
MISSOURI				
07-01-89	1987	1.037	1.040	1.039
09-01-90	1988	1.044	0.985	1.010
09-01-91	1989	1.015	1.002	1.008
MONTANA				
07-01-89	1987	0.816	0.947	0.908
07-01-90	1988	1.213	0.899	1.005
07-01-91	1989	1.040	0.944	0.979
NEBRASKA				
09-01-89	1987	1.028	0.905	0.958
10-01-90	1988	1.090	1.066	1.076
07-01-91	1989	1.038	1.023	1.030
NEW HAMPSHIRE				
N/A	1987			
07-01-90	1988	0.960	0.950	0.954
01-01-91	1989	0.973	0.975	0.974
NEW MEXICO				
04-01-89	1987	1.125	1.085	1.100
01-01-90	1988	1.063	0.920	0.980
02-15-91	1989	0.974	0.932	0.950
NORTH CAROLINA				
N/A	1987			
01-01-90	1988	1.046	1.039	1.043
01-01-91	1989	1.036	1.000	1.017
OKLAHOMA				
07-01-89	1987	0.909	1.029	0.986
07-01-90	1988	1.174	1.097	1.128
07-01-91	1989	0.962	0.990	0.980
OREGON				
01-01-89	1987	1.031	1.078	1.055
01-01-90	1988	0.989	1.004	0.997
01-01-91	1989	0.959	1.000	0.980
RHODE ISLAND				
06-22-89	1987	1.048	1.024	1.029
02-01-90	1988	1.033	0.968	0.982
N/A	1989			

* AY L/R's adjusted to common cost level of PY L/R's.

**NATIONAL COUNCIL ON COMPENSATION INSURANCE
COMPARISON OF LOSS RATIOS
Policy Year vs. Accident Year
Calendar Year EP Adjusted for Estimated Difference in Earning Patterns**

Filing Effective	Year = N	Trended AY N L/R Ratioed to PY N-1 L/R		
		Medical	Indemnity	Combined
SOUTH CAROLINA				
02-06-89	1987	1.048	1.052	1.051
07-01-90	1988	1.026	1.028	1.027
07-01-91	1989	1.199	1.081	1.126
SOUTH DAKOTA				
02-01-89	1987	1.132	1.026	1.066
06-01-90	1988	1.113	1.030	1.060
05-01-91	1989	0.973	1.045	1.014
TENNESSEE				
N/A	1987			
01-01-90	1988	1.049	1.049	1.049
01-01-91	1989	0.962	0.944	0.952
TEXAS				
01-01-89	1987	1.039	1.021	1.028
01-01-90	1988	1.118	1.098	1.106
01-01-91	1989	0.993	1.000	0.997
UTAH pc				
01-01-89	1987	0.994	0.892	0.946
01-01-90	1988	1.232	1.275	1.252
01-01-91	1989	1.073	0.947	1.021
VERMONT				
07-01-89	1987	1.018	1.087	1.060
07-01-90	1988	0.986	1.087	1.049
07-01-91	1989	1.014	0.883	0.932
VIRGINIA				
11-01-88	1987	0.955	0.984	0.971
N/A	1988			
11-01-90	1989	1.000	0.949	0.974
WISCONSIN				
07-01-88	1987	1.091	0.966	1.017
07-01-88	1987	1.046	0.988	1.012
07-01-89	1988	1.077	1.002	1.033
07-01-90	1989	1.042	1.048	1.045

* AY L/R's adjusted to common cost level of PY L/R's.

NATIONAL COUNCIL ON COMPENSATION INSURANCE

Comparison of Policy Year 1986 and Accident Year 1987 Loss Ratios

	<u>Medical</u>	<u>Indemnity</u>	<u>Combined</u>
Number of States with Data	34	34	34
Number of States for Which the Accident Year Loss Ratio is Greater than the Policy Year Loss Ratio	20	19	19
Percentage of States for Which the Accident Year Loss Ratio is Greater than the Policy Year Loss Ratio	58.8%	55.9%	55.9%
Average Ratio of Accident Year Loss Ratio to Policy Year Loss Ratio	0.998	1.009	1.007
Weighted Average Ratio of Accident Year Loss Ratio to Policy Year Loss Ratio	1.009	1.008	1.008

Notes: Losses have been developed to ultimate, adjusted to common benefit level, and trended to a common average accident date.

Policy Year premiums have been developed to ultimate; both Policy Year and Accident Year premiums have been adjusted to a common rate level.

Calendar Year premiums have been adjusted for estimated bias in the current rate level calculation.

NATIONAL COUNCIL ON COMPENSATION INSURANCE

Comparison of Policy Year 1987 and Accident Year 1988 Loss Ratios

	<u>Medical</u>	<u>Indemnity</u>	<u>Combined</u>
Number of States with Data	35	35	35
Number of States for Which the Accident Year Loss Ratio is Greater than the Policy Year Loss Ratio	28	24	26
Percentage of States for Which the Accident Year Loss Ratio is Greater than the Policy Year Loss Ratio	80.0%	68.6%	74.3%
Average Ratio of Accident Year Loss Ratio to Policy Year Loss Ratio	1.067	1.022	1.039
Weighted Average Ratio of Accident Year Loss Ratio to Policy Year Loss Ratio	1.072	1.035	1.049

Notes: Losses have been developed to ultimate, adjusted to common benefit level, and trended to a common average accident date.

Policy Year premiums have been developed to ultimate; both Policy Year and Accident Year premiums have been adjusted to a common rate level.

Calendar Year premiums have been adjusted for estimated bias in the current rate level calculation.

NATIONAL COUNCIL ON COMPENSATION INSURANCE

Comparison of Policy Year 1988 and Accident Year 1989 Loss Ratios

	<u>Medical</u>	<u>Indemnity</u>	<u>Combined</u>
Number of States with Data	35	35	35
Number of States for Which the Accident Year Loss Ratio is Greater than the Policy Year Loss Ratio	17	15	13
Percentage of States for Which the Accident Year Loss Ratio is Greater than the Policy Year Loss Ratio	48.6%	42.9%	37.1%
Average Ratio of Accident Year Loss Ratio to Policy Year Loss Ratio	1.010	0.994	1.002
Weighted Average Ratio of Accident Year Loss Ratio to Policy Year Loss Ratio	1.005	1.004	1.005

Notes: Losses have been developed to ultimate, adjusted to common benefit level, and trended to a common average accident date.

Policy Year premiums have been developed to ultimate; both Policy Year and Accident Year premiums have been adjusted to a common rate level.

Calendar Year premiums have been adjusted for estimated bias in the current rate level calculation.

NATIONAL COUNCIL ON COMPENSATION INSURANCE
ANALYSIS OF RELATIONSHIP BETWEEN POLICY YEAR AND CALENDAR YEAR EARNED PREMIUM

DATA FOR PREMIUM RANKING COMPARISONS -
UNCORRECTED FOR EXPECTED EARNING PATTERNS

RANKINGS, LOWEST TO HIGHEST

STATE	POLICY YEAR 87	CALENDAR YEAR 88	POLICY YEAR 88	STATE	POLICY YEAR 87	CALENDAR YEAR 88	POLICY YEAR 88
ALABAMA	464,458,248	449,031,628	473,343,554	ALABAMA	2	1	3
ALASKA	155,714,809	154,025,757	153,394,992	ALASKA	3	2	1
ARIZONA	299,300,146	288,806,125	310,657,815	ARIZONA	2	1	3
ARKANSAS				ARKANSAS			
COLORADO	557,432,282	539,123,048	538,558,609	COLORADO	3	2	1
CONNECTICUT	692,545,118	692,060,302	754,403,439	CONNECTICUT	2	1	3
D.O.C.	136,138,021	135,778,764	148,277,741	D.O.C.	2	1	3
FLORIDA				FLORIDA			
GEORGIA	1,062,593,661	1,026,870,182	1,050,974,027	GEORGIA	3	1	2
HAWAII	199,768,509	222,513,811	223,879,677	HAWAII	1	2	3
IDAHO	89,447,223	89,306,633	89,348,428	IDAHO	3	1	2
ILLINOIS	1,787,743,784	1,799,974,498	1,835,208,808	ILLINOIS	1	2	3
INDIANA	493,764,578	481,859,987	503,305,301	INDIANA	2	1	3
IOWA	333,336,353	335,647,183	347,281,048	IOWA	1	2	3
KANSAS	272,352,780	284,494,590	282,735,834	KANSAS	1	3	2
KENTUCKY	223,667,930	213,925,229	224,844,956	KENTUCKY	2	1	3
LOUISIANA	390,284,898	365,890,410	365,316,866	LOUISIANA	3	2	1
MAINE	358,777,821	333,412,235	339,315,103	MAINE	3	1	2
MARYLAND	309,771,490	330,477,617	315,990,369	MARYLAND	1	3	2
MICHIGAN	851,879,038	883,483,491	985,180,601	MICHIGAN	1	2	3
MISSISSIPPI	258,511,716	243,480,146	249,662,967	MISSISSIPPI	3	1	2
MISSOURI	535,481,752	555,712,330	570,853,871	MISSOURI	1	2	3
MONTANA	56,829,510	56,989,768	54,762,526	MONTANA	2	3	1
NEBRASKA	164,153,838	158,048,172	174,144,320	NEBRASKA	2	1	3
NEW HAMPSHIRE	259,261,471	262,683,767	268,483,208	NEW HAMPSHIRE	1	2	3
NEW MEXICO	182,562,816	178,111,068	180,615,976	NEW MEXICO	3	1	2
N CAROLINA	582,016,705	575,375,451	605,040,540	N CAROLINA	2	1	3
OKLAHOMA	274,701,004	250,548,468	262,275,836	OKLAHOMA	3	1	2
OREGON	302,428,503	315,017,942	328,460,918	OREGON	1	2	3
RHODE ISLAND				RHODE ISLAND			
S CAROLINA	231,888,711	238,573,105	255,828,552	S CAROLINA	1	2	3
S DAKOTA	78,410,323	76,725,792	82,878,193	S DAKOTA	2	1	3
TENNESSEE	550,322,676	563,813,759	580,783,523	TENNESSEE	1	2	3
TEXAS	3,964,822,664	3,599,835,383	3,820,206,623	TEXAS	3	1	2
UTAH	56,303,043	49,223,447	49,538,854	UTAH	3	1	2
VERMONT	81,192,258	88,304,991	91,223,497	VERMONT	1	2	3
VIRGINIA	530,464,830	539,257,853	572,416,028	VIRGINIA	1	2	3
WISCONSIN	721,647,977	720,724,106	766,023,875	WISCONSIN	2	1	3
TOTALS	17,509,976,490	17,099,107,039	17,855,216,475	AVERAGE	1.943	1.571	2.486
				Number of 1's	13	18	4
				Number of 2's	11	14	10
				Number of 3's	11	3	21

NATIONAL COUNCIL ON COMPENSATION INSURANCE
ANALYSIS OF RELATIONSHIP BETWEEN POLICY YEAR AND CALENDAR YEAR EARNED PREMIUM

DATA FOR PREMIUM RANKING COMPARISONS -
CORRECTED FOR EXPECTED EARNING PATTERNS

RANKINGS, LOWEST TO HIGHEST

STATE	POLICY YEAR 87	CALENDAR YEAR 88	POLICY YEAR 88	STATE	POLICY YEAR 87	CALENDAR YEAR 88	POLICY YEAR 88
ALABAMA	464,458,248	453,521,945	473,343,554	ALABAMA	2	1	3
ALASKA	155,714,809	154,333,809	153,394,992	ALASKA	3	2	1
ARIZONA	299,300,146	289,961,350	310,657,815	ARIZONA	2	1	3
ARKANSAS				ARKANSAS			
COLORADO	557,432,282	541,279,540	538,558,609	COLORADO	3	2	1
CONNECTICUT	692,545,118	699,672,965	754,403,439	CONNECTICUT	1	2	3
D.O.C.	136,138,021	136,593,437	148,277,741	D.O.C.	1	2	3
FLORIDA				FLORIDA			
GEORGIA	1,062,593,661	1,046,380,715	1,050,974,027	GEORGIA	3	1	2
HAWAII	199,768,509	224,516,435	223,879,677	HAWAII	1	3	2
IDAHO	89,447,223	89,663,859	89,348,428	IDAHO	2	3	1
ILLINOIS	1,787,743,784	1,807,174,396	1,835,208,808	ILLINOIS	1	2	3
INDIANA	493,764,578	485,714,867	503,305,301	INDIANA	2	1	3
IOWA	333,336,353	337,325,419	347,281,048	IOWA	1	2	3
KANSAS	272,352,780	287,055,042	282,735,834	KANSAS	1	3	2
KENTUCKY	223,667,930	216,278,406	224,844,956	KENTUCKY	2	1	3
LOUISIANA	390,284,898	369,183,424	365,316,866	LOUISIANA	3	2	1
MAINE	358,777,821	336,746,357	339,315,103	MAINE	3	1	2
MARYLAND	309,771,490	329,816,662	315,990,369	MARYLAND	1	3	2
MICHIGAN	851,879,038	886,133,941	985,180,601	MICHIGAN	1	2	3
MISSISSIPPI	258,511,716	245,427,987	249,662,967	MISSISSIPPI	3	1	2
MISSOURI	535,481,752	562,380,878	570,853,871	MISSOURI	1	2	3
MONTANA	56,829,510	57,274,717	54,762,526	MONTANA	2	3	1
NEBRASKA	164,153,838	158,996,462	174,144,320	NEBRASKA	2	1	3
NEW HAMPSHIRE	259,261,471	265,310,605	268,483,208	NEW HAMPSHIRE	1	2	3
NEW MEXICO	182,562,816	178,289,179	180,615,976	NEW MEXICO	3	1	2
N CAROLINA	582,016,705	582,279,957	605,040,540	N CAROLINA	1	2	3
OKLAHOMA	274,701,004	250,799,016	262,275,836	OKLAHOMA	3	1	2
OREGON	302,428,503	317,853,103	328,460,918	OREGON	1	2	3
RHODE ISLAND				RHODE ISLAND			
S CAROLINA	231,888,711	241,913,128	255,828,552	S CAROLINA	1	2	3
S DAKOTA	78,410,323	77,262,873	82,878,193	S DAKOTA	2	1	3
TENNESSEE	550,322,676	569,451,897	580,783,523	TENNESSEE	1	2	3
TEXAS	3,964,822,664	3,635,833,737	3,820,206,623	TEXAS	3	1	2
UTAH	56,303,043	49,321,894	49,538,854	UTAH	3	1	2
VERMONT	81,192,258	89,099,736	91,223,497	VERMONT	1	2	3
VIRGINIA	530,464,830	544,650,431	572,416,028	VIRGINIA	1	2	3
WISCONSIN	721,647,977	724,327,727	766,023,875	WISCONSIN	1	2	3
TOTALS	17,509,976,490	17,241,825,895	17,855,216,475	AVERAGE	1.800	1.771	2.429
				Number of 1's	17	13	5
				Number of 2's	8	17	10
				Number of 3's	10	5	20

DATA FOR PREMIUM RANKING COMPARISONS-
UNCORRECTED FOR EXPECTED EARNING PATTERNS

RANKING
LOWEST TO HIGHEST
(1=LOWEST, 3=HIGHEST)

STATE	POLICY	CALENDAR	POLICY	RANKING		
	YEAR	YEAR	YEAR	PY	CY	PY
	1986	1987	1987	86	87	87
ALABAMA	461,549,304	464,804,390	464,002,428	1	3	2
ALASKA	160,816,542	158,866,768	160,716,128	3	1	2
ARIZONA	557,193,213	580,325,793	583,191,019	1	2	3
ARKANSAS	306,727,609	316,399,575	312,852,843	1	3	2
COLORADO (a)	279,780,132	280,647,637	283,194,866	1	2	3
CONNECTICUT	610,366,176	642,514,746	682,349,482	1	2	3
DISTRICT OF COLUMBIA	136,322,760	140,557,870	144,766,988	1	2	3
FLORIDA	1,628,118,891	1,693,352,841	1,683,500,380	1	3	2
GEORGIA	1,018,431,419	1,038,461,817	1,062,060,663	1	2	3
HAWAII						
IDAHO (a)	89,910,302	94,711,583	92,696,406	1	3	2
ILLINOIS	1,743,235,331	1,879,269,626	1,920,015,084	1	2	3
INDIANA	444,839,107	459,516,016	487,076,455	1	2	3
IOWA	291,254,448	289,800,816	305,822,409	2	1	3
KANSAS	307,525,899	316,053,598	333,013,533	1	2	3
KENTUCKY						
LOUISIANA	461,598,020	469,705,544	477,601,084	1	2	3
MAINE	300,884,871	324,603,344	362,289,948	1	2	3
MARYLAND	268,229,329	291,686,339	299,203,497	1	2	3
MICHIGAN	858,310,037	902,472,558	854,824,893	2	3	1
MISSISSIPPI						
MISSOURI	677,543,219	681,488,462	693,818,655	1	2	3
MONTANA (a)	63,285,341	62,556,029	58,348,743	3	2	1
NEBRASKA	203,430,711	208,848,207	216,430,809	1	2	3
NEW HAMPSHIRE	243,650,197	255,240,065	273,397,013	1	2	3
NEW MEXICO	189,896,992	184,299,060	182,472,504	3	2	1
NORTH CAROLINA	544,462,496	552,335,892	592,082,930	1	2	3
OKLAHOMA (a)	270,429,658	291,725,205	267,803,700	2	3	1
OREGON (a)	314,756,541	291,604,604	305,815,522	3	1	2
RHODE ISLAND	223,148,406	228,628,343	234,530,282	1	2	3
SOUTH CAROLINA	322,492,900	334,614,110	350,507,321	1	2	3
SOUTH DAKOTA	78,020,455	77,005,587	80,335,049	2	1	3
TENNESSEE	582,449,855	597,372,196	621,001,946	1	2	3
TEXAS	4,151,721,537	3,993,304,716	3,926,139,944	3	2	1
UTAH (a)	51,554,183	58,261,918	56,473,733	1	3	2
VERMONT	82,578,940	83,739,251	95,796,649	1	2	3
VIRGINIA						
WISCONSIN	666,023,882	623,850,975	707,986,858	2	1	3
Totals/Averages	18,590,538,705	18,868,632,480	19,172,119,762	1.441	2.059	2.500

