Tennessee Valley Authority 1101 Market Street Chattanooga Tennessee 37402

JAN 15 1992

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Gentlemen:

In the Matter of	)	Docket Nos.	50-259	50-327
Tennessee Valley Authority	)		50-260	50-328
	)		50-296	50-438
	)		50-390	50-439
	)		50-391	

TVA NUCLEAR QUALITY ASSURANCE (NQA) PLAN (TVA-NQA-PLN89-A) - ANNUAL UPDATE - REVISION 2

In accordance with 10 CFR 50.54(a)(3) and 10 CFR 50.55(f)(3), changes to the quality assurance program that do not reduce commitments must be periodically submitted to NRC. Enclosure 1 is an annual update of such changes to the TVA NQA Plan. This update addresses organizational changes within Nuclear Power that affect the quality assurance program, and describes refinements which have been made to the NQA Plan since the time that Revision 1 of the plan was implemented. This update incorporates changes which have previously been submitted to NRC on April 1, September 23, and December 4, 1991, and describes some additional refinements to the NQA Plan as well.

Enclosure 2 provides cross references of the changes made from Revision 1 to Revision 2 of the NQA Plan, and provides appropriate justifications.

Revision 2 of the plan is being distributed to holders of controlled copies within Nuclear Power and is planned to be implemented no later than April 17, 1992.

If you have any questions or if we can be of any assistance, please telephone P. J. Hammons at (615) 751-2736.

Sincerely,

Mark J. Burzynski

M. J. Burzynski
Acting Manager
Nuclear Licensing and Regulatory Affairs

Enclosures
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U.S. Nuclear Regulatory Commission

JAN 15 1992

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NUCLEAR QUALITY ASSURANCE

Tennessee Valley Authority

Nuclear Quality Assurance Plan

TVA-NQA-PLN89-A

Revision 2

REVISION LOG

REVISION NUMBER	EFFECTIVE DATE	DESCRIPTION OF REVISION	PAGES AFFECTED
0	Refer to Appendix A	Initial Issue	All
1	No later than 2/25/91	First annual update	All
2	No later than 4/17/92	Second annual update	All

NUCLEAR QUALITY ASSURANCE PROGRAM (NQAP) POLICY STATEMENT

It is the policy of the Tennessee Valley Authority (TVA) that activities which affect quality be accomplished in a planned and systematic manner to achieve compliance with preestablished quality objectives and acceptance criteria. Accordingly, TVA has established and will maintain a Nuclear Quality Assurance Program (NQAP). The NQAP includes the Nuclear Quality Assurance Plan and the approved documents which are used to implement the plan. The quality assurance program and requirements for specific items and activities are applied commensurate with their importance to safe, reliable nuclear operations.

Management policies and requirements for the TVA NQAP are established by the Senior Vice President, Nuclear Power. These management policies and requirements provide the controls that must be applied to the activities performed by and for the agency to ensure implementation of TVA commitments.

Nuclear Quality Assurance is responsible for maintaining the TVA Nuclear Quality Assurance Plan. Nuclear Quality Assurance and Completion Assurance are responsible for determining if the QA program and quality requirements are being implemented by performing verification activities, and informing management of quality problems.

Line management is responsible for establishing quality requirements in procedures and instructions and ensuring that the achievement of quality receives major emphasis in planning, implementing, verifying, and documenting work. Quality assurance objectives are not to be subordinated to achieving cost or schedule objectives. Line management will be held accountable for compliance with the QA program and quality requirements.

Conflicts involving interpretation of quality assurance requirements of TVA's NQAP are resolved by the Manager, Nuclear Quality Assurance or, if necessary, the Senior Vice President, Nuclear Power. Where TVA has delegated responsibility for implementation of parts of the NQAP to contractors, TVA line management retains responsibility for adequacy of contractor implementation of quality requirements.

Activities may be performed by a contractor using their quality assurance program, provided that the contractor's quality assurance program is approved by TVA and appropriate interfaces are established.

Each employee is encouraged and expected to do the job right the first time and is responsible for complying with the requirements contained in the Nuclear Quality Assurance Plan and its implementing documents. Procedures and instructions must be followed or appropriately changed through a controlled change process before work proceeds.

D. A. Nauman
Senior Vice President, Nuclear Power

J. P. Maciejewski
Manager, Nuclear Quality Assurance

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LIST OF ABBREVIATIONS

The following abbreviations are used in this plan:

ALARA	- As Low as Reasonably Achievable
ANS	- American Nuclear Society
ANSI	- American National Standards Institute
ASME	- American Society of Mechanical Engineers
ASME III QAM	- ASME Section III Quality Assurance Manual
ASNT	- American Society for Nondestructive Testing
ATWS	- Anticipated Transient Without Scram
BFN	- Browns Ferry Nuclear Plant
BLN	- Bellefonte Nuclear Plant
CFR	- Code of Federal Regulations
CSSC	- Critical Structures, Systems, and Components
DOE	- Department of Energy
EPRI	- Electric Power Research Institute
FSAR	- Final Safety Analysis Report
I&C	- Instrument and Control
IEEE	- Institute of Electrical and Electronics Engineers
ISEG	- Independent Safety Engineering Group
M&TE	- Measuring and Test Equipment
MC&AS	- Materials, Contracts, & Administrative Support
NAL&F	- Nuclear Assurance, Licensing, and Fuels
NDE	- Nondestructive Examination
NF	- Nuclear Fuels
NFPA	- National Fire Protection Association
NG&BC	- New Generation and Bellefonte Construction
NLRA	- Nuclear Licensing and Regulatory Affairs
NNS	- Non-nuclear Safety
NO	- Nuclear Operations
NP	- Nuclear Power
NPS	- Nuclear Procedures System
NQA	- Nuclear Quality Assurance
NQA&E	- Nuclear Quality Audit and Evaluation
NQAP	- Nuclear Quality Assurance Program
NRC	- Nuclear Regulatory Commission
NSRB	- Nuclear Safety Review Board
NSSS	- Nuclear Steam Supply System
P&OM	- Policy and Organization Manual
QA	- Quality Assurance
QC	- Quality Control
SNM	- Special Nuclear Material
SQM	- Site Quality Manager
SQN	- Sequoyah Nuclear Plant
TVA	- Tennessee Valley Authority
WBN	- Watts Bar Nuclear Plant

1.0 PURPOSE

This document defines and describes the Quality Assurance (QA) requirements for Nuclear Power (NP) and establishes responsibilities and methods necessary for their implementation. The principal objective of the Nuclear Quality Assurance Program (NQAP) is to provide confidence that activities affecting quality during design, construction, operation, and maintenance are accomplished in a manner to achieve compliance with preestablished quality objectives and acceptance criteria.

A description of the NQAP elements to be applied to deferred nuclear plants is provided in Appendix F of this plan.

2.0 APPLICABILITY

The NQAP applies to (1) NP personnel and organizations performing activities that could affect quality-related structures, systems, and components at TVA's nuclear plants; (2) non-NP TVA organizations as required by Intergroup Agreement; and (3) contractor activities that could affect quality-related structures, systems, and components, unless NP has approved alternate administrative controls for those activities.

3.0 GENERAL

This NQA Plan is formatted in such a manner as to provide users with a functionally usable document from which NPS documents are developed to implement the requirements stated herein.

