

Nuclear Facilities Standards Committee

**An Introduction to the Preparation of ANSI/ANS
Standards and Their Role in the Licensing Process**

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Foreword

This document was prepared by William B. Reuland a long-standing member of the Nuclear Facilities Standards Committee (NFSC) to be used as a resource by members new to the American Nuclear Society (ANS) Standards Committee but especially those involved in activities of the NFSC. As noted throughout, this document excerpts from several other documents providing useful information in one place. Any of the referenced documents, policies, and procedures mentioned may be superseded at any time. All ANS Standards Committee policies and procedures are available on the ANS Web site in the Standards Resources Section available through the following link: <http://www.ans.org/standards/resources/>. The Standards Resources section also provides links to forms and additional background information about the standards development process that may be beneficial to ANS Standards Committee members.

The information provided in this document is believed to be current at the time of publication. Contact the ANS Standards Administrator (standards@ans.org) for any questions on the standards development process or current procedures and policies.

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An Introduction to the Preparation of ANSI/ANS Standards and Their Role in the Licensing Process

1. Introduction

The objective of this document is to function as a primer for users, writers, and regulators of standards used in the design, construction, operation, maintenance, and licensing of nuclear facilities. It outlines the legal basis for the use of voluntary consensus standards in the licensing process, explains where standards are used, and provides a description of the development of a standard by the American Nuclear Society (ANS) Nuclear Facilities Standards Committee (NFSC).

In March of 2007, the Nuclear Energy Institute (NEI) published NEI 07-06, *The Nuclear Regulatory Process*. NEI 07-06 presents a basic description of the nuclear regulatory process and its elements for operating nuclear power plants. It is intended to provide a foundation for maintaining a common understanding of the nuclear regulatory process, to refresh our knowledge of the nuclear regulatory process and to provide a foundation for transferring our knowledge to professionals entering the nuclear work force. Due to the success of the document in meeting these goals, it became apparent to the NFSC and to its NEI liaison that a similar approach would be useful in elaborating on the role of voluntary consensus standards in the nuclear industry.

All references cited are available on the Internet and can be downloaded and saved for more detail. This document should be especially useful to new NFSC members and all persons involved with ANSI/ANS standards.

2. The Legal Basis for NRC Use of Consensus Standards

2.1 NRC Voluntary Compliance with Public Law 104-113

The U.S. Nuclear Regulatory Commission (NRC) is an independent federal regulatory agency. It is not part of the executive branch and answers to Congress rather than the President. However, the NRC voluntarily complies with the National Technology Transfer and Advancement Act (NTTAA or the Act) of 1995 (Public Law 104-113).

The NTTAA of 1995 directed federal agencies to use technical standards developed and adopted by voluntary consensus standards bodies. It further directed federal agencies to consult with and participate in voluntary, private sector, consensus standard bodies when such participation is in the public interest and is compatible with the agency mission, priorities, and budget. If an agency determines that use of a voluntary consensus standard is inconsistent with applicable law or otherwise impractical, the agency must report to the Office of Management and Budget (OMB) and provide an explanation. Each federal agency is required to submit an annual report on the nature and extent of participation in the development and use of voluntary consensus standards.

The NTTAA also directed the National Institute of Standards and Technology (NIST) to

develop a plan for implementing the provisions of the Act dealing with standards conformity. OMB Circular A-119, “Federal Participation in the Development and Use of Voluntary Consensus Standards and Conformity Assessment,” effective February 19, 1998, was issued to provide policy guidance to federal agencies. This circular defines use as “incorporation of a standard in whole, in part, or by reference in regulation.”

NRC issued Management Directive 6.5, *NRC Participation in the Development and Use of Consensus Standards*, in November 1999. This directive contains organizational responsibilities and guidance for staff participation in the development of consensus standards including identifying and prioritizing needs for new and revised standards; and the use of consensus standards for endorsement including exceptions, and limitations and modifications of standards. The NRC intends to incorporate in the supplementary information for proposed rules or interim final rules statements soliciting comment on NRC intent to use a consensus standard, or its intent to use a government-unique standard with an explanation. Each NRC office has responsibility for implementation, and overall coordination is assigned to a standards executive in the Office of Research.

The NRC currently identifies approximately 4,000 codes and standards in regulations, regulatory guides, branch technical positions, the standard review plan, inspection procedures and NUREG documents. According to SECY 99-029, approximately 20 voluntary consensus standards are mandated in NRC regulations. Clearly, a vast number of codes and standards are incorporated into plant design and licensing bases without the need for a regulatory mandate.

2.2 NRC Membership on NFSC

The NRC has a staff member assigned to the ANS Nuclear Facilities Standards Committee (NFSC) as required by NRC Management Directive 6.5. The question is often asked if this membership gives NRC control of standards development. The NRC member has a single vote, which is based on his or her professional knowledge. The member can provide valuable insight into current NRC thinking and regulatory activities, which can be evaluated in crafting a standard. However, the NRC does not control the consensus process beyond any organization having representation on NFSC or other Standards Development Organizations (SDO). Each ANS consensus committee maintains a balance of interest to ensure that all stakeholders are appropriately represented.

3. Voluntary Consensus Standards

3.1 Definition of a Standard

The definition of a standard used in this document is taken from OMB Circular A-119; Federal Participation in the Development and Use of Voluntary Consensus Standards and in Conformity Assessment Activities. This document describes the application of The National Technology Transfer and Advancement Act of 1995 (Public Law 104-113)

a. The term standard, or technical standard as cited in the Act includes all of the following:

(1) Common and repeated use of rules, conditions, guidelines or characteristics for products or related processes and production methods, and related management systems practices.

(2) 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.

b. The term standard does not include the following:

(1) Professional standards of personal conduct.

(2) Institutional codes of ethics.

c. A performance standard is a standard as defined above that states requirements in terms of required results with criteria for verifying compliance but without stating the methods for achieving required results. A performance standard may define the functional requirements for the item, operational requirements, and/or interface and interchangeability characteristics. A performance standard may be viewed in juxtaposition to a prescriptive standard which may specify design requirements, such as materials to be used, how a requirement is to be achieved, or how an item is to be fabricated or constructed.

d. A non-government standard is a standard as defined above that is in the form of a standardization document developed by a private sector association, organization, or technical society which plans, develops, establishes or coordinates standards, specifications, handbooks, or related documents.

