



American Nuclear Society



American
Nuclear
Society

Unraveling the Mystery of Consensus Standards

Presented by:

The American Nuclear Society

Standards Committee

January 31, 2017

Copyright©2017 by American Nuclear Society



American
Nuclear
Society

Purpose

- “Standards” and “consensus standards”
- Standards relevance, benefits, and content
- Standards development and approval process
- Importance of broad industry participation



American
Nuclear
Society

STANDARDS

WHY

BENEFITS

PROCESS

RULES

PARTICIPATION



American
Nuclear
Society

Agenda

- Definition of a standard
- Need for standards
- Application of standards
- Benefits of standards
- Federal use of standards
- Nuclear Standards Development Organizations (SDOs) in the U.S.



American
Nuclear
Society

Agenda (Cont'd)

- History of ANS standards development
- Role of the American National Standards Institute (ANSI)
- The ANS Standards Committee
- Process of ANS standards development
- Getting involved in the standards process



American
Nuclear
Society

What is a Standard?

- “Standards” as we generically know them are applied to many things in our society such as international trade, codes of conduct, common practices in the way of doing things, and the old “just the way its always been.”
- Standards are “common and repeated use of rules, conditions, guidelines, or characteristics for products or related processes and production methods, and related management systems practices.”*

* from OMB A-119



American
Nuclear
Society

Other Definition of a Standard

- The definition of terms; classification of components; delineation of procedures; specification of dimensions, materials, performance, designs, or operations; measurement of quality and quantity in describing materials, processes, products, systems, services, or practices; test methods and sampling procedures; or descriptions of fit and measurements of size or strength*

* from OMB A-119



American
Nuclear
Society

What is a Consensus Standard?

- Used worldwide for all types of fabrication facilities, operations and de-establishment of facilities, protection of the environment, people's health, and safety.
- Developed using a fair and balanced process by SDOs both domestic and international
- Known as national consensus standards, non-government standards, voluntary consensus standards (government term), or American National Standards (ANSI term) in the U.S.
- May be endorsed by a regulator and thus become a regulatory requirement in state or federal law.



American
Nuclear
Society

Policy on Federal Use & Participation of Consensus Standards

- OMB Circular A-119 on the use and development of consensus standards requires the following:
 - Use of consensus standards
 - Consultation with SDOs
 - Participation in the development of consensus standards
- OMB Circular A-119 is available at https://www.whitehouse.gov/omb/circulars_a119/#7.



American
Nuclear
Society

What is Consensus?

- Substantial agreement among a cross section of the industry
- Comment resolution
- Minimal dissent
- Evaluation to ensure compliance with policies and procedures



Why Do We Need Consensus Standards?

- Provide sufficient safety margins in product design, development, and operation
- Provide improved economics and reliability through commonality of design and use
- Influence regulatory expectations
- Ensure quality and reliability



American
Nuclear
Society



Why Do We Need Consensus Standards? (Cont'd)

- Establish best practices
- Provide consumer acceptance through form, fit, and function
- Set requirements for professional competency, conduct, and sufficiency
- Enhance international trade through commonality



American
Nuclear
Society



American
Nuclear
Society

Who Uses Consensus Standards?

- Owners
- Plant operators
- Architect-engineers
- Component fabricators
- Vendors
- Government agencies
- National laboratories
- Universities
- Consultants

The above includes both international and domestic entities.



American
Nuclear
Society

How are Consensus Standards Used?

- To set forth criteria for activities
- To address physical and functional features of equipment, application, operation, maintenance, etc.
- Voluntary use
- Applicable when invoked by an organization
- “Shall” = requirement for compliance with standard



American
Nuclear
Society

Why Consensus Standards and Not Regulations?

- Regulations set down absolute requirements to comply with a law or a regulator's mandate.
- Consensus standards satisfy laws and mandates.
- Consensus standards provide a forum all interested parties to participate.
- Consensus standards incorporate broadest technical experience from all parts of industry.
- Consensus standards establish efficient methods to satisfy regulatory requirements.