(a) Private Carrier Data Only

NUMBER OF 1'S	24	5	5
NUMBER OF 2'S	5	22	7
NUMBER OF 3'S	5	7	22

DATA FOR PREMIUM RANKING COMPARISONS
CORRECTED FOR EXPECTED EARNING PATTERNS

RANKING
LOWEST TO HIGHEST
(1=LOWEST, 3=HIGHEST)

STATE	CORRECTION FACTORS	POLICY	CALENDAR	POLICY	PY 86	CY 87	PY 87
		YEAR 1986	YEAR 1987	YEAR 1987			
ALABAMA	1.008	461,549,304	468,522,125	464,002,428	1	3	2
ALASKA	1.000	160,816,542	158,866,768	160,716,128	3	1	2
ARIZONA	1.003	557,193,213	582,066,770	583,191,019	1	2	3
ARKANSAS	1.005	306,727,609	317,981,573	312,852,843	1	3	2
COLORADO (a)	1.001	279,780,132	280,928,285	283,194,866	1	2	3
CONNECTICUT	1.010	610,366,176	648,939,894	682,349,482	1	2	3
DISTRICT OF COLUMBIA	1.005	136,322,760	141,260,660	144,766,988	1	2	3
FLORIDA	1.007	1,628,118,891	1,705,206,311	1,683,500,380	1	3	2
GEORGIA	1.014	1,018,431,419	1,053,000,283	1,062,060,663	1	2	3
HAWAII	1.006						
IDAHO (a)	1.003	89,910,302	94,995,718	92,696,406	1	3	2
ILLINOIS	1.002	1,743,235,331	1,883,028,165	1,920,015,084	1	2	3
INDIANA	1.006	444,839,107	462,273,112	487,076,455	1	2	3
IOWA	1.003	291,254,448	290,670,218	305,822,409	2	1	3
KANSAS	1.008	307,525,899	318,582,027	333,013,533	1	2	3
KENTUCKY	1.007						
LOUISIANA	1.001	461,598,020	470,175,250	477,601,084	1	2	3
MAINE	1.000	300,884,871	324,603,344	362,289,948	1	2	3
MARYLAND	0.998	264,229,329	291,102,966	299,203,497	1	2	3
MICHIGAN	1.003	858,310,037	905,179,976	854,824,893	2	3	1
MISSISSIPPI	1.006						
MISSOURI	1.010	677,543,219	688,303,346	693,818,655	1	2	3
MONTANA (a)	1.000	63,285,341	62,556,029	58,348,743	3	2	1
NEBRASKA	1.005	203,430,711	209,892,448	216,430,809	1	2	3
NEW HAMPSHIRE	1.009	243,650,197	257,537,225	273,397,013	1	2	3
NEW MEXICO	1.001	189,896,992	184,483,359	182,472,504	3	2	1
NORTH CAROLINA	1.011	544,462,496	558,411,586	592,082,930	1	2	3
OKLAHOMA (a)	1.000	270,429,658	291,725,205	267,803,700	2	3	1
OREGON (a)	1.006	314,756,541	293,354,231	305,815,522	3	1	2
RHODE ISLAND	1.001	223,148,406	228,856,972	234,530,282	1	2	3
SOUTH CAROLINA	1.013	322,492,900	338,964,094	350,507,321	1	2	3
SOUTH DAKOTA	1.003	78,020,455	77,236,604	80,335,049	2	1	3
TENNESSEE	1.009	582,449,855	602,748,546	621,001,946	1	2	3
TEXAS	1.005	4,151,721,537	4,013,271,239	3,926,139,944	3	2	1
UTAH (a)	1.001	51,554,183	58,327,187	56,473,733	1	3	2
VERMONT	1.007	82,578,940	84,325,426	95,796,649	1	2	3
VIRGINIA	1.010						
WISCONSIN	1.002	666,023,882	625,098,677	707,986,858	2	1	3
Average/Totals/Averages	1.005	18,590,538,705	18,972,476,317	19,172,119,762	1.441	2.059	2.500

(a) Private Carrier Data Only

NUMBER OF 1'S	24	5	5
NUMBER OF 2'S	5	22	7
NUMBER OF 3'S	5	7	22

DATA FOR PREMIUM RANKING COMPARISONS-
UNCORRECTED FOR EXPECTED EARNING PATTERNS

RANKING
LOWEST TO HIGHEST
(1=LOWEST, 3=HIGHEST)

STATE	POLICY	CALENDAR	POLICY	RANKING		
	YEAR	YEAR	YEAR	PY	CY	PY
	1988	1989	1989	88	89	89
ALABAMA	xxx	xxx	xxx	1	2	3
ALASKA	xxx	xxx	xxx	1	2	3
ARIZONA	xxx	xxx	xxx	1	2	3
ARKANSAS	xxx	xxx	xxx	---	---	---
COLORADO	xxx	xxx	xxx	3	1	2
CONNECTICUT	xxx	xxx	xxx	2	3	1
DISTRICT OF COLUMBIA	xxx	xxx	xxx	1	2	3
FLORIDA	xxx	xxx	xxx	3	2	1
GEORGIA	xxx	xxx	xxx	---	---	---
HAWAII	xxx	xxx	xxx	1	2	3
IDAHO	xxx	xxx	xxx	1	2	3
ILLINOIS	xxx	xxx	xxx	1	2	3
INDIANA	xxx	xxx	xxx	1	2	3
IOWA	xxx	xxx	xxx	1	2	3
KANSAS	xxx	xxx	xxx	1	3	2
KENTUCKY	xxx	xxx	xxx	2	1	3
LOUISIANA	xxx	xxx	xxx	3	2	1
MAINE	xxx	xxx	xxx	1	3	2
MARYLAND	xxx	xxx	xxx	1	3	2
MICHIGAN	xxx	xxx	xxx	1	2	3
MISSISSIPPI	xxx	xxx	xxx	---	---	---
MISSOURI	xxx	xxx	xxx	---	---	---
MONTANA	xxx	xxx	xxx	---	---	---
NEBRASKA	xxx	xxx	xxx	---	---	---
NEW HAMPSHIRE	xxx	xxx	xxx	1	3	2
NEW MEXICO	xxx	xxx	xxx	1	2	3
NORTH CAROLINA	xxx	xxx	xxx	1	2	3
OKLAHOMA	xxx	xxx	xxx	2	1	3
OREGON	xxx	xxx	xxx	2	1	3
RHODE ISLAND	xxx	xxx	xxx	1	3	2
SOUTH CAROLINA	xxx	xxx	xxx	---	---	---
SOUTH DAKOTA	xxx	xxx	xxx	3	2	1
TENNESSEE	xxx	xxx	xxx	1	2	3
TEXAS	xxx	xxx	xxx	1	2	3
UTAH	xxx	xxx	xxx	1	3	2
VERMONT	xxx	xxx	xxx	---	---	---
VIRGINIA	xxx	xxx	xxx	---	---	---
WISCONSIN	xxx	xxx	xxx	1	2	3
Totals/Averages	17,302,426,747	17,452,475,994	17,712,856,002	1.414	2.103	2.483

NUMBER OF 1'S 21 4 4

NUMBER OF 2'S 4 18 7

NUMBER OF 3'S 4 7 18

NOTE: THE RANKINGS ARE BASED ON PRELIMINARY DATA. THE PREMIUM INFORMATION CANNOT BE SHOWN SINCE THIS INFORMATION HAS NOT YET BEEN USED IN STATE RATE FILINGS.

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Examination of NCCI

Section III: Practical Implications of
Implementing Workers' Compensation Loss Costs

Book 5

**PRACTICAL IMPLICATIONS OF IMPLEMENTING WORKERS
COMPENSATION LOSS COSTS**

**NCCI EXAMINATION
SECTION III
IMPLEMENTATION OF LOSS COSTS**

February 22, 1991

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CHART 1

ELEMENTS OF THE TYPICAL LOSS COST SYSTEM

1. The NCCI files loss costs with provisions for:
 - a. Prospective losses by classification which reflect loss development, trend, and anticipated benefit levels
 - b. Assigned risk subsidies to be paid by the voluntary market
 - c. Loss-based assessments
 - d. Loss adjustment expense
 - e. Disease loss components
2. The NCCI distributes information relating to its loss cost calculations including (1) alternative approaches for loss development and trend, (2) information on benefit change calculations, (3) information on judgmental decisions such as classification relativity capping, (4) the difference between voluntary and residual market experience overall (and by classification, if relevant), etc.
3. The NCCI also distributes historical and factual information with regard to:
 - a. Premium taxes
 - b. Assessments
 - c. Historical information on other insurer operating expenses with appropriate categorization and adjustment for policyholder size and assigned risk service expense considerations
 - d. Premium comparisons
 - e. Individual insurer loss experience compilations
 - f. Expense studies by size of policyholder

CHART 1

ELEMENTS OF THE TYPICAL LOSS COST SYSTEM (CONT.)

4. The NCCI administers an Experience Rating Plan, which is common to all policyholders within a state.
5. The anniversary rating date rule continues.
6. Existing state limitations on individual insurer independence with respect to classification definitions and relativities are continued.
7. The NCCI committees of insurers become advisory.
8. The Classification and Rating Committees continue to assist in adjudicating questions of class definitions and other roles permitted by the state regulator.
9. The NCCI continues to establish residual market plan manual rates.
10. For the voluntary market, the NCCI no longer files:
 - a. Provisions for expenses related to premium tax, production, and general overhead
 - b. Provisions for profit and contingencies
 - c. Expense constants
 - d. Premium discounts
 - e. Minimum premiums
11. The NCCI adjusts rating plans, where necessary, to exclude expenses as noted above. The relevant plans pertain to experience rating, retrospective rating, schedule rating, excess loss rating for employers liability, and other miscellaneous rating items.

CHART 1

ELEMENTS OF THE TYPICAL LOSS COST SYSTEM (CONT.)

12. State regulators, using the NCCI as their statistical agent, develop rules and procedures to maintain and improve the level of data accuracy and availability. This might include increases in field inspections and verification of insurer reported data.
13. Filing procedures for individual insurers are streamlined in a manner analogous to the ISO process, including standardized filing forms appropriate for workers compensation insurance and loading factors that remain in effect until changed by the insurer or disapproved by the regulator.
14. Schedule rating is permitted or not permitted based on current state law and regulation. Where schedule rating is permitted, NCCI filings could include schedule rating, but individual insurers could file independent schedule rating plans.
15. State rating laws remain basically unchanged. Prior approval laws continue to be administered as prior approval for NCCI loss cost filings and for individual company loading factors or other deviations from NCCI advisory material.
16. NCCI continues its other field operations work and its role in maintaining policy forms.

**PRACTICAL IMPLICATIONS OF IMPLEMENTING WORKERS
COMPENSATION LOSS COSTS**

**NCCI EXAMINATION
SECTION III
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SUMMARY

BACKGROUND

The National Association of Insurance Commissioners (NAIC) has adopted a system for implementing loss costs in property/casualty lines of insurance other than workers compensation. Under the loss cost system, advisory organizations are responsible for the following activities:

- Collecting historical loss information from insurers.
- Developing past losses to ultimate and trending to future cost levels.
- Distributing and/or filing prospective loss cost information.
- Developing and filing rating manuals and supplementary rating information (excluding the final rate pages).
- Developing and filing policy forms and endorsements.

In a loss cost system, insurers must individually determine and file final rates referencing, where appropriate, material filed by the advisory organization. Each insurer's rates are intended to reflect its own method and expense of operation and to the extent credible, its own loss experience.

This approach seeks to promote competition and maximize benefits to consumers. Efficiencies gained through the joint collection and analysis of loss information are preserved, while independence is enforced in the areas of expenses and profits.

The NAIC is investigating the implementation of a similar loss cost system for workers compensation insurance. However, prior to taking action, the NAIC has requested this evaluation of the practical considerations of implementing a nationwide workers compensation loss cost system.

Some of the specific areas identified in the evaluation specifications are the following: (1) minimum premiums, (2) rating plans, (3) premium discount plans, (4) schedule rating plans, (5) expense constants, (6) experience rating systems, (7) policyholder dividend plans and practices, (8) retrospective rating plans, (9) anniversary rating date rules, (10) other rate-related rules, (11) distribution of

SUMMARY

expense data to insurers, (12) changes to the Insurance Expense Exhibit, (13) rate changes to in-force policies, and (14) rate filings with retroactive effective dates.

This report presents the results of the evaluation.

APPROACH

Our approach to achieving the objectives of this project was as follows:

1. Identify the important practical issues using input from the following sources: National Council on Compensation Insurance (NCCI), Insurance Services Office (ISO), insurers, regulators, agents/sales representatives, and policyholders, among others.
2. Examine how those issues are addressed by the procedures actually implemented in workers compensation loss cost states and by ISO for other property/casualty lines of insurance.
3. Describe the structure of a model loss cost system for the NAIC and the practical implications of variations from that model.

In our analysis we focused on the operations of the NCCI and the commercial insurance system in states with an administered-pricing system.

While some states have independent rating organizations which perform some or all of the same functions as NCCI, this report is prepared as part of an examination of the NCCI, and thus the focus of the report is on the NCCI. The conclusions are generally applicable to independent bureau states, but a complete analysis of state-to-state variations is beyond the scope of this report.

Most states have an administered-pricing system which require the NCCI or independent rating organization to obtain prior approval of filings proposing gross rates including insurer operating expenses and profit. The focus of this study is the identification of practical implications of the implementation of a loss cost system for those administered pricing states.

SUMMARY

States without an administered pricing system require the rating organization to file loss costs (in addition to or instead of gross rates). These filings are subject to either prior approval or open competition rating laws. We utilized the loss cost experiences of this second group of states in our analysis.

SUMMARY AND RECOMMENDATIONS

Chart 1 attached to the cover letter outlines the elements of a workers compensation loss cost system "typical" of existing workers compensation loss cost systems, supplemented by concepts from the ISO where appropriate. This typical system provides a reasonable basis for a model workers compensation loss cost system.

As more states adopt loss cost systems that permit greater individual insurer independence, assuring the accuracy of workers compensation data becomes more difficult. The NCCI and independent state advisory organizations should therefore be charged with taking the steps necessary to assure data accuracy.

ADMINISTERED-PRICING SYSTEMS

In NCCI administered pricing states individual insurers generally adhere to rules and rating plans filed on their behalf by the NCCI. Most importantly:

1. NCCI classification definitions and rate relativities are followed by individual insurers.
2. The NCCI collects data on individual policyholder experience and calculates an experience rating modification for each eligible policyholder. The experience modification applies to that policyholder regardless of which insurer provides coverage.
3. The Anniversary Rating Date Rule limits the frequency with which a policyholder can change rates by changing insurers. The rule provides that if a policyholder moves from one insurer to a second insurer during the policy term, then the second insurer must use rates in effect for the second insurer at the original rating date of the

SUMMARY

policyholder. The second insurer must also use the experience modification calculated by the NCCI at the original rating date of the policyholder. When the original rating period expires, a new experience modification is calculated and the current insurer's rates at that time become applicable to the policyholder.

The decisions of the NCCI with respect to ratemaking procedures in the state and with respect to rate filing actions are made by committees of insurers. A committee of insurers also adjudicates disputes between policyholders and insurers with respect to the appropriate classification definitions.

Individual insurers are permitted to vary from NCCI rates in one or more of the following ways:

1. Uniform deviations from NCCI rates for all classifications¹
2. Schedule rating which adjusts individual policyholder rates²
3. Policyholder dividends³

After a rate filing is approved, revised rates are immediately applicable to each insurer without further action by the insurer. Any filed deviations are applied automatically to the newly approved NCCI rates.

In addition to the individual policyholder information used for the experience rating process, the NCCI collects premium, payroll and claim experience from insurers through a number of different data calls. The insurers are required to convert their collected premiums to the premium level of the NCCI before deviations or schedule rating. This adjusted premium is referred to as Designated Statistical Reporting (DSR) level premium.