3.2 Definition of a Voluntary Consensus Standard

Voluntary Consensus Standards

a. For purposes of this policy, voluntary consensus standards are standards developed or adopted by voluntary consensus standards bodies, both domestic and international. These standards include provisions requiring that owners of relevant intellectual property have agreed to make that intellectual property available on a non-discriminatory, royalty-free, or reasonable royalty basis to all interested parties. For purposes of this Circular, “technical standards that are developed or adopted by voluntary consensus standard bodies” is an equivalent term.

(1) Voluntary consensus standards bodies are domestic or international organizations which plan, develop, establish or coordinate voluntary consensus standards using agreed-upon procedures. For purposes of this Circular, “voluntary, private sector, consensus standards bodies,” as cited in Act, is an equivalent term. The Act and the Circular encourage the participation of federal representatives in these bodies to increase the likelihood that the standards they develop will meet both public and private sector needs. A voluntary consensus standards body is defined by the following attributes:

(i) Openness.

(ii) Balance of interest.

(iii) Due process.

(vi) An appeals process.

(v) Consensus, which is defined as general agreement, but not necessarily unanimity, and includes a process for attempting to resolve objections by interested parties, as long as all comments have been fairly considered, each objector is advised of the disposition of his or her objection(s) and the reasons why, and the consensus body members are given an opportunity to change their votes after reviewing the comments.

b. Other types of standards, which are distinct from voluntary consensus standards, are the following:

(1) “Non-consensus standards,” “industry standards,” “company standards,” or “de facto standards,” which are developed in the private sector but not in the full consensus process.

(2) “Government-unique standards,” which are developed by the government for its own uses.

(3) Standards mandated by law, such as those contained in the United States Pharmacopeia and the National Formulary, as referenced in 21 U.S.C. 351.

4. American National Standards Institute (ANSI)

The standards developed by ANS through the NFSC are accredited by the American National Standards Institute (ANSI). ANSI accreditation insures that all of the requirements stated above for a voluntary consensus standard are met. The ANSI process is summarized in Table 1 on page 7 of this document.

4.1 Essential Requirements for ANSI Accreditation

The following is a list of ANSI essential requirements for a standards development organization to be an ANSI-Accredited Standards Developer. This list is taken from *ANSI Essential Requirements (2008 Edition)*.

4.1.1 Openness

Participation shall be open to all persons who are directly and materially affected by the activity in question. There shall be no undue financial barriers to participation. Voting membership on the consensus body shall not be conditional upon membership in any organization, nor unreasonably restricted on the basis of technical qualifications or other such requirements.

4.1.2 Lack of dominance

The standards development process shall not be dominated by any single interest category, individual or organization. Dominance means a position or exercise of dominant authority, leadership, or influence by reason of superior leverage, strength, or representation to the exclusion of fair and equitable consideration of other viewpoints.

4.1.3 Balance

The standards development process should have a balance of interests. Participants from diverse interest categories shall be sought with the objective of achieving balance.

Balance is a goal. However, efforts to achieve balance is a requirement. Outreach efforts shall be documented.

The historical criteria for balance is a useful guideline when determining whether the goal of balance has been achieved.

Balance relates to the nature of the standard.

4.1.4 Coordination and harmonization

Good faith efforts shall be made to resolve potential conflicts between and among existing American National Standards and candidate American National Standards.

4.1.5 Notification of standards development and coordination

Notification of standards activity shall be announced in suitable media as appropriate to demonstrate an opportunity for participation by all directly and materially affected persons.

4.1.6 Consideration of views and objections

Prompt consideration shall be given to the written views and objections of all participants, including those commenting on the Project Initiation Notification System (PINS) announcement or public comment listing in *Standards Action*.

4.1.7 Consensus vote

Evidence of consensus in accordance with these requirements and the accredited procedures of the standards developer shall be documented.

4.1.8 Appeals

Written procedures of an ANSI-Accredited Standards Developer (ASD) shall contain an identifiable, realistic, and readily available appeals mechanism for the impartial handling of procedural complaints regarding any action or inaction. Procedural complaints include whether a technical issue was afforded due process. Appeals shall be addressed promptly and a decision made expeditiously. Appeals procedures shall provide for participation by all parties concerned without imposing an undue burden on them. Consideration of appeals shall be fair and unbiased and shall fully address the concerns expressed.

4.1.9 Written procedures

Written procedures shall govern the methods used for standards development and shall be available to any interested person.

4.1.10 Compliance with normative American National Standards policies and administrative procedures

All ANSI-Accredited Standards Developers (ASDs) are required to comply with the normative policies and administrative procedures established by the ANSI Executive Standards Council or its designee.

Table 1

American National Standard (ANS) Development: Key Steps

Governing document: “ANSI Essential Requirements: Due process requirements for American National Standards” (11.30.07)

- 1) Standards developer’s procedures are accredited by the ANSI Executive Standards Council (ExSC) (Upon accreditation, which includes a public review of procedures, a developer may be referred to as an ANSI-Accredited Standards Developer)
- 2) Accreditation may be appealed to the ANSI ExSC and then to the ANSI Appeals Board
- 3) Consensus body established; discretely defined interest categories assigned or selected
- 4) Preliminary Development Stage of Document as an ANS in accordance with developer’s procedures (Filing of ANSI PINS form – online or via Email - for draft new, national adoptions and revised ANS; Publication of PINS in *ANSI Standards Action*; deliberation among stakeholders if claim of conflict or duplication is lodged)
- 5) Draft Document is Announced in *ANSI Standards Action* for ANSI Public Review (Filing of ANSI BSR-8 Form – online or via Email - by developer, subsequent substantive changes require additional public review, developer must make document available for review)
- 6) Draft Document Balloted to Consensus Body. (If vote to approve a document as an ANS is taken at a meeting, members who are absent shall have the opportunity to vote before or after the meeting.)
- 7) Attempt to Resolve and Respond to Comments Resulting from Public Review and Consensus Body Ballot (Written responses required; comments not related to the proposal at hand must be processed as a new proposal)
- 8) Recirculation of Unresolved Public Review Comments, Unresolved Votes from Consensus Body Members along with attempts at resolution and Substantive Changes to the Full Consensus Body (in order to afford all Consensus Body Members the Opportunity to Respond, Reaffirm, or Change Their Vote – typically via ballot, but may be via meeting minutes)
- 9) Notification of Right to Appeal (in writing) at the Standards Developer Level Sent to Unresolved¹ Objectors (Public Review & Consensus Body Members)

¹ As defined in the ANSI Essential Requirements: “Unresolved: Either (a) a negative vote submitted by a consensus body member or (b) written comments, submitted by a person during public review expressing disagreement with some or all of the proposed standard, that have not been satisfied and/or withdrawn after having been addressed according to the developer’s approved procedures.”