American
Nuclear
Society

Why Consensus Standards and Not Regulations? (Cont'd)

- Consensus standards may exceed regulatory minimum performance.
- Consensus standards can be implemented without regulatory approval in areas not of interest to regulators.
- Consensus standards combine a peer review process with prescribed methods to reach consensus.
- Consensus standards provide a workable solutions to concepts and established principles.
- Consensus standards can provide a legal reference for professional conduct, technical sufficiency, and adequate product performance.

Applications of Consensus Standards



American
Nuclear
Society

- Consensus standards have voluntary application by end users.
- Endorsement by a federal or state governmental agency makes it mandatory for regulatory compliance or international trade.
- Consensus standards can also be endorsed as an acceptable way to meet regulatory expectations such as in an NRC regulatory guide.
- If cited in a federal or state regulation (e.g., 10CFR52), they become law.



American
Nuclear
Society

Historic Perspective

- ASME developed the first standard in 1884, which was necessitated by repeated boiler failures.
- ASTM was founded in 1898 under the name International Association for Testing and Materials; became ASTM in 1902.
- First ASTM standard, specifications for “Structural Steel for Bridges,” was approved in 1901.
- ASTM adopted principles of consensus and due process in 1908.



**American
Nuclear
Society**

Standards Development Organizations (SDOs)

The following are the principal organizations that develop nuclear-related consensus standards:

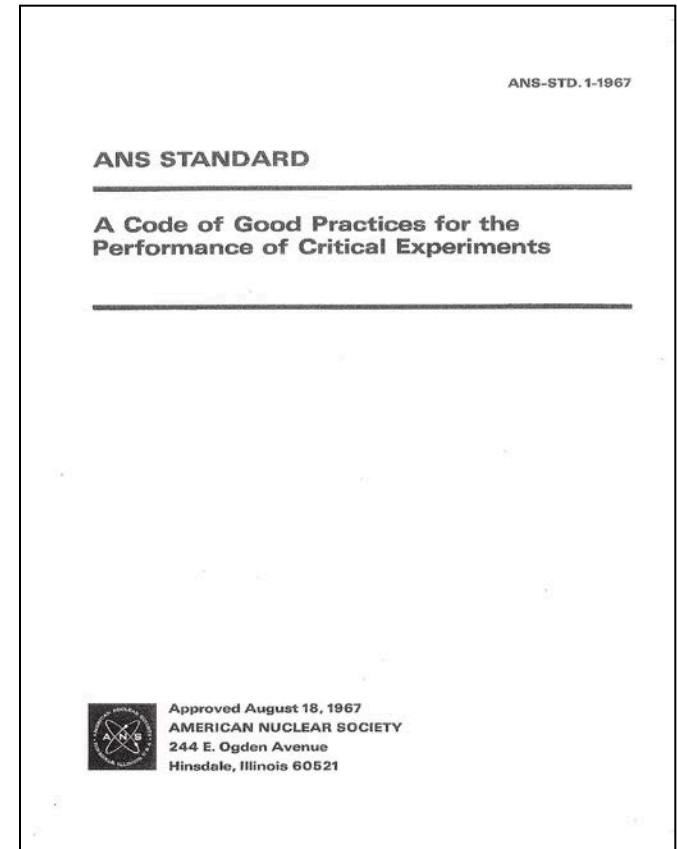
- American Nuclear Society (ANS)
- American Society of Mechanical Engineers (ASME)
- Institute of Electrical and Electronics Engineers (IEEE)
- American Society for Testing & Materials (ASTM)
- National Fire Protection Association (NFPA)
- American Institute of Chemical Engineers (AIChE)
- The Instrumentation, Systems, and Automation Society (ISA)
- American Concrete Institute (ACI)
- Health Physics Society (HPS)
- Institute of Nuclear Materials Management (INMM)



American
Nuclear
Society

Standards Development History at ANS

- ANS Standards Committee was formed in 1957.
- The first three ANS standards were developed prior to 1967 in the areas of computer programming and criticality experiments.
- ANS was accredited by ANSI in 1967 and developed its first American National Standard ANS-1, “A Code of Good Practices for the Performance of Critical Experiments.”





American
Nuclear
Society

Standards Development History at ANS (Cont'd)

- ANS and ASME formed a combined committee (N6) “Reactor Safety” in 1958 that produced ASA/N6.1-1964, “Safety Standard for Operations with Fissionable Material Outside Reactors.” (Current version is ANSI/ANS-8.1-2014.)
- ANS developed 12 national consensus standards from 1968 through 1973.
- To date, ANS has produced >450 standards (August 2016).