¹Applicable in nearly all states.

²Applicable in approximately a dozen states.

³Applicable in all states. Outside the jurisdiction of rating organizations.

SUMMARY

The operation of the system in NCCI administered-pricing states is described more fully in Chapter 2.

OBJECTIVES OF A LOSS COST SYSTEM

The advantages of a loss cost system include the following:

1. Independent insurer decision-making is encouraged. A loss cost system should facilitate and encourage initiatives in pricing and operations that will improve the workers compensation system.
2. The appearance of cartel-like behavior among insurers will be reduced or eliminated as collective activities are limited.

If not properly structured, the potential disadvantages of a loss cost system include the following:

1. Increased risk of inadequate, excessive, or unfairly discriminatory rates.
2. Deterioration in data quality.
3. Reduced incentives for workplace safety.
4. Increased cost to operate the workers compensation system.
5. Increased confusion to policyholders, insurers, agents/sales representatives, and regulators.

These potential disadvantages can be minimized by properly structuring the loss cost system.

In comparing the objectives of a loss cost system for workers compensation with the objectives for a loss cost system for other lines of insurance, the following fundamental differences should be considered:

1. For other lines of insurance, the residual market is not managed by the voluntary market advisory organization. For purposes of this study we were

SUMMARY

instructed by the NAIC to assume that the NCCI continues to be responsible for the management of residual market rates. Therefore, unlike the situation for ISO, the NCCI necessarily remains involved in developing gross rates for some markets.

2. The NCCI administers a common Experience Rating Plan applied to all policyholders in the state, no matter which insurer provides coverage. This gives policyholders a common basis on which to measure their workers compensation experience. There is no comparable system in other lines of insurance. Maintaining the experience rating system in that form may imply some limits on the independence permitted to individual insurers.

A TYPICAL LOSS COST SYSTEM

Our examination of existing workers compensation loss cost systems and ISO loss cost systems for other lines of insurance did not reveal any insurmountable obstacles to the implementation of a loss cost system for workers compensation. Ease of implementation and potential long-term effects depend on the structure of the loss cost system adopted.

Chart 1 outlines the characteristics common to existing workers compensation loss cost systems. The Chart also describes historical and factual expense information that the NCCI might collect and distribute. The system outlined in Chart 1 could be implemented with minimal disruption to the workers compensation system consistent with the loss cost concept.

The loss cost system characteristics which differ among loss costs states are the following:

1. Loss adjustment expenses are either (1) included in the advisory organization loss costs or (2) excluded from loss costs and included in individual insurer loadings.
2. Individual insurers are either (1) required to use the advisory organization classification definitions and rate relativities or (2) permitted to establish their own definitions or rate relativities.

SUMMARY

3. Individual insurer loading factors either (1) remain in effect when NCCI loss costs change or (2) must be re-filed when NCCI loss costs change.
4. Uniform filing forms have not been developed to simplify the administration of the regulatory compliance process.

There are many alternatives to this typical loss cost system.

EVALUATION OF THE TYPICAL LOSS COST SYSTEM

Benefits

While the typical loss cost system outlined in Chart 1 may be considered by some to be a minimum step towards a loss cost system, this typical loss cost system includes the two primary features of a loss cost system. It requires that insurers establish their own margins for operating expenses, profit, and contingencies, and decision-making in establishing loss costs is vested in the rating organization rather than insurer personnel. These are also two of the key changes in the ISO loss cost system.

Although the impact of any system change is uncertain, the typical system is likely to have a more significant effect on workers compensation than the system being implemented by ISO will have on other property and casualty lines. For example, the role of dividend competition for workers compensation is likely to be significantly reduced in a loss cost system as it is replaced by competition through loading factors. The transformation from dividend competition to initial price competition is evident in the experience of loss cost states. In the ISO lines, on the other hand, initial price competition, not dividend competition, was the norm before the conversion to loss costs.

Risks--Data Accuracy

The loss cost system in Chart 1 is not obtainable without risk in the area of the accuracy of the data used for overall loss cost analysis by the NCCI. The NCCI depends on individual insurers to report premium converted to the designated

SUMMARY

statistical reporting (DSR) level. For many years insurers have been reporting DSR premium when the only necessary conversions relate to uniform deviations or schedule rating, apparently without significant problems.

However, the loss cost system described in Chart 1 might permit more individual insurer deviations from NCCI loss cost relativities by classification. For this type of deviation, determining the DSR premium is more difficult for the insurer, and verifying the accuracy of the DSR calculation is more difficult for the NCCI. There has not been sufficient experience with this type of system to be confident that accuracy will be achieved without special monitoring efforts by the NCCI. Additional NCCI audit efforts should be required as loss cost systems permitting classification flexibility are introduced.

In the long run, the NCCI may be able to revise statistical plans and reporting procedures to become less reliant on individual insurer DSR calculations.

Perceptions

The system described on Chart 1 permits the NCCI to collect historical expense information, adjust the data to a common basis, and report the data to insurers and regulators. This continued involvement in the expense area may, for some, leave the impression that the system has not sufficiently accomplished the objectives of a loss cost system.

ALTERNATIVES TO THE TYPICAL LOSS COST SYSTEM

Areas of increased insurer independence and reduced rating organization involvement might include the following:

SUMMARY

1. Components of Loss Costs
 - a. Include provision for loss adjustment expenses in individual insurer loadings. This item would be excluded from NCCI loss costs.
 - b. Include provision for residual market subsidies and/or loss-based assessments in individual insurer loadings. These items would be excluded from NCCI loss costs.
2. Experience Rating Plan
 - a. Allow individual insurers to file for the use of their own experience rating adjustments on top of the experience modifications determined by the common NCCI-administered Experience Rating Plan. This approach provides some insurer independence, but maintains a common experience rating plan and the common data base.
 - b. Maintain the NCCI as a statistical agent collecting individual policyholder data and providing that data to insurers that use the common data to apply their own experience rating plans. This approach grants insurers independence from a common experience rating plan, but it maintains the common data base.
 - c. Abandon the use of common experience rating plans and common policyholder data bases. This approach provides maximum independence to insurers.
3. Classification independence
 - a. Permit insurers to subdivide NCCI classifications.
 - b. Permit insurers to use their own classification relativities.
4. Anniversary rating date rule--allow modifications to the rule.



SUMMARY

5. Individual insurer filing forms--require new filings when NCCI rates change.
6. Expense data--restrict the NCCI from the compilation and distribution of any expense information.

These areas are discussed below.

Components of loss costs

The typical loss cost system as presented in Chart 1 of the cover letter, provides that loss costs include adjustments for the following: loss development, trend, anticipated benefit levels, residual market subsidies, loss-based assessments, and loss adjustment expense. Although excluding adjustments for any of these items does not necessarily impair the system, the workers compensation rating system is complex, and all insurers may not be able to properly adjust for these factors. Even a small number of insurers improperly calculating loss costs could result in inadequate, excessive, or unfairly discriminatory rates.

These risks are greatest if adjustments for loss development, trend, anticipated benefit levels, and residual market subsidies are not included. Almost all loss cost systems allow the rating organization to include these adjustments.

Existing loss cost systems vary in their treatment of loss adjustment expense and loss-based assessments, but advisory organizations are generally permitted to include these factors in the advisory loss costs.

Premium-based assessments are generally excluded from loss costs.

Experience rating plan

The weight of history and the practice in loss cost states suggest that continuing a common centrally administered plan is desirable. The common plan may (1) encourage workplace safety in ways which may not be achieved through individual

SUMMARY

insurer action, (2) reduce policyholder confusion and (3) permit policyholders to compare their experience to that of other similarly-classified policyholders. The use of a common plan has been viewed as a way to achieve equity among policyholders. Moreover, if there were no common experience rating plan then there are technical issues related to the off-balance in the individual insurer experience rating plans which might affect loss cost adequacy. Further study of the effects seems desirable before taking action to replace a common plan with individual insurer plans.

However, permitting the use of approved individual insurer plans in addition to the common centrally-administered plan is an alternative that minimizes the potential disadvantages listed in the OBJECTIVES OF A LOSS COST SYSTEM section above. Insurer proposed and regulator approved rating plans would be designed to produce adequate and equitable rates. The process of calculating DSR premium would be similar to the process now required to calculate DSR premium when schedule rating is applied. Incentives for workplace safety would probably remain unchanged, because the NCCI common plan remains a factor in the policyholders premium. Control of cost and policyholder confusion would be in the hands of the insurer that proposes to use such a plan.

Classification independence

It is generally recognized that data accuracy is greatest when the data affects the insured's premium. From this perspective, maintaining the common experience rating plan helps to assure uniform classification coding.

Thus, if insurer classification definitions vary too far from the NCCI classification, there is an increase in the risk of classification errors.

In addition to the need for data accuracy in the experience rating plan, the NCCI ratemaking system requires that insurers convert their premium data to NCCI DSR level. This conversion process is critical to the accuracy of NCCI loss cost levels. Too much variation in definitions may affect insurer accuracy and limit the ability of NCCI to audit this process.

SUMMARY

By maintaining an enhanced NCCI field audit program it may be possible to better assure data accuracy under a flexible classification system. However, this will probably require increasing NCCI's role as a statistical agent. Specifically, NCCI enforcement authority may need to be increased, and increased costs may result.

Anniversary rating date rule

The anniversary rating date rule has two components:

1. The NCCI prepares experience rating modifications effective on the anniversary rating date, which approximates the policyholder renewal date.
2. The manual rates of the policyholder change only on the anniversary rating date, subject to the same flexibility now provided for in the NCCI Experience Rating Plan.

Item 1 is required to maintain a centrally-administered experience rating plan, while item 2 is a convenience in maintaining item 1. The anniversary rating date rule is assumed to apply when the NCCI calculates premium at current rate level. If the rule were totally eliminated, the NCCI would need to collect additional data and/or apply approximations to adjust for the change in procedure. Typically both parts of the rule are maintained in the system. This is the simplest process.

One alternative is the following: (1) experience modifications are promulgated at the anniversary rating date, (2) a policyholder can change insurers and obtain the benefit of the new insurer's rates for the period from the date the policy changed until the anniversary rating date, but (3) at the anniversary rating date, the insured's rates would change based on the revised experience modification and based on the new insurer's rates at the anniversary rating date. The policyholder receives the benefit of the new insurer's rates at the transfer date for the short-term period until the anniversary rating date.

SUMMARY

Filing forms

Potential regulatory delay, with resulting inaccuracies in rate levels, makes it undesirable to require companies to file a revised form with every NCCI loss cost change.

The automatic process also simplifies the designated statistical reporting (DSR) process for data reporting. If insurer premiums do not change at the same date that the NCCI loss costs change, then the insurer must do a special conversion of premium to DSR level for the short time period until a uniform, or nearly uniform, relationship to the new NCCI loss costs is reestablished.

Distribution of expense data

The individual workers compensation loss cost states have not addressed the role of the advisory organization in the compilation and distribution of expense information. The system approved for ISO lines of insurance permits ISO to distribute historical factual expense information. We propose that NCCI be permitted to proceed as follows:

1. Collect historical general and other acquisition expense data from insurers.
2. Adjust the data to a common basis with respect to policyholder premium size distribution, residual market servicing carrier fees, and variations in rate level.
3. Summarize the adjusted expense data into groups such as stock insurer, non-stock insurers, national insurers, regional insurers, small insurers, and large insurers.
4. Distribute that information to insurers, regulators, and others.

SUMMARY

The disadvantage of this approach is that the NCCI appears to maintain a role in insurer expense analysis. The advantages are that the adjusted data is more meaningful than publicly available expense information, and the comparative data would be useful to regulators as well as insurers in evaluating the reasonableness of an insurer's filed loading factor.

With regard to this issue, it is important to note that regardless of the NCCI expense role in the voluntary market, the NCCI appears to maintain a role in insurer expense analysis because of its involvement in the residual market system. Overall, we conclude that the benefits of the distribution of this historical information outweigh the disadvantages. ISO also plans to distribute historical expense information.

Studies of expense by size of policyholder

Objective studies of general and other acquisition expenses by size-of-risk are likely to be available to regulators and insurers only if historic information is collected, analyzed, and distributed by the NCCI. If multi-company studies of expense by size of risk are not available to insurers and regulators, then it is likely that insurer operating expense discounts will become more market-driven rather than cost-driven. In the typical system, the NCCI would continue conducting these studies and make the information available to insurers and regulators

Distribution of premium tax and assessment information

In the typical system, this would include historical and factual information on premium tax levels and assessment levels in the state, and how the assessments are handled in the loss costs.

SUMMARY

TRANSITION ISSUES

To minimize the costs and confusion associated with the transition to loss costs, we suggest the following:

1. There should be as much consistency as possible in the loss cost implementation procedures among states.
2. Consideration should be given to deferring the transition to a loss cost system until ISO has completed its own program of loss cost implementation for other property and casualty lines; late 1992 or early 1993 was suggested by many of those we interviewed during this examination.
3. The transition should coincide with the NCCI's usual state rate review schedule.
4. The implementation procedures should include an educational effort by the NCCI and perhaps other interested organizations for the affected parties. This would include regulatory personnel, insurer personnel, and agents/sales representatives. The timing for loss cost implementation should allow for this educational effort.

REPORT STRUCTURE

Chapter 1 discusses the issues related to loss costs identified in our interviews, reviews of testimony, and other research. Chapter 2 describes current NCCI rate-related procedures in administered-pricing states. Chapter 3 describes NCCI and independent rating (advisory) organization rate-related procedures in loss cost states. Chapter 4 covers loss cost procedures implemented or under consideration by ISO. Based on the issues identified in Chapter 1 and our analysis in Chapters 2, 3, and 4, we evaluate alternative components of loss cost systems in Chapter 5.

SUMMARY

CHART 1

ELEMENTS OF THE TYPICAL LOSS COST SYSTEM

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 - c. Loss-based assessments
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 - e. Disease loss components
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3. The NCCI also distributes historical and factual information with regard to:
 - a. Premium taxes
 - b. Assessments
 - c. Historical information on other insurer operating expenses with appropriate categorization and adjustment for policyholder size and assigned risk service expense considerations
 - d. Premium comparisons

SUMMARY

CHART 1

ELEMENTS OF THE TYPICAL LOSS COST SYSTEM (CONT.)

3. (Continued)
 - e. Individual insurer loss experience compilations
 - f. Expense studies by size of policyholder
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5. The anniversary rating date rule continues.
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8. The Classification and Rating Committees continue to assist in adjudicating questions of class definitions and other roles permitted by the state regulator.
9. The NCCI continues to establish residual market plan manual rates.
10. For the voluntary market, the NCCI no longer files:
 - a. Provisions for expenses related to premium tax, production, and general overhead
 - b. Provisions for profit and contingencies
 - c. Expense constants

SUMMARY

CHART 1

ELEMENTS OF THE TYPICAL LOSS COST SYSTEM (CONT.)

10. (Continued)
 - d. Premium discounts
 - e. Minimum premiums
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14. Schedule rating is permitted or not permitted based on current state law and regulation. Where schedule rating is permitted, NCCI filings could include schedule rating, but individual insurers could file independent schedule rating plans.
15. State rating laws remain basically unchanged. Prior approval laws continue to be administered as prior approval for NCCI loss cost filings and for individual company loading factors or other deviations from NCCI advisory material.
16. NCCI continues its other field operations work and its role in maintaining policy forms.

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Identification of Loss Cost Issues

In this chapter, we identify issues of importance to various participants in the workers compensation system: insurers, regulators, agents/sales representatives, policyholders, and others. To obtain input from those groups, we reviewed testimony already provided to the NAIC, interviewed additional individuals, and obtained written material from various groups. Appendix A lists the sources of information for this portion of the examination.

Issues associated with the implementation of a loss cost system for workers compensation insurance are similar but not identical to the issues associated with the implementation of loss cost systems for other property/casualty lines of insurance.

The issues can be divided into the following categories:

- I. THE RATING ORGANIZATION
- II. INSURERS
- III. AGENTS/SALES REPRESENTATIVES
- IV. INSURANCE REGULATORS
- V. OTHER ISSUES

The remainder of this chapter is a discussion of these issues.

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I. THE RATING ORGANIZATION

The current activities of the NCCI which may be affected by the transition to loss costs are discussed below.

A. Material filed by the rating organization

Under a loss cost system, the rating organization files for the loss cost portion of the rate, not the gross rate. The portion of the rate for which the rating organization is responsible could include the following:

- a. Historical losses
- b. Analysis of loss development
- c. Analysis of trend
- d. Adjustments to current benefit level
- e. Residual market subsidies to be paid by voluntary market policyholders
- f. Loss-based assessment provisions for costs such as second injury funds and other special funds, and workers compensation board costs
- g. Loss adjustment expenses
- h. Disease element loss costs
- i. Premium-based assessments for items similar to those listed in item f

These items are discussed in greater detail in Chapter 2.

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In addition to gross rates by classification, NCCI filings currently include minimum premiums, premium discount plans, schedule rating plans (applicable in some states), an experience rating plan, retrospective rating plans, other rating plans, expense constants, anniversary rating date rules, and other rating rules. Some or all of these items may continue to be filed by the NCCI in a loss cost state.

