



NUCLEAR QUALITY ASSURANCE



Tennessee Valley Authority
Nuclear Quality Assurance Plan
(Formerly QA Topical Report TVA-TR75-1A)
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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 term "Program" as used herein includes this plan and the approved documents which are used to implement this plan. Implementation of the NQAP and the achievement of quality objectives are the responsibility of each employee.

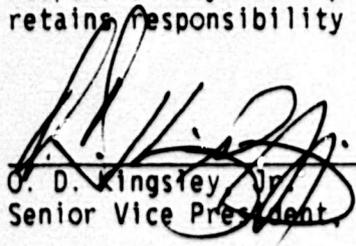
The management policies and requirements for the TVA NQAP are established by the Senior Vice President, Nuclear Power. These management policies and requirements provide the controls that must be applied to the quality-related activities performed by and for the agency to ensure implementation of TVA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

As part of this Policy, the NQAP ensures that the achievement of quality receives major emphasis in planning, implementing, verifying, and documenting work and that quality assurance objectives are not subordinated to achieving cost or schedule objectives. The program includes graded quality assurance requirements and establishes the extent to which the graded requirements are imposed on specific items and activities.

To implement this Policy, the NQAP includes procedures and instructions to document program requirements and to establish controls. Processes which affect quality are controlled as needed to obtain the desired results. For control purposes, grading of quality assurance requirements for specific items and activities is commensurate with their importance to nuclear safety. To control processes and ensure compliance with requirements in each phase of nuclear activities, independent verifications such as tests, inspections, audits, and in-process monitoring are conducted. Records to demonstrate compliance with requirements are prepared and maintained. When deviations from quality requirements are identified, they are documented and corrective action taken in a timely manner.

In addition, the NQAP requires that employees be trained and qualified, as necessary, to perform their assigned tasks.

Conflicts involving implementation 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 retains responsibility for adequacy of the overall program.


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Senior Vice President, Nuclear Power


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REVISION LOG

<u>REVISION NUMBER</u>	<u>EFFECTIVE DATE</u>	<u>DESCRIPTION OF REVISION</u>	<u>PAGES AFFECTED</u>
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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.

This Plan replaces the Quality Assurance Program Description (Topical Report) TVA-TR75-1A. A description of the transition of the current Nuclear Quality Assurance Manual (NQAM) to the TVA Nuclear Procedures System (NPS) is provided in Appendix A of this Plan. 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 Interoffice 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 QA 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 Nuclear QA Plan, the QA Manual for ASME Section III, and other quality-related Nuclear Procedure System (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 Guidance Conformance Status."

3.3.1 Implementation

The requirements established by this Plan and the NCM are implemented by Interoffice 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.

The individuals and organizations responsible for performing 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.

Nuclear Quality Assurance (NQA) 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 and report assessment results to the appropriate levels of management.

NQA organizations performing activities within the scope of the NQAP shall regularly review the status and adequacy of that part of the NQAP for which they have a designated responsibility.

NQA shall arrange for an annual assessment of its performance to be performed 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 NQAP requirements. Differences involving interpretation or implementation of the NQAP 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 and primary responsibilities of NP organizations and responsibilities of non-NP TVA organizations involved in the NQAP. The Human Resource Organization shall prepare organization charts that show overall NP organizational structure. The overall organizational structure and the NQA organizational structure is shown in Appendix H.

Chapter 13 of each plant's Final Safety Analysis Report (FSAR) provides a description of other key organizational positions, including the site director'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 QA functional responsibilities that the identified organizations are to develop through NPS documents.

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

- Vice President, Nuclear Business Operations
- Vice President, Nuclear Construction
- Vice President, Nuclear Engineering
- Vice President and Nuclear Technical Director
- Manager, Nuclear Human Resources
- Vice President, Nuclear Assurance and Services
- Vice President, Nuclear Power Production
- Chairman, Nuclear Safety Review Board

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.
- C. Develop 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 conditions adverse to quality (CAQs) and perform related corrective action activities.
- 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.

4.1.3 Nuclear Business Operations

In addition to the responsibilities described in subsection 4.1.2, the Vice President, Nuclear Business Operations (NBO) 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 procedures or instructions sponsored by NBO.

- A. Procurement document control.
- B. Control of purchased material, equipment, and services.
- C. Identification and control of materials, parts, and components.
- D. Handling, storage, and shipping.

4.1.4 Nuclear Construction

In addition to the responsibilities described in subsection 4.1.2, the Vice President, Nuclear Construction (NC) 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 procedures or instructions sponsored by NC.

