Public Assistance Sampling Procedure

3/31/2022

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INTRODUCTION

Sampling is the process of selecting and evaluating a few items in a group to learn something about the whole group or similar, unobserved items. When Applicants submit a significant number of documents to support claims for assistance, Federal Emergency Management Agency (FEMA) may select a representative sample to review. Additionally, if an Applicant submits a significant number of damaged sites, in lieu of FEMA inspections at all sites, the Applicant may submit damage information and documentation for FEMA to validate using this sampling methodology.

I.   Purpose

This document intends to provide FEMA staff uniform guidance on selecting representative samples when determining programmatic eligibility and proper accounting of costs for Public Assistance (PA) projects. It outlines appropriate sample sizes, procedures for what do when issues or deviations are found in a sample and provides a standard method for documenting the sample for potential future reviews. It is meant to be flexible for all instances where sampling is appropriate. Applicants may be subject to audits by their Recipient, the DHS Office of Inspector General, the Government Accountability Office, the Comptroller General of the United States, or as part of a Single Audit.

II.   Audience

The audience for this document is FEMA PA staff.

III.   Reference Documents

This procedure references the following documents:

- Public Assistance Program and Policy Guide
- Section 450: "Sampling Control Tests" of the GAO Financial Audit Manual.
- FEMA Job Aid Damage Information Inspections and Validation
- Public Assistance Reasonable Cost Evaluation Job Aid

IV.   Document Management and Maintenance

FEMA strives to ensure the PA program continuously improves and encourages feedback on this *Procedure* and all other aspects of the program. FEMA staff may provide best practices, lessons learned and other feedback regarding this document via the Change Control Tool (CCT). State, Local, Tribal, Territorial (SLTT) partners may provide best practices, lessons learned and other feedback regarding this document via the Feedback feature in PA Grants Manager (GM). FEMA will review this document no less than every two years to continuously improve and update as necessary.

CHAPTER 1: DOCUMENTATION COLLECTION

I.   Applicant Responsibilities in Sampling and Validation

Applicants provide documentation to support claims in their project application. They maintain all the necessary supporting documentation required for projects and are required to provide the Recipient and FEMA access to those records upon request. In instances where providing complete physical or electronic copies of all supporting documentation is not practical, they may provide summaries of the documentation.

FEMA's use of a sampling methodology for validation of summary information does not relieve an Applicant of their document retention requirements. As described in Title 2 Code of Federal Regulations (C.F.R.) § 200.333, financial records, supporting documents, statistical records and all other non-Federal entity records pertinent to a Federal award must be retained for a period of three (3) years from the date of submission of the final expenditure report or, for Federal awards that are renewed quarterly or annually, from the date of the submission of the quarterly or annual financial report, respectively, as reported to the Federal awarding agency or pass-through entity in the case of a subrecipient.

II.   FEMA's Responsibilities in Sampling and Validation

Various FEMA staff may conduct sampling and validation including, but not limited to, Consolidated Resource Center (CRC) Validation Specialists reviewing completed work, regional staff reviewing closeout documentation, or Site Inspectors completing tabletop site inspections. FEMA reviews Applicant provided information and documentation to ensure that Applicants, facilities, work, and costs are eligible for funding. FEMA may select a representative sample rather than inspecting all sites or reviewing all documentation.

CHAPTER 2: SAMPLING PROCESS

I. Grouping Items

The first step is to identify groups of similar items. FEMA performs sampling based on the grouping of similar sites to inspect or documentation to review. These groups may include the following:

- For Site Inspections: Similar types of facilities (e.g., culverts, schools, substations, vehicles), similar types of damage (e.g., debris blockage, flood damaged floors, flooded components), or similar components may be sampled.
- For Documentation: Similar types of documents are grouped (e.g., timesheets, invoices). Other potential groupings include, but are not limited to, contracts or materials/supplies receipts.

II. Selecting the Sample

Next, FEMA randomly selects an initial sample of 105 items from a summary list of items (e.g., select 105 employees' timesheets from the summary list of force account labor). The initial sample size is always 105 items, regardless of the size of the population. However, if the population is less than 105, all items must be reviewed.