B. Role of NCCI staff

Decision-making

In the workers compensation administered-pricing states listed in Chapter 2, insurer personnel serve on committees which are directly involved in making decisions concerning the development and filing of rates.

In a loss cost environment, it is generally assumed that insurer committee decision-making is eliminated. This is the case for ISO, and also applies to NCCI ratemaking in open competition states. In these situations, the rating organization staff makes the decisions. Insurer personnel are available to provide technical guidance and professional (not business) advice to the rating organization staff.

Thus rating organization staff might become responsible for decision-making in the following areas:

- Preparation of prospective loss costs
- Filing, negotiation, and refiling of loss costs with insurance regulators
- Development of classification definitions and relativities
- Rating plans including the Experience Rating Plan

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Distribution of information

In a loss cost system, the rating organization may become responsible for distributing information such as (1) loss cost filings; (2) summaries of expense information for use by insurers, regulators, and others; (3) comparative rate and rating plan information; (4) special studies of the workers compensation system; and (5) evaluations of actual or potential benefit changes.

This information could be made available to a narrow audience--member insurers and regulators on request--or to a broader audience, potentially including any entity requesting and willing to pay for the information, but subject to appropriate confidentiality on individual insurer or policyholder data.

NCCI structure

Some changes in NCCI funding may be desirable. NCCI is funded primarily by premium-based assessments of insurers, which differs from the situation at ISO, where over 70% of financing is from fees for specific services. The assessment process is most suitable for an organization providing similar services to all members, with essentially mandatory membership. If members are allowed to vary their practices from the NCCI's approach, and if NCCI staff is to operate more independently of NCCI's member/owner insurers, then it may become increasingly desirable for financing to be more service-related and less assessment-based. Obviously, the service charges should be structured to enhance competition. More financial independence is also desirable if the NCCI is responsible for providing data to entities other than regulators and member insurers.

In addition to financing issues, the NCCI has testified that it intends to amend its Constitution to permit public representation on its Board. ISO already has one public member on its Board.

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Identification of Loss Cost Issues

Within the NCCI structure, the issue arises whether the NCCI should rearrange priorities, e.g., put less emphasis on insurer profitability issues and more on research and benefit pricing. It is not clear how a loss cost environment will change the relative need for various NCCI services. As the loss cost system evolves, NCCI must be alert to the need to redirect efforts appropriately. Changes in NCCI organization and committee structure may be needed.

II. INSURERS

The activities of insurers will be expected to change with the transition to loss costs. Below, we identify the major issues.

A. Degree of independence permitted individual insurers

Currently permitted independence

In administered-pricing states, the NCCI files rates and rating plans on behalf of all insurers. Depending on state law and regulations, individual insurers are permitted one or more of the following:

1. Uniform deviations from NCCI rates for all classifications
2. Schedule rating which adjusts rates for individual policyholders
3. Policyholder dividends

Individual insurer variations from NCCI classifications are not generally permitted.

In a loss cost system, individual insurers may be limited to the same level of flexibility available in an administered-pricing state, i.e., deviations, schedule rating,

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and policyholder dividends. Alternatively, a loss cost system could be more flexible and allow variations in classification relativities, classification definitions, experience rating, and other rating plans. Some of these variations are discussed below.

Variations in classifications

In establishing a loss cost system, there are two fundamental areas of classification rating that require decisions: variations in classification relativities, and variations in classification definitions.

The current common practice in prior-approval loss cost states is to allow rate deviations (varying multipliers) in only a limited number of classes and few new classifications. Some states require that insurers provide support for the deviation, while others allow more freedom.

It is a common practice in open competition states to allow greater freedom in classification relativities and definitions. In administered-pricing states, the common practice is to permit no variation from NCCI classifications.

Regardless of the classification relativity or definition used by the insurer, the insurer is required to report exposure, premium, and claim experience using NCCI classification definitions and to adjust premiums to the NCCI Designated Statistical Reporting (DSR) level (i.e., the standard rates, advisory rates, or loss costs appropriate in the state). Where rate deviations by class are allowed, the conversion to the NCCI DSR level may not be accurately accomplished.

This requirement that an insurer provide data on the NCCI classification basis, even if the insurer uses a different pricing system, varies from the procedure used in other lines of insurance. In most lines of insurance, insurers report statistical data in a manner consistent with their pricing plans. However, in workers compensation, it is the use of a common experience rating plan that requires insurers to convert their own classification definitions to those of the NCCI. Allowing insurers to create

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variations in classification definitions introduces a risk to the quality of data used for experience rating, classification ratemaking, and overall cost level calculations.

Variations in experience rating

A fundamental facet of the workers compensation system is the current use by all insurers of a common experience rating plan centrally administered by the NCCI and independent state rating and advisory organizations. Under this system, all insurers apply the same modification factor to a policyholder.

The use of a common experience rating system is considered important because it is intended to encourage policyholder loss prevention in ways which may not be achievable by individual insurer action. It is also argued that the use of a mandatory common experience rating plan is more equitable to policyholders than the insurer-designed voluntary experience rating plans used in other lines of insurance.

The use of a common, centrally-administered plan requires that all insurers report data to the NCCI on a common classification basis. Furthermore, such a plan requires that the NCCI collect individual policyholder data and maintain premium and claim data in the same database. If a common experience rating plan were not continued, the NCCI could maintain separate premium and claim databases, a simpler task than maintaining the current common database.

Accuracy at an individual policyholder level is critical for experience rating calculations; any errors arising in the experience rating process from variations in classifications from insurer to insurer are therefore significant. For classification and overall ratemaking, however, errors in a small number of individual policyholder situations are not usually material to the ratemaking process. Thus, the need to maintain common classifications is reduced if a common, centrally-administered experience rating plan is abandoned.

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The experience rating plan issue does not arise in the ISO context because (1) plans for ISO lines have generally been voluntary, (2) the plans are applied by insurers rather than ISO, and (3) the plans apply to fewer policyholders.

In workers compensation loss cost states, the use of a common, centrally-administered plan is generally mandatory. Only Michigan permits variations in the experience rating plan.

B. Structure and content of insurer filings

In administered-pricing states, individual insurers are not required to make any workers compensation filings if the insurer intends to follow the NCCI rates. Furthermore, if an insurer chooses to file a deviation from NCCI rate levels, that deviation generally remains in effect until the insurer files a new deviation, regardless of whether the NCCI rates change in the interim.

Loss cost filings

In a loss cost system, all insurers must, at a minimum, file for a loading factor which is applied to NCCI loss costs to produce manual rates. Individual insurers must also file other expense-related rules such as minimum premiums. Depending on the degree of flexibility permitted, insurers may need to file additional rating rules and rating plans.

Filing form

For the loss cost system applicable to ISO lines of insurance, the NAIC has prepared a standard form. In this form, the insurer refers to the ISO loss cost circular and adds its own expense and profit provisions, and perhaps loss deviations. The form requires support for the provisions proposed by the insurer, and is structured so that

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an insurer can either have it apply only to the most current revision or to future revisions until the form is resubmitted.

In a workers compensation loss cost system, a comparable form is desirable to simplify the insurer preparation and regulator review of individual insurer filings. However, changes to the ISO form are necessary, since workers compensation filings must address issues which are not part of the ISO form. These issues are described below.

First, the standard workers compensation rating system includes the use of expense constants for small risks. A provision in the form to show the proposed insurer expense constant, its justification, and the effect on the insurer expense loading would be desirable.

Second, the workers compensation manual rate structure includes a premium adjustment for expenses by size-of-risk. To determine manual rates for workers compensation, it is necessary for the insurer to consider and file information related to both its overall average expenses for all policyholders and the effect of its premium discount and expense constant programs on the manual rate. The average expense information is required to establish the overall loading factor and to allow the regulator to examine the profit level implied by the loading factor. The effect of the insurer's premium discount and expense constant programs is needed to calculate the loading to be applied to manual loss costs to produce rates which yield the target overall loading factor. The current form for ISO lines of insurance does not consider information of this type.

Third, the ISO form does not elaborate on the insurer's development of its profit provision. The investment income potential for workers compensation is more significant than for many ISO lines of insurance; treatment of investment income on the filing form may thus be desirable. Standardization in the investment income area may be difficult, however, because of the wide variations in state practices.

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Fourth, depending on how assessment provisions are handled in the loss costs, the individual insurer filing should show how those assessments are treated in the proposed rates.

Finally, the NCCI loss costs include an off-balance for the average effect of experience rating plan modification factors. If insurers are permitted to use their own experience rating plans, separate identifiable adjustments for the plan off-balance for each insurer would be appropriate. ISO requires no such adjustment because the ISO experience rating plan off-balance is assumed to equal to unity for manual ratemaking purposes.

Benefit changes

In a workers compensation system, consideration of benefit changes is required. For most property casualty insurance policies, contractual coverage seldom changes during the term of the policy. In workers compensation insurance, however, changes in benefit level occur regularly, either due to legislative action or to automatic adjustments built into the benefit structure. These adjustments are typically effective based on the date of the accident; thus, these benefit changes affect in-force policies. In the current workers compensation system, the NCCI files for changes to in-force policies when there is a significant benefit change, and the change is accomplished by filing a table of premium adjustment factors which vary by policy effective date.

A loss cost system should accommodate this aspect of workers compensation coverage. Presumably, the NCCI will evaluate the effect of benefit changes on loss costs and prepare the appropriate loss cost filings, including the appropriate loss cost adjustment factors for in-force policies.

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Regulatory compliance

Two concerns regarding regulatory compliance are potential delays and insurer costs. The extent of regulatory delay depends significantly on the details of the filing process, and particularly on whether insurer rate changes happen automatically with NCCI changes or require individual insurer action.

The costs of regulatory compliance also depend on the details of the process. The expenses of rate filings are now largely included in NCCI costs. The NCCI prepares filings, supplemental supporting information, and expert testimony, and supplies legal representation and expert witnesses. The increase in insurer expenses related to filings in loss cost states will probably not be major if (1) the NCCI continues to bear the costs of achieving approval for the loss cost portion of the rate and (2) insurer filings are generally approved without significant regulatory proceedings. If insurers are required to regularly defend their individual filings in independent regulatory proceedings, compliance costs will increase.

C. Other impacts on insurer practices

Dividend plans

Dividend plans are not necessarily affected by the change to a loss cost system; however, some changes can be reasonably expected. The extent of these changes depends in part on the purpose of the dividend plan from the insurer's viewpoint.

Dividend plans serve varying purposes. For one type of dividend plan, the aim is to return expense savings to policyholders; this type would disappear to the extent that expense savings are reflected in individual insurer loading factors. Another type is intended to provide groups of policyholders a dividend based on better-than-expected loss experience for the group, essentially acting as a group retrospective rating plan. This type is likely to continue unless group retrospective rating arrangements are permitted. Finally, differences in loss costs between individual

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insurers and the NCCI-approved average loss costs may be treated differently by different insurers. Some may choose to reflect expected differences in the loss cost loading factor, and others may choose to wait until actual results are available and reflect the differences in dividends. Overall, some reduction in dividends is likely.

Changes in dividend structure may produce changes in insurer marketing strategies. In ISO lines, the introduction of loss costs does not change the basis on which insurers compete. However, for workers compensation prior to loss costs, dividend plans may have been a focus of competition. After loss costs, even with minimal pricing freedom, the focus of price competition is likely to shift toward initial cost based on the loading factor, and away from dividends.

Insurer-agent/sales representative communications

Insurers will need to communicate their rate levels to their agents/sales representatives; this could be done by manual rate pages or other means. This is discussed further in the next section.

III. AGENTS/SALES REPRESENTATIVES

The two major issues directly affecting agents/sales representatives are issues that also affect other participants: (1) how the loss cost system will affect the agents/sales representatives' ability to communicate efficiently with insurers and policyholders, and (2) the extent to which the loss cost system might reduce the number of insurers willing to provide workers compensation coverage.

A. Communication

In other lines of insurance, insurers and agents/sales representatives have varying methods of communicating loss cost information. These methods include agents/sales representatives receiving the ISO loss cost manual, agents/sales

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representatives receiving individual insurer loading factors and instructions on the application of those factors to the loss costs, agents/sales representatives receiving insurer manuals containing insurer final rates, and agents/sales representatives using computer rating systems developed by computer service bureaus.

For workers compensation, the possible means of communication are the same, except that there is currently no significant computer rating service market. If there were significant variation in rates and/or rating approaches between insurers, computer rating services for workers compensation might emerge.

Agents/sales representatives use rate vendor services not only to obtain individual policyholder premium quotes, but also to obtain information regarding the market level of rates and to identify unreasonably high or low rates. For workers compensation, that process has been relatively easy when insurers are limited to uniform deviations, individual risk schedule rating modifications, and policyholder dividends. If increased individual insurer variability is permitted, the need for comparative rating services may be increased.

B. Interstate risks

Workers compensation involves interstate risks at least as often as other lines of insurance. Therefore, for agents/sales representatives as well as insurers, standardization of approaches across states is important. Since the workers compensation system includes independent workers compensation rating/advisory organizations in many of the largest workers compensation states, it may be more difficult to achieve standardization in workers compensation than in the ISO lines of insurance. While the current system is not standardized, implementing loss costs may make standardization even more difficult.

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C. Market concentration

There is concern that the additional complexities of dealing with a loss cost environment will reduce the number of insurers providing workers compensation coverage. This can affect agents/sales representatives, policyholders, and others. The effect of loss costs on market concentration may be different in smaller states than in larger states. Analysis of this issue is beyond the scope of this study.

IV. INSURANCE REGULATORS

From a workload perspective, the issues discussed in section II.B above with respect to the content of insurer rate filings will also have a significant effect on the regulatory workload.

The overall regulatory objectives of a loss cost system can be viewed as those expressed in the Alternative Model Workers Compensation Competitive Rating Act. These are as follows:

1. To prohibit price-fixing agreements and other anti-competitive behavior by insurers.
2. To protect policyholders and the public against the adverse effects of excessive, inadequate, or unfairly discriminatory rates.
3. To promote price competition among insurers, thus providing rates responsive to competitive market conditions.
4. To provide regulatory procedures for the maintenance of appropriate data reporting systems.
5. To improve the availability, fairness, and reliability of insurance.
6. To authorize essential cooperative action among insurers in the

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ratemaking process and to regulate such activity to prevent practices that tend to substantially lessen competition or create a monopoly.

7. To encourage the most efficient and economic marketing practices.

Our evaluation of a reasonable loss cost system is based on these criteria.

V. OTHER ISSUES

Other issues which are affected by loss costs concern transitional issues, data quality, the impact on the residual market plans, the potential for needed changes to the Insurance Expense Exhibit, and other issues.

A. Transitional issues

Timing

The foremost transitional issue is timing. Many are concerned that a change to workers compensation loss costs while ISO is completing its transition will create problems for agents/sales representatives, regulators, and insurers. There is some degree of consensus from within the industry that it would be desirable for workers compensation loss costs to begin after ISO is essentially through its transition for the currently scheduled lines of business. This would mean beginning in late 1992 or early 1993.

The reasons for waiting include the fact that attention by insurer, agent/sales representative, and regulator personnel is required for the ISO transition, and multiple transitions may be too much to handle. Furthermore, some expressed the view that it would be desirable to allow ISO to resolve potential problems with the system before introducing it to workers compensation.

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It is also considered important that the transition occur in a phased manner like the ISO transition, rather than by converting all rates to loss costs at a single date.

Education

The second transitional issue is education for agents/sales representatives, insurer personnel, regulators, and others. To some extent, these groups will have been educated to the requirements of a loss cost system through the ISO conversion. However, the current workers compensation system is different from the pre-loss cost ISO system, and the workers compensation loss cost system is also likely to differ from the ISO loss cost system. Therefore, an active education process by the NCCI, at least at the level of the ISO education process, is reported desirable.

Use of rate freedom

It remains uncertain how quickly, if at all, insurers will use the rating freedom given to them under the provisions of a loss cost system.

B. Data quality

The issue of maintaining data quality was mentioned by most of those we interviewed as being one of their greatest concerns in the loss cost transition for workers compensation.

Data accuracy for individual policyholders is critical for a centrally-administered experience rating system. A loss cost system does not necessarily disrupt that process; however, depending upon the degree of independence available to insurers, the loss cost system does put additional burdens upon the system.

With respect to overall loss cost levels, the accuracy of the NCCI procedures depends on insurer compliances with the Designated Statistical Reporting (DSR)

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level rules for premiums. The greater the insurer independence, the greater the chance for inaccuracies in the process.

The anniversary rating date rules are also relied upon in the NCCI calculation of earned premium on current level. If the rule is eliminated, additional data or approximate methods will be needed. In the long run, the NCCI may need to change its approach to obtaining premium at current rate level in order to rely less on insurer calculations (DSR) and policy writing rules (anniversary rating date rules).

For classification relativities and experience rating values, the accuracy with which insurers define classes and convert them back to NCCI classifications is important. For reasons including the use of a common experience rating plan, the NCCI has probably been more attentive to classification assignments than is true for other lines of insurance. Changes to the system may reduce the homogeneity of classification data.

