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

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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-3.2-1988.)

Preparation for 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 standard was completed during a period when the subject of quality assurance was becoming of increasing interest to the nuclear community. The membership of the subcommittee that developed American National Standard Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants, ANSI N18.7-1972 (ANS-3.2) was strongly oriented toward power reactor operation, and developed a document aimed at providing guidance for administrative controls over activities associated with the operation of nuclear power plants. At the same time Subcommittee N45.2, "Nuclear Quality Assurance Standards," of the American National Standards Committee N45, "Reactor Plants and Their Maintenance," was developing quality assurance standards related to design, construction, maintenance, and modification of nuclear power plant structures, systems, and components.

When N18.7-1972 was approved and issued, 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. This dual endorsement caused some confusion among users and the Executive Committee of the American National Standards Institute (ANSI) Nuclear Technical Advisory Board (now Nuclear Standards Management Board) directed that an ad hoc Task Force, comprising ANS-3 and a representative of ANSI N45.2 Subcommittees, attempt to develop a single standard that could stand alone in defining "Quality Assurance Program Requirements (Operation)." ANSI N18.7-1976 (ANS-3.2) was the result of that effort. ANSI N18.7-1976 (ANS-3.2) was subsequently endorsed by NRC Regulatory Guide 1.33, Revision 2 (February 1978).

Following the Three Mile Island Unit 2 accident in 1979, ANS-3 undertook a revision of N18.7-1976 to incorporate the administrative "lessons learned" into the standard, which was subsequently published as ANSI/ANS-3.2-1982. During the course of this effort, American National Standard Quality Assurance Program Requirements for Nuclear Power Plants, ANSI/ASME NQA-1-1979, was issued and approved. This standard superseded several of the N45.2 standards which had previously been incorporated by reference into N18.7-1976. A second purpose of this revision of N18.7 was therefore to reflect the issuance of NQA-1. The NQA-1 standard has been revised subsequently in 1983 and 1986.

Since ANS-3.2-1982 was published, the industry has moved progressively closer to an all-operating reactor environment. It is envisioned that this version can be endorsed by the Nuclear Regulatory Commission and be adopted by the nuclear industry to provide acceptable guidance for the establishment and implementation of an effective administrative controls and Quality Assurance Program for the operation of nuclear power plants.

The Code of Federal Regulations, Title 10, "Energy," Part 50, "Licensing of Production and Utilization Facilities," Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," defines the term "quality assurance" as ". . . all those planned and systematic activities necessary to provide adequate confidence that a structure, system, or component will perform satisfactorily in service." Inherent in this definition is recognition of the fact that quality assurance encompasses activities associated with doing a job correctly as well as verifying and documenting the satisfactory progress and completion of the work. The performance of work is itself the most fundamental aspect of quality assurance in its broadest sense.

On the other hand, the term quality assurance also has been frequently, and quite properly, used to describe the programs, the technical discipline and the organizational unit established to implement procedural steps to verify and document the satisfactory completion of work. In this context, the term quality assurance (as a technical specialty or as a formal organization) describes a staff support function to assist in the overall goal of the high quality performance of equipment, structures, procedures and personnel.

It should be recognized that the assurance of quality is not the sole responsibility of the formally established Quality Assurance organization. Other organizations, including plant management, are also responsible for assuring quality.

Quality verification organizations 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 suggestions, where appropriate, that should improve the reliability and performance of operating nuclear power plants. It should be recognized that the requirements of this standard, although formally and specifically limited by the Scope and Purpose Sections, may be applied to balance of plant equipment and activities. Such efforts should not only enhance plant reliability, but should also indirectly enhance plant safety.

Historically, quality assurance as an accepted discipline has been associated with manufacturing and construction activities from which it originated as a separate function. It is identified most clearly with systems of checks, audits, inspections, technical evaluations, and other forms of verification that can be applied to products that can be examined at various stages of manufacture or construction before they are placed in service; and with the documentation needed to show conformance to requirements and to perform investigations in the event of subsequent malfunction of these products. The nature of manufacturing or construction activities is such that time usually is available or can be taken to perform verification without affecting the quality of the product or activity.