Within each QA activity area, source requirement documents are listed. Not only are the source requirement documents listed (e.g., ANSI Standards and Regulatory Guides) but they also specify the particular sections of these source documents that must be addressed (e.g., ANSI N18.7, Section 5.2.12). Providing specific sections of the source requirement documents facilitates use by individuals responsible for the development of applicable procedures and instructions.

However, it must be stressed that the entire set of source requirement documents referenced in each section must be reviewed and understood to capture the program requirements of each source requirement document in NQAP procedures and instructions.

The following subsections identify the management and regulatory requirements applicable to the NQAP. An overview of the program and a description of the functions of the various organizations performing activities within the scope of the program are provided.

3.1 General Management Requirements

The management policies and requirements for the NQAP are established by the Senior Vice President, Nuclear Power. These management policies and requirements provide the administrative controls that shall be applied to activities performed by and for TVA to ensure activities are performed in a manner consistent with QA objectives and to provide adequate record of accomplishment of commitments.

3.2 General Regulatory Requirements

The NQAP shall address the conditions of licenses and permits and encompass the applicable regulatory requirements contained in Appendix B of this plan.

3.3 NQAP Overview

The NQAP includes the NQAP Policy, this NQA Plan, the ASME Section III Quality Assurance Manual (ASME III QAM), and other quality-related NPS documents. The NQAP provides direction and implements requirements derived from regulatory requirements, national codes and standards, and other TVA commitments. General regulatory guidance and national standards that TVA is obligated to implement in the NQAP are listed in Appendix B, "Regulatory Guide Conformance Status."

3.3.1 Implementation

The requirements established by this plan and the ASME III QAM are implemented by Intergroup Agreements and NP documents sponsored by various organizations. To ensure the NQAP is fully integrated and implemented, procedures and instructions address additional implementing level details contained in requirement documents on which the NQAP is based.

The terms "procedure" and/or "instruction," when used within this plan, include written rules, orders, policies, directives, standards, procedures, instructions, and other documents of a similar nature.

3.3.2 Authority and Organizational Freedom of Those Performing QA Verification

Personnel with responsibility for performing QA verification functions shall have sufficient authority and organizational freedom to:

A. Identify quality problems.

B. Initiate, recommend, and provide corrective actions through a comprehensive corrective action program.

C. Verify the implementation of corrective actions.

D. Initiate stop work, if required, to restrict further processing, delivery, or installation of a nonconforming item or unsatisfactory condition until completion of corrective action or satisfactory dispositioning.

3.3.2 (continued)

The individuals and organizations responsible for performing QA verifications and assessments of the NQAP shall be formally designated and sufficiently independent from considerations of cost or scheduling to ensure objectivity in performing assessments. They shall be afforded direct access to appropriate management levels.

QA verification of conformance to established quality assurance program requirements is accomplished by those who have neither the direct responsibility nor the authority for performing the quality-related work activities being verified.

3.3.3 Assessment of Effectiveness

The Manager, NQA shall assess the overall effectiveness of the NQAP for corporate, BFN, and SQN. The Vice President, Completion Assurance, shall assess the overall effectiveness of the NQAP for BLN and WBN. Assessment results shall be reported to the Senior Vice President, Nuclear Power, and affected vice presidents. These assessments include Nuclear Power and non-Nuclear Power TVA organizations and contractors. NQA verifies the effectiveness of NSSS suppliers through audits and annual review of their performance.

The Vice President, NAL&F shall arrange for an annual assessment of TVA site and corporate quality assurance organizations' performance by an organization external to NQA.

3.3.4 Achievement of Quality in Performance

Management personnel shall ensure, through organizational structure and assigned functional responsibilities, that the attainment of program objectives is accomplished by those who have been assigned the work. Achievement of quality in the performance of quality-related activities is the responsibility of each individual involved in TVA's nuclear power program.

3.3.5 Interpretation of Quality Assurance Program Requirements

The Manager, NQA shall provide interpretation of NQA Plan requirements. Differences involving interpretation or implementation of the NQA Plan shall be immediately identified and reported to NQA for resolution. If satisfactory resolution is not readily attainable, then the difference shall be escalated to the Senior Vice President, Nuclear Power.

4.0 ORGANIZATION

The organizational structure, functional responsibilities, levels of authority, and lines of internal and external communication for the management, direction, and execution of the NQAP shall be clearly established for all organizational levels. The NP Policy and Organization Manual (P&OM) describes the general organizational structure

4.0 (continued)
and primary responsibilities of NP organizations and responsibilities of non-NP TVA organizations involved in the NQAP. The Employee Relations and Development organization shall prepare organization charts that show overall NP organizational structure. The overall organizational structure is shown in Appendix H. The NAL&F organization is responsible for establishing upper-tier QA Program requirements and implementation of QA functions at corporate, BFN, and SQN. The Completion Assurance organization is responsible for implementing QA functions at BLN and WBN. The size of the QA organization, including the size of respective site QA staffs, is determined by assessing the resources required to adequately perform functions and workloads assigned to each QA organizational unit.

Chapter 13 of each plant's Final Safety Analysis Report (FSAR) references the TVA Nuclear Power Organization Description (TVA-NPOD89) or provides a description of other key organizational positions, including the vice president's organization and plant operating staffs, responsible for administering and implementing the NQAP.

4.1 Functions of Organizations

NP management, while carrying out their functions, are required to fully comply with all aspects of the NQAP applicable to their organization and ensure proper implementation. This subsection identifies (1) functional responsibilities that are generally implemented through procedures and instructions by all NP organizations involved in the program, and (2) specific NQAP responsibilities for sponsors of upper-tier corporate program documents.

4.1.1 The Senior Vice President, NP has the overall responsibility for the establishment, implementation, and administration of TVA's NQAP and the evaluation of its effectiveness. This responsibility is administered through his management staff, including:

Vice President, Nuclear Assurance, Licensing and Fuels
Vice President, Completion Assurance
Vice President, Nuclear Projects
Vice President, Bellefonte Construction
Vice President, Nuclear Operations
Manager, Nuclear Employee Relations and Development (matrix reporting relationship)

4.1.2 NP Organizations

All NP organizations have the following general functions:

A. Invoke appropriate NQAP requirements on non-NP TVA organizations that provide services for quality-related programs and features.

B. Regularly review the status and adequacy of those parts of the NQAP which they are executing.

4.1.2 (continued)

C. Develop, control, and maintain procedures and instructions as appropriate to implement quality-related activities and processes.

D. Ensure appropriate controls for documents and records generated within the organization or received from external sources.

E. Ensure appropriate controls are developed and implemented to maintain housekeeping and cleanness requirements of facilities, systems, and components during the performance of work activities.

F. Identify and resolve adverse conditions and perform related corrective action activities including assessing trends for internally and externally identified problems.

G. Make personnel and resources available during audit performance and ensure that audit responses and corrective actions are completed within established timeframes.

H. Develop certification programs as appropriate and ensure that trained, qualified, and, where required, certified employees are used in the performance of quality-related activities.

I. Initiate stop work within their area of responsibilities when warranted.

J. Ensure personnel performing quality-related activities receive indoctrination and training as necessary to ensure that adequate proficiency is achieved and maintained.

K. Ensure procedures adequately address interfaces of affected organizations.

L. Ensure during preparation and review of procedures and procurement documents that appropriate technical and QA requirements are included.