In general, it should be recognized that exceptions which can be readily accommodated on a state exception basis become more difficult in a national system.

In addition, the impact on the database will depend on the manner in which loss costs are implemented.

C. Management of residual market plans

The residual market plans are now administered through the NCCI. In administered-pricing states, insurer committees have the decision-making responsibility for residual market plans, including the development of final gross rates. In advisory rate and loss cost states, insurer committees have largely removed themselves from residual market plan decision-making.

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ISO is moving towards an environment where it will no longer be involved in any gross rate promulgation, voluntary or involuntary. All ISO activity will be limited to loss costs. This is feasible for ISO, because there are separate organizations like Automobile Insurance Plans Service Office (AIPSO) that handle residual market rate filings. This may be desirable for public relations purposes as well as for the purpose of encouraging greater competition. As long as the NCCI is involved with residual market gross rate levels however, the ISO-type separation will not be achieved for workers compensation. The role of NCCI committees in the residual market process may need to be carefully separated from the role of the committees as advisors in voluntary loss costs.

D. Insurance Expense Exhibit data

Currently, Part III of the Insurance Expense Exhibit (IEE) requires insurers to adjust net earned premium to a standard premium basis by adding premium discounts and retrospective rating adjustments. By making these adjustments, premiums for all insurers are intended to be on the same level.

With loss costs, insurers are required to report "premium" at the DSR level in NCCI data calls. If "Standard Premium" were replaced by DSR premium for the purposes of the IEE, a uniform level of data would be available when, if ever, all states are on a loss cost basis. At best, the value of this portion of the IEE will be uncertain for several years. Very likely, this portion of the IEE will never accomplish the purpose it had when essentially all states were subject to administered-pricing systems without deviations. Considering that the NCCI may be permitted to collect and distribute more meaningful data, the NAIC should consider eliminating the section.

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E. Other perspectives

Some of the comments from the perspective of labor, the general public, and others both inside and outside of the insurance industry follow:

1. Will loss costs really result in increased competition and a reduction in rates? Arguments vary on this issue.
2. Some say that the full benefit of a loss cost system will not be achieved unless the rating organizations are limited to historical loss costs (consideration of trend, loss development, and the like would be the responsibility of individual insurers) and totally removed from the expense issue (no publication of expense information).
3. Will the loss cost system result in fewer insurers and more concentration of the market share by the larger insurers?
4. Will a loss cost system increase the cost of doing business and therefore increase the cost to the policyholder? There are no reliable estimates of the additional cost. The magnitude of any such costs will depend on details of the process by which loss costs are regulated.
5. With increased competition and perhaps lower premiums, will insurer safety activities be reduced, to the disadvantage of workers? Similarly, will changes to the Experience Rating Plan, if any, reduce policyholder incentives for reducing workplace injuries? Unlike the systems in which ISO is involved, the workers compensation system evolved with the intent of encouraging worker safety as well as policyholder financial security.
6. The workers compensation system is under a variety of strains, as evidenced by the increasing residual market, the size of requested rate level changes, and the legislative attention to proposed changes. The loss cost system is not

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seen as a way to deal with any of these problems. The real problems, some say, include increasing attorney involvement, increasing health costs, inappropriate benefit structures, and erosion of the exclusive remedy rule.

7. Should there be more freedom in rating for large policyholders than for smaller policyholders? It is difficult to separate large from small, but more freedom might reduce the pressure to self-insure.

These issues are generally beyond the scope of this study.

CHAPTER 2 Current NCCI Rate-Related Procedures

This chapter describes the services the NCCI provides to its member companies in the traditional prior-approval, administered-pricing environment. This applies to the following states:

Alabama	Mississippi
Alaska	Missouri
Arizona	Montana
Colorado	Nebraska
District of Columbia	New Hampshire
Florida	Oklahoma
Idaho	South Dakota
Iowa	Tennessee
Kansas	Utah
Maine	Virginia

Procedures in independent bureau states with administered pricing systems are generally similar, but the scope of the study did not require a state by state analysis of the differences. In open competition and loss cost states, the procedures will vary from those described in this chapter. Chapter 3 discusses the main variations. This chapter contains the following sections:

- I. RATE COMPONENTS AND RULES
- II. COMMITTEE ROLES
- III. DISTRIBUTION OF MATERIAL TO AGENTS/SALES REPRESENTATIVES
- IV. RELATIONS TO REGULATORS
- V. POLICYHOLDER SERVICES
- VI. DATA COLLECTION

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I. RATE COMPONENTS AND RULES

The NCCI rates and rules in administered-pricing states generally determine the premium the policyholder will pay for its coverage, subject to the degree of independence permitted to individual insurers by state law or regulation. The sections below discuss how NCCI filings consider the following: (A) Rates; (B) Expense constants; (C) Premium discounts; (D) Minimum premiums; (E) Anniversary rating date rule; (F) Experience rating plan; (G) Retrospective rating plans; (H) Schedule rating plans; (I) Other rating plans; (J) Policyholder dividend plans and practices; (K) Rate changes for policies in effect; (L) Retroactive rate changes; (M) Distribution of expense information to insurers; (N) Employers liability increased limit percentages; (O) Loss constants; and (P) Residual market classification relativities.

A. Rates

Rates are subject to prior approval and are filed by NCCI on behalf of insurers. The rates the NCCI files in these jurisdictions contain allowances for all losses, expenses, and profit. Specifically, they include the following categories:

Provisions for losses

Workers compensation losses consist of the indemnity and medical benefit payments to injured workers and their healthcare providers for covered injuries. They also include reserves for anticipated future payments for accidents which have occurred. For purposes of ratemaking, there are three major adjustments to losses reported as of a given date.

Loss development

Workers compensation claims take time to settle, pay, and close. As a result, the losses reported under the statistical plan and in the financial data calls are often

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estimates. Loss development factors adjust the reported losses by the observed historical pattern of the changes in prior loss estimates.

Benefit level changes

Workers compensation losses are governed by the statutory provisions contained in each state's workers compensation act. The benefits under these statutes often change automatically through indexed provisions or amendments. Consequently, historical losses may be adjusted by the average impact of benefit changes contained in the workers compensation act. The NCCI reviews these legislative changes and calculates factors representing their average impact.

Trend

The trend factor adjusts the historical workers compensation losses for expected cost changes over and above the expected changes in the exposure base. The exposure base for workers compensation is generally total payroll, which increases (decreases) yearly by changes in wage rates and employment levels. Thus, workers compensation premiums are indexed to payroll changes.

Provision for Expenses

The expense categories of production; general; and taxes, licenses, and fees are included in the rates.

Production expenses

These are all expenses relating to the production of insurance premiums. They include commission and brokerage and other acquisition expenses, and are usually included as 15% of the manual rate. Premium discounts will reduce this expense

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percentage for premiums in excess of \$5,000. Premium discounts are discussed in greater detail below.

General expenses

These expenses are for the general operations of the insurers, other than production and claims. The NCCI's Actuarial Committee annually recommends a provision for these expenses after reviewing countrywide experience. Premium discounts reduce this expense percentage for premiums in excess of \$5,000, based on periodic countrywide multi-insurer size-of-risk expense studies.

Taxes, licenses, and fees

These expenses usually consist of the premium tax in each state, premium-based assessments, and taxes such as industrial commission taxes, second injury assessments, and guaranty fund assessments. They also include miscellaneous fees such as insurer licensing fees, rate and policy form filing fees, agency licensing fees, and the policyholder share of employee Social Security taxes. This expense component is not reduced through the application of premium discounts.

Profit and contingencies

This is a provision for underwriting profit and contingencies. Traditionally, the NCCI requests 2.5% of premium for this provision. The NCCI maintains that this is a reasonable value for underwriting profit and contingencies, after the consideration of investment income.

However, this item is often adjusted downward, sometimes to negative values, in response to alternate calculations of the consideration of investment income. The profit and contingency allowance is not adjusted by the premium discount program.

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Loss adjustment expenses

Loss adjustment expenses are considered in the final rates through a factor applicable to losses alone. The NCCI's Actuarial Committee annually reviews and recommends a loss adjustment factor after a review of countrywide Insurance Expense Exhibit loss adjustment expense averages.

Loss-based assessments

Certain loss-based assessments are included directly in the definition of losses collected by the Statistical Plan and under the financial data calls. Other loss-based assessments are calculated and applied to the losses as a factor.

Disease elements

Some classifications contain extra amounts which are added to produce the final rate. Disease elements recognize the impact of special disease limitations introduced in the ratemaking process, the extra hazard implicit in the multiple-occurrence nature of these losses, and the fact that the long latency period associated with many occupational diseases may result in the exclusion of these losses from the classification data.

B. Expense constants

The expense constant, \$140 in current NCCI filings, is a flat charge added to the premium otherwise produced, and is designed to recognize a minimum expense amount common to all policyholders regardless of premium size. It thus recognizes the fixed elements of general and other acquisition expenses. The expense constant is determined through an NCCI special study by size-of-risk, usually performed once every five years. Between studies, the expense constant is adjusted by inflationary factors. The expense constant is added once per policy.

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C. Premium discounts

The NCCI promulgates two tables of premium discounts: a stock table and a non-stock table. In each state, an insurer may use either table regardless of whether it is legally structured as a stock, mutual, reciprocal, etc. Generally, an insurer must notify the NCCI of its decision and must use the selected premium discount table on all policies it issues.

Premium discounts recognize that the expenses of insurers do not increase directly with increases in premium volume. Instead, they result in reduced percentage allowances for commission and brokerage and other acquisition and general expenses at higher layers of premiums. The non-stock premium discounts are determined by an NCCI committee and are based on judgement.

For other acquisition and general expenses, the stock premium discount table is based on the same special study of expenses by size-of-risk as the expense constant. Other portions of the discount program are based on judgement.

D. Minimum premiums

The NCCI Basic Manual also provides for minimum premiums. If the premium for a policyholder as otherwise determined by the rates and rules is below the minimum premium, the minimum is charged. The NCCI publishes minimum premiums by classification in each of the administered-pricing states. In general, the minimum premium is calculated as a multiple of the rate designed to represent the annual premium for one average worker. The expense constant is then added. Typically, the minimum premium resulting from this formula is limited to a minimum and maximum amount before publication on the rate pages. When the minimum premium changes, current ratemaking procedures contain an offset to the rates so that this change does not produce additional premium.

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E. Anniversary rating date rule

The Basic Manual contains a rule stating that if a policy is canceled and then rewritten, the rates, rules, and experience modification factor in effect at the beginning of the original policy period are applicable to the rewritten policy. The NCCI or other rating bureau can reestablish the anniversary rating date.

F. Experience rating plan

The NCCI publishes and administers an Experience Rating Plan mandatory for all eligible policyholders. The rules of this plan are contained in the Experience Rating Plan Manual. The experience of all policyholders is reported to the NCCI by insurers according to the Statistical Plan. The NCCI's experience rating formula compares the individual experience of each policyholder to the average experience expected for similar policyholders, and results in an experience modification factor. In general, a three-year period expiring one year prior to the effective date of the new policy is used, although the rules provide for shorter or longer periods in certain circumstances. Factors greater than unity increase the policyholder's premium, whereas factors lower than unity decrease it. All insurers follow the uniform plan, and a single experience modification factor is issued regardless of the insurer writing the policy. In general, the experience is combined for policyholders with operations in more than one state or with more than one insurance policy.

G. Retrospective rating plans

Five retrospective rating options are published by the NCCI. Retrospective rating is optional for eligible policyholders, subject to insurer and policyholder agreement. Generally, only large-premium-sized policyholders are eligible (eligibility starts at \$5,000 in standard premium). Under retrospective rating, the premium charged to a policyholder depends on the actual loss experience that emerges under the policy. A minimum and maximum premium is agreed on, expressed as a percentage of standard premium. Within the minimum and maximum, the premium is based on

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the loss record of the policyholder, multiplied by an expense factor.

The first four plans are called tabular plans. The minimum and maximum premium factors are pre-determined based on the expected loss size of the policyholder, and the other parameters of the plan are contained in a table based on these pre-determined minimum and maximum premiums. The fifth plan is more complicated because it allows different combinations of maximum and minimum premiums to be selected. All retrospective rating options automatically include the standard expense provisions and premium discount plans.

H. Schedule rating plans

In twelve states NCCI files a schedule rating plan, in which the premium for a policyholder may be modified in accordance with the filed plan based on individual risk characteristics. There is a minimum and maximum charge or discount for each of the following risk characteristics: premises; classification peculiarities; medical facilities; safety devices; employee selection, training, and supervision; management cooperation with the insurer; and management-safety organization. The overall schedule modification is subject to maximum and minimum values. The schedule rating plans contain minimum eligibility requirements based on premium at manual rates.

I. Other rating plans

In addition to the standard plans, some rating classes are subject to special rules. In the calculation of chemical and dyestuff rating classes, the applicable rates are tempered through a complicated averaging technique so that the more hazardous chemical classifications receive higher rates. Overall, no additional premium is produced through this procedure. Similarly, the rates for maritime coverage are determined through a combination of state act and federal act rates according to a pre-filed formula. Coal mine classes are subject to a different rate manual, rating rules, and experience rating plan. There are also merit rating plans, and loss deductible plans available in some jurisdictions. Michigan has a special plan for the wrecking of buildings, and Florida has a special plan applicable to contracting

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classes. Other states have implemented an adjustment to the standard experience rating plan for contracting classifications called the Loss Ratio Adjustment Program (LRAP).

J. Policyholder dividend plans and practices

The NCCI does not file, recommend, or administer the dividend plans of any insurers.

K. Rate changes for policies in effect

The amount of workers compensation benefits in a state are determined by that state's legislature. It is customary for legislatures to modify the workers compensation benefit package from time to time. In addition, many state workers compensation statutes automatically adjust benefit levels in response to changes in an index, usually wages. Workers compensation benefit changes affect the benefits for all accidents on or after the effective date of the change.

The impact of these benefit changes are often not known at the time of policy inception, and are not included in the price. The workers compensation policy, however, automatically responds to pay the amount determined by the revised statute. Therefore, to respond to the changes in losses resulting from benefit changes, the workers compensation policy permits the insurer to revise the premium for the unexpired portion of the policy if approval is received by the regulator.

L. Retroactive rate changes

Occasionally, manual rates are not available to agents and/or insurers prior to the effective date of the rates. In that situation, the estimated premium for the policyholder is based on the prior rates. At audit, the final premium is calculated based on the approved rates. From the policyholder's perspective, this appears to

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be a retroactive rate change.

M. Distribution of expense information to insurers

The NCCI publishes countrywide summaries of the Insurance Expense Exhibit, with loss, expense, and premium information shown by type of insurer (Stock, Mutual, Reciprocal, State Funds, Other). This information is compiled from the individual insurer submissions of the Insurance Expense Exhibits. In addition, the NCCI rate filings contain the expense allowances used in the determination of manual rates.

N. Employers liability increased limit percentages

The standard workers compensation policy includes employers liability coverage up to \$100,000 for bodily injury by accident, \$100,000 for bodily injury by disease, and a \$500,000 policy limit. The NCCI publishes a table of increased limit percentages to provide the premiums for higher limits, if so elected. The same table contains minimum premiums for the increased limits.

O. Loss constants

Loss constants apply in only a few states. Where applicable, one loss constant is used per state, corresponding to the classification with the highest loss constant. Loss constants are not subject to experience rating. Where applicable, the minimum premium includes the loss constant premium so a further addition is not necessary. Loss constants are not applicable if the premium in any state with loss constants is in excess of \$500.

P. Residual market classification relativities

In general, the NCCI files for the residual and voluntary market rates in the same filing. The residual voluntary market rates use the same classification relativities. In some states, the rates for the residual market are at a higher level than the voluntary

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market rates. In other states, the same rates are used for both markets.

II. COMMITTEE ROLES

The NCCI has four committees directly affecting what is contained in a rate filing in administered-pricing jurisdictions.

A. Actuarial Committee

The Actuarial Committee is directly responsible for the ratemaking methodologies contained in the rate filing. Techniques for loss development, trending, experience periods, classification relativity calculations, credibility formulas, and so forth, are first approved by this committee prior to use in any state. These are the general techniques which become available to the NCCI staff for use in preparing the rate filing. The Actuarial Committee does not review the particular application of the methodologies chosen by the staff for use in any particular state in connection with a specific rate filing. Examples of Actuarial Committee decisions include:

Experience Period

Overall rate levels are determined on the basis of an unweighted average of the indications from the most recent calendar-accident year data and from the most recent completed policy year data.

Loss development methods

Currently available development methods are paid loss development, incurred loss development excluding insurer estimates for Incurred-But-Not-Reported losses (IBNR), and incurred loss development including insurer estimates for IBNR.

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Regardless of which method is used, the unweighted average of the development emerging in the two most recent calendar years provides the basis for the development factors. NCCI staff independently reviews the specific conditions applicable in a particular state and recommends a method for use in a specific state for a specific filing. However, the Actuarial Committee does not review these recommendations prior to their use in a state filing.