- 10) Appeals process concluded or appeals filing period expires at the standards developer level
- 11) Documentation of Consensus Submitted to ANSI (Filing of ANSI BSR-9 Form by developer, which includes the Final Tally by Interest Category of the Consensus Body and Other Supporting Documentation that demonstrates evidence of consensus and due process); Approval of Document by ANSI Board of Standards Review (BSR) or by an ANSI Audited Designator
- 12) Notification by ANSI of the right to appeal procedural, not technical issues, to the ANSI BSR (In the case of an Audited Designator, there is no notification by ANSI and any related appeals are filed with the ANSI ExSC)
- 13) Notification by ANSI of right to appeal an ANS BSR or ANSI ExSC decision to the ANSI Appeals Board

One can see from Table 1 above that the process required to produce a voluntary consensus standard is time consuming. However, the NFSC is currently working on a schedule for high priority standards that would expedite the development process.

The NFSC and other SDO procedures follow this process as a requirement for development of an American National Standard, which brands the standard as a Voluntary Consensus Standard.

5. NRC Endorsement of a Standard

The NRC and the nuclear industry utilize many standards that are not voluntary consensus standards. These standards are typically industry standards developed by standards development organizations not members of ANSI or meeting the essential requirements for voluntary consensus standards. The acceptance of specific standards in the design or the licensing process other than voluntary consensus standards can be advantageous for many reasons. For example, technical and regulatory documents developed by NEI are often the result of a concentrated effort by top industry personnel to resolve timely design, operational, or regulatory issues. Standards developed by the industry through EPRI are the results of extensive research and development. Industry standards exist for many applications for which a voluntary consensus standard is not available. These documents are often approved for use in the same role as a voluntary consensus standard by the regulatory agency.

5.1 Endorsement by Rulemaking or Reference

NRC requirements established by rulemaking or by adjudication in accordance with the Administrative Procedure Act (APA) are the only requirements that are directly

enforceable. These requirements (NRC regulations, orders, and licenses) must be satisfied by NRC applicants and licensees in order to maintain compliance. The agency's internal rulemaking process is described in NRC guidance documents that are provided in NRC Management Directive 6.3, *The Rulemaking Process*. Procedures and guidance for rulemaking development are also provided in LIC-300, *Rulemaking Procedures*. A standard may be endorsed in an NRC rule or order.

A *rule* is an agency statement of general or particular applicability and future effect designed to implement, interpret, or prescribe law or policy. (An NRC regulation is the same as an NRC rule.)

An *order* is a final disposition, whether affirmative, negative, injunctive, or declaratory in form, of an agency in a matter other than rulemaking but including licensing. At the end of the licensing process, the NRC may issue a *license*: an agency permit, certificate, approval, registration, charter, membership, statutory exemption, or other form of permission. The issuance and amendment of reactor operating licenses is governed by NRC regulations in 10 CFR Part 50; the renewal of reactor operating licenses is governed by 10 CFR Part 54. The NRC has promulgated regulations in 10 CFR Part 52 that apply to the issuance of Early Site Permits, Design Certifications, and Combined Operating Licenses (COLs).

Regulatory Guides (RG) provide an acceptable method for compliance with a regulation. Regulatory Guides may endorse all or part of an industry standard by reference. Solutions other than those in a RG may be acceptable if the licensee can demonstrate equivalent protection. Regulatory Guides cited in 10 CFR 50.55a, Codes and Standards, effectively establish referenced standards as regulatory requirements.

5.2 Standards as Part of the Design Basis and Licensing Basis

According to 10 CFR 50.2, *design bases* means “that information which identifies the specific functions to be performed by a structure, system, or component of a facility, and the specific values chosen for controlling parameters as reference bounds for design.”

The *licensing basis* for a plant is comprised of selected information exchanged between a licensee and the NRC relating to design features, equipment descriptions, operating practices, site characteristics, programs and procedures, and other factors that describe a plant's design, construction, maintenance and operation. Licensing basis information is contained in a variety of document types (e.g., final safety analysis report, license amendments, etc.). Each licensing basis document has certain characteristics in terms of change control mechanisms, reporting of changes to the NRC, dealing with discrepancies, and the possible involvement of the public.

A final safety analysis report (FSAR) must be included in each application for a license to operate a nuclear reactor facility. The FSAR is intended to describe the facility, present the design bases and the limits on plant operation, and provide a safety analysis of the structures, systems, and components (SSC) and of the facility as a whole. Detailed

requirements relating to FSAR content are addressed in 10 CFR 50.34(b). The applicant's FSAR is the principal document upon which the NRC bases its safety evaluation supporting the issuance of a facility operating license (OL). The updated FSAR (updated FSAR or UFSAR) incorporates changes made in accordance with 10 CFR 50.71(e). The UFSAR serves as a major source of information on the current plant design and supporting analyses, and is considered part of the current licensing basis.

Standards play a significant role in the licensing basis information. The license contains commitments to all or part of standards of all types. Standards undergo periodic revalidation and revision. Standards may also be allowed to expire or become historical. Adoption of a revised standard is voluntary for the licensee unless required by the NRC. Requirement of a revised standard is subject to the NRC's Backfitting Rule, 10 CFR 50.109. Historical standards may remain part of the license, and SDOs retain copies for reference. The use of a standard in one license does not imply that the other licensees may automatically use the same standard without NRC approval as part of their licensing basis. LIC-102, Relief Request Reviews provides guidance on methods to permit a licensee to deviate from regulatory requirements related to codes and standards, as well as guidance on the content of the safety evaluations and cover letters authorizing alternatives, granting relief or approving later code editions and addenda pursuant to various 10 CFR 50.55a paragraphs.

6. Excerpts from NFSC Policy

6.1 Background

6.1.1 Objective

The objective of this section is to provide a short concise introduction to the NFSC standards preparation and consensus process. It is intended to provide some useful NFSC policies that are required for writing and understanding an NFSC or other American National Standard.