- A. Control of special processes.
- B. Verification activities.
- C. Test control.
- D. Handling, storage, and shipping.
- E. Inspection, test, and operating status.
- F. Implementing the requirements of the NCM for ASME Section III activities.
- G. Providing written declaration to the Vice President, Nuclear Assurance and Services (NA&S) of the plant status. This declaration should address those activities, at sites with units under construction permits or units with operating licenses but not yet commercial, affecting the unit that have been transitioned to the Vice President, Nuclear Power Production (NPP).

4.1.5 Nuclear Engineering

In addition to the responsibilities described in subsection 4.1.2, the Vice President, Nuclear Engineering (NE) 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 procedures or instructions sponsored by NE.

- A. Design control.
- B. Procurement document control.
- C. Control of purchased material, equipment, and services.
- D. Identification and control of materials, parts, and components.
- E. Inspections
- F. Control of special processes.

- G. Test control.
- H. Calibration and control of measuring and test equipment (M&TE) and installed instrumentation and control (I&C) devices.
- I. Handling, storage, and shipping.
- J. Inspection, test, and operating status.
- K. Auditing of NE.

4.1.6 Nuclear Technical Direction

In addition to the responsibilities described in subsection 4.1.2, the Vice President and Nuclear Technical Director is responsible for ensuring the QA requirements established by this Plan in the following activity areas are either included or referenced (as appropriate) in related procedures or instructions sponsored by Nuclear Technical Direction.

- A. Establishing an interface between TVA and the Nuclear Regulatory Commission (NRC) for nuclear licensing activities.
- B. Reviewing and approving submittals and correspondence between TVA and NRC concerning NQAP elements.
- C. Ensuring that commitments to NRC concerning NQAP elements are documented and that procedures are developed for the implementation of these commitments.

4.1.7 Human Resources

In addition to the responsibilities described in subsection 4.1.2, the Manager, Nuclear Human Resources is responsible for:

- A. Preparing and obtaining the approval of the Senior Vice President, Nuclear Power for NP's Organization Charts and Position Descriptions (for key management level positions within NP) that establish the organizational structures and division of responsibilities established for the NQAP.
- B. Establishing a position qualification documentation and validation program.

4.1.8 Nuclear Assurance and Services

A. In addition to the responsibilities described in subsection 4.1.2, the Vice President, NA&S 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 procedures or instructions sponsored by NA&S.

1. Procedures and instructions.
2. Document control.
3. Quality assurance records.
4. Control of purchased material, equipment, and services.
5. Inspection and line verification.
6. Monitoring.
7. Control of special processes.
8. Test control.
9. Calibration and control of M&TE and I&C devices.
10. Handling, storage, and shipping.
11. Inspection, test, and operating status.
12. Conditions Adverse to Quality (CAQs).
13. Stop work.
14. Trending.
15. Auditing.
16. Indoctrination and training.
17. Control of computer software and data.

B. The Vice President, NA&S has five principal reports and administers his responsibilities through this staff which includes:

Manager, Nuclear Quality Assurance
Manager, Management Programs
Manager, Nuclear Training
Manager, Technical Programs
Manager, Nuclear Manager's Review Group

1. Manager, Nuclear Quality Assurance (NQA)

The Manager, NQA reports directly to the Vice President, NA&S. However, the Manager, NQA has direct, unencumbered access to the Senior Vice President, Nuclear Power and other Vice Presidents on quality matters warranting such attention. This is to ensure that the quality organization continues to have sufficient independence and organizational freedom from the influence of cost and schedule to be able to effectively ensure conformance to NQAP matters. The responsibilities of the Manager, NQA and his direct reports are noted in Section 4.1.9.

2. Manager, Management Programs (MP)

The Manager, MP reports to the Vice President, NA&S 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 procedures or instructions sponsored by MP.

- a. Procedures and instructions.
- b. Document control.
- c. Quality assurance records.
- d. Configuration management.
- e. Computer software and data.

3. Manager, Nuclear Training (NT)

The Manager, NT reports to the Vice President, NA&S and is responsible for establishing, maintaining, and implementing the indoctrination and training programs.

4. Manager, Technical Programs (TP)

The Manager, TP reports to the Vice President, NA&S and is responsible for the development and implementation of the following programs.

- a. Chemistry and Environmental Protection
- b. Protective Services
- c. Emergency Preparedness
- d. Radiological Control

5. Nuclear Manager's Review Group (NMRG)

The Manager, NMRG reports to the Vice President, NA&S and is responsible for the following activities:

- a. Develops and implements a review program to assess activities associated with design, construction, and operation of TVA nuclear plants.
- b. Provides an independent check on the effectiveness of NP programs and their implementation.
- c. Provides senior management direction to the Manager, Independent Safety Engineering Group (ISEG) and ensures that the results of ISEG activities are appropriately addressed.
- d. Periodically provides reports to senior management.