4.1.3 Nuclear Assurance, Licensing, and Fuels (NAL&F)

A. In addition to the responsibilities described in subsection 4.1.2, the Vice President, NAL&F is responsible for establishing and managing the nuclear fuel program, Nuclear Safety Review Board and Nuclear Reviews functions, and ensuring that the QA requirements established by this plan in the following activity areas are either included or referenced (as appropriate) in related NAL&F sponsored upper-tier corporate program documents.

1. Procurement document control.

2. Control of purchased material, equipment, and services.

4.1.3.A (continued)

3. Identification and control of materials, parts, and components.

4. Handling, storage, and shipping.

5. Procedures and instructions.

6. Document control.

7. Quality assurance records.

8. Inspection and line verification.

9. Monitoring.

10. Control of Special Processes (NDE).

11. Inspection, test, and operating status.

12. Adverse conditions.

13. Stop work.

14. Trending.

15. Auditing.

16. Computer software and data.

B. The Vice President, NAL&F, administers his responsibilities through his staff which includes:

General Manager, Materials, Contracts, and Administrative Support
Manager, Nuclear Licensing and Regulatory Affairs
Manager, Nuclear Fuels
Manager, Nuclear Quality Assurance
Chairman, Nuclear Safety Review Board
Manager, Nuclear Reviews

1. General Manager, Materials, Contracts, and Administrative Support (MC&AS).

The General Manager, MC&AS reports to the Vice President, NAL&F and is responsible for ensuring that the QA requirements established by this plan in the following activity areas are either included or referenced (as appropriate) in related NAL&F sponsored upper-tier corporate program documents.

a. Procurement document control.

4.1.3.B.1 (continued)

b. Control of purchased material, equipment, and services.

c. Identification and control of materials, parts, and components.

d. Handling, storage, and shipping.

e. Procedures and instructions.

f. Document control.

g. Quality assurance records.

h. Computer software and data.

2. Manager, Nuclear Licensing and Regulatory Affairs (NLRA)

The Manager, NLRA reports to the Vice President, NALF and is responsible for maintaining an interface between TVA and NRC for quality-related activities.

3. Manager, Nuclear Fuels (NF)

The Manager, NF reports to the Vice President, NAL&F and is responsible for ensuring tnat the QA requirements established by this plan in the following nuclear fuel program areas are either included or referenced (as appropriate) in related procedures or instructions sponsored by NF.

a. Audit of and review and concurrence with QA programs for suppliers of nuclear fuels, fuel-related components, and services.

b. Procurement document control.

c. Control of purchased material, equipment, and services.

d. Identification and control of materials, parts, and components.

e. Handling, storage, and shipping.

4.1.3.B (continued)

4. Manager, Nuclear Quality Assurance (NQA)

The Manager, NQA reports directly to the Vice President, NAL&F and has an independent reporting relationship to the Senior Vice President and other vice presidents on quality matters. This is to ensure that the quality organization has direct access to appropriate levels of management and sufficient independence and organizational freedom to be able to effectively assure conformance to quality assurance program requirements. The responsibilities of the Manager, NQA, and his direct reports are noted in Section 4.1.3.C.

5. Chairman, Nuclear Safety Review Board

The Chairman, Nuclear Safety Review Board (NSRB) reports to the Vice President, NAL&F and has an independent reporting relationship to the senior vice president and other vice presidents on nuclear safety matters. The Chairman, NSRB is responsible for ensuring that the QA requirements established by this plan related to NSRB functions are either included or referenced (as appropriate) in related procedures or instructions. The Chairman, NSRB is also responsible for providing recommendations to the Senior Vice President, Nuclear Power for improving the NQAP and for complying with the administrative requirements delineated in Technical Specifications.

6. Manager, Nuclear Reviews

The Manager, Nuclear Reviews reports to the Vice President, NAL&F and is responsible for the Independent Safety Engineering function (as required by NUREG 0737), the Nuclear Experience Review program, and the Nuclear Safety Review Board Support.

C. Manager, Nuclear Quality Assurance (NQA)

The Manager, NQA is responsible for:

1. Developing and administering the Nuclear Quality Assurance Plan and the NQA organization procedures required to ensure that TVA activities provide the required degree of safety and reliability.

2. Auditing, inspecting, and monitoring the conduct of TVA activities at corporate, BFN, and SQN to ensure that they provide the required high degree of safety and reliability and are carried out consistent with applicable laws, regulations, regulatory commitments, licenses, and other requirements.

4.1.3.C (continued)

3. Directing and managing the NQA organization.

4. Performing assessments on a planned and periodic basis to comprehensively determine the effectiveness of the program and its implementation at corporate, BFN, and SQN and submitting results of assessments to the Senior Vice President, Nuclear Power, and affected vice presidents.

5. Stopping work or further processing, delivery, or installation or taking other comparable actions when warranted to control and/or prevent the use of nonconforming materials or continuance of activities adverse to quality at corporate, BFN, and SQN.

6. Establishing upper-tier QA requirements for QA training and for assessing the implementation and effectiveness of that training.

7. The Manager, NQA administers his responsibilities through his staff which includes:

   Quality Programs Manager
   Site Quality Managers (BFN and SQN)

   The Manager, NQA is required to have a bachelor's degree in an engineering or related science, or equivalent related experience. The Manager, NQA shall have at least 10 years experience in an executive managerial capacity with five years' experience in nuclear quality assurance.

   The NQA organization is shown in Appendix H.

   a. Quality Programs Manager

      The Quality Programs Manager is responsible to:

      1. Develop and implement the materials and procurement QA program (except nuclear fuel-related activities) which includes auditing, source inspection, and surveillance of supplier activities. Develop and maintain the Acceptable Supplier List (ASL) of approved vendors (except nuclear fuel-related activities).

      2. Develop and maintain upper-tier QA requirements for receipt inspection at each plant site (except nuclear fuel-related activities).

4.1.3.C.7.a (continued)

3. Develop, review, and maintain upper-tier nuclear QA program requirement documents that include the Nuclear Quality Assurance Plan and the ASME III Quality Assurance Manual.

4. Provide quality assurance support for NP organizations.

5. Review and approve QA programs of TVA and supplier organizations supporting the nuclear program, except for suppliers of nuclear fuels and fuel-related components and services.

6. Establish upper-tier QA requirements for auditing, monitoring, QC, and NDE activities.

7. Manage a program for tracking and trending adverse conditions.

8. Assess NDE, Quality Engineering, Quality Control, and QA activities.

9. Review and/or monitor corporate procurement documents for QA requirements, utilizing graded approach criteria, except for those related to nuclear fuels and fuel-related components and services.

10. Conduct overview of procured engineering services (offsite) including the review of procurement documents for QA requirements utilizing graded approach criteria, in-depth technical and/or performance based auditing, performing preaward surveys,and reviewing contractor QA programs except for nuclear fuels and fuel-related components and services.

11. Audit or assess TVA Nuclear Fuels QA Program and TVA quality-related programs.

12. Review and/or monitor corporate directives and standards identified as quality related, utilizing graded approach criteria, to assess their adequacy.

4.1.3.C.7.a (continued)

13. Provide an annual assessment on the adequacy and effectiveness of QA program implementation by involved corporate TVA organizations.

14. Plan, conduct, and report the results of corporate audits and to follow up identified adverse conditions to ensure appropriate corrective action has been taken.