This abbreviated section includes sections from the Policy Manual for the ANS Standards Committee (updated February 11, 2007) and the ANS Nuclear Facilities Standards Committee Policy and Procedures Manual, November 2004. The material covers areas where most new standards users and writing committees can benefit. These areas include the characteristics of a consensus standard, the use of references, interaction with regulations, guidance material, and the use of verbiage including "shall," "should" and "may." The correct use of these verbs cannot be overemphasized when identifying requirements.

6.1.2 NFSC Organization

The NFSC is responsible for the preparation and maintenance of standards associated with nuclear facilities. The Committee's standards address siting, design, operation, and

waste management activities at these facilities, as well as remediation and restoration of formerly utilized sites.

The ANS Standards Committee, through its Standards Board, coordinates all aspects of standards activities and interests within ANS and makes recommendations to the Society on matters involving standards. Four consensus committees report directly to the Standards Board.

The NFSC consists of the consensus committee (the “Committee”), seven subcommittees, and various working groups. The NFSC is responsible for establishing and managing the activities of the subcommittees and working groups needed to develop proposed standards within its scope of responsibility.

Subcommittees have been established to manage the activities of working groups and to perform detailed reviews of proposed standards for technical need, relevance, and acceptability. Each subcommittee has been assigned a unique and specific area of technical responsibility. These subcommittees have been organized as follows:

- ANS-21 Maintenance, Operations, Testing, and Training
- ANS-22 Systems Design Criteria
- ANS-24 Modeling and Analysis
- ANS-25 Siting: Environmental and Emergency Preparedness
- ANS-27 Fuel Cycle, Waste Management, and Decommissioning
- ANS-28 HTGR Design Criteria
- ANS-29 Advanced Initiatives

Each subcommittee has established various working groups to develop specific proposed standards and maintain existing standards within its respective area of responsibility. These working groups create the text of NFSC standards as well as review and resolve ballot comments.

6.2 Types of ANSI/ANS Nuclear Facilities Standards

NFSC efforts include the development of standards for utilization by the nuclear industry. These standards fall into one of three general categories. This policy provides a definition of the types of standards that NFSC has under its cognizance as a consensus body and how these categories may be used.

The identification of new standards projects shall include an evaluation of what type of standard is intended; plant criteria, design basis, or system criteria. The purpose of this categorization is to ensure that other standards exist or are planned in the other categories to adequately supplement the work to form a complete design package for the user. It also identifies the major interfaces to be covered during the development of the standard.

The categorization shall use the following definitions:

6.2.1 Plant Criteria Standard

Plant Criteria Standard A standard that puts forth that set of non-hardware plant requirements which bound the plant design and which must be assumed for systems design.

This type of standard states the requirements for the level of adequacy of the plant and certain of its major systems, but does not necessarily limit the components of those systems except as required to meet the performance levels specified for the plant or system. The purpose of this type of standard is to specify the overall plant criteria so that consistence is maintained among: (a) plant types, (b) various systems of a plant, and (c) subsystems of a major plant system. This type of standard may include rules for: (a) classifying components, (b) setting plant conditions of design, (c) determining overall plant and individual system functional design criteria, and (d) preparing the plant safety analysis. An example of this type of standard is ANS-51.1 “Nuclear Safety Criteria for the Design of Stationary PWR Plants.”

6.2.2 Design Basis Standard

Design Basis Standard A standard that puts forth the rules and methodology for determining the need for, and the design basis of, a system or a set of related systems in a plant.

This type of standard establishes the functional foundation required to prepare the design requirements (i.e., the design basis) of the subject system(s); the specific requirements are addressed in a system criteria standard. This standard may include the plant conditions of design to be considered as design assumptions. In some cases, this information is included in a plant criteria standard. An example of this type of standard is “Design Basis Criteria for Safety Systems in Nuclear Power Generating Stations,” ANS-4.1.

6.2.3 System Criteria Standard

System Criteria Standard A standard that puts forth the criteria by which a system and its constituent components are to be designed to fulfill the function of the system.

This type of standard contains criteria that are the design requirements for the system. Their development is governed by the requirements, rules, and methodology set forth in plant criteria and design basis standards. This type of standard usually addresses only one functional part of a system (such as the structural requirements as opposed to the electrical, mechanical, or fluid-conveying parts). Such requirements, of course, frequently influence the design of other functional parts. Generally, standards related to plant siting and plant operation fall into this category.

6.3 Policy on the Development of Guidance Standards (Policy Manual for the ANS Standards Committee)

The accredited rules and procedures of the ANS Standards Committee specify that standards developed by the committee are intended to become American National Standards. Standards developed by the ANS Standards Committee are criteria-based, containing specific requirements to be implemented by the user. (Many of these standards also contain guidance in the text or in appendices.)

In the development of PRA and risk-informed standards, the Nuclear Risk Management Coordinating Committee (a joint ASME and ANS committee) recommended consolidation of the requirements from existing American National Standards into a single standard. Since the existing standards also contain valuable guidance for the user, it was suggested to retain this guidance information in a set of guidance standards. The purpose of this policy is to permit the development and publication of ANS guidance standards.

The ANS Standards Committee may develop guidance standards that do not contain requirements but provide valuable information for the implementation of criteria contained in American National Standards. These guidance standards shall be developed using the accredited rules and procedures of the ANS Standards Committee, including those related to due process and consensus.

Guidance standards shall be developed only with the agreement (that is, formal vote for approval) of the responsible consensus committee and the Standards Board. In addition, a PINS form, or equivalent, shall be prepared for review and comment by the consensus committee and by the Standards Board.

Guidance standards shall not be submitted to ANSI for accreditation as American National Standards, but shall be certified by the Standards Board as having followed due process and consensus procedures. Guidance standards shall be issued as copyrighted ANS standards.

This policy may be applied by any ANS consensus committee.

Because this policy establishes a process for the development and issuance of ANS guidance standards, it is not addressed in the accredited rules and procedures.

6.4 Specifying Requirements in a Standard (NFSC Policy and Procedures Manual)

Much discussion has taken place regarding the proper use of the verbs “shall,” “should,” and “may.” The purpose of this policy statement is to explicitly define the use of these three terms and how they are to be used in the development of a standard.

Standards prepared under the cognizance of the NFSC shall be written to avoid ambiguity among those actions that are mandatory, recommended, or permissive. The text shall be clear in purpose and maintain technical continuity. For example, where acceptable practice includes two or more options, these options shall be clearly stated as such in the

body. The number of appendices shall be kept small and shall be used to either illustrate possible approaches or to discuss known problems when a clearly acceptable practice has not been widely adopted or defined.