Population: A set of similar items or the entire set of possible items.

Sample: The sample is a statistically significant portion of the population.

Deviation: deviations, irregularities or issues that are departures from approved procedures, documents, or specifications.

A. The Simple Random Sampling (SRS) Approach

The sample must be selected randomly to ensure accurate assessments are made for the population. The Simple Random Sampling (SRS) approach can be used for random sample selection. Specialists may use an automated tool to select the sample, or if done manually, then a random number is assigned to each item in the summaries and samples are selected by sorting the numbers. The details of the SRS approach are as follows:

Step 1 – FEMA lists each damage number or summary work/cost item in an Excel document, with each line item occupying an individual row.

Step 2 – FEMA assigns a random number to each row. This is done using the Excel formula "=Rand()". in a cell at the end of the row. FEMA drags or copies the formula into a new cell at the end of each row.

Step 3 – FEMA uses the Excel "sort function" to sort the line items by random number (e.g., lowest to highest values).

Step 4 – FEMA selects the first 105 items from the sorted list. If there are less than 105 items, all items will be reviewed.

III. Evaluating the Sample

FEMA evaluates the selection of the 105 entries. If all 105 selections are determined to be valid, FEMA accepts the population as valid.

FEMA may accept up to two deviations in the sample. For a deviation to be accepted an explanation for the deviation must be provided. If three or more deviations are detected, in a specific sample, then FEMA follows the steps in Selecting Additional Samples section of this document.

Minor typographical errors, such as misspellings or grammatical errors are not considered a deviation unless they have a substantial impact on the sample. An incorrect cost is a deviation and could change the claimed cost.

A. Damage (Site Inspection) Validation

For Site Inspections, FEMA reviews the documentation provided by the Applicant. FEMA and the Applicant must reach an agreement on the disaster-related damage, description and dimensions (DDD) before proceeding with the scope of work (SOW) development. Applicant provided documentation must support and substantiate the damage elements of the facility. To effectively verify and validate damage claimed by the Applicant, FEMA:

- Validates the damage claimed was caused by the disaster and that only disaster-related damage is claimed.
- Validates damage information, description, and dimensions for sampled facilities.

The *Damage Information Inspections and Validation Public Assistance FEMA Job Aid*, found in the [Delivery Toolbox](#), assists FEMA staff with the review and validation of the Applicant's disaster related damage of the selected facilities.

B. Work and Cost (Documentation) Validation

For work and cost, FEMA reviews the samples to ensure Applicant provided documentation is accurate, eligible, and complete in support claimed costs. FEMA validates the sample by reviewing Applicant provided documentation associated with an item to confirm eligibility as outlined in the FEMA Public Assistance Program and Policy Guide (PAPPG). For example, for each employee selected from the project's support documentation, FEMA reviews the employee's timesheet, activity/work orders/daily logs, pay rates, and payroll policy. To effectively verify and substantiate the documentation submitted by the Applicant, FEMA:

- Validates the employees' work/tasks are required as a result of the disaster.
- Validates that the work is eligible, and costs are associated with eligible work.
- Validates that the work and cost information the Applicant has provided is complete, accurate and supports the claim.

The Reasonable Cost Job Aid, found in the [Delivery Toolbox](#), assists FEMA staff with the review of work and cost information to validate the Applicant's disaster related claims.

C.   No deviations found in initial sample

If FEMA successfully validates the initial 105 sample items, all associated records within the population are accepted without further review. No additional samples are selected.

D.   Deviations found in initial sample

If significant deviations are identified in the first sample selection, selecting more from the population will not eliminate those initial deviations. FEMA identifies deviations, FEMA works with the Applicant to address the deviations, Applicant corrects identified deviations, and then FEMA reviews an additional sample as detailed below and shown in the Sampling and Validation Flow Chart.