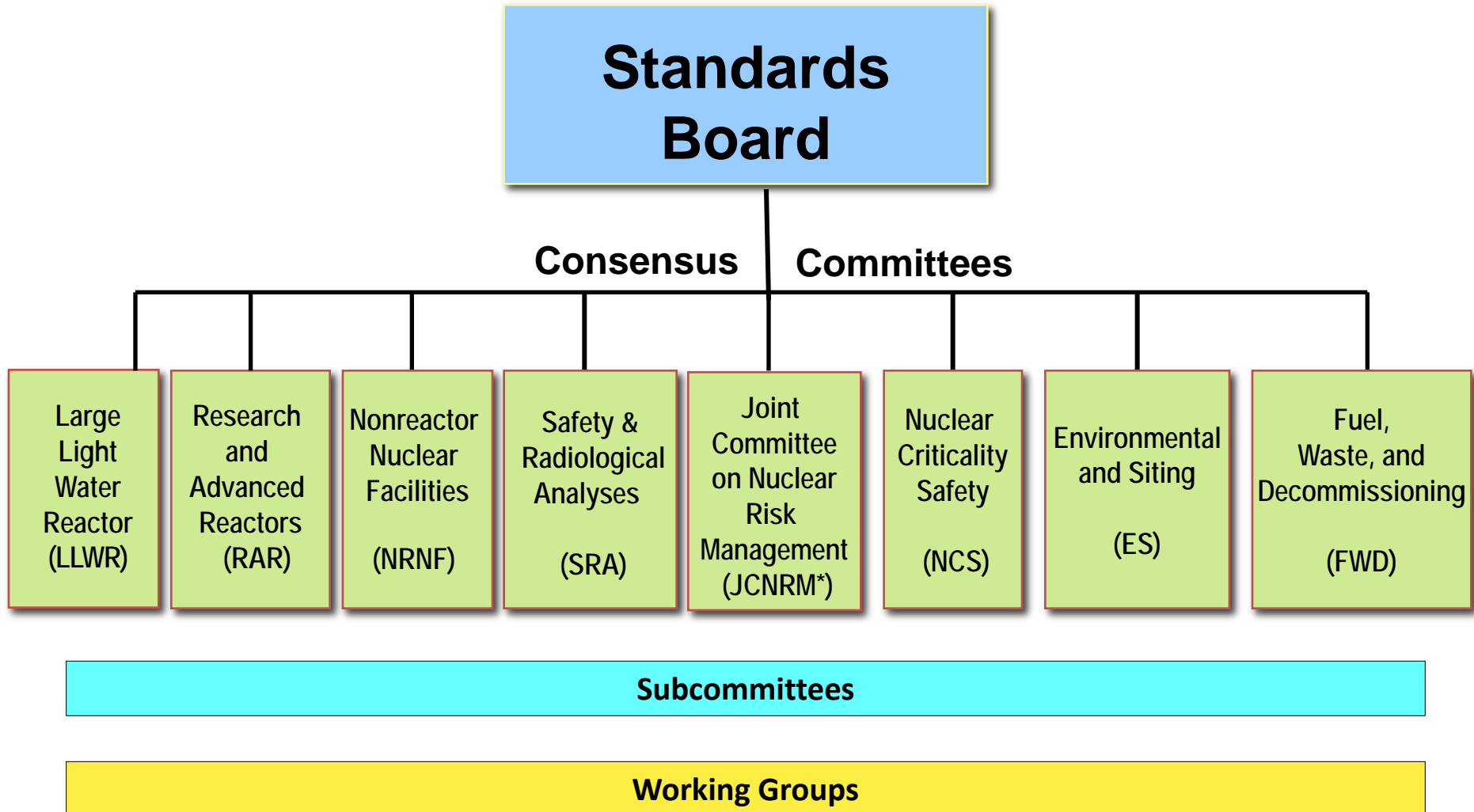
American
Nuclear
Society

ANS Standards Committee

- The ANS Standards Committee (SC) consists of consensus committees (CC), subcommittees (SubC), and working groups (WG), all of which are under the administrative control and policy direction of the ANS Standards Board (SB).
- Membership is well over 600 professionals.
- The SB is an ANS Standing Committee supported by the ANS staff and by the ANS Board of Directors.
- SC activities are guided by SC rules that comply with ANSI accredited procedures.
- Consensus standards developed by the ANS SC are issued as ANSI certified American National Standards.