As required by approved motion at the June 10, 2008, Standards Board meeting, all consensus committees shall be consistent with the ANSI definition and use for “should” and “shall” from their 2003 Style Guide as follows:

1. No requirements in informative (and some normative –e.g., scope; terms and definitions) text:

No requirements in the foreword, introduction, scope, terms and definitions, informative annexes, notes, examples, footnotes to text, notes to figures, notes to tables.

2. Correct use of "shall, "should" and "must", i.e., correct form of requirements and recommendations:

The correct verb form for indicating a requirement is "shall". The correct verb form for indicating a recommendation is "should". Universally accepted "standardese" does not recognize "must". Use "shall" for indicating a mandatory aspect or an aspect on which there is no option.

Furthermore, the Standards Board approved a motion (6/10/06) that each consensus committee adopt and implement the ANSI accepted definition of “shall” and “should” for all new and revised standards and include the definition in each standard.

The following definition is generally used to comply with the motion:

shall, should, and may: The word “shall” is used to denote a requirement; the word “should” is used to denote a recommendation; and the word “may” is used to denote permission, neither a requirement nor a recommendation.

Shall, to designate a mandatory action. It is not sufficient to simply use a “shall” statement. Each requirement shall be specific, unambiguous, and within the ability of a qualified auditor to determine that the requirement has been met. This means avoiding “shall consider,” “shall, if possible,” and similar phrases that are not quantitative. Terms like “evaluate” and “demonstrate” carry more weight but could still be considered difficult to properly audit.

Should, to delineate a recommended action. If the standard describes all known acceptable actions, then "shall" is to be used (in the context of "one of the following shall be done") instead of "should." This policy prohibits the use of "should" statements as a crutch in those cases where the Working Group is unwilling to exercise the needed unequivocal direction.

May, to designate a permissive action. This verb shall not be used as a recommendation but as an indication of an added action that might otherwise be questioned as being acceptable in the context of the requirements of the standard. For example, a “may” statement might be necessary to preclude a regulatory agency from determining that such an action is not permitted simply because it was not explicitly addressed.

Note: Plant Criteria Standards put forth principles for the function of specified systems. These standards include the set of non-hardware plant requirements that bound the [total] plant design, which shall be assumed to apply to system design. Therefore, “should” statements shall [only] be placed in the appendix for Plant Criteria Standards.

6.5 Relationship of Standards Verbiage to Normal Usage

Common usage of shall, should, may, and other frequently used verbs would indicate somewhat different definitions than those presented in this policy. This section is meant to assist the standards writer in the use of other verbs so the more common pitfalls can be avoided.

The word “may” is often used to indicate ability (to be able) or contingency. In these cases where permission is not being specifically granted, it is generally preferred to use the past tense “might.” The context of the statement might dictate another word, but in any event “may” shall not be used.

The words “is,” “are,” “will,” “need,” and “must” (etc.) are often used in the context of a requirement. If a requirement is meant, then only the word “shall” is to be used.

Statements of simple fact should be avoided in the text of a standard. If such statements are needed, use of “can” and “are” (and equivalent verb forms) shall be used; “shall” and “should” shall not be used.

6.6 Format Guide for System Criteria Standards (NFSC Policy and Procedures Manual)

The standards prepared under NFSC management generally fall into two categories which can be called plant criteria and system criteria standards. The purpose of this policy, and of the policy for plant criteria standards, is to present a general format that can be readily followed for each of these two types of standards.

The purpose of this guide is to establish a format of organization and presentation for use by the subcommittees of NFSC in writing system criteria standards. These systems are important to safety and are identified in the plant criteria standards (plant nuclear safety design criteria). The major objective is to provide a logical and uniform arrangement of system safety criteria and related topics that will be consistent with and expand upon plant criteria standards.

In this document, a system is considered to be a major subdivision of a plant that accomplishes a safety function as defined in the plant criteria standards. This may include systems that have no defined safety function but interface with, or have the potential for affecting, systems that do have defined safety functions.

American Nuclear Society standards are categorized into groups comparable to existing standards published by other standards-developing organizations, government, and industry. System criteria standards are intended for use by system designers and design reviewers. This format provides the user with a means of presentation that will permit ease of comparison with existing related standards and a logical method of approach to design. Uniformity of approach permits the objectives outlined in the scope to be attained to the extent practicable. The format may vary only when necessary to permit a more logical presentation of requirements for different subjects than a single outline or rigid sequence of topics would allow. Deviation should be made only with justification.

The following format guide shall be used in preparing all system criteria standards for NFSC. All NFSC standards shall use the format of this policy or of the policy for plant criteria standards unless specifically exempted by NFSC at the time the standard is first reviewed by the Committee.

Content of System Criteria Standards

The following suggested content outline is provided, complete with numbering designation to be assigned to each topic:

1. Introduction and Scope

State the purpose of the standard. Summarize the system functions and conditions of design. Include a brief discussion of the general relationship of the standard to plant criteria standards and related standards.

Identify limits of application. Briefly identify systems and subsystems for which the application is intended.

2. Definitions

Define terms considered to be important to the application and understanding of the criteria. Terms whose definitions are common to NFSC standards may be found in the NFSC "Glossary of Definitions and Terminology." These definitions shall be employed in each standard where applicable unless the definition clearly does not suit the use of the term in the context of the given standard. In such cases, the altered definition shall be preceded by the words, "For the purposes of this standard....."

Other definitions should be drawn from existing standards where possible to provide uniformity of definitions among standards. Reference definitions in existing standards where applicable. When a definition is substantially different from that in existing standards, this should be clearly indicated to the user along with the basis for requiring a difference.

3. System Safety Functions

Identify the system safety functions and modes of operation under which these functions must be accomplished. Where applicable, relate to the requirements of existing plant criteria standards. Subdivide as necessary for any subsystems identified in the scope.

4. System Definition

Describe the extent and boundaries of the system and identify interfaces with related systems or between subsystems. Include a description of major components or structures, or both, a typical diagram may be included in an appendix to the standard.

5. System Performance Requirements

For each safety function defined above, identify parameters important to operation of the system and an acceptable range of values where appropriate. Identify any redundancy or diversity requirements, or both, related to performance of safety functions. Include as subsections the performance requirements related to individual components of the system or subsystems.

