



TVA NUCLEAR



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NUCLEAR QUALITY ASSURANCE

**Tennessee Valley Authority
Nuclear Quality Assurance Plan
TVA-NQA-PLN89
Revision 0**

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.

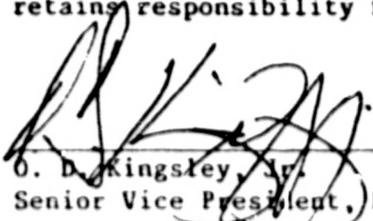
The management policies and requirements for the TVA NQAP are established by the Senior Vice President, Nuclear Power. These management policies and requirements provide the controls that must be applied to the quality-related activities performed by and for the agency to ensure implementation of TVA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

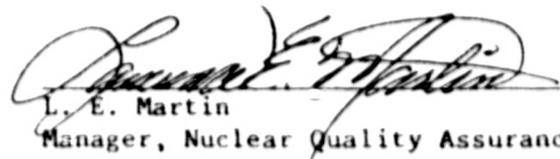
As part of this policy, the NQAP ensures that the achievement of quality receives major emphasis in planning, implementing, verifying, and documenting work and that quality assurance objectives are not subordinated to achieving cost or schedule objectives. The program includes graded quality assurance 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.


O. D. Kingsley, Jr.
Senior Vice President, Nuclear Power


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Manager, Nuclear Quality Assurance

REVISION LOG

<u>REVISION NUMBER</u>	<u>EFFECTIVE DATE</u>	<u>DESCRIPTION OF REVISION</u>	<u>PAGES AFFECTED</u>
0	Refer to Appendix A	Initial Issue	All

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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
ASNT	- American Society for Nondestructive Testing
ATWS	- Anticipated Transient Without Scram
CAQ	- Condition Adverse to Quality
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
ID-QAP	- Interdivisional Quality Assurance Procedure
IEEE	- Institute of Electrical and Electronics Engineers
ISEG	- Independent Safety Engineering Group
M&TE	- Measuring and Test Equipment
MP	- Management Programs
NA&S	- Nuclear Assurance and Services
NBO	- Nuclear Business Operations
NCM	- Quality Assurance Manual for ASME Section III Power Plant Components
NDE	- Nondestructive Examination
NE	- Nuclear Engineering
NFPA	- National Fire Protection Association
NHR	- Nuclear Human Resources
NMRG	- Nuclear Manager's Review Group
NNS	- Non-nuclear Safety
NP	- Nuclear Power
NPP	- Nuclear Power Production
NPS	- Nuclear Procedures System
NQA	- Nuclear Quality Assurance
NQA&E	- Nuclear Quality Audit and Evaluation
NQAM	- Nuclear Quality Assurance Manual
NQAP	- Nuclear Quality Assurance Program
NRC	- Nuclear Regulatory Commission
NSRB	- Nuclear Safety Review Board
NSSS	- Nuclear Steam Supply System
NT	- Nuclear Training
NTD	- Nuclear Technical Director
P&OM	- Policy and Organization Manual
QA	- Quality Assurance
QC	- Quality Control
SNM	- Special Nuclear Material
SQM	- Site Quality Manager
TP	- Technical Programs
TVA	- Tennessee Valley Authority

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 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 QA Manual for ASME Section III (Nuclear Components Manual), 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 Nuclear Components Manual (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 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.

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 Senior Vice President, Nuclear Power, affected vice presidents and site directors. These assessments include Nuclear Power and non-Nuclear Power TVA organizations. NQA verifies the effectiveness of NSSS suppliers through audits and annual review of their performance.

The Vice President, NA&S shall arrange for an annual assessment of Nuclear Quality Audit & Evaluation's 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 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. The size of the NQA 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 NQA organizational unit.

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, New Projects
- 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, 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 cleanliness 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 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.

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 New Projects

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

- A. Ensuring that activities at unlicensed units are conducted in a safe, efficient, reliable, and quality manner.
- B. Implementing the Nuclear Maintenance Program during construction phase activities.
- 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 New Projects.
 - 1. Control of special processes.
 - 2. Line verification activities.
 - 3. Test control.
 - 4. Handling, storage, and shipping.
 - 5. Inspection, test, and operating status.
 - 6. Implementing the requirements of the NCM for ASME Section III activities.
 - 7. Control of maintenance.
 - 8. Implementing the deferred plant quality assurance program requirements as identified in Appendix F.

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. Inspection and line verification.
- C. Control of special processes.
- D. Test control.
- E. Control of M&TE and installed I&C devices.

- F. Handling, storage, and shipping.
- G. Inspection, test, and operating status.

4.1.6 Vice President and Nuclear Technical Director

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 the Nuclear Technical Director.

- A. Serving as the principal interface between TVA and the Nuclear Regulatory Commission (NRC) for nuclear licensing activities.
- B. Establishing and maintaining a licensing program for and maintaining required licenses and permits for nuclear plants.
- C. Providing management an oversight of the nuclear experience review, generic issues, including implication evaluations, and the corporate commitment tracking program.
- D. Ensuring resolution of NRC issues.
- E. Establishing and managing the Nuclear Fuels program including the review and concurrence with QA programs for suppliers of nuclear fuels, fuel-related