15. Conduct in-depth technical audits and assessments to assess the technical adequacy of TVA engineering activities.

16. Perform audits and assessments of engineering, construction and operations activities (except supplier nuclear fuel-related activities) to determine compliance with QA program requirements.

17. Review and audit QA programs of TVA organizations which support quality-related activities.

18. Perform audits and assessments of onsite major engineering contractors who perform engineering services.

b. Site Quality Manager (SQM) BFN and SQN

The SQM establishes and maintains a quality assurance organization to perform the quality control, technical support, and quality audit/monitoring/engineering functions. The SQM is involved in day-to-day plant quality-related activities through participation in plant meetings, review of relevant documentation, and execution of the following duties and responsibilities:

1. Assisting site management in developing, planning, initiating, directing, and auditing nuclear plant QA programs.

2. Reviewing and/or monitoring work control documents and activities, utilizing graded approach criteria, to assess their adequacy.

3. Evaluating the effectiveness of the nuclear quality assurance program through auditing, assessing, inspection, and review.

4. Verifying through monitoring or other means that quality assurance requirements are contained in applicable site QA program procedures.

4.1.3.C.7.b (continued)

5. Developing and implementing the site quality control inspection program.

6. Working with site management to support quality improvement by performing functions such as trend analysis, root cause analysis of quality deficiencies, evaluation of dispositions of major quality issues, interface with line management on quality improvement initiatives, and development of QA operational/start-up readiness assessment plans.

7. Stopping work or further processing, delivery or installation, and issuing formal stop work orders when warranted to control and/or prevent the use of nonconforming materials or continuance of activities adverse to quality.

8. Performing in-depth technical monitoring to determine the effectiveness of engineering work (onsite).

9. Reviewing and/or monitoring procurement documents and activities, including services (onsite), utilizing graded approach criteria to assess their adequacy.

10. Providing an annual assessment on the adequacy and effectiveness of QA program implementation by involved site TVA organizations and support by corporate organizations.

11. Planning and implementing inspection activities associated with the ASME Section XI NDE inspection program.

12. Planning, conducting, and reporting the results of site audits, assessments, and monitorings and following up identified adverse conditions to ensure appropriate corrective action has been taken.

13. Ensuring audits, assessments, and monitorings of site engineering, construction, and operations activities are performed (except supplier nuclear fuel-related activities) to determine compliance with QA program requirements.

14. Performing audits and assessments of onsite contractors.

4.1.3.C.7.b (continued)

The SQMs are required to have a bachelor's degree in an engineering or scientific discipline, or equivalent related experience. The SQMs shall have at least nine years experience in plant design, construction, power plant operation or maintenance, including five years experience in QA-related activities. SQMs are required to have at least one year of experience in the QA organization of a nuclear power plant at the time of initial core loading or assignment to the active position.

SQM's organizations are shown in Appendix H.

4.1.4 Completion Assurance

A. In addition to the responsibilities described in subsection 4.1.2, the Vice President, Completion Assurance is responsible for:

1. Oversight efforts directed toward completion of recovery, construction, and licensing of BLN and WBN.

2. Ensuring that appropriate quality assurance programs and systems for BLN and WBN are developed, implemented, evaluated, reported, and problem solutions are recommended (e.g., implementation of the ASME Section III Program).

3. Auditing, inspecting, and monitoring the conduct of TVA activities at BLN and WBN to ensure that they provide the required high degree of safety and reliability and are carried out consistent with applicable laws, regulations, regulatory commitments, licenses, and other requirements.

4. Directing and managing the Completion Assurance organization.

5. Performing assessments on a planned and periodic basis to comprehensively determine the effectiveness of the program and its implementation at BLN and WBN and submitting results of assessments to the Senior Vice President, Nuclear Power, and affected vice presidents.

6. Stopping work or further processing, delivery, or installation or taking other comparable actions when warranted to control and/or prevent the use of nonconforming materials or continuance of activities adverse to quality at BLN and WBN.

4.1.4 (continued)

B. The Vice President, Completion Assurance administers his responsibilities through his staff which includes:

Inspection Services Manager
Site Quality Managers (BLN and WBN)

The Vice President, Completion Assurance is required to have a bachelor's degree in an engineering or related science, or equivalent related experience. The Vice President, Completion Assurance shall have at least 10 years experience in an executive managerial capacity with five years' experience in nuclear quality assurance.

The Completion Assurance organization is shown in Appendix H.

1. The Inspection Services Manager is responsible to:

   a. Provide inspection resources for outage and recovery support to the nuclear plants.

   b. Establish and implement programs for training and certification of personnel performing QC and NDE activities.

   c. As appropriate, develop and maintain quality control inspection and nondestructive examination (NDE) methods and procedures.

   d. Resolve interpretation of NDE results when not achievable at the site level.

   e. Work with the SQM in planning and implementing inspection activities associated with the ASME Section XI NDE Inspection Program.

2. The SQM (BLN and WBN) responsibilities are as described in 4.1.3.C.7.b.

4.1.5 Nuclear Projects

In addition to the responsibilities described in subsection 4.1.2, the Vice President, Nuclear Projects is responsible for:

Ensuring that the QA requirements established by this plan in the following activity areas are either included or referenced (as appropriate) in related Nuclear Projects sponsored upper-tier corporate program documents.

A. Control of special processes (other than NDE).

B. Test control.

C. Handling, storage, and shipping.

D. Design control.

E. Configuration management.

4.1.6 Bellefonte Construction

In addition to the responsibilities described in subsection 4.1.2, and responsibility to implement the deferred plant QA program requirements as identified in Appendix F, the Vice President, Bellefonte Construction has responsibility for development and implementation of programs at Bellefonte Nuclear Plant (BLN), ensuring that the QA requirements of this plan are appropriately established in BLN site procedures.

4.1.7 Nuclear Employee Relations and Development

In addition to the responsibilities described in subsection 4.1.2, the Manager, Nuclear Employee Relations and Development is responsible for maintaining a position qualification documentation and validation program.

4.1.8 Nuclear Operations (NO)

In addition to the responsibilities described in subsection 4.1.2, the Vice President, NO is responsible for the following:

A. Development and implementation of the following technical programs:

1. Chemistry and Environmental Protection

2. Protective Services (Fire Protection, Nuclear Security)

3. Emergency Preparedness

4.1.8.A (continued)

4. Radiological Control

5. Radioactive Waste Management

B. Ensuring that the QA requirements established by this plan in the following activity areas are either included or referenced (as appropriate) in related NO sponsored upper-tier corporate program documents.

1. Inspection and line verification.

2. Test control.

3. Inspection, test, and operating status.

4. Control of maintenance.

5. Control of M&TE and installed safety-related I&C devices.

6. Indoctrination, training, qualification, and certification.

5.0 NUCLEAR QA PROGRAM

The Manager, NQA develops this plan to establish the requirements of the NQAP that encompass the General Management and General Regulatory Requirements in Sections 3.1 and 3.2 of this plan. The program requirements apply to design, construction, testing, operation, maintenance, repair, replacement, and modification of TVA nuclear facilities. Units in transition to the operational phase require special processing. The Vice Presidents, Nuclear Projects and Bellefonte Construction shall provide notification to the Vice Presidents of NO and NAL&F of those activities affecting the unit that have been transitioned to Operations.