6. Design Requirements

If convenient, subsystems defined above may each be considered separately in this section. Proper direction to material appearing in the appendixes is made by footnote

Safety Class and Applicable Codes Standards and Regulations

Identify the safety class of systems, subsystems and major components and structures. Indicate, where applicable, the system classifications under other existing standards.

Conditions of design

Describe how the conditions of design are applied in designing the system. These conditions of design should include normal and extreme environmental conditions occurring for components of the system in performing safety functions.

Interface

Identify interface requirements on other systems or subsystems and parameters, which should be specified in design. (For example, will the system require emergency power and, if so, what are power and actuation time requirements?)

Testing, inspection and maintenance design criteria

Identify design features necessary to provide the capability for testing, inspection and maintenance.

Design documentation

Indicate what documentation and safety analyses must be included in a design description to provide information necessary to support technical specifications and interface requirements.

7. References

References shall be listed in a separate section of the document in the order in which they appear in the text. State the document identifier, complete title, publisher of the document, and where the document can be acquired. A footnote shall be placed following the first reference in the text to direct the user to the reference section.

The following statement shall be included at the beginning of the References section of all new and revised standards.

The user is advised to review each of the following references to determine whether it, a more recent version, or a replacement document is the most pertinent for each application. When alternate documents are used, the user is advised to document this decision and its basis.

The following two statements shall be included in the foreword of all new, revised, or reaffirmed standards. The second statement shall be incorporated into those standards where the application of risk-informed insights, performance-based requirements, or a graded approach to quality assurance is appropriate. If one or more of these three elements is addressed in the standard, that portion of the statement shall be deleted. If the working group determines that this statement is not relevant to the subject included in the standard, the entire statement may be eliminated, but only with the written concurrence of the consensus committee chair.

This standard might reference documents and other standards that have been superseded or withdrawn at the time the standard is applied. A statement has been included in the references section that provides guidance on the use of references.

This standard does not incorporate the concepts of generating risk-informed insights, performance-based requirements,

or a graded approach to quality assurance. The user is advised that one or more of these techniques could enhance the application of this standard.

It is important that a reference be explicit and not to the standard in general. If the referenced standard has a reference to yet another standard, an explicit reference to that referenced standard is required.

6.7 ANS Policy on Handling References in Standards (Policy Manual for the ANS Standards Committee)

Standards typically use references to substantiate or supplement its requirements. Referencing other American National Standards is usually done in the text of a standard, but referencing other types of documents, including regulations, other government documents, and draft documents, requires special instructions. This policy addresses all types of references and provides related guidelines on where to use references.

6.7.1 Referencing Regulations and American National Standards

References to and quotes from regulations and American National Standards may be included in the text of a standard. When a reference to or a quote from a regulation is made a requirement, a “shall” statement shall be used. The verbs “should” and “may” shall not be used in referring to or quoting from a regulation.

When referencing or quoting from an American National Standard, the verb used (shall, should, or may) shall accurately reflect whether the document or its excerpt is being made a requirement, is being recommended for use, or is permitting its use.

If a regulation or American National Standard is used to justify a value used in the standard or to support a requirement in the standard, a footnote shall be used to cite the reference. An example of the use of a footnote follows.

A similar requirement is set forth in a regulation.^a

^a *See 10CFR50.76(b).*

Also, a footnote shall be used when the standard points out that a regulation or American National Standard addresses the same, similar, or alternative concept as that being discussed in the standard.

6.7.2 Referencing Published Documents Other Than Regulations and American National Standards

Referencing or quoting from any published document, including regulatory documents that are not regulations, shall adhere to the same requirements as set forth in Article 6.7.1 for American National Standards.

Excerpts from a government document may be used without quotation marks because they are not copyrighted. However, the source of the material used shall be given in a footnote.

Any document relied on by the standard shall be available to all potential users.

If a referenced document can be obtained only by purchase, the cost shall be nominal; that is, the cost shall be similar to the cost of the standard itself and the cost of other American National Standards being referenced or quoted. If the cost of the referenced document exceeds this general range, the document shall not be referenced or quoted. However, the document may be included in a footnote, as noted in 6.7.1.

6.7.3 Referencing Draft Documents and Withdrawn Standards

Draft documents may be referenced in a standard under the following conditions only.

- The draft document shall not be quoted.
- The draft document shall not be included in a requirement (“shall” statement).
- A draft document may be used to support an observation or a “should” or “may” statement by characterizing (or paraphrasing) the pertinent portion of the draft. When used for such a purpose, a footnote shall be included that provides the title, identifier (such as working group number in the case of a draft standard, or other unique designator for other documents), the status of the draft (such as a revision number or date), the location of the pertinent text within the draft, and contact information for the responsible owner, author, or correspondent. Also, the scope of the draft document should be included in the footnote.

In the case where a standard has been approved but not issued, the requirements of 6.7.1 shall be applied, but the referenced standard shall be indicated by “(draft).”

If a standard that has been withdrawn is referenced, the requirements of 6.7.1 shall be applied, but the referenced standard shall be indicated by “(withdrawn).”

6.7.4 Statement to be Included in the Reference Section of All standards

A statement shall be included in the references section of all new and revised Standards concerning the allowed use of subsequent revisions to referenced standards. The statement to be incorporated is set forth in the Policy on the Implementation of Maintenance Procedures.

6.8 Policy on Referencing of Regulatory Guides (NFSC Policy and Procedures Manual)

The purpose of this policy statement is to provide guidance to the working groups under the jurisdiction of NFSC in dealing with the content of existing regulatory guides in the creation of standards that

- (a) have essentially the same scope or requirements,
- (b) have requirements that overlap, or
- (c) have interfacing requirements.

Regulatory guides provide the Nuclear Regulatory Commission (NRC) regulatory staff's suggested method of complying with the General Design Criteria (10 CFR Part 50, Appendix A) and other portions of the Commission's regulations. They state positions of the NRC, adherence to which provides the applicant's bases for obtaining licenses. Each regulatory guide covers a relatively narrow scope and often has essentially the same scope as one of the nuclear standards existing, in process, or being planned. Conformance to the recommendations of any given regulatory guide is not mandatory, provided the applicant adopts an acceptable alternative. Each regulatory guide has a disclaimer to this effect displayed on its cover sheet.