The ANS Standards Committee



*The JCNRM is a joint ANS and ASME committee



American
Nuclear
Society

Committees Responsibilities

- The SB manages the SC's activities.
- CCs reach consensus by ballot. (Balance of Interest required.)
- SubCs ensure standards remain current, review WG final drafts, and ensure all comments are addressed.
- WGs draft new standards, revise existing standards, review standards for reaffirmation, and respond to all comments collected.



American
Nuclear
Society

Balance of Interests for Consensus Committees (CCs)

- “Balance of Interests” (BOI) among CC members is required.
- CCs are made up of interest groups with a limit of one-third membership for any one group. Interest groups include:
 - Owners / operators
 - Vendors
 - Architect-engineers
 - Consultants
 - Government agencies
 - National laboratories
 - Universities
 - Societies (including SDOs)
 - Individuals

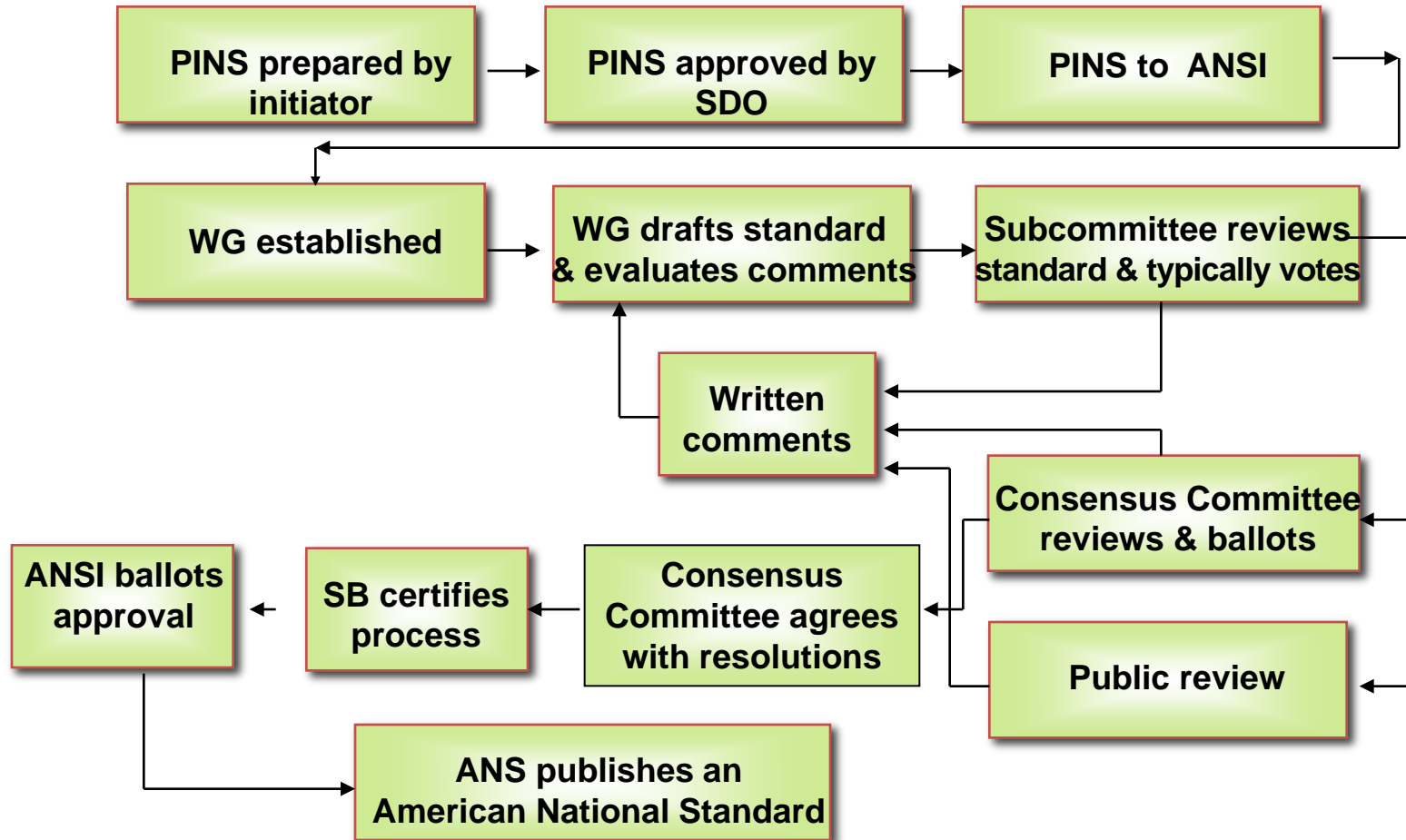
Consensus Standards Development Process

- Identify need
- Form working group
- Initiate project
- Develop standard
- Review/ballot
- Respond to comments
- Certify due process, balance of interest, and consensus
- Publication
- Maintenance



American
Nuclear
Society

Standards Development Process





American
Nuclear
Society

Initiation of Consensus Standards

- Any individual or organization is encouraged to recommend development of a new standard.
- A Project Initiation Notification System (PINS) form is prepared by the SubC or proposed WG chair. It includes:
 - a scope summary,
 - need statement,
 - stake-holders,
 - additional background, and
 - intended membership of WG



American
Nuclear
Society

Content of a Standard

- Foreword (to explain why the standard was created and perhaps the history of its evolution)
- A scope statement (typically, one paragraph) to describe the extent and coverage of the standard
- A set of definitions (specifically applicable to understanding the standard)
- Requirements (in a format suitable to the subject matter)
- References (only those cited in the text)
- Appendix (to provide examples of the application of the standard and/or supplemental information)



American
Nuclear
Society

Unique Verbs in Consensus Standards

- “*Shall*” designates a requirement.
- “*Should*” designates a recommendation, not a requirement.
- “*May*” designates permission, neither a requirement nor a recommendation.



American
Nuclear
Society

Developing a Standard

- The WG:
 - outlines the content
 - develops a project plan