The Vice President, NAL&F shall develop and maintain a fuel program that is consistent with requirements of the NQAP. The fuel program shall address suppliers interface responsibilities related to nuclear fuel from plant design and construction through operation and disposal of the fuel.

NP organizations performing activities within the scope of the NQAP shall implement the program through written procedures and instructions.

Non-NP TVA organizations providing services within the scope of the NQAP shall develop QA programs as required by Intergroup Agreements. Non-NP TVA organization QA programs shall be reviewed and approved by NQA.

5.1 Program Scope

A. The requirements of the NQAP shall apply to safety-related structures, systems, and components and associated activities and shall take into account special equipment, environmental conditions, skills, or processes.

B. The requirements shall also apply to TVA identified quality-related programs and features which are important to the continued reliable operation of TVA's nuclear facilities. Organizations responsible for these programs and features shall determine the extent to which these requirements apply and develop and document applicable NQAP elements and the levels of verification required. Technical requirements related to engineering design are specified by the Vice President, Nuclear Projects. NQA shall review or assess these programs and features. The program procedures shall be included in NPS documents.

Programs and features for which the NQAP applies are listed below. Appendix C, "Guidelines for Determination of TVA-Identified Quality-Related Classifications," was used to develop the list.

1. Radiological Control.

2. Emergency Preparedness.

3. Nuclear Plant Security.

4. Radioactive Material Shipment.

5. Special Nuclear Material Management.

6. Independent Offsite Safety Review.

7. Fire Protection.

8. Radwaste Management Systems, Structures and Components.

9. Seismic Category I (L) Items.

10. Non-safety-related Anticipated Transient Without Scram (ATWS) Equipment.

11. Chemistry.

12. Safety Parameter Display System

When using services outside NP, responsible organizations, for the above programs and features, shall specify the extent of applicable QA requirements.

5.1 (continued)

C. To facilitate proper application and implementation of the NQAP, the Vice Presidents, Nuclear Projects, Bellefonte Construction and NO shall develop a Q List for each nuclear unit. The Q List shall document and classify structures, systems, and components consistent with their importance to safety. During the transition to the Q List, the Critical Structures, Systems, and Components (CSSC) list and other program documents will provide the items which are subject to the QA program.

5.2 Graded Approach

The NQAP shall provide for the graded application and verification of QA requirements to quality-related items and activities.

A. The following criteria are to be considered when applying NQAP requirements:

1. The impact on safety of an item malfunction or failure.

2. The specification, design, fabrication complexity, or uniqueness of the item, and the environment under which the item must function.

3. The need for special controls and monitoring of equipment, processes, and operational activities.

4. The degree to which functional compliance can be demonstrated by an inspection or test.

5. The quality history of the item or activity and its degree of standardization.

6. The intended life span during which the item must perform a quality-related function.

7. Requirements of applicable codes and standards.

B. The following factors are to be considered in the degree of QA verification required to ensure implementation of NQAP requirements:

1. New activities not previously performed or implemented.

2. Trend or previous histories of quality problems.

3. Activities critical to safety or having the most potential to impact safety.

4. Revisions of the procedures which have recently been implemented.

5. Activities that have not been monitored in the recent past or are performed infrequently.

5.2.B (continued)

6. Activities that are performed by new personnel, contractors, or technicians.

7. The requirements of applicable codes and standards that are mandated for the item or activity.

5.3 Program Elements

This section identifies or references the NQAP elements delineated through the NP P&OM, the ASME III QAM, and implemented through NP procedures and instructions. The documents identified in Appendix B contain QA requirements applicable to the NQAP elements. The NQAP shall encompass the following elements:

A. Establishment and use of a comprehensive list of safety-related structures, systems, and components for each TVA nuclear plant unit identifying the critical plant features that will receive the highest level of QA program application.

B. Use of a graded approach in the application and verification of NQAP requirements. Quality-related items and activities shall be subjected to a level of QA controls and verification commensurate with their importance to nuclear safety.

C. Assignment of responsibilities to appropriate organizations and positions for implementation of the NQAP.

D. Preparation of NPS documents which provide specific guidance in planning, performing, monitoring, and controlling activities affecting quality to ensure that quality-related activities are performed in accordance with applicable national codes and standards, regulatory requirements, licensing commitments, and management requirements.

E. Verification of the adequacy of quality-related structures, systems, and components by appropriate inspections, tests, and monitoring; and of quality-affecting activities by periodic reviews, audits, and assessments to ensure the adequacy and effectiveness of the NQAP and its implementation.

F. Provisions for adequate indoctrination and training of personnel, and qualification or certification when required, prior to their performing activities which affect quality.

G. Provisions for special controls, processes, test equipment, tools, and skills necessary to attain the required quality.

H. Measures to control cleanness of facilities, material, and equipment; fire prevention; plant access; and equipment protection. Controls shall be applied to the extent necessary to ensure that only proper materials, equipment, processes, and procedures are utilized, and that the quality of items is not degraded through improper practices and techniques.

5.3 (continued)

I. Prompt identification, documentation, evaluation, and correction of adverse conditions.

J. Generation and retention of adequate records to demonstrate compliance with NQAP requirements, applicable national codes and standards, and regulatory requirements.

5.4 Program Documents

The NQAP shall be documented by written procedures and instructions. The NQAP documents, required by this plan and the ASME III QAM are contained in the NPS. Requirements for preparation, review, concurrence, and approval of NQAP documents are contained in NPS documents.

A. NP P&OM

This manual defines the structure and principal responsibilities of NP organizations and formalizes the division of responsibilities between NP and other TVA organizations.

B. ASME III QAM

Associated with this plan is the ASME III QAM. The ASME III QAM is a self-contained manual that prescribes specific QA requirements for the control of items and activities subject to the ASME Code Section III, Division 1. The ASME III QAM satisfies the ASME Section III Code requirement to fully describe both the quality assurance program and the specific responsibilities applied to TVA's activities as an "N" certificate holder. The ASME III QAM is filed with the Authorized Inspection Agency in accordance with the requirements of ASME Code, Section III. Changes to the ASME III QAM shall be coordinated with the Authorized Inspection Agency for review and acceptance prior to implementation.

C. Nuclear Quality Assurance Plan

This NQA Plan contains regulatory and management QA requirements and responsibilities that other NPS documents must address. This plan and implementing documents meet the requirements of 10 CFR 50, Appendix A; 10 CFR 50, Appendix B; and applicable ASME Section XI requirements for a nuclear QA program. To ensure the nuclear program is fully integrated, additional implementing level details contained in requirements documents shall be included in procedures and instructions sponsored by implementing organizations.

5.4 (continued)

D. Implementing Procedures

The NQA Plan establishes the quality assurance program requirements. The NQA Plan places responsibilities on identified sponsors to develop specific elements of the quality assurance programs addressing specific requirements of source requirement documents. Sponsors of NPS documents are required to identify the document as "quality related" if it contains quality assurance program requirements. Corporate directives and standards identified as quality related receive review and concurrence by NQA personnel or others knowledgeable of QA requirements.

5.5 Program Changes

Changes to the NQA Plan shall be submitted to the NRC in compliance with 10 CFR 50.54, and 10 CFR 50.55.