Regulatory Guides fall into two broad categories in their relationships to standards. If they precede industry standards by some time increment, they do not reference industry standards and are self-contained, stating criteria and requirements in enough depth to satisfy regulatory concerns. If they are essentially parallel to or follow industry standards, they reference the standard and state the degree of acceptability of the standard in terms of constraints or added requirements. To satisfy industry concerns, an increasing proportion of the newer regulatory guides are of the latter category.

While applicants are required to state their positions with respect to regulatory guides, each one usually has a number of specific exceptions to some of these guides. Where the safety concern is adequately treated, different methods and solutions are often acceptable to the NRC staff.

The first regulatory guides were issued in 1970, and there were only a few. At that time, very few nuclear standards existed. In the intervening years, production of regulatory guides was accelerated. A similar acceleration was applied to industry nuclear standards, partly at the urging of the NRC, partly to satisfy an industry need, and partly out of competition with the NRC.

During this period, the Power Reactor Systems Committee, ANS-50, structured itself to handle a large portion of the desired nuclear standards and established review procedures. Many of the draft standards reviewed required conformance to specific regulatory guides.

Given the basis of regulatory guides and background information cited, such references often were found to be unacceptable. The result was a decision in the January 1975 meeting of ANS-50 to establish a policy statement. NFSC (NUPPSO) adopted the major portions of this statement.

Direct referencing of regulatory guides is not permitted within the text of a standard. Citation of regulatory guides shall be given in footnote form and shall include the revision number and date of issue. An example of an acceptable citation is "Guidance exists in a regulatory guide."

Any criteria or passages from regulatory guides may be used, either verbatim or paraphrased, that are deemed to adequately express the intent of the working group. There are no copyrights on regulatory guides and such practice is acceptable to the NRC. The content of such criteria shall be subjected to the consensus process along with the rest of the standard. The test of such a criterion is its survival in this process.

6.9 NFSC Working Group Guide (NFSC Policy and Procedures Manual)

6.9.1 Standards Development Activities

After the selection of the working group membership and the preparation of a draft Project Initiation Notification System (PINS) Form, the working group chair should hold a group meeting to complete and agree on the final PINS. A membership list is prepared, including name, affiliation, address, and telephone number. This list is then sent to the NFSC Secretary and the responsible subcommittee chair.

The content of the standard should be set at the first meeting of the working group and a tentative schedule established. A standard format guide shall be used where available in establishing the projected content. The subcommittee chair should attend this first meeting to explain to the working group how the NFSC conducts its business and all related policies. The subcommittee chair will also instruct that a copy of all correspondence prepared by the working group in the development of the proposed standard is sent directly to the NFSC Secretary and that all correspondence to the NFSC is sent through the subcommittee chair. Lastly, the subcommittee chair shall encourage the working group to establish a schedule that results in a draft standard ready for review within 12 to 18 months from the date of this kickoff meeting.

Members of the working group should leave the first meeting with an in-depth understanding of the project, its expected end use, and a specific assignment for preparing a portion of the standard. A general outline of the draft standard and schedule for completion shall be developed and provided to the responsible subcommittee chair who, in turn, shall inform the NFSC at its next scheduled meeting. The outline and schedule for developing the standard is expected to be sufficiently detailed and should be reviewed at each working group meeting or teleconference. Significant changes to the schedule shall be promptly communicated to the subcommittee chair who shall keep the NFSC apprised of the most realistic schedule.

At this initial meeting, the working group shall carefully evaluate whether or not a performance-based approach lends itself to the development of the draft standard. The adoption of a performance-based standard may help make the ANS standards effort more effective and efficient. A performance-based standard focuses on attaining specific objectives. Identifying these objectives clearly is one of the most important functions of the working group. Once a standard is developed with properly identified objectives and approved for use, it is anticipated that there would be no need to make further revisions to the standard, unless the objectives themselves change, which is highly unusual. Hence, a performance-based standard can be expected to be valid for much longer periods of time. A structured approach for developing a performance-based standard is presented in Appendix A of the 2004 NFSC Policy and Procedures Manual. Should the working group elect to develop a performance-based standard, the subcommittee chair shall be notified and the PINS Form modified accordingly.

The Working Group should meet until a thorough draft is prepared, consistent with the appropriate format and style guides. The group may include more material in this draft than is realistically expected to be contained in the final document. The group should consider use of a value-impact assessment in preparing the standard and in responding to the comments received. The assessment should be reserved for consideration of the major problem areas and major topics of controversy. It consists of the following five steps:

- a. Define the problem to be solved. Designs, methods, and tests called for by a standard can usually be specified in more than one acceptable way and it is not always clear which choice is preferred.
- b. Identify the different approaches that can be taken to solve the problem.
- c. Attempt to determine the impact of each approach on safety and other safety systems, cost, schedule, regulatory acceptance, and engineering feasibility. Care should be taken not to become too involved or detailed in this process or the technique will lose its effectiveness. It is more important to assess the relative importance of these factors for the problems being considered.
- d. Determine the relative effectiveness of each alternative considering the potential impact and priority of each factor identified in step (c) above.
- e. Make a selection based on step (d) and by comparing the overall impact of each proposed solution to the importance of the problem itself.

6.9.2 Subcommittee Review of Draft Standards

When the working group has reached agreement that a draft standard is ready for external review and comment, the draft shall be sent to the responsible subcommittee chair for subcommittee review. Technical comments are provided back to the working group for resolution. At this time, the subcommittee chair may elect to send the draft standard to the NFSC Secretary for an editorial review, as appropriate. When the working group has satisfactorily addressed subcommittee comments, the draft standard is considered ready for NFSC review.

6.9.3 Review and Approval Process

Depending on its workload and member availability, the NFSC may elect to perform two reviews:

- a. A technical review in parallel with or following the subcommittee review and
- b. A review to form the basis for the consensus ballot. Note that a public review is held by ANSI in parallel with or following this ballot.

When the results of an NFSC review or ballot are to be discussed at a scheduled Committee meeting, the working group chair (or designated alternate) shall be present to clarify the intent of the draft standard and help resolve the comments. In addition, the entire working group is encouraged to attend the NFSC review session(s) to better understand the comments and to hold a concurrent meeting to resolve Committee comments and revise the draft standard. The working group shall respond to all ballot comments within 90 days after ballot closure.