If one deviation is found to affect multiple items within the sample; the deviation is considered a single-issue deviation (e.g., an incorrect equipment cost rate used throughout a document is considered one issue deviation even though it may affect multiple line items within the sample population).
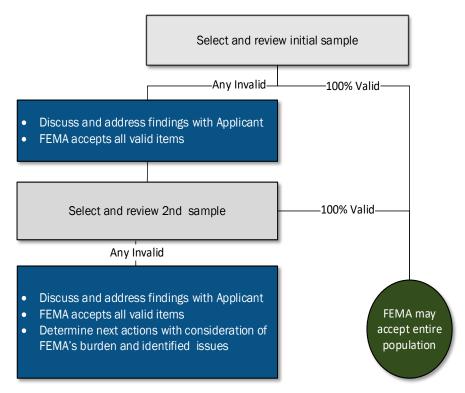
Figure 1. Sampling and Validation Flow Chart

III.   Selecting and Evaluating Additional Samples

A.   Deviations in initial sample

If some of the initial group of samples is invalid, FEMA:

- Accepts the submissions that are valid.
- Sends a request for information (RFI), requesting clarification of the deviation(s).
- If the number of deviations within the initial sample is 3 or more, FEMA:
  - selects a second sample from the remaining unreviewed population.
  - a second sample is not required for up to 2 deviations, if the deviations are accepted by FEMA.
- If the number of deviations within the initial sample exceeds 6 items, FEMA:
  - considers moving forward with collecting a second sample, or
  - works with the Applicant on correcting the deviations in the remaining population then selects a new initial sample (105 items) from the revised population.

The size of the second sample is based on the number of damage line items or work or cost document deviations in the initial sample. FEMA uses Table 1: Determining Second Sample Size to identify the required items for the second or subsequent sample sets.

Table 1: Determining Second Sample Size[1]

Number of deviations identified in initial sample	Number of items for second sample from the unreviewed population	Total sample items reviewed from the population
1-3	27	132
4	53	158
5-6	104	209

Once the expanded sample size is determined, FEMA will randomly select the second sample from the unreviewed population remaining.

Example 1: Of the 105 samples initially selected, 3 deviations are identified in the sample.
- Using *Table 1*, the total sample items reviewed must be 132.
- 105 items were previously reviewed, the second sample selection (Sample Size Expansion) will include 27 new items from the unreviewed population. This brings the total sample size reviewed for the second round to 132 items.

Example 2: Of the 105 samples initially selected, 6 deviations are identified in the sample.
- Using *Table 1*, the total sample items reviewed must be 209.
- 105 items were previously reviewed, the second sample selection (Sample Size Expansion) will include 104 new items from the unreviewed population. This brings the total sample size reviewed for the second round to 209 items.

B.   Selecting a second sample

If some of the second sample is invalid, FEMA:
- Accepts the submissions that are valid.
- Sends requests for information (RFI), requesting corrections and/or clarification to invalid submissions also requiring the corrections are made to the entire population.
- If the deviations found in the second sample are **similar** to those found in the first sample
  - o work with the Applicant to help them amend the deviations in the population and resubmit a revised population for sampling.
  - o select a new initial sample (105 items) from the revised population.

> **Similar** deviations can represent a systemic problem within the population. FEMA may assist the Applicant in revising the population by identifying these deviations for correction and or resampling and reviewing.
>
> **Different** deviations represent random and non-systemic problems. FEMA may not be able to assist the Applicant in identifying all deviations for correction, and it will be the responsibility of the Applicant to correct in support of its claim.

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[1] The sample size is based on the acceptance sampling approach used in Section 450: "Sampling Control Tests" of the *GAO Federal Audit Manual p450-4. The sample size uses a 90% confidence interval and 5% tolerable deviation rates.*

- If deviations found in the second sample are **different** from the first sample, the variations in the population information may not be easily targeted for correcting by the Applicant and even a revised population may contain other deviations.
- FEMA considers its administrative burden on the number of items remaining that have not yet been reviewed and chooses between the following actions:
  - Work with the Applicant on correcting the deviations in the remaining population then select a new initial sample (105 items) from the revised population, or
  - Review all remaining items in the population (i.e., 132 timesheets have been reviewed, if there are only 150 in the total population, FEMA may want to review the remaining items).
  - Issue a determination memo (DM) for the invalid ineligible items (i.e.,132 timesheets have been reviewed with many different types of deviations and it appears the Applicant is not able to make the necessary changes, FEMA may choose to issue a DM.)
  - Select a third sample from the population, which are more stringent than the initial two samples to account for the risk (i.e., 132 timesheets have been reviewed, if 400,000 remain in the population, FEMA may want to review a third sample, see "Selecting a Third Sample" below).