Trending methods

The current procedure results from actuarial committee recommendations. NCCI staff may make specific adjustments, where appropriate, for a given state in connection with a specific filing. These staff decisions are not reviewed by the Actuarial Committee prior to their use.

Other decisions

The NCCI classification ratemaking procedures, including development methods, experience periods, national experience, and credibility, directly result from the decisions of the Actuarial Committee.

In addition, the Actuarial Committee reviews historical countrywide expense data and provides recommendations for the allowances to be used for production expenses; general expenses; miscellaneous taxes, licenses, and fees; and loss adjustment expenses. The committee also determines recommended Premium Discount Tables and expense constants. This review takes place annually and is used by NCCI staff in preparing rate filings in all administered-pricing states.

Other tasks performed by the Actuarial Committee are a review of the percentages for employers liability increased limits, which are then recommended for filing in all states when the Committee determines changes are appropriate, and implementation

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of special programs. Examples of these special programs include rate differentials for residual markets and the elimination of premium discounts for the residual market.

B. Individual Risk Rating Committee

The Individual Risk Rating Committee reports to the Actuarial Committee. It is responsible for recommending the formulas used under the Experience Rating Plan, the Retrospective Rating Plan, schedule rating plans, merit rating plans, and other plans. The Actuarial Committee has final authority over the Individual Risk Rating Plan Committee.

C. Rates Committee

The Rates Committee reviews the specific rate indications and the specific methodology or methodologies recommended by the NCCI staff prior to their use in a particular state filing. This committee recommends the methodology and rate indication to the individual state's Classification and Rating (C&R) Committee for final approval.

D. Classification and Rating Committees

There are separate Classification and Rating (C&R) Committees for each state. They have final authority over the rate filings filed in their states, and they review all aspects of the rate indication, including the specific methodologies used. They consider the Rates Committee recommendations, but are not bound by them. The C&R Committees authorize the NCCI filings. They are also involved in the decisions whether to litigate or compromise in states where the original rate filing is disapproved.

In addition to their responsibilities concerning rates and rate filings, the C&R Committees also hear appeals by policyholders concerning the application of the

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classifications and rates to their specific policy. They issue decisions regarding the specific classifications and rates which should be applied to the policies under appeal. The decisions of the C&R Committees on these issues can usually be appealed to the insurance department and/or the courts. The C&R Committees also have jurisdiction over individual classification definitions and new classifications.

III. DISTRIBUTION OF MATERIAL TO AGENTS/SALES REPRESENTATIVES

The NCCI provides a variety of materials to insurers; many of these are available to agents/sales representatives and the general public.

A. Rate and rule manuals

Three NCCI rate and rule manuals are available for agents/sales representatives and insurers.

Basic Manual

The Basic Manual contains the General Rules applicable to all states concerning the premium determination for workers compensation policies. It contains state pages listing exceptions to the General Rules and the rates applicable in a given state. Subscription service is available for updates.

Experience Rating Plan Manual

This manual contains the General Rules and formulas applicable to the Experience Rating Plan. It also contains state pages which list state exceptions and the current experience rating values (Expected Loss Rates, D Ratios, W and B values). Again, subscription service is available for updates.

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Retrospective Rating Plan Manual

This manual contains the General Rules, formulas, tables, and endorsements applicable to the retrospective rating plan. State exception pages are also provided. Subscription service is available for updates.

B. Experience modification factors

NCCI sends experience modification calculations to the insurer of record 30 days prior to renewal. Additional copies of the experience modification factors are available, for a charge, with a letter of authorization. In addition, the NCCI provides experience modification factors over the phone to authorized requestors (principally agents/sales representatives).

C. Other products and services

The NCCI also provides a brochure containing the products and services it offers. They are available to insurers, as well as outside parties, including agents/sales representatives.

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IV. RELATIONS TO REGULATORS

The NCCI submits filings to regulators and serves as their statistical agent.

A. NCCI rate filings

Rate filings in administered-pricing states are made with the insurance department and are subject to prior approval. The NCCI government, consumer, and industry affairs department is responsible for making and supporting the filings in each state.

B. Statistical agent

The NCCI is the statistical agent in administered-pricing states. A common Statistical Plan is filed and approved in most of the jurisdictions. Insurers are required to adhere to the Statistical Plan.

V. POLICYHOLDER SERVICES

NCCI provides the following policy services:

A. Policy review

Copies of individual policies are filed with the NCCI's field operations division, where the rates and payrolls are reviewed for compliance with the approved rates and classifications. These policy submissions set up a control procedure whereby the NCCI expects to receive Unit Statistical Reports in accordance with the Statistical Plan.

Unit Statistical Reports contain individual policyholder exposure, premium, and loss data. They are used in the calculations of classification relativities and experience modification factors.

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B. Classification inspections

Another service provided by the NCCI field offices is individual on-site inspections to review the insurer's application of the correct classification code assignments. These inspections are performed as requested. In addition, inspections are performed on randomly selected risks.

C. Policyholder inquiries

Finally, the NCCI responds to individual policyholder requests concerning the rates and rating procedures it administers.

VI. DATA COLLECTION

The NCCI collects four distinct types of data:

A. Financial data calls

The NCCI bases the overall rate level changes on the data collected on financial data calls. These calls contain insurer aggregate loss and premium data.

Calendar year experience

Premiums and losses by state are on a calendar year basis. Premiums collected are standard earned premium at NCCI rates, standard earned premium at insurer rates (if deviations or schedule rating are used), and net earned premium (premium after the impact of premium discounts and retrospective rating adjustments). The losses are calendar year incurred losses.



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Calendar-accident year experience

The premium information on this call is the same as that for the calendar year call, except that the history for up to the last 15 years is collected. The losses are split into indemnity and medical components, and paid losses, case reserves, bulk reserves, and IBNR reserves are collected for each accident year.

Policy year experience

The same three types of premium are collected; however, policy year premiums contain premiums for policies written during a one-year period. Ultimately, fifteen years of data will be collected. The losses are those that result from the policies issued in each year. The same indemnity/medical and paid/reserve breakdowns are provided as for the calendar-accident year call.

B. Statistical plan data

Data is continuously reported under the NCCI Statistical Plan as individual policy experience reaches the appropriate maturity. Payroll, premium, and loss information is provided on an individual policy basis. These data form the basis for the Experience Rating Plan modifications and the individual classification rate relativities.

C. Detailed claim information

This data system collects descriptive information on lost-time cases, and it is used to review the individual characteristics of losses in the jurisdictions where it is in place. It is not used directly in ratemaking, except to the extent it may provide information useful to the valuation of benefit changes.

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D. Other data calls

These data calls are designed to provide supporting information for specific purposes. Information is sought for expense data, including the Insurance Expense Exhibit, state allocations of expenses, and special expense studies by size-of-risk. Information is collected on the impact of schedule rating adjustments, where it is used in the reconciliation of premiums on the other calls. There are also special calls requesting specific information in certain jurisdictions where these data are not available through other sources.

CHAPTER 3 NCCI Procedures in Loss Cost States

This chapter describes the services the NCCI and independent rating organizations provide to insurers in open competition and prior approval states which have already implemented loss costs. These services apply to the following states:

Connecticut
Georgia
Hawaii
Illinois
Indiana
Kentucky
Louisiana

Maryland
Michigan
Minnesota
New Mexico
Oregon
Rhode Island
South Carolina
Vermont

This chapter contains the following sections:

- I. RATE COMPONENTS AND RULES
- II. COMMITTEE ROLES
- III. DISTRIBUTION OF MATERIAL TO AGENTS/SALES REPRESENTATIVES
- IV. RELATIONS TO REGULATORS
- V. POLICYHOLDER SERVICES
- VI. DATA COLLECTION

There are independent rating organizations with jurisdiction in some of the states included in this chapter. The role of the independent rating organization and the relationship between the independent rating organization and the NCCI varies from state to state. Section I, *Rate Components and Rules*, discusses the components of loss costs developed by either the NCCI or independent rating organizations. Sections II through VI, discuss only NCCI procedures.

CHAPTER 3

NCCI Procedures in Loss Cost States

I. RATE COMPONENTS AND RULES

The discussion below relates to two types of loss cost states. The following major subdivisions apply:

1. Open competition states with advisory loss costs that exclude some or all expense and profit. The states listed here require the filing of advisory loss costs. The rate organization might also file advisory rates. Informational filings are made with the insurance departments containing these advisory loss costs.

Georgia
Illinois
Kentucky
Maryland

Michigan
Minnesota
Rhode Island¹
Vermont

¹Rhode Island is a competitive rating state for insurers with greater than 1% market shares, and a prior approval state for others. The NCCI files traditional rates for the insurers with less than 1% market shares.

CHAPTER 3

NCCI Procedures in Loss Cost States

2. Prior-approval states with loss costs. The loss costs filed by the NCCI in these states are subject to prior approval. In addition, individual insurers must file either a multiplier or full rates, also subject to prior approval.

Connecticut
Hawaii
Indiana¹

Louisiana
New Mexico
Oregon
South Carolina

¹Allows advisory rates.

In both sets of states, gross rates are filed for the residual market plans. The sections below discuss how loss cost filings consider the following: (A) Rates; (B) Expense constants; (C) Premium discounts; (D) Minimum premiums; (E) Anniversary rating date rule; (F) Experience rating plan; (G) Retrospective rating plans; (H) Schedule rating plans; (I) Other rating plans; (J) Policyholder dividend plans and practices; (K) Rate changes for policies in effect; (L) Retroactive rate changes; (M) Distribution of expense information to insurers; (N) Employers liability increased limit percentages; (O) Loss constants; (P) Residual market plan classification relativities; (Q) Other assessments; and (R) Classification relativities and definitions. We confine our discussions below to those states where some form of loss cost, either advisory or prior approval, is used.

A. Rates

The provisions included in the loss cost rates create the principal difference between the filings for the administered-pricing states (discussed in Chapter 2) and filings in the loss cost states (discussed in this chapter).

CHAPTER 3

NCCI Procedures in Loss Cost States

Provisions for losses

The rates filed in loss cost states consist of only the loss portion of the premium. States differ as to their treatment of the amount of actuarial adjustment permitted to historical reported losses in the published loss cost rates.

Loss Development

Loss development is always included in the loss costs. Minnesota, however, only allows development up to an eighth report. All other states allow development to an ultimate report. Minnesota, however, publishes pure premiums which include the differential impact of eighth-to-ultimate development as it impacts the more serious indemnity and medical losses. The Minnesota ratemaking report contains information concerning historical eighth-to-ultimate factors which could be used by insurers to convert the published loss costs to an ultimate basis.

Benefit level changes

These are included in all states. Oregon, however, does not permit the use of benefit adjustment factors representing the impact of changes in the maximum and minimum weekly benefits, which are indexed to that state's average weekly wage. Oregon believes that these benefit changes are reflected in the premium through payroll increases.

Trend

Trend is included in all states except for Michigan and Minnesota. Michigan excludes trend in its entirety, but Minnesota includes indemnity and medical trend relativities in the loss costs. The Minnesota ratemaking report provides information on observed trends and provides a method for insurers to include trend if they wish.

CHAPTER 3

NCCI Procedures in Loss Cost States

Provision for expenses

Provision for production expenses; general expenses; taxes, licenses, and fees; and premium-based assessments is excluded in loss cost filings.

Profit and contingencies

Provision for underwriting profit and contingencies is uniformly excluded in the loss cost filings.

Loss adjustment expenses

Loss adjustment expenses are included in a small majority of states (8 of 15 states). States excluding loss adjustment expenses are Georgia, Hawaii, Illinois, Kentucky, Louisiana, Maryland, and Oregon. Loss adjustment expenses are comprised of allocated and unallocated components. Allocated loss adjustment expenses are those specifically attributable to an identifiable claim, such as outside legal expenses. All loss adjustment expenses, both allocated and unallocated, are either included or excluded in the aggregate. We have not found a state which allows one type of loss adjustment expenses, but which excludes the other.

Loss-based assessments

States which include loss adjustment expenses generally also include loss-based assessments. Exceptions are Connecticut and South Carolina, which allow loss adjustment expenses, but exclude loss-based assessments.

Indiana, Rhode Island, and Vermont include loss adjustment expenses, but have no loss-based assessments to include. The states of Connecticut, Georgia, Hawaii, Illinois, Kentucky, Louisiana, Maryland, Oregon and South Carolina all have loss-based assessments but exclude them from the loss cost rates.

CHAPTER 3

NCCI Procedures in Loss Cost States

Disease elements

The disease elements in the loss cost states exclude the expenses and profit in the same manner as the rates for other classes.

B. Expense constants

Expense constants are excluded in all loss cost only filings. They are, however, included in states that allow both advisory rates and advisory loss costs. They are included in Rhode Island.

C. Premium discounts

Premium discounts are excluded in most loss cost only states. However, they are filed on an advisory basis in Hawaii and Rhode Island. They are included in states that allow both advisory rates and advisory loss costs.

D. Minimum premiums

Minimum premiums are included in the states where the NCCI or independent rate organization publishes both advisory rates and advisory loss costs, and they are also included in Rhode Island. In Oregon, the NCCI publishes only the loss cost portion of the minimum premium. Minimum premiums are not published in any other loss cost only states.

E. Anniversary rating date rule

This rule is applicable in all states listed above except Illinois.

CHAPTER 3

NCCI Procedures in Loss Cost States

F. Experience rating plan

The NCCI Experience Rating Plan is mandatory for all eligible policyholders in all of the above states except Michigan. Insurers must file their own plans in Michigan.

G. Retrospective rating plans

States differ in their treatment of NCCI retrospective rating options. Implicit in options 1 through 4 are the standard expense allowances and premium discount schedules. The NCCI includes references to plans 1 through 4 in all states that allow advisory rates as well as advisory loss costs. The Rhode Island filing also references plans 1 through 4. The other loss cost only states do not include references for plans one through four.

Option 5 is more complicated in that some aspects of this plan include expense elements whereas other aspects do not. In advisory-rate states, all values pertaining to option 5 are supported. The practice in loss cost states, however, is to eliminate all reference to the items in option 5 which relate to expenses or which are impacted by expenses. Specifically, the following references are eliminated:

- Expected Loss Ratios - These depend upon the final expense allowances in the manual rates.
- Table of Expense Ratios - These depend on the actual expense needs of retrospectively-rated policies.
- Loss Conversion Factor - These depend upon the expense needs of retrospectively-rated policies.
- Tax Multipliers - These depend upon the specific tax provisions applicable in a state.
- Retrospective Development Factors - These depend on the expense allowances included in the manual rates.

CHAPTER 3

NCCI Procedures in Loss Cost States

Items that are preserved in option 5 for the loss cost states include:

- **Table of Expected Loss Ranges** - This is maintained in some states, but reference to it appears to be eliminated in others. This table indicates which column of the Table of Insurance Charges is applicable to risks of a given size, when size is measured in terms of expected losses.
- **Table of Insurance Charges** - This table is the key to determining the amount to charge for the minimum and maximum premiums agreed to under the retrospective rating option. The net insurance charge is expressed as a percentage of expected losses, and consequently does not include expense provisions.
- **Excess Loss Factors** - This table determines the amount of losses expected in excess of specific loss limitations. The tables in administered-pricing states are expressed as percentages of standard premium which presume the standard expense loadings. A modification to these tables is made in loss cost states to express the losses expected in excess of specific loss limitations as percentages of the loss cost portion of the premium, rather than as a percentage of standard premium. This modification eliminates the impact of expenses in these factors.

H. Schedule rating plans

Of the states considered in this chapter, the rating organizations file a schedule rating plan only in Indiana, New Mexico, Rhode Island, and South Carolina.

I. Other rating plans

In advisory-rate states, the special rating plans continue as they have in the administered-pricing states. For the loss cost only states, these rating plans are adapted to the loss cost environment without difficulty.

CHAPTER 3

NCCI Procedures in Loss Cost States

J. Policyholder dividend plans and practices

The rating organizations do not file, recommend, or administer the dividend plans of any insurers.

K. Rate changes for policies in effect

The NCCI files for an adjustment for outstanding policies in situations where a benefit change has a significant impact on benefit costs in the same manner as in the administered-pricing states discussed in Chapter 2.

L. Retroactive rate changes

We did not find an example of where this occurred in an advisory-rate or loss cost state.

M. Distribution of expense information to insurers

The NCCI publishes countrywide tabulations of historical expense data contained in insurer Insurance Expense Exhibits. Specific expense allowances are shown in NCCI filings in states which allow advisory rates as well as advisory loss costs. There are no voluntary market expense allowances distributed to insurers for the loss cost only states.

N. Employers liability increased limit percentages

These are applied in the traditional manner.

CHAPTER 3

NCCI Procedures in Loss Cost States

O. Loss constants

Loss constants did not apply in any state reviewed in this chapter.

P. Residual market plan classification relativities

Generally, residual market filings are made at the same time as the voluntary market filings, but are filed separately. The residual market maintain the same classification relativities as the voluntary market in the loss cost states.

Q. Other assessments

A few states have assessments which are charged directly to policyholders and are not a part of the workers compensation premium. Examples of states with these assessments are Kentucky and Oregon.