4.1.9 Manager, Nuclear Quality Assurance

The Manager, Nuclear Quality Assurance (NQA) is responsible for:

- A. Developing and administering the NQAP, including this Plan and the NQA organization procedures required to ensure that TVA activities provide the required degree of safety and reliability.
- B. Auditing, inspecting, and monitoring the conduct of TVA activities 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.
- C. Directing and managing the QA organization.
- D. Performing assessments on a planned and periodic basis to comprehensively determine the effectiveness of the program and its implementation and submitting results of assessments to the appropriate management.
- E. 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.
- F. Establishing requirements for QA training and for monitoring the implementation and effectiveness of that training.

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

Nuclear Quality Audit and Evaluation Manager
Quality Programs Manager
Site Quality Managers
NDE Engineering Manager

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 in NQA.

The Nuclear Quality Assurance organization is shown in Appendix H.

1. Nuclear Quality Audit and Evaluation Manager

The Nuclear Quality Audit and Evaluation (NQA&E) Manager is responsible to:

- a. Plan, conduct, and report the results of audits and to follow up identified adverse conditions to ensure appropriate corrective action has been taken.
- b. Perform programmatic audits of Engineering Assurance verification of design activities.
- c. Perform audits of construction and operations activities.
- d. Review and audit QA programs of TVA organizations which support quality-related activities.
- e. Provide an annual assessment on the adequacy and effectiveness of QA program implementation by involved TVA organizations.

2. Quality Programs Manager

The Quality Programs Manager is responsible to:

- a. Develop and implement the materials and procurement QA program which includes auditing, source inspection, and surveillance of supplier activities.
- b. Develop and maintain the QA program for receipt inspection, handling, and storage of materials at each plant site.

- c. Develop and maintain the NCM. Changes to the NCM are submitted to the authorized inspection agency for review and acceptance prior to implementation.
- d. Provide quality engineering and monitoring support functions for NP organizations.
- e. Review and approve QA programs of TVA and supplier organizations supporting the nuclear program.
- f. Establish requirements for selection, training, and certification of personnel performing NQA activities.
- g. Manage a program for tracking and trending CAQs.

3. Site Quality Manager

The Site Quality Manager (SQM) establishes and maintains a quality assurance organization to perform the quality engineering, quality control, quality improvement, and QA monitoring 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:

- a. Assisting site management in developing, planning, initiating, and directing nuclear plant QA programs.
- b. Performing quality engineering functions relative to site activities.
- c. Evaluating the effectiveness of the nuclear quality assurance program through the review of audit, monitor, inspection and review results.
- d. Reviewing and verifying, utilizing graded approach criteria, that quality assurance requirements are contained in applicable site QA program procedures.
- e. Developing and implementing the site quality control inspection program.
- f. 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.

- g. 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.

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.

A typical SQM's organization is shown in Appendix H.

4. NDE Engineering Manager

The Nondestructive Examination (NDE) Engineering Manager is responsible to:

- a. Develop and implement the corporate NDE program (except leak testing) in support of the nuclear plants.
- b. Provide NDE engineering and technical resources for conduct of examination activities.
- c. Develop, implement, and maintain the corporate QA welding program and other applicable special processes.

5. Manager of Engineering Assurance

The Manager of Engineering Assurance (EA) reports to the Vice President, NE and is responsible for developing and maintaining the NE QA procedures and instructions and for implementing engineering assurance activities. The Manager, EA has the authority to stop unsatisfactory engineering work or control further processing that does not conform to established requirements. The Manager, EA reports to the Manager, NQA on QA matters. EA functions include the following in NE:

- a. Developing, approving, maintaining, and controlling engineering quality program procedures.
- b. Ensuring that engineering procedures interface effectively with organizations outside of Nuclear Engineering.

- c. Facilitating implementation of engineering procedures through project Engineering Assurance engineers.
- d. Auditing and monitoring engineering activities to evaluate compliance with QA programmatic requirements.
- e. Verifying the technical adequacy and effectiveness of engineering work.
- f. Overview of procured engineering services, including review of procurement documents for QA requirements, and auditing contractors who provide engineering services.
- g. Assessing trends, problem identification, and administering corrective and preventive action for internally and externally identified engineering problems.
- h. Issuing formal stop work orders, as required.

4.1.10 Nuclear Power Production

In addition to the responsibilities described in subsection 4.1.2, the Vice President, Nuclear Power Production (NPP) is responsible for the following:

- A. Ensuring that activities at licensed units are conducted in a safe and quality matter.
- B. Developing maintenance program requirements and implementing of these requirements at licensed units.
- C. Ensuring that the QA requirements established by this Plan in the following activity areas are either included or referenced (as appropriate) in related procedures or instructions sponsored by NPP.
 - 1. Verification activities.
 - 2. Test control.
 - 3. Inspection, test, and operating status.
 - 4. Control of maintenance.
 - 5. Calibration and control of M&TE and installed instrumentation.