6.0 CONTROL OF DOCUMENTS AND RECORDS

6.1 Procedures and Instructions

6.1.1 General

The QA program requires that quality-related activities shall be prescribed by documented procedures and instructions appropriate to the circumstances. Activities shall be accomplished in accordance with these procedures and instructions.

The requirements of this section are applicable to the preparation, review, and approval of procedures and instructions (for example, this plan, NPS documents, ASME III QAM, etc.). Requirements for the preparation, review, and approval of drawings are in Section 7.0 of this plan. Requirements for control after approval and for use of procedures, instructions, and drawings are in Section 6.2 of this plan.

6.1.2 Program Elements

A. Content

Procedures and instructions shall:

1. Describe quality-related activities in adequate detail for the intended user, and include quantitative or qualitative acceptance criteria sufficient for determining that the activities have been satisfactorily accomplished.

2. Describe significant interfaces between personnel and organizations that affect, or are affected by, quality-related activities.

6.1.2.A (continued)

3. Include or reference appropriate technical, QA, regulatory, and licensing requirements, including those in design output documents.

B. Review

Procedures and instructions shall:

1. Receive a documented review for adequacy by a qualified reviewer other than the preparer.

2. Receive the review and concurrence of affected organizations outside the issuing organization prior to approval, unless concurrence has been established in a higher-level document.

3. Receive a review to ensure proper incorporation of QA requirements. These reviews are by QA personnel or others knowledgeable of QA requirements.

C. Approval

Procedures and instructions shall be approved for release by the sponsoring organization prior to use.

D. Procedural Control

Procedures shall be issued for the identification and control of quality-related procedures, instructions, and their changes. The organizations responsible for preparing, reviewing, approving, and issuing procedures, instructions, and changes shall be specified.

E. Review of Operational Phase Procedures

Operational phase site procedures and instructions shall be reviewed to ensure that specific known changes in source documents or changes identified through usage are included as necessary and in a timely manner. The following mechanisms ensure that appropriate procedure reviews are conducted:

1. Plant modification program

2. Resolution of issues identified by QA, NRC, nuclear experience review, and corrective action program

3. Technical specification and FSAR update reviews

4. Source document program and process for administering site procedures

5. Testing program

F. Change Control

1. Changes to procedures and instructions shall be reviewed and approved prior to their implementation by the same organizations that performed the original review and approval, or by another organization assigned by appropriate management or designated in a controlling procedure or instruction.

2. Changes shall be reviewed by organizations having access to pertinent background information upon which to base their approval and having adequate understanding of the requirements and intent of the original document.

3. Minor changes, such as inconsequential editorial corrections that do not affect the outcome, results, functions, processes, responsibilities, and requirements of the performance of procedures or instructions, do not require the same review as the original, but shall be reviewed and approved as defined in controlling documents.

6.1.3 Responsibilities

A. The Vice President, NAL&F as delegated to the General Manager, MC&AS is responsible for the development of programs to control procedures and instructions. The program elements in Section 6.1.2 and the related source requirements contained within the documents listed in Section 6.1.4 shall be addressed.

B. The Vice President, Completion Assurance as delegated to the SQM (BLN and WBN); and the Vice President, NAL&F as delegate to the Manager, NQA shall:

1. Perform reviews or monitoring of NPS documents that implement the NQAP and,

2. Verify through monitoring or other means that reviews are conducted by personnel knowledgeable in QA requirements.

C. NP organizations are responsible for:

1. Implementing the requirements of the QA program through written procedures and instructions.

2. Ensuring reviews of NPS documents that implement the NQAP are conducted by personnel knowledgeable of QA requirements.

6.1.4 Source Requirement Documents

The following source requirement documents, as applicable, with exceptions as noted in Appendix B of this plan, establish mandatory controls which must be addressed in the development of programs for instructions and procedures.

6.1.4 (continued)

A. 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings."

B. ANSI N18.7-1976/ANS-3.2, "Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants" (Section 5) and Regulatory Guide 1.33, Revision 2, February 1978.

C. ANSI N45.2-1971, "Quality Assurance Program Requirements for Nuclear Power Plants" (Section 6), and Regulatory Guide 1.28, Revision 3, August 1985 (Design and Construction).

D. ANSI N45.2.1-1973, "Cleaning of Fluid Systems and Associated Components During Construction Phase of Nuclear Power Plants" (Sections 2.1 and 2.2), and Regulatory Guide 1.37, Revision 0, March 16, 1973.

E. ANSI N45.2.2-1972, "Packaging, Shipping, Receiving, Storage and Handling of Items for Nuclear Power Plants" (Sections 2.1 and 2.2), and Regulatory Guide 1.38, Revision 2, May 1977.

F. ANSI N45.2.3-1973, "Housekeeping During the Construction Phase of Nuclear Power Plants" (Sections 2.1 and 2.2), and Regulatory Guide 1.39, Revision 2, September 1977.

G. ANSI N45.2.4-1972/IEEE Standard 336-1971, "Installation, Inspection, and Testing Requirements for Instrumentation and Electric Equipment During the Construction of Nuclear Power Generating Stations" (Sections 2.1 and 2.3), and Regulatory Guide 1.30, Revision 0, August 11, 1972.

H. ANSI N45.2.5-1974, "Supplementary Quality Assurance Requirements for Installation, Inspection, and Testing of Structural Concrete and Structural Steel During the Construction Phase of Nuclear Power Plants" (Sections 2.1 and 2.2), and Regulatory Guide 1.94, Revision 1, April 1976.

I. ANSI N45.2.8-1975, "Supplementary Quality Assurance Requirements for Installation, Inspection, and Testing of Mechanical Equipment and Systems For the Construction Phase of Nuclear Power Plants" (Sections 2.1 and 2.2), as endorsed by Regulatory Guide 1.116, Revision 0-R.

J. ANSI N45.2.9-1974, "Requirements for Collection, Storage, and Maintenance of Quality Assurance Records for Nuclear Power Plants," and Regulatory Guide 1.88, Revision 2, October 1976.

K. ANSI N45.2.11-1974, "Quality Assurance Requirements for the Design of Nuclear Power Plants" (Sections 2.2 and 7), and Regulatory Guide 1.64, Revision 2, June 1976.

6.1.4 (continued)

L. ANSI N45.2.13-1976, "Quality Assurance Requirements for Control of Procurement of Items and Services for Nuclear Power Plants" (Section 2), and Regulatory Guide 1.123, Revision 1, July 1977.

M. American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section III, Division 1, "Nuclear Power Plant Components," Article NCA-4000, "Quality Assurance."

N. Plant Technical Specifications (Administrative Controls Section).

6.2 Document Control

6.2.1 General

The QA program requires that for activities affecting quality, measures shall be established to ensure that documents prescribing the activity, including changes, are approved for release by authorized personnel, reviewed for adequacy, and made available to personnel performing the prescribed activity prior to commencing work.

The requirements of this section are applicable to the distribution and control of documents after they have been approved for use.

6.2.2 Program Elements

A. Identification and Distribution

1. The types of documents to be controlled shall be identified. Appendix G lists types of controlled documents and manuals.

2. Master document indexes shall be established and maintained for identifying all controlled documents and their revision status.

3. The distribution of documents shall be controlled and maintained to assist in preventing the use of obsolete or superseded documents.

B. Controlled Use

1. Quality related activities shall be performed in accordance with approved and controlled instructions, procedures, and drawings.