In contrast to potential effects of deficiencies in manufacturing and construction, defi-

ciencies in operating activities can be much more immediate in their effect. For example, it is important that the dynamic aspects of operation be monitored on an essentially continuous basis. Instrumentation for monitoring, control and actuation of safety systems, and observations by, and response from, the operating staff are both extensively used for these controls and quality assurance practices. The critical appraisal by supervisory personnel of plant operating evolutions, trends in parameters, maintenance, and day-to-day work practices, is the most significant portion of ensuring the quality of plant operation (in the broad sense of the term "quality assurance"). Quality assurance (as a technical discipline or an organizational unit) of operating activities is associated principally with checking and verifying the adequacy of operating practices and obtaining correction where it is needed. This standard emphasizes that both operating staff and personnel performing other functions have important quality assurance roles in the ". . . planned and systematic activities . . ." specified in the Appendix B definition of quality.

This standard discusses requirements for preoperational tests, while recognizing that these tests fall outside the strict definition of the operational phase. This guidance was included because of the frequent heavy involvement of the operations staff in conducting the preoperational tests, and as a response to requirements to implement the operational quality assurance program prior to the start of the operational phase.

Appended to this foreword is a chart showing the comparison of 10 CFR 50 Appendix B criteria with the corresponding section of this standard.

This revised standard was prepared by Subcommittee ANS-3, Reactor Operations, of the American Nuclear Society Standards Committee. At the time of the revision, the membership of the ANS-3.2 Working Group was:

C. H. Moseley, Jr., Chairman, *Carolina Power & Light Company*
G. A. Beer, *Management Analysis Company*
J. P. Bongarra, *U. S. Nuclear Regulatory Commission*
O. S. Bradham, *South Carolina Electric and Gas*
C. Eldridge, *Pacific Gas & Electric*
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M. Malloy, *U. S. Nuclear Regulatory Commission*
W. J. Rudolph II, *Wolf Creek Nuclear Operating Corporation*

In addition, the chairman would like to acknowledge the assistance of S. L. Westman (Wolf Creek Nuclear Operating Corporation) and B. W. Wells (Carolina Power & Light Company) toward the completion of this standard.

At the time of approval of the standard, Subcommittee ANS-3, Reactor Operations and Support Activities, of the American Nuclear Society Standards Committee had the following membership:

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L. Davis, *Commonwealth Edison Company*
F. Dougherty, *Tenera, L.P.*
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J. Hannon, *U.S. Nuclear Regulatory Commission*
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R. N. Smith, *Argonne National Laboratory*
P. Walzer, *Public Service Electric & Gas Company*

The American Nuclear Society's Nuclear Power Plant Standards Committee (NUPPSCO) had the following membership at the time of its approval of this standard.

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G. P. Wagner ..... Commonwealth Edison Company
G. L. Wessman ..... Torrey Pines Technology
G. J. Wrobel ..... Rochester Gas & Electric Corporation

Comparison Chart
of
10 CFR 50 Appendix B
and ANSI/ANS-3.2-1988 Requirements

10 CFR 50 Appendix B	ANS-3.2-1988 Section	Comments
I	1.	
I	3.1	
I	3.3	
II	3.1	
II	3.3	
II	3.4.2	Refs. ANSI/ANS-3.1, ANSI/ASME NQA-1
II	4.5.2	Refs. ANSI/ASME NQA-1
II	5.1	
II	3.5	Refs. ANSI/ANS-3.1
II	5.3	
II	3.5	Refs. ANSI/ANS-3.1
II	3.4.2	Refs. ANSI/ANS-3.1
III	5.2.7.2	Refs. ANSI/ASME NQA-1
IV	5.2.13.1	Refs. ANSI/ASME NQA-1 Refs. ANSI/ASME NQA-1,
V	5.2.7	ANSI/ASME NQA-2, ASTM D3843
V	5.3	
VI	5.2.15	
VII	5.2.13.2	
VIII	5.2.13.3	
IX	5.2.18	
IX	5.2.12	
X	5.2.17	
XI	5.2.19	Refs. ANSI/ASME NQA-2
XII	5.2.16	Refs. ANSI/ASME NQA-2
XIII	5.2.13.4	Refs. ANSI/ASME NQA-2
XIV	5.2.6	
XIV	5.2.14	Refs. ANSI/ASME NQA-1
XV	5.2.14	Refs. ANSI/ASME NQA-1
XVI	5.2.11	
XVII	5.2.12	Refs. ANSI/ASME NQA-1
XVIII	4.5	Refs. ANSI/ASME NQA-1

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