C.   Selecting a third sample

In the event a third sample must be selected, follow the steps below:

Step 1: Sum the total number of deviations identified in the first two rounds of sampling.
Step 2. Determine the Total Sample Items Needed for review using *Table 2: Third Sample Selection.*

Number of Samples to Pull for Round 3 = Total Sample Items Needed (From Table 2) – Total Sample Items Already Reviewed (From Initial and Second Sample)

Step 3: Calculate the number of samples that must be selected from the unreviewed population in round 3 using the following formula:

Table 2: Third Sample Selection

Total number of deviations identified in Round 1 & 2	Total sample items needed
3-6	209
7-8	258
9-10	306
11-14	400
15-22	583

Examples provided below:

Example 1: In the initial sample, 3 deviations were found from the 105 items reviewed. The second sample selection was expanded by 27 items and 3 more deviations were noted. 132 total items were reviewed.

- o The Total Number of Deviations for rounds one and two of sampling was 6.
- o Using Table 2, the Total Sample Items Needed must be 209.
- o The third sample selection will consist of 77 items.
  3rd Sample Selection = 209-132=77

Example 2: In the initial sample, 6 deviations were found from the 105 items reviewed. The second sample selection was expanded by 104 items and 4 more deviations were noted. 209 total items were reviewed.

- o The Total Number of Deviations for rounds one and two of sampling was 10.
- o Using Table 2, the Total Sample Items Needed must be 306.
- o The third sample selection will consist of 103 items.
  3rd Sample Selection = 306-209=97

If deviations are found in the third sample FEMA considers its administrative burden on the number of items remaining that have not yet been reviewed and chooses between the following actions:

- Review all remaining items in the population.
- Issue a determination memo (DM) for the invalid items.

D.   Documenting the Sampling Process

The sampling methodology must be documented using Appendix (C): Selecting Samples Checklist. The FEMA staff responsible for validating the sample must upload the completed checklist to Grants Manager in the project file.

E.   Later Review of the Sample

FEMA conducts reviews of proposed documentation at various points in the grant lifecycle, for example a project may receive an initial validation prior to award, and then a later review during closeout. If FEMA has verified the accuracy of an Applicant's summary, and the summary remains unchanged during a later review, FEMA will accept the earlier validation without a new sample.

If the earlier summary has changed substantially, a new initial sample should be conducted in accordance with this procedure. If the summary has undergone only minor changes, FEMA may elect to review only the changes in the summary in lieu of a new initial sample. Minor changes generally refer to cases where a review of changes to the summary will result in a smaller administrative burden than performing a new initial sample.

If you suspect corruption, waste, fraud, abuse, mismanagement or misconduct contact the Department of Homeland Security Office of Inspector General hotline or submit a concern online.

APPENDIX A: LIST OF ACRONYMS AND ASSOCIATED TERMS

Appendix A lists acronyms and associated terms mentioned in this document. For a comprehensive list, see the *PA Acronyms and Associated Terms Book*.

CCT   Change Control Tool

CRC   Consolidated Resource Center

DDD   Damage Description Dimensions

DM   Determination Memo

FEMA   Federal Emergency Management Agency

GM   Grants Manager

PA   Public Assistance

PAPPG   Public Assistance Program and Policy Guide

RFI   Request for Information

SRS   Simple Random Sampling

SLTT   State, Local, Tribal, and Territorial

SOW   Scope of Work

Appendix B: SELECTING SAMPLES CHECKLIST

The purpose of this checklist is to assist FEMA staff when randomly selecting samples from Applicant-provided damage, work, and cost information. Include the completed checklist in the project files along with notes from meetings and communications with the Applicant when requests for information (RFI) and/or determination memos (DM) are issued.