4.1.11 Nuclear Safety Review Board

In addition to the responsibilities described in subsection 4.1.2, the Chairman, Nuclear Safety Review Board (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 complying with the administrative requirements delineated in Technical Specifications.

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 President, NC shall provide written declaration to the Vice President, NA&S of those activities affecting the unit that have been transitioned to the Vice President, NPP. The Vice President, NE shall develop and maintain a fuel program that is consistent with requirements of the NQAP.

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 Interoffice Agreements. Non-NP TVA organization QA programs shall be reviewed and approved by NQA or NE-EA.

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. These programs and features are listed below. Appendix C, "Guidelines for Determination of TVA Identified Quality-Related Classifications," was used to develop the list. 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, NE. NQA shall review and concur with these programs and features. The program procedures shall be included in NPS documents.

Programs and features for which the NQAP applies include:

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. Environmental Protection.
9. Radwaste Management Systems, Structures and Components.
10. Seismic Category I (L) Items.
11. Non-safety-related Anticipated Transient Without Scram (ATWS) Equipment.
12. Chemistry.

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

- C. To facilitate proper application and implementation of the NQAP, the Vice President, NE in coordination with the Vice President, NC and Vice President, NPP 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.
 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 NCM, 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 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.
- I. Prompt identification, documentation, evaluation, and correction of CAQs.
- 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 Quality Assurance Manual for ASME Section III Power Plant Components (NCM), 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. Quality Assurance Manual for ASME Section III

Associated with this Plan is the NCM. The NCM 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 NCM 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 NCM is filed with the Authorized Inspection Agency in accordance with the requirements of ASME Code, Section III. Changes to the NCM shall be coordinated with the Authorized Inspection Agency for review and acceptance prior to implementation.

C. Nuclear Quality Assurance Plan

This Nuclear QA Plan contains regulatory and management QA requirements and responsibilities that other Nuclear Procedure System documents must address. This Plan and implementing documents also meet 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.

5.5 Program Changes

Changes to the Nuclear QA 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, NCM, 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.
3. Include or reference appropriate technical, 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 implementation 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. Periodic Review of Operational Phase Procedures

Operational Phase site procedures and instructions shall be periodically reviewed by an individual knowledgeable in the area affected by the procedure to determine if changes are necessary. This periodic review shall be performed and documented at least once every two years or, for procedures that are used less frequently than every two years, the review shall be performed and documented prior to use. A general revision of a procedure is an acceptable means of performing the review.

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. Inconsequential typographical corrections that do not affect the outcome, results, function, or performance of the procedures or instructions do not require the same review as the original, but shall be reviewed and approved as defined in controlling NPS documents.

6.1.3 Responsibilities

- A. The Vice President, NA&S as delegated to the Manager, Management Programs (MP) is responsible for the development of programs to control procedures and instructions. The program elements in paragraph B of this section and the related source requirements contained within the documents listed in paragraph D of this section shall be addressed.
- B. The Vice President, NA&S as delegated to the Manager, NQA shall ensure through monitoring activities, utilizing graded approach criteria, that reviews are conducted by personnel knowledgeable in QA requirements.
- C. Affected NP organizations are responsible for implementing the requirements of the QA program through written procedures and instructions.

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.

- 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" (Sections 5.2.7 and subparagraphs and 5.3 and subparagraphs) 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 0, June 7, 1972 (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 N45.2.9-1979, "Requirements for Collection, Storage, and Maintenance of Quality Assurance Records for Nuclear Power Plants."
- K. Regulatory Guide 1.88, "Collection, Storage, and Maintenance of Nuclear Power Plant Quality Assurance Records," Revision 2, October 1976.
- L. 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.
- K. 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.
- N. ANSI N101.4-1972, "Quality Assurance for Protective Coatings Applied to Nuclear Facilities" (Sections 2.2 and 2.3), and Regulatory Guide 1.54, Revision 0, June 1973.
- O. American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section III, Division 1, "Nuclear Power Plant Components," Article NCA-4000, "Quality Assurance."
- P. Plant Technical Specifications (Section 6).

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.

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 examples of controlled documents.
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.

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, NA&S as delegated to the Manager, MP is responsible for the development of programs to control documents. The program elements in paragraph B of this section and the related source requirements contained within the documents listed in paragraph D of this section 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 0, June 7, 1972 (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" (Sections 2.2 and 2.3), 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" (Sections 2.2 and 2.3), 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."

6.3 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 records 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.