 - writes the body of the standard
 - uses the ANS glossary terms and definitions
 - prepares a foreword
 - adds references and appendices
 - develops a committee draft and forwards to the SubC for review and comment





American
Nuclear
Society

Approval of a Consensus Standard

- CC ballot comments addressed by WG.
- Substantial agreement reached; consensus declared by CC Chair.
- ANS SB verifies that the rules and procedures (process) has been followed and certifies that a BOI has been satisfied before seeking ANSI approval.
- ANSI reviews SDO process and certifies as an American National Standard.
- Publication initiated by SDO once approved by ANSI.



American
Nuclear
Society

Final Product

- Published as an ANSI/ANS, ANSI/ASME, ANSI/ACI, IEEE, ASTM, etc., standard.
- Standards are copyrighted documents.
- ANS and other SDOs charge a fee for their standards to offset costs of development and publication.
- ANSI rules:
 - Review and take action on all approved standards every five years
 - Reaffirm, revise, or withdraw



American
Nuclear
Society

Why Get Involved?

Support ANS:

- A consensus standards program, like the one at ANS, stands on the strength and diversity of its volunteers.
- ANS consensus standards come into existence due to the hard work, loyalty, and dedication of its volunteer network of hundreds of qualified individuals from the industry.
- ANS always seeks and welcomes new volunteers to its development and maintenance process.



American
Nuclear
Society

Why Get Involved?

Support ANS:

- You not only have the opportunity to meet and work with people from a variety of backgrounds, but you have a chance to learn from their experiences.
- Recognition – standard preparers, SubC members, and CC members are listed in each published standard.
- Volunteers influence selection and content of new consensus standards.
- You are encouraged to identify potential needs for new standards and to participate.



American
Nuclear
Society

Why Get Involved?

Support the Industry:

- Participants fulfill their professional responsibility to contribute to a more effective nuclear industry today and for the future.
- Active participation in SDOs like ANS ensures that industry consensus standards stay current with the needs of the industry and enhances public safety and industry economics.
- Participants gain a broader understanding of specific topics through collaboration with others across the industry.



American
Nuclear
Society

Send questions

to...

standards@ans.org