R. Classification relativities and definitions

Some states require adherence to the rating organizations' classification definitions, while others allow individual insurer definitions. Where individual definitions are allowed, data is converted back to NCCI definitions. Of the prior approval states, Oregon allows insurers to subdivide the rating organization's classifications.

Independent insurer classification relativities is a related issue. Of the prior approval states, New Mexico and Oregon allow it. It has not been tested in South Carolina and Hawaii. Connecticut and Louisiana do not allow independent classification relativities.

CHAPTER 3

NCCI Procedures in Loss Cost States

II. COMMITTEE ROLES

The NCCI committees, active in the administered-pricing states, have a restricted role in the loss cost and competitive rating states identified in this chapter.

A. Actuarial Committee and Individual Risk Rating Committee

The activities of the Actuarial Committee and the Individual Risk Rating Committee are the least affected because they operate on a general basis, non-specific to a particular state or rate filing. The basic procedures, tools, and techniques used in the loss cost states are the same as those for the other states. However, these committees do not have any authority concerning a specific state filing.

B. Rates Committee

The Rates Committee does not issue any recommendations concerning the rate filings in the loss cost and competitive rating states. The NCCI staff makes all decisions concerning the specific elements to include, the final methodologies chosen, and the timing and amounts of rate filings.

C. Classification and Rating Committees

Each Classification and Rating Committee relinquishes its authority over voluntary loss costs and residual market rates in each of these states. The NCCI staff is fully responsible for the contents of the rate filings. The Classification and Rating Committees, however, still perform their functions concerning the application of the classification plan to particular policyholders.

CHAPTER 3

NCCI Procedures in Loss Cost States

III. DISTRIBUTION OF MATERIAL TO AGENTS/SALES REPRESENTATIVES

Instead of manual rates, the Basic Manual contains advisory rates or loss costs. In loss cost states, retrospective rating plans 1 through 4 are generally excluded. The same Basic Manual, Experience Rating Manual, Retrospective Rating Manual, and products and services are available in most states. The NCCI does not publish advisory loss costs for Minnesota's voluntary market in the Basic Manual. However, the Minnesota Workers Compensation Insurance Association, Inc. does publish advisory loss costs in its Minnesota Ratemaking Report. This publication is available to agents/sales representatives, insurers, and other interested parties.

Experience modification factors are calculated and promulgated in the same manner as in the administered-pricing states. An exception exists in Michigan, which does not use uniform manuals or a uniform experience rating plan. Consequently, no manual pages or experience modification factors are issued for that state.

IV. RELATIONS TO REGULATORS

The NCCI role with regulators includes the following:

A. NCCI rate/loss cost filings

In the loss cost and competitive rating states, rate filings are made with state insurance departments. The loss costs or advisory rates are informational filings in the competitive rating states, and are subject to prior approval in prior-approval states. The NCCI's government, consumer, and industry affairs department is responsible for making and supporting the filings in each of these states in the same manner as in the administered-pricing states, but without guidance from insurer committees.

CHAPTER 3

NCCI Procedures in Loss Cost States

B. Individual insurer rate filings

In some states, particularly the advisory-rate states, individual insurers can reference the NCCI filing and adopt it as their own. Alternately, they can reference the loss cost component in the states with advisory loss costs, but must file for the other elements constituting final rates. Frequently, a multiplier from the loss costs is all that need be filed. In the prior approval states, a similar referencing can take place. Usually, if approved, the NCCI's loss costs are the mandatory starting point for individual insurer rates. Adjustments to the level of loss costs, for factors relating to losses as well as expenses are frequently permissible.

C. Statistical agent

The NCCI is the statistical agent in the advisory-rate and loss cost states. A Statistical Plan is filed and approved in most of the jurisdictions. Insurers are required to adhere to the Statistical Plan. Where insurers are free to use subclassifications or other adjustments to the NCCI's Statistical Plan, the insurers must convert data back to the NCCI's Statistical Plan for statistical reporting purposes.

V. POLICYHOLDER SERVICES

NCCI provides the following policyholder services:

A. Policy review

Copies of individual policies are filed with the NCCI's field operations division. The rates are not reviewed, but the payrolls and classifications are. These policy submissions form the basis for the control procedure governing the statistical reporting and experience rating requirements expected to emerge in the future as a result of the policy reviewed.

CHAPTER 3

NCCI Procedures in Loss Cost States

B. Classification inspections

Classification inspections continue in the usual manner for the open competition states as well as for the administered-pricing states. As a result of the inspection, the NCCI instructs the insurer on the appropriate NCCI classifications for the risk.

VI. DATA COLLECTION

Of the data collected in NCCI calls, the financial data and the special calls are impacted the most by loss costs. Statistical plan reporting is impacted in a minor way, and the detailed claim call not at all.

A. Financial data calls

The loss information on the three financial data calls, i.e., calendar year call, policy year call, and calendar-accident year call, are no different in the loss cost or advisory-rate states. The reporting of premiums, however, is substantially different. The loss cost and advisory rate states use the concept of a Designated Statistical Reporting (DSR) level for the reporting of the premiums in these states. In the states which allow the NCCI to publish both rates and loss costs, the DSR is usually at the level of the advisory rates published during the applicable time periods. In states that allow only loss costs, the DSR is usually at the level of the NCCI's published loss costs.

The use of advisory rates or loss costs, therefore introduces a complication to the reporting process. Insurers must report amounts they would have charged had they used either the NCCI's published advisory rates or published loss costs. The NCCI requests the Standard Earned Premiums at the DSR level, the Standard Earned Premiums at insurer level (i.e., the actual charged rates), and Net Earned Premiums. The Net Earned Premiums are at insurer level and include the impact of premium discounts and retrospective rating adjustments.

CHAPTER 3

NCCI Procedures in Loss Cost States

This process appears to be working satisfactorily at this time. However, for most insurers in most states the difference between DSR premium and standard premium is a uniform multiplier. As individual insurers deviate by classification from NCCI loss costs, it becomes more difficult for the insurer to maintain DSR premium information and it becomes more difficult for the NCCI to verify the accuracy of the insurer data.

B. Statistical plan data

The statistical plan reporting continues in exactly the same manner in the advisory-rate and loss cost states. The rates and premium reported under this plan are to be the actual rates charged for the policy. The reporting of losses is unaffected.

C. Detailed claim information

Since the detailed claim call collects only loss and claim information, it is unaffected and functions normally in these states.

D. Other data calls

The other data calls are adapted to DSR level concept where appropriate.

CHAPTER 4

Loss Costs as Applied by ISO

This chapter contains the following sections:

- I. ISO APPROACH
- II. STATE REGULATORY CHANGES
- III. CALIFORNIA RATING LAWS
- IV. MATERIALS SUPPLIED BY ISO
- V. MAJOR DIFFERENCES BETWEEN ISO AND NCCI

I. ISO APPROACH

Some important points to consider in a discussion of the ISO implementation of loss costs are:

- Loss costs include loss development, trend factors, and all loss adjustment expenses.
- The change to loss costs is being made gradually, state by state, at state rate revision anniversary dates.
- Rules and rating factors are generally not affected by the change to loss costs.
- Individual risk rating plans will be modified to "key off" of loss costs rather than premiums. This will allow the same plan to apply to insurers with different expense loadings.
- Retrospective rating plans will not be changed. They have been designed to reflect insurers' own expense provisions, rather than the ISO provisions underlying manual rates. Therefore, ISO believes that any modification to the plans is not necessary.

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- As of October 1990, approximately 35 states have adopted loss cost procedures. ISO did not expect adoption of loss cost procedures in Texas and Puerto Rico. The status of procedures for the remaining states is pending.
- For automobile insurance, ISO has responsibility for voluntary rates only. ISO is not responsible for residual market rates, except in that it serves as statistical agent for AIPSO. Residual market rates are still determined on a gross basis by AIPSO.

II. STATE REGULATORY CHANGES

The NAIC has two model rating laws: a competitive rating law and a prior-approval law. The competitive rating law has not been changed, since it already refers to ISO loss costs. The prior approval law, which previously required that advisory organization rates be filed for prior-approval, has been modified to require that advisory organization loss costs be filed for prior approval.

Under the NAIC-suggested prior-approval procedure, ISO obtains prior approval of loss cost documents. Insurers are required to complete and file for prior approval a form to reference the ISO document, with an expense and profit load and possibly a loss provision modification.

A standard form has been prepared by the NAIC enabling an insurer to reference files from the ISO rate circular, adding expense and profit provisions, and perhaps loss deviations, in a uniform format. The form requires support for the provisions proposed by the insurer.

In states with use and file rating laws, the ISO loss cost circulars and insurer forms will also be filed and subject to evaluation by the insurance department after the rates have been put into effect.

We have not found any states considering fundamental changes in their rating laws, e.g., changing from use and file to prior approval, as a result of the ISO loss cost change. Instead, states are only modifying their regulations where necessary to accept loss costs instead of rates.

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Massachusetts, Texas, and North Carolina have statutory rating organizations for some lines of insurance. In these states, no action has been taken to adopt loss cost procedures for statutory line of insurance.

III. CALIFORNIA RATING LAWS

The California system for Proposition 103 lines of insurance (i.e., excluding workers compensation) is unlike the systems in other states. The ISO loss cost approach is not used in California. Instead, insurers individually file a detailed series of forms in which losses are trended, loaded for expenses and profit, and so forth. All computations are done by the insurers on the forms, with all necessary judgements made by the insurers.

ISO is permitted to maintain a personal automobile data bank which is accessible, for a fee, to insurers. In other respects, ISO continues to operate as a statistical agent in California.

Residual market rates are computed by the California Assigned Risk Pool Association. These rates are uniform for all insurers, and are set by prior approval of the department.

IV. MATERIALS SUPPLIED BY ISO

The standard form developed by the NAIC is structured so that an insurer can have it apply only to the most current revision, or to future revisions until the form is resubmitted.

For commercial lines, ISO will distribute loss cost manual pages to insurers and agents/sales representatives on their mailing list. Manual holders will determine gross rates either by obtaining factors or gross rate pages from insurers. They also may obtain the gross rate information from computer servicing organizations.

For personal lines, ISO will produce a manual containing rules only. Loss costs will be distributed by circular to insurers. No manual pages will be distributed by ISO.

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ISO publishes other advisory circulars containing information which may be used by insurers to support their pricing actions, for example, expense data by line and by size-of-risk, loss compilations, trend and loss development circulars, and premium comparisons (for personal lines only, and not in all states).

As stated above, ISO is changing its individual risk rating plans to a loss cost basis. To help insurers adapt to this change, they are distributing explanatory material regarding the change and also are distributing material explaining how an insurer might convert the ISO loss cost plan to its own premium plan.

ISO has prepared educational materials to assist insurers and agents/sales representatives with the transition to loss costs. In addition, they participated in a video teleconference with the Society of Chartered Property and Casualty Underwriters (CPCU) to disseminate loss cost information.

ISO has shifted all responsibility for decisions on actuarial methodology and judgment to the ISO staff. Many of these decisions were formerly made by insurer committees. ISO still has insurer committees, but they act strictly in an advisory capacity.

V. MAJOR DIFFERENCES BETWEEN ISO AND NCCI

The ISO statistical data base is not significantly changing as a result of the implementation of loss costs. However, some major aspects of the ISO data base are different from those of the NCCI workers compensation data base.

The ISO data base is used only for ratemaking. This is unlike the NCCI data base, which is used for experience rating as well as ratemaking. Because of the experience rating requirement, the NCCI data base is a policy data base, where premiums and losses on individual policies can be identified. The ISO data base, however, is actually comprised of a premium/exposure data base and a loss data base, where the two are processed separately. It is thus not possible to match up premiums and losses on individual policies from the ISO data base.

The ISO rules are also more flexible than the NCCI rules in several respects, and this is reflected in the larger number of options in the ISO Statistical Plan. For example,

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ISO experience rating plans are optional, while NCCI plans are mandatory. Also, ISO has schedule rating plans permitting premium credits and debits based upon subjective underwriting criteria in all states, while the NCCI does so only in approximately a dozen states.

There is also much less uniformity of policy forms and coverages underlying the data in the ISO data base than is the case for workers compensation. Many insurers have their own special package program or unique coverages and report the experience for these packages or coverages to ISO, but it is specially coded and used in a limited fashion for ratemaking.

ISO has "A-rated classes," broadly defined classes (e.g. metal products manufacturing) where ISO believes that the average loss per exposure for the class is not indicative of the loss potential for any particular risk within the class. For this reason, ISO does not determine manual rates for A-rated classes. The NCCI, on the other hand, has just a limited number of A-rated classes.

Not all ISO data for standard coverages or packages is used for commercial lines ratemaking; several large classes such as composite-rated risks, large A-rated risks, and loss-rated risks are excluded. This data corresponds to larger corporate risks, where it is believed that premiums are not based on ISO manual rates. This varies from workers compensation, since, workers compensation rates are computed based on experience from all risks.

ISO has a three-tiered statistical plan, i.e., a full plan, an intermediate plan, and a mini-plan. The smallest insurers qualify for the mini-plan, while the largest must use the full plan. The mini-plan data is usually excluded from ratemaking calculations for all commercial lines. The intermediate plan data is used for overall rate level calculations, but not for increased limits factor calculations and is used in a limited fashion for other relativity calculations. The NCCI only has one statistical plan for all insurers.

Some insurers have received permission from ISO to submit data in limited detail. Exposure units are typically not provided in these cases, so the data cannot be used for ratemaking.

Package policies represent a fundamental difference between ISO and the NCCI, in

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that ISO has package policies and the NCCI does not. For commercial lines, ISO segregates monoline and package data. Furthermore, not all package policy data is included in the ISO data base. Data from the ISO SMP Package Program and certain insurer package programs are included in the ISO ratemaking data base, but other insurer package policies are not. ISO makes the decision whether or not to include an insurer's data.

Conversely, the workers compensation data base currently includes data for all risks and is not affected by package variations. Complete recording is required of all insurers reporting to the NCCI.

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This chapter describes a manner in which loss costs could be implemented for workers compensation in NCCI administered-pricing states with a minimum of disruption to the current system. This plan adopts the features common to existing workers compensation loss cost states on issues specific to workers compensation, and it uses concepts from the ISO loss cost procedures in areas where national issues are involved. The system is referred to as the Typical loss cost system. Many variations to this typical system are possible, and some of these are also discussed.

In this chapter we will discuss assumptions in the following areas:

- I. CONTENTS OF NCCI LOSS COST FILINGS
- II. EXPERIENCE RATING PLANS
- III. INSURER FILINGS
- IV. CLASSIFICATION RATING
- V. RETROSPECTIVE RATING
- VI. SCHEDULE RATING
- VII. RELATIONSHIP BETWEEN NCCI AND INSURER COMMITTEES
- VIII. INFORMATION SUPPLIED TO INSURERS
- IX. RESIDUAL MARKET RATES AND RATING VALUES
- X. POLICY FORMS
- XI. OTHER MANUAL RULES
- XII. DISTRIBUTION OF INFORMATION TO AGENTS/SALES REPRESENTATIVES

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XIII. AVAILABILITY OF NCCI DATA

XIV. TRANSITION PROVISIONS

I. CONTENTS OF NCCI LOSS COST FILINGS

The NCCI would produce loss cost filings in which loss costs are based on historical loss experience modified by loss development, adjustments to current benefit level, and trend. The following additional adjustments would also be included in the loss costs:

- a. Residual market subsidies to be paid by voluntary market policyholders
- b. Loss-based assessments
- c. Loss adjustment expenses, both allocated and unallocated
- d. Disease loss components

As part of the filing, the NCCI would produce loss costs by rate classification. Classification rates would reflect all relevant actuarial procedures, including adjustment for the off-balance in the Experience Rating Plan.

NCCI would also evaluate benefit changes and file in-force policy loss cost adjustment tables.

Currently, the NCCI loss costs include these elements in most loss cost states. A notable exception is Michigan, which does not include trend. Another exception is Minnesota, where the Minnesota Workers Compensation Insurers Association, Inc. (MWCIA) loss costs reflect special treatment of trend and loss development. The

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treatment of loss-based assessments is variable among loss cost states, some include them, but most states exclude them.

These elements are discussed below.

A. Loss development and trend

All states for workers compensation and all states except California for ISO lines have included loss development in the loss costs produced by the rating organization.

One partial exception is Minnesota workers compensation, in which MWCIA loss costs are developed to 8th report, and companies are supplied with information that includes several methodologies with which to calculate development factors from 8th report to ultimate. The Minnesota exception may be viewed as a response to its unique circumstances. Minnesota law provides escalating benefits which have a tendency to increase the loss development "tail" beyond the 8th report. Minnesota also has a mandatory reinsurance pool that covers large claims. This shortens the tail on net of reinsurance data.

All states except Michigan and Minnesota for workers compensation, and all states except California for ISO lines, include trend in the loss costs produced by the rating organization.

While it is true that functioning markets exist in states that have followed alternate paths, to exclude trend and loss development from loss costs for workers compensation would be a major departure from the existing programs. At a minimum, it is likely that if trend or loss development were excluded in whole or in part from the loss costs, additional data must be made available to insurers, and educational efforts would have to be augmented.