When a draft standard is submitted for ballot, all technical changes made from the previously reviewed draft shall be clearly indicated (e.g., by sidebars and showing any deleted or inserted text). In the case of a consensus ballot, it is necessary to respond to each negative comment, but other comments may be consolidated into a single reply for the purpose of responding to all commenting.

In the case of “Not Approved” (negative) ballots from the consensus ballot, the working group shall write to each negative balloter and request that the ballot be reconsidered based on the new draft prepared in response to all comments. If this process results in one or more negative ballots being retained, all NFSC members shall be given an opportunity to reconsider their ballots, taking into account the negative ballots and the reasons therefore.

In the case of comments received from the ANSI public review, the working group shall respond to each commenter with a copy to ANSI. The letter of response shall include notification that the commenter has 15 working days in which to reply if not satisfied with the attempted resolution of the comments.

Utilization of the Standards Comments and Resolutions Form eliminates having to write individual letters of response. The working group should prepare a general cover letter, a copy of the comment resolution forms, and a copy of the revised draft standard to send to each commenter. As a minimum, the working group shall include the rewritten portion of the standard when a substantial change has been made to resolve one or more comments.

After completion of the consensus ballot, completion of the required response to each commenter (with formal requests for withdrawal of any negative ballots), and reconsideration of ballots has been permitted (if needed because of outstanding negative ballots), the NFSC Chair shall determine if consensus has been achieved (see Section defining the balloting process in the 2004 NFSC Policy and Procedures Manual).

Upon determination of consensus, the Standards Board shall certify that all consensus procedures have been followed. ANSI is then notified that consensus for approval has been achieved, and approval by the ANSI Board of Standards Review is requested.

The working group chair assists the ANS staff with editing and publication details, as necessary, and shall have the opportunity to review the document prior to release for printing. ANS staff then proceeds with final publication of the standard. All working group members receive a copy of the printed standard. In addition, members of NFSC may request a copy.

6.9.4 Resolution of Review and Ballot Comments

The NFSC Standards Comments and Resolutions Form is used to document comments and their resolution during review and balloting of proposed new, revised, or reaffirmed standards. This form is to accompany the Ballot Form when members record their votes as either “Approved with Comments” or “Not Approved.”

In responding to comments, the working group shall take the following steps:

- a. Enter personal data (i.e., name, phone number, organization, address) in the spaces provided at the right side of the form.
- b. Clearly indicate in the box provided where acceptance of the comment is essentially total. For such cases, no explanation is needed, although explanations are welcomed.
- c. Where comments are accepted in part or not accepted, use the space under "Resolution of Comments" to set forth the rationale for non acceptance of all or part of the comment. Do not simply indicate disagreement or the fact that such suggestions were previously considered. Offer a technical basis for not being able to accept the comment.
- d. Upon satisfactory completion of the individual forms, the working group chair or other designated individual shall forward copies to the commenter and to the NFSC Secretary.

Responses and comments may be consolidated by subject or location if the working group believes this is more efficient. It is helpful to supply portions of the text that have had substantive revisions made along with comment responses. Responses other than acceptance should include a rationale, such as the technical basis, a compromise among conflicting expert opinion, or specific reference to a governing authority.

The working group shall send copies of all comment responses, accompanying letters, and responses back from balloters to the NFSC Secretary. Upon receipt of replies from each negative balloter, the working group chair and the NFSC Secretary shall discuss the final ballot tally and agree on the results.

Frequently, a working group carefully addresses the comments forming the basis of a negative ballot but essentially ignores other comments offered by the balloter. It is acceptable to give priority to negative comments, but it is unacceptable to dismiss other comments as insignificant.

The responsible subcommittee chair carefully reviews all comment responses to ensure that the replies are affirmative, responsive, and include a rationale for decision. The NFSC Chair performs a similar review emphasizing controversial and negative comments prior to releasing each standard for final certification.

The types of comment responses to be avoided:

"This was discussed by the working group during preparation of the draft standard and was

- a. not used,
- b. decided against, or
- c. found not practical, etc."

"Not accepted"

"This comment disagreed with

- a. another commenter comment, or
- b. comment made during the Subcommittee review or similar comment."

Appropriate replies include a technical basis for the decision, a reason for deciding on a particular phrasing, a rationale for compromising among conflicting requests, or the fact that specific direction was given by the Committee regarding scope or content.

Each balloter has an obligation to make substantial, technically based comments and to include alternate words or adequate discussion upon which new words can be logically included. Both the balloter and the working group shall adhere to technical issues and avoid frivolous and unsubstantiated comments.

The working group shall provide a written response to each negative ballot individually. This letter shall request that the ballot upgrade the “Not Approved” (negative) ballot to indicate “Approved” or “Approved with Comments” based on the working group's responses to the negative comments. A review period of 30 days shall be indicated for the ballot to respond. The letter shall also request that specific reasons be provided if the ballot disagrees with the working group’s attempted resolution of the negative comments.

Any difficulty in getting timely responses from negative ballots shall be brought to the attention of the responsible subcommittee chair, the NFSC Secretary, and the NFSC Chair in that order and to the extent necessary.

If one or more negative ballots remain unresolved, the NFSC Secretary shall ask those Committee members who originally voted to reconsider their position in view of the outstanding negative ballots. Appropriate background material pertaining to those negative ballots shall also be sent. A review period of 30 days is set, during which members may change their votes. No response is necessary unless a ballot decides to change the initial ballot and submit supporting technical reasons. When all negative ballots have been cleared or reconsideration has been completed, the responsible subcommittee chair and the NFSC Chair shall review the documentation and the revised standard.

In the event major changes have been made in the standard, a re-ballot shall take place and the above procedure repeated. The NFSC Chair in consultation with the cognizant subcommittee chair and working group chair shall determine the need for re-ballot.

Note: If there is a possibility of additional unresolved ballots or public objections on a re-ballot, it may be more efficient to conduct the recirculation ballot after all re-ballots eliminating the potential for more than one recirculation ballot.

6.9.5 Evaluation of Consensus

1. Determination
 - A Approved including approved with comments
 - D Disapproved (not approved)
 - B Abstain (usually indicating a judgment of non-competence; done by marking the ballot "not voting" and stating the reason)
 - I Invalid (see NFSC policy)
 - N Ballots not received

2. Consensus for approval permitted (provided paragraph 3 above is met)

$$\frac{A}{A+D} > \frac{1}{2}$$

3. Consensus for approval dictated

$$\frac{A}{A+D+B+I+N} > \frac{2}{3}$$