If documentation was sampled, explain how the sample was selected (select all that apply):

- ☐ What type of information was sampled (e.g., invoices, timesheets)?Describe_____
- ☐ What was the size of the entire population of items to be reviewed (e.g., 200 culverts,6500 invoices)?Describe_____

Were 105 items chosen for the first set of samples in accordance with the PA Sampling Procedure? (ex. 105 roads, 105 invoices)? Yes/ No

- ☐ Samples were increased to (select all that apply):

1st Sample	Initial Sample: ☐ 105
2nd Sample	Increased to: ☐ 132 ☐ 158 ☐ 209
3rd Sample	Increased to: ☐ 209 ☐ 258 ☐ 306 ☐ 400 ☐ 583

If documentation was sampled, select the sample review process (select all that apply):

1. 1st set of samples were reviewed:
- ☐ No further reviews were required.
- ☐ Invalid items were found. Describe deviations found.

    _____
    - ☐ 1-2 deviations were found and accepted with justification.
    - ☐ 3 or more deviations were found, and additional samples were selected for review.
    - ☐ 7 or more deviations were found, Request for Information (RFI) was issued notifying Applicant of invalid submissions and requesting corrections to entire population.
    - ☐ Deviations were corrected by the Applicant and a revised population was submitted.
    - ☐ New sample of 105 items were reviewed, following same procedure as initial sample reviews.

2. 2nd set of samples were reviewed:

    ☐ No further reviews were required.

    ☐ Invalid items were found. Describe deviations found.

    _____

        ☐ Invalid submissions had **similar** deviations as the 1st set of samples.

        ☐ Request for Information (RFI) was issued requesting corrections to entire population.

        ☐ Deviations were corrected by the Applicant and a revised population was submitted

        ☐ Sample of 105 items were reviewed, following initial sample review procedure.

        ☐ Invalid submissions for 2nd set of samples had **different** deviations then the 1st set of samples.

        ☐ Reviewed the remaining items in the population.

        ☐ Additional samples were selected for review.

        ☐ Issued a determination memo for invalid items.

3. 3rd samples were reviewed:

    ☐ No further reviews were required.

    ☐ Invalid items were found. Describe deviations found. _____

        ☐ Reviewed the remaining items in the population.

        ☐ Issue a determination memo (DM) for the invalid items.

APPENDIX C: SAMPLING METHODOLOGY

Sampling is a method of selecting a subset of the population to make statistical inferences. From the sample, the characteristics of the whole population can be estimated. Sampling is generally used when it is not efficient to review 100% of the items.

I.   Choosing Sample Sizes

The sample sizes used in this procedure are based on the acceptance sampling approach used in Section 450: "Sampling Control Tests" of the GAO Financial Audit Manual p 450-4. The manual provides tables to determine sample sizes and the accepted number of deviations. FEMA uses Table C-1 based on a 90% confidence interval and 5% tolerable deviation rates.

Table C-1

Sample Size	Acceptable number of deviations
45	0
78	1
105	2
132	3
158	4

If no deviations are expected in the reviewed items, the sample size can be 45. For efficiency FEMA uses an initial sample size of 105 allowing 2 deviations before action is taken. When deviations are found it is important to investigate the nature and cause of the deviations identified and evaluate their possible effect on the purpose of the procedure.

II.   Selecting Representative Samples

The random sampling method uses a manner of a random choice. The main benefit of the simple random sample is that each member of the population has an equal chance of being chosen.

Samples must be selected randomly to ensure accurate assessments are made for the population. There are many methods for creating a random sample (e.g., lottery method, random number tables, etc.). The Simple Random Sampling (SRS) approach is suggested in this procedure for random sample selection. Directions are provided for selecting random samples from a dataset using Excel. A random number is assigned to each item in the summaries and samples are selected by sorting the numbers. Following the directions in Public Assistance Sampling Procedure guarantees that the sample chosen is representative of the population, the sample is selected in an unbiased way, and the analysis of the sample is valid.