2. Organizations shall ensure through procedures or instructions that those participating in an activity are made aware of and use proper and current documents.

6.2.2 (continued)

C. Control of Equipment Technical Information

Administrative controls shall provide for control and distribution of equipment technical information (ETI) supplied to TVA.

6.2.3 Responsibilities

The Vice President, NAL&F as delegated to the General Manager, MC&AS is responsible for the development of programs to control documents. The program elements in Section 6.2.2 of this section and the related source requirements contained within the documents listed in Section 6.2.4 shall be addressed.

6.2.4 Source Requirement Documents

The following source requirement documents, as applicable, with exceptions as noted in Appendix B of this plan, establish mandatory controls which must be addressed in the development of programs and procedures for the control of documents.

A. 10 CFR 50, Appendix B, Criterion VI, "Document Control."

B. ANSI N18.7-1976/ANS-3.2, "Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants" (Section 5.2.15), and Regulatory Guide 1.33, Revision 2, February 1978.

C. ANSI N45.2-1971, "Quality Assurance Program Requirements for Nuclear Power Plants" (Section 7), and Regulatory Guide 1.28, Revision 3, August 1985 (Design and Construction).

D. ANSI N45.2.4-1972, "Installation, Inspection, and Testing Requirements for Instrumentation and Electric Equipment During the Construction of Nuclear Power Generating Stations" (Section 2.3), and Regulatory Guide 1.30, Revision 0, August 11, 1972.

E. ANSI N45.2.5-1974, "Supplementary Quality Assurance Requirements for Installation, Inspection, and Testing of Structural Concrete and Structural Steel During the Construction Phase of Nuclear Power Plants" (Section 2.2), and Regulatory Guide 1.94, Revision 1, April 1976.

F. ANSI N45.2.8-1975, "Supplementary Quality Assurance Requirements for Installation, Inspection, and Testing of Mechanical Equipment and Systems for the Construction Phase of Nuclear Power Plants" (Section 2.2), and Regulatory Guide 1.116, Revision 0-R, June 1976.

G. American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section III, Division 1, "Nuclear Power Plant Components," Article NCA-4000, "Quality Assurance."

6.2.4 (continued)

H. NUTAC Report on Generic Letter 83-28, "Required Actions Based on Generic Implications of Salem ATWS Events," Section 2.2.2 (letter from L. M. Mills to H. R. Denton dated September 17, 1984).

6.3 QA Records

6.3.1 General

The QA program established for the generation, collection, storage, maintenance, and retrieval of QA records requires that records be correctly identified, reviewed, stamped or otherwise authenticated, retained, and retrievable without undue delay.

6.3.2 Program Elements

A. Sufficient records and documentation shall be prepared and maintained to provide evidence of the quality of items or activities affecting quality. QA records shall be legible, complete, and identifiable to the item involved.

B. Design specifications, procurement documents, procedures, and instructions shall specify the QA records to be generated, supplied, and maintained by or for TVA. Retention times shall be designated. Indexes shall be established to designate those types of QA records to be maintained.

C. Measures shall be established to maintain control of in-process QA documents prior to their completion.

D. Requirements and responsibilities shall be established consistent with applicable codes, standards, and procurement documents for record transmittal, receipt, retention, updating and supplementing of information, and maintenance of the records subsequent to the completion of work and record retrieval.

E. Permanent and temporary QA record storage facilities shall be established to store QA records to prevent infestation, deterioration, or destruction.

F. Measures shall be taken to preclude the entry of unauthorized personnel into QA record storage areas to ensure the integrity of the stored QA records.

G. Records shall be maintained in a manner that will allow access by the Authorized Inspection Agency representative.

6.3.3 Responsibilities

The Vice President, NAL&F as delegated to the General Manager, MC&AS is responsible for the development of a QA records program. The program elements in Section 6.3.2 and the related source requirements contained within the documents listed in Section 6.3.4 shall be addressed.

6.3.4 Source Requirement Documents

The following source requirement documents, as applicable, with exceptions as noted in Appendix B of this plan, establish mandatory controls which must be addressed in the development of programs and procedures for the control of records.

A. 10 CFR 50, Appendix B, Criterion XVII, "Quality Assurance Records."

B. ANSI N18.7-1976/ANS-3.2, "Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants" (Section 5.2.12), and Regulatory Guide 1.33, Appendix A, Revision 2, February 1978.

C. ANSI N45.2-1971, "Quality Assurance Program Requirements for Nuclear Power Plants" (Section 18), and Regulatory Guide 1.28, Revision 3, August 1985 (Design and Construction).

D. ANSI N45.2.1-1973, "Cleaning of Fluid Systems and Associated Components During Construction Phase of Nuclear Power Plants" (Section 9), and Regulatory Guide 1.37, Revision 0, March 16, 1973.

E. ANSI N45.2.2-1972, "Packaging, Shipping, Receiving, Storage, and Handling of Items for Nuclear Power Plants (During the Construction Phase)" (Section 8), and Regulatory Guide 1.38, Revision 2, May 1977.

F. ANSI N45.2.3-1973, "Housekeeping During the Construction Phase of Nuclear Power Plants" (Section 4), and Regulatory Guide 1.39, Revision 2, September 1977.

G. ANSI N45.2.4-1972, "Installation, Inspection, and Testing Requirements for Instrumentation and Electric Equipment During the Construction of Nuclear Power Generating Stations" (Section 8), and Regulatory Guide 1.30, Revision 0, August 11, 1972.

H. ANSI N45.2.5-1974, "Supplementary Quality Assurance Requirements for Installation, Inspection, and Testing of Structural Concrete and Structural Steel During the Construction Phase of Nuclear Power Plants" (Section 7), and Regulatory Guide 1.94, Revision 1, April 1976.

6.3.4 (continued)

I. ANSI/ASME N45.2.6-1978, "Qualifications of Inspection, Examination, and Testing Personnel for Nuclear Power Plants" (Section 5), and Regulatory Guide 1.58, Revision 1, September 1980.

J. ANSI N45.2.8-1975, "Supplementary Quality Assurance Requirements for Installation, Inspection, and Testing of Mechanical Equipment and Systems for the Construction Phase of Nuclear Power Plants" (Section 7), and Regulatory Guide 1.116, Revision 0-R, June 1976.

K. ANSI N45.2.9-1974, "Requirements for Collection, Storage, and Maintenance of Quality Assurance Records for Nuclear Power Plants," and Regulatory Guide 1.88, Revision 2, October 1976.

L. ANSI N45.2.13-1976, "Quality Assurance Requirements for Control of Procurement of Items and Services for Nuclear Power Plants" (Section 11), and Regulatory Guide 1.123, Revision 1, July 1977.

M. American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section III, Division 1, "Nuclear Power Plant Components," Article NCA-4000, "Quality Assurance."

N. Plant Technical Specifications (Administrative Controls Section).

7.0 DESIGN CONTROL

7.1 General

The QA program requires that measures shall be established and documented to ensure that applicable specified design requirements, such as design bases, regulatory requirements, and codes and standards, are correctly translated into specifications, drawings, procedures, or instructions.

7.2 Program Elements

7.2.1 Basic

A. Specific items, services, and activities subject to design control shall be identified (e.g., reactor physics analysis, stress and thermal analyses, computer code development and use, computer software, compatibility of materials, drawings, specifications, engineering procedures, and instructions).

