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administrative controls and quality assurance for the operational phase of nuclear power plants

an American National Standard

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American National Standard Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants

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American National Standard

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Foreword

(This Foreword is not a part of American National Standard "Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants," ANSI/ANS-3.2-2006)

Preparation of the first edition of this standard commenced in 1969 prior to the establishment of formal quality assurance requirements for the operation of nuclear power plants. Historically, the administrative controls section of Facility Operating License Technical Specifications had contained provisions for meeting many of the requirements that subsequently became identified with quality assurance for operation. It was the original intent of the standard to define administrative controls for this purpose. The members of the subcommittee that developed the initial version of this standard had experience primarily in power reactor operation, and they developed a document that would provide guidance for administrative controls over activities associated with the operation of nuclear power plants. At the same time, American Society of Mechanical Engineers (ASME) Subcommittee N45.2, "Nuclear Quality Assurance Standards," was developing quality assurance standards related to design, construction, maintenance, and modification of nuclear power plant structures, systems, and components (SSCs).

The U.S. Nuclear Regulatory Commission (NRC) issued its Safety Guide 33 (now Regulatory Guide 1.33), "Quality Assurance Program Requirements (Operation)," endorsing Draft 8 of ANS-3.2 (which later became ANSI N18.7-1972) and American National Standard "Quality Assurance Program Requirements for Nuclear Power Plants," ANSI/ASME N45.2-1971. Because of this dual endorsement, the two committees attempted to develop a single standard. The result of that effort was ANSI N18.7-1976 (ANS-3.2), which was subsequently endorsed by NRC Regulatory Guide 1.33, Revision 2 (February 1978).

Following the Three Mile Island Unit 2 accident in 1979, the American Nuclear Society (ANS) revised N18.7-1976 to incorporate the administrative "lessons learned" into the standard, which was subsequently published as ANSI/ANS-3.2-1982. This revision also reflected the issuance of American National Standard "Quality Assurance Program Requirements for Nuclear Power Plants," ANSI/ASME NQA-1-1979, which had superseded several of the N45.2 standards, which had previously been incorporated by reference into N18.7-1976.

Since ANS-3.2-1982 was published, the industry has moved progressively closer to an all-operating reactor environment. The 1988 version of ANS-3.2 recognized this fact and incorporated many changes to emphasize operational aspects and performance-based quality assurance techniques. The 1994 version continued the strong emphasis on this approach.

Since there were few new quality assurance initiatives actively being pursued in the late 1990s, a decision was made to reaffirm the 1994 standard in 1999.

Since the 1999 reaffirmation, several initiatives have been pursued by the industry, and this revision addresses those activities. One of the major initiatives undertaken in the past several years by the industry and the NRC is for an alternate treatment of SSCs using a risk-informed categorization process to determine the safety significance of the SSCs. Using the framework of 10CFR50.69, licensees can categorize their SSCs according to their safety significance and then may remove certain identified special treatment requirements for lower-graded safety-significant, safety-related Risk Informed Safety Class (RISC) categories. The industry expects this to allow plant resources to be focused on higher-risk-significant activities and eliminate unnecessary expense.

As efforts within the nuclear industry continue to redefine the approach to quality assurance, including changes to enhance the efficiency and effectiveness of implementing 10CFR50 Appendix B in nuclear plant operations, maintenance, and supporting activities, the ANS-3.2 Working Group will continue to work with the industry to develop future revisions of this standard.

It is the intent that this version will be accepted by the NRC.

This revision of ANS-3.2 continues to be based on the philosophy that the assurance of quality is the responsibility of the individual performing the task and is not the sole responsibility of the formally established quality assurance organization.

Quality verification organizations in this standard act in a measurement and advisory function, monitoring the overall performance of the plant; identifying substandard or anomalous performance, or precursors of potential problems; reporting findings in an understandable form in a timely fashion to a level of line management having the authority to effect corrective action; and promptly verifying the effectiveness of the corrective action and reporting those verification results back to line management. An effective quality verification organization is technically and performance oriented; it focuses its efforts toward end products as opposed to being concerned only with processes and procedures. The organization should have technical resources available to it, and it should be aggressive in searching for, identifying, and following up on problems.

In addition to describing administrative controls and quality assurance requirements for the operational phase of nuclear power plants, this standard provides guidance, where appropriate, that should improve the reliability and performance of operating nuclear power plants. The application of this standard to balance of plant equipment and activities can be beneficial in enhancing plant reliability and plant safety.

This revision significantly reformats the previous edition to better align its content with 10CFR50 Appendix B criteria and the ASME NQA-1 standard.

This revised standard was prepared by the ANS-3.2 Working Group and reviewed by ANS-21 and the ANS Nuclear Facility Standards Committee. At the time of the revision, the membership of the ANS-3.2 Working Group was the following:

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J. O. Fowler, *Entergy*
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The Nuclear Facility Standards Committee (NFSC) had the following membership at the time of its approval of this standard:

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Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants

1 Scope, applicability, and purpose

1.1 Scope and applicability

This standard provides requirements and recommendations for administrative controls and the owners' quality assurance program to help ensure that activities associated with nuclear power plant operation are carried out without undue risk to the health and safety of the public.

This standard provides requirements for implementing quality assurance programs consistent with requirements of *Code of Federal Regulations*, Title 10, Part 50, Appendix B [1].[1)]

This standard is not specifically intended for application to test, mobile, or experimental reactors nor to reactors not subject to U.S. Nuclear Regulatory Commission (NRC) licensing. Applicable sections of this standard can be used in those cases for activities similar to those addressed herein.

1.1.1 Traditional programs

For traditional programs (programs that are not risk informed), requirements of this standard identified as applying to activities affecting safety-related structures, systems, and components (SSCs) shall be applied to all activities affecting those functions necessary to ensure

(1) the integrity of the reactor coolant boundary;

(2) the capability to shut down the reactor and maintain it in a safe shutdown condition;

(3) the capability to prevent or mitigate the consequences of accidents that could result in potential off-site exposures comparable to the guideline exposures of *Code of Federal Regulations*, Title 10, Part 100 [2].

1.1.2 Risk-informed programs

This standard may be used as the basis for implementing a risk-informed quality assurance program in accordance with *Code of Federal Regulations*, Title 10, Part 50, Section 50.69 [3].

If this standard is used as the basis for a risk-informed program, requirements of the standard apply based on the Risk-Informed Safety Class (RISC) category of SSCs.

Requirements of this standard shall be applied to activities affecting SSCs categorized as RISC-1, unless otherwise specified.

Requirements of this standard that apply specifically to activities affecting RISC-2 and RISC-3 SSCs are identified in Secs. 3.2.4 and 3.2.5, respectively.

Requirements of this standard are optional for activities affecting RISC-4 SSCs.

1.2 Purpose

This standard contains criteria for administrative controls and quality assurance for nuclear power plants during the operational phase of plant life. This phase is generally considered to commence prior to fuel loading, although certain initial construction activities may extend past fuel loading. Owner organizations are expected to identify those activities that fall in these overlapping time periods and are expected to specify whether the activities are to be considered as operational or as construction activities. This phase continues until the operating license is withdrawn.

[1)]Numbers in brackets refer to corresponding numbers in Sec. 4, "References."