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B. Loss adjustment expense

The treatment of loss adjustment expense varies widely among loss cost states in the workers compensation system. Loss adjustment expense is included in the ISO loss costs, except in California.

Insurers divide loss adjustment expense into two categories. The first, allocated loss adjustment expense, (ALAE) refers to claim handling expenses assigned to a specific claim file, for example, attorney fees for a specific case. The second, unallocated loss adjustment expense, (ULAE) refers to claims handling expenses that are not assigned to particular files. These could include the cost of salaries for a claim department.

For liability coverages, allocated loss adjustment expense is defined by ISO to include only the legal defense provided to the policyholder under the terms of the contract. This does not depend on the manner in which the insurer handles claims. ALAE can be included in the overall loss costs and distributed in the ratemaking system to states, territories, and classifications. ULAE by its nature, is not directly chargeable to states, territories, and classification.

For workers compensation, there has not previously been a precise definition of allocated loss adjustment expense for NCCI Statistical Plan purposes. Since the relative proportion of expenses between ALAE and ULAE depends on the extent to which an insurer uses salaried claim personnel or outside claim personnel, the expense distribution varies among insurers. Including only allocated loss adjustment expenses for workers compensation is thus not feasible because insurers may have far different distributions of allocated versus unallocated when compared to the industry, and the resulting loss costs would not properly represent average costs.

Therefore, we propose that all loss adjustment expense be included in the typical system. The alternative is to include no loss adjustment expense. There have been some NCCI attempts to obtain better allocated loss adjustment expense data in the rating system, so it may be premature to eliminate all loss adjustment expense from a nationwide loss cost system.

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Even when loss adjustment expense is included in loss costs, insurers can readily use different loss expense provisions by adjusting their loading factors.

C. Assessments

Workers compensation is unlike most other types of insurance with respect to the range of assessment programs. For example, workers compensation may be subject to assessments for (1) second injury funds, (2) workers compensation board expenses, (3) supplemental benefit funds, (4) reinsurance funds, and so on. The magnitude of the assessments varies widely from state to state, and the assessment base also varies from state to state and program to program. For example, some assessments are based on premium, some on premium after several adjustments, some on paid indemnity losses, and some on total paid losses; some are charged directly to policyholders like a sales tax, rather than included in premiums.

Most of the workers compensation states permit the advisory organization to include loss-based assessments in the loss rate. If loss costs do not include loss-based assessments, it becomes particularly important that the NCCI summarize and report to insurers on the details of assessment provisions.

D. Residual market subsidies

Voluntary loss costs would contain provision for residual market subsidies to be paid by voluntary market policyholders. There are three possibilities. First, if the voluntary and residual markets experience is combined to determine a uniform level of loss costs, then the voluntary loss costs will contain a subsidy, provided the assigned risk experience is worse than the voluntary market. Second, if some but not all of the generally worse than average experience is reflected in the assigned risk rates, then the subsidy will be lower, but will still be positive. Finally, if the assigned risk rates reflect all of the experience differential, then there is no voluntary market subsidy.

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II. EXPERIENCE RATING PLANS

In the typical system there would be a single Experience Rating Plan applied to all policyholders. The rating values underlying the plan would be determined by NCCI as part of the loss cost filing. Therefore, as under the current administered-pricing procedure, the experience modification factor for policyholders would be the same no matter which insurer offers coverage. The modification factors would continue to be calculated by the NCCI or the appropriate rating (advisory) organization. Therefore, the NCCI would continue to collect the policyholder data that underlies the experience modification calculations.

These decisions are discussed below.

A. Experience rating in workers compensation loss cost states

In workers compensation loss cost states, the experience rating plans are generally mandatory. Only Michigan permits variations in the plan among insurance companies.

B. Goals of an experience rating plan

The use of a mandatory common experience rating plan is intended to produce more equity among policyholders than insurer-designed plans or the voluntary plans used in other lines of insurance. If mandatory experience rating were eliminated, the experience rating process is likely to be more market-driven and less cost-driven.

The use of a common experience rating plan, centrally administered and applied to all policyholders, has been viewed as important because it is intended to encourage policyholder loss prevention in ways which may not be achieved through individual insurer action. The use of a common plan can reduce policyholder confusion and permit policyholders to compare their experience to that of other similarly-classified policyholders.

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C. Other issues

If a common experience rating plan is to be used, the NCCI needs to continue collecting individual policyholder data. If a common, centrally-administered plan is not to be used, the NCCI's data collection goals could change. The NCCI could then collect data for exposures and claims, but need not retain the ability to match individual policyholder exposures and losses. This kind of data base is simpler to maintain than the current NCCI database.

Our typical system has a common experience rating plan which applies to both voluntary and residual markets. The rating parameters will be based on the combined experience of the voluntary and residual markets.

There is potentially some logical inconsistency in simply applying a uniform set of experience rating values for companies charging different rate levels. For example, suppose one insurer charges 20% more than another insurer because its loss costs per unit payroll are 20% higher. Use of a common experience rating plan could double-count the adverse experience, since the experience rating parameters are used to measure how much better or worse an individual risk is compared to an average risk. The situation can be handled satisfactorily by the proper selection of the insurer loss cost multiplier. For example, if Insurer A's risks are 20% "worse" than average, then the loss cost differential must be chosen so that the loss cost differential, in combination with the average experience modification, produces the proper amount of premium differential for Insurer A.

III. INSURER FILINGS

Insurers would file a loading factor with the insurance department. This loading factor would adjust loss costs for insurance insurer expenses, profit, and possible differences in expected loss cost levels.

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In addition, insurance companies would file their own premium discount plans, expense constant programs, minimum premiums, and schedule rating, as appropriate.

A form should be developed to assist the insurers with the calculations necessary to derive the multiplier. Workers compensation has an expense structure, which includes expense constants and premium discounts. This is more complex than the expense structures in filings for other commercial lines of insurance. Furthermore, workers compensation is also more commonly subject to assessments than other lines of insurance. The filing form should accommodate these elements of the workers compensation expense structure.

It would also be beneficial to regulators and insurers if NCCI provides some summary expense information. This is discussed in item VIII, below.

The rate multiplier filed by an insurer would remain in effect until it is revised by the insurer or disapproved by the insurance department. That is, if the NCCI files a new set of loss costs, the insurer would automatically adopt the new loss costs with its current rate multiplier unless it files to do otherwise. This includes changes in loss costs caused by changes in benefit levels (i.e., law amendment adjustments). Insurers would be permitted to automatically adopt NCCI in-force loss cost adjustment tables when necessitated by benefit changes and approved by the insurance department.

In cases we studied, the loadings sometimes remained in effect until changed. Of seven prior-approval states three allow loadings to continue, and four do not. The alternative procedure would require that insurers constantly reevaluate their loading and may lead to increased competition. On the other hand, insurance departments would need to process far more filings than they would have to process in the typical system.

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IV. CLASSIFICATION RATING

In the typical system, we assume insurers have limited freedom to establish alternative classification relativities and new classification definitions, so long as provisions are made to redefine the experience in standard classifications for ratemaking purposes. For each state, the degree of permitted independence would be the same in loss cost states as it is in the current system. This approach should be able to maintain the existing level of integrity of data for experience rating, overall loss cost calculations, and classification relativities.

Increasing insurer independence is feasible, but it increases the risk to the accuracy of experience rating, overall loss cost calculations, and classification relativities. Diligence by NCCI and insurers could control those risks. However, particularly during the transition to loss costs, the effort required for that increased diligence may not be available.

The risks to the various elements of the NCCI process were discussed in Chapter 1.

V. RETROSPECTIVE RATING

NCCI would continue to provide support for the loss elements of retrospective rating. Options 1 through 4, which rely on tables that include expense elements, would no longer be available. In any event, the NCCI intends to eliminate these options for other reasons, including the fact that they are not frequently used.

Insurers will have to determine their own expense tables for use in option 5. This should not be a significant problem, because these plans are generally used by more sophisticated insurers.

Furthermore, the NCCI is currently responsible for reviewing insurer retrospective rating plan calculations. That service would be discontinued as a standard practice, but the NCCI could provide the service if requested by an insurer. Again, since retrospective rating plans are generally used by more sophisticated insurers, we do

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not expect that the review service would be frequently used. In order for the NCCI to review an insurers retrospective rating plan calculation, the insurer would need to provide its expense provisions to the NCCI.

VI. SCHEDULE RATING

If schedule rating plans are permitted, the NCCI would be allowed to file advisory plans. Any insurer wishing to file an alternative schedule rating plan would be permitted to do so.

VII. RELATIONSHIP BETWEEN NCCI AND INSURER COMMITTEES

NCCI staff would make all decisions regarding loss cost filings. This would include decisions regarding loss development, trend, the effect of changes in benefit levels, classification relativity capping procedures, and others. If the loss cost filing is subject to approval by a state insurance department, NCCI staff would be responsible for negotiations required in achieving a resolution. These issues would not be referred to committees of insurers.

The NCCI Actuarial Committee could continue to provide advice, but would not be permitted to require staff to adopt procedures generally or in any specific states.

The state Classification and Rating Committee would no longer make state specific recommendations regarding loss cost filings, but they would continue to have a role as referee in classification disagreements between policyholders and insurers.

The Classification and Rating Committee may still advise NCCI staff on establishing new classification codes and/or refining existing class code definitions. However, the specific loss costs to be implemented for individual new classifications would be decisions of the NCCI staff.

The removal of insurer personnel from a decision-making role in the loss cost preparation and filing process is common to all the systems we studied.

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We believe that the use of Classification and Rating Committees (C&R) to referee classification disputes is reasonable given the use of a common classification system. Moreover, this reduces the burden upon insurance departments, which would otherwise need to serve as the first level referee for those classification disputes. This is not an issue for ISO lines where classifications are not necessarily uniform across companies. It should be noted that if common classifications are not required then the classification role of the C&R Committees might no longer be necessary.

VIII. INFORMATION SUPPLIED TO INSURERS

NCCI should supply a broad spectrum of materials to insurers to assist them in making independent decisions about their pricing behavior.

Material to be supplied to insurers should include the following categories:

A. Information relating to NCCI's loss cost calculations

This would include such material as alternative approaches for loss development and trend, and information on judgmental decisions such as classification relativity capping. This is the type of information provided in detail form by the Minnesota Workers Compensation Insurers Association and in summary form in NCCI rate adequacy studies.

Increasing the information supplied to insurers seems valuable in a competitive environment. All states we studied permit the advisory organization to publish as much loss cost (as defined in the state) information as it considers appropriate. The NCCI should be permitted and encouraged to maximize the information it publishes so that insurers can knowledgeably evaluate the appropriateness of industry-wide loss cost provisions in relation to their manner of operation, their views of trend, loss development, and so forth.

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B. Premium tax and assessment information

This would include information on premium tax levels in the state, assessment levels in the state, and how those assessments are handled in the loss costs.

C. Expense information

The NCCI would summarize insurer expense ratio data in a form where (1) expenses are adjusted to eliminate the impact of residual market servicing insurer fees; (2) expenses are shown on a uniform size-of-risk basis, and (3) premiums are put on a common level, for example, the DSR level which is the loss cost level in loss cost states. This information should be provided for a number of categories of insurers including stock insurers, non-stock insurers, small insurers, large insurers, and regional insurers.

Commission variations by size-of-risk would not be addressed by the NCCI.

If multi-company studies of expense by size-of-risk are not available to insurers and regulators, then it is likely that insurer operating expense discounts will become more market-driven rather than cost-driven. Multi-company information on expense by size-of-risk is desirable for developing residual market rates. In this typical system, the NCCI would continue to conduct expense studies by size-of-risk and make that information available to insurers and regulators.

The publication of expense information is potentially subject to more contention. ISO publishes expense data. In workers compensation to date, the expense issue has not been significant, since NCCI generally uses countrywide expense provisions, which would be readily available until a nationwide loss cost system is established. Even after a loss cost system operates nationally, some expense data would be available through the residual market rate filings.

The issue of expenses for ratemaking is more complex in workers compensation than for other lines of insurance due to the regular use of such items as premium discount plans and expense constants. If the NCCI is not permitted to publish any expense information, there is a risk of unnecessary confusion.

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D. Instructions on how to calculate loss cost multipliers

This should include theoretical discussion as to where individual insurers might obtain expense information for their own use.

E. Premium comparisons

ISO publishes premium comparison information for a number of its lines of insurance. It may be desirable for NCCI, or some other party, to do this for workers compensation.

F. Individual insurer loss compilations

Both the NCCI and ISO make available to individual insurers compilations of their own loss data. To increase competition, regulators might encourage insurers, especially larger insurers, to rely more on their own loss data.

IX. RESIDUAL MARKET RATES AND RATING VALUES

The NCCI would continue to develop gross rates and rating values for the residual market. Insurers would be provided with sufficient information to analyze the voluntary and residual market experience separately.

Overall rate level

A residual market loading in voluntary prices becomes more visible in a loss cost environment. Regulators will need to establish a policy on the extent to which residual market rates are self-supporting and the extent to which those rates are supported by subsidies from voluntary rates. The typical system assumes that the residual market subsidy is included in voluntary loss costs.

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Classification rates and rating values

Since policyholders move between the voluntary and residual markets, and since classification data may be sparse in either market separately, it seems reasonable to combine the experience for calculating classification relativities.

The interaction of classification relativities and experience rating plan values discussed earlier also applies to ratemaking for residual markets. The relative distribution of residual market policies and voluntary policies by classification can also affect this calculation. Technical aspects of this issue require future NCCI analysis; in the meantime, the use of common rating values is a reasonable approach.

X. POLICY FORMS

Insurers would be allowed to continue to participate in the design and filing of policy forms. Uniformity of coverage for workers compensation is generally required because of the statutory nature of the benefit.

XI. OTHER MANUAL RULES

The anniversary rating date rule would be preserved under the typical system. This would reduce the strain on the system that calculates experience modifications, compared to alternate scenarios that could eliminate this rule.

The anniversary rating date rule has two components:

- a. NCCI prepares experience rating modifications once a year at a date which approximates the policyholder renewal date.

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- b. Manual rates of the policyholder change only on the anniversary date, subject to the same flexibility now provided for in the NCCI experience rating plans.

Part (a) is required to maintain a centrally-administered experience rating plan, while part (b) is a convenience in maintaining part (a). We propose that both parts of the rule be maintained in this typical system.

The anniversary date rule is assumed to apply in the NCCI calculations of premium at current rate level. If the rule were eliminated, NCCI would need to collect additional data and/or apply approximations to adjust for the change in procedure.

XII. DISTRIBUTION OF INFORMATION TO AGENTS/SALES REPRESENTATIVES

Although insurers and agents/sales representatives may have to change how information is communicated, the situation in workers compensation should not be significantly more complex than other lines of insurance. Companies can provide agents/sales representatives with entire rate manuals or loss cost multipliers and instructions on premium discounts, minimum premiums, and expense constants, if any.

XIII. AVAILABILITY OF NCCI DATA

Summarized data from NCCI, including the information supplied to insurers cited in Section VIII above would be made available to regulators, researchers, and other parties on a request basis. However, distribution of individual policyholder and individual insurer experience would be limited as under the current system.

The issue of allocating costs for the production of this data is an important consideration, but it is not easily considered in isolation from the whole issue of how

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NCCI funds all its operations. In the interests of simplicity, the typical system assumes that regulators will obtain this information free of charge, insurers would receive the "standard" information as part of their membership, and other data for companies and all data for other parties will be obtainable at "cost."

XIV. TRANSITION PROVISIONS

The change from gross rates to loss costs would be implemented gradually on a state-by-state basis as each state is scheduled for a rate review.

The transition would not begin until the implementation of loss costs by ISO late 1992 or early 1993.

The NCCI would begin a series of education and training seminars. Individual seminars would be focused on various target audiences including regulators, small insurers, large insurers, agents/sales representatives, and others. These seminars could be similar to those presented by ISO, but should concentrate on the differences between workers compensation and ISO lines. By then, the various audiences may be more familiar with the general concept of loss costs and how their procedures will need to change. The timing for loss cost implementation should allow for this educational effort.

Even states which have adopted their rating laws or regulations to ISO loss costs may require additional changes to accommodate workers compensation loss costs.

APPENDIX A
List of Organizations
Contributing Background or
Information to Our Study

AFL-CIO

Alliance of American Insurers

American Insurance Association

American Bar Association

Independent Insurance Agents of America

Insurance Services Office

International Association of Industrial
Accident Boards and Commissions

National Association of Insurance Commissioners

National Association of Independent Insurers

National Association of Mutual Insurance Companies

National Council of Self-Insurers

National Council on Compensation Insurance

National Insurance Consumer Organization

Professional Insurance Agents of America

Risk and Insurance Management Society

APPENDIX A
List of Organizations
Contributing Background or
Information to Our Study

Connecticut Insurance Department
Georgia Insurance Department
Illinois Insurance Department
Michigan Insurance Department
Minnesota Insurance Department
New Mexico Insurance Department
Oregon Insurance Department
South Carolina Insurance Department

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