B. Design activities shall be documented in sufficient detail to permit verifications and audits.

7.2.1 (continued)

C. Measures shall be established and implemented to ensure that design output documents appropriately identify engineering requirements that apply to plant activities, and to ensure that plant personnel are made aware of engineering requirements that could affect the performance and scope of their responsibilities before those engineering requirements are implemented.

D. Measures shall be established and implemented to provide test requirements in design output documents for the following tests as appropriate:

1. Design qualification.

2. Product acceptance (proof).

3. Preoperational.

4. Construction.

5. Start-up.

6. Surveillance.

7. Functional.

8. Postmaintenance.

9. Postmodification.

E. Measures shall be established and implemented to provide documented input to other organizations which may request input for their special tests.

F. Acceptance criteria shall be defined for verifications, inspections, and tests in appropriate design output documents.

G. Design output documents shall be utilized, as appropriate, for procurement activities.

H. The Q List identified in Section 5.1.C of this plan shall be developed using appropriate regulations, regulatory guides, and national codes and standards (such as 10 CFR 50, Appendix R, Regulatory Guides 1.26 and 1.29, and ASME Boiler and Pressure Vessel Code).

I. Measures shall be established to ensure the environmental qualification (EQ) of safety-related electrical and mechanical equipment is included, as appropriate, within the design basis.

J. Errors and deficiencies in approved design documents, including design methods (such as described in calculations) that could affect quality-related activities are documented and corrected.

7.2.2 Design Inputs

A. Design assumptions, design inputs, and deviations from approved design inputs shall be identified, reviewed, approved, and documented prior to declaring the structure, system, or component affected by the design operable.

B. Design inputs shall be correctly translated into design outputs.

C. Provisions shall be made to relate the final design to the source of design input.

7.2.3 Design Analysis

A. The performance of design analysis shall be planned and controlled.

B. The suitability of application of materials, parts, equipment, and processes essential to the function of a structure, system, or component shall be reviewed to ensure that functional requirements are met.

7.2.4 Interface Control

Internal and external design responsibilities and interface controls shall be established and defined to facilitate the preparation, review, approval, release, distribution, and revision of documents involving design interfaces. This process ensures that quality-related structures, systems, and components are compatible geometrically, functionally, and with plant processes and environments.

7.2.5 Design Output

A. Engineering requirements on plant activities (e.g., operation, maintenance, installation, modification, surveillance) shall be identified in design output documents.

B. Measures shall be established and documented to control the preparation, review, approval, issuance, and revision of design output documents. These measures shall include criteria and responsibilities to ensure that adequate technical and quality requirements are incorporated prior to issuance.

C. Drawings and specifications shall include, as appropriate, quantitative and qualitative acceptance criteria. These acceptance criteria shall be sufficient for determining that quality-related activities have been satisfactorily accomplished.

7.2.5 (continued)

D. Drawings and specifications shall receive documented reviews and approvals (and concurrences as required) by responsible organizations prior to use.

E. After approval, drawings shall be controlled in accordance with the requirements of Sections 6.2 and 6.3 of this plan.

F. Revisions shall be reviewed and approved by the same organizations that performed the original review unless another appropriate organization that has access to pertinent background information is designated in the appropriate NPS document or procurement documents.

7.2.6 Design Verification

A. The translation of design inputs into design output documents shall be verified and the verification documented.

B. Criteria for determining design verification methods shall be established, identified, implemented, and procedurally controlled. The responsibilities of the verifier, the areas and features to be verified, and documentation requirements shall be included.

C. Design verification shall be performed by individuals or groups other than those who performed the original design.

D. For nuclear units under a construction permit, design verification shall be complete prior to initial fuel loading.

E. For operating nuclear units, design verification shall be complete prior to reliance upon the component, system, or structure to perform its function. Design outputs which are released prior to verification being completed shall be identified and tracked to ensure the component, system, or structure is not relied upon to perform its function until the verification is complete.

F. When a verification test is used to verify the adequacy of a specific design feature in lieu of other verifying processes, the test shall include suitable qualification testing of a prototype unit under conditions that simulate, to the extent practical, the most adverse design condition. The prototype, component, and feature tests are performed as early as possible and prior to plant installation of the equipment or at least prior to the point where installation of the item would be relied upon to perform its function. In those cases where the most adverse design conditions can not be achieved in tests, suitable analysis shall be performed to extrapolate test results to design conditions.

7.2.7 Design Changes

A. Design changes including field changes and modifications shall be identified. They are subject to design control measures commensurate with or better than those applied to the original design.

B. Design changes shall be reviewed and approved by the organization responsible for the original design unless another appropriate organization that has access to pertinent background information is designated in the appropriate NPS document or procurement documents.

C. Design changes that affect the supply of quality-related items or services controlled by procurement documents shall not be implemented or considered approved until: (1) the change is reflected in the appropriate change document such as a contract or purchase order change notice, (2) the change document has received the requisite reviews and approvals, and (3) the change document has been submitted to and accepted by the respective supplier.

D. Proposed modifications to quality-related structures, systems, and components shall be reviewed, approved, and controlled in accordance with applicable requirements of the Operating License and Plant Technical Specifications.

E. Design modifications shall be at least equivalent to the quality specified in the latest approved design basis.

F. Measures to control plant configuration and ensure that the actual plant configuration is accurately depicted on drawings and other appropriate design output documents and reconciled with the applicable design basis shall be established, documented, and implemented.

G. The design integrity shall be maintained during plant maintenance and modification processes, including temporary changes, and throughout the life of the plant.

7.3 Responsibilities

The Vice President, Nuclear Projects is responsible for the development of a design control program. The program elements in Section 7.2 and the related source requirements contained within the documents listed in Section 7.4 shall be addressed.

7.4 Source Requirement Documents

The following source requirement documents, as applicable, with exceptions as noted in Appendix B of this plan, establish mandatory controls which must be addressed in the development of programs and procedures for control of the design process:

A. 10 CFR 50, Appendix B, Criterion III, "Design Control."

B. 10 CFR 50.55a, "Codes and Standards."

C. 10 CFR 50.49, "Environmental Qualification of Electrical Equipment Important to Safety for Nuclear Power Plants."

D. 10 CFR 50.59, "Changes, Tests and Equipments."

E. ANSI N18.7-1976-ANS 3.2, "Administrative Controls and Quality Assurance Program Requirements for the Operational Phase of Nuclear Power Plants" (Section 5.2.7.2), and Regulatory Guide 1.33, Revision 2, February, 1978.

F. ANSI N45.2-1971, "Quality Assurance Program Requirements for Nuclear Power Plants" (Section 4), and Regulatory Guide 1.28, Revision 3, August 1985.

G. ANSI N45.2.11-1974, "Quality Assurance Requirements for the Design of Nuclear Power Plants," and Regulatory Guide 1.64, Revision 2, 1976.

H. American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section III, Division 1, "Nuclear Power Plant Components," Article NCA-4000, "Quality Assurance."

I. American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," Article IWA-1000, "Scope and Responsibility."

8.0 PROCUREMENT AND MATERIAL CONTROL

8.1 Procurement Document Control

8.1.1 General

The QA program requires that measures shall be established to ensure that control is applied to documents used to obtain materials, parts, components, spare and replacement parts, and services required to construct, test, modify, maintain, repair, or operate nuclear facilities, commensurate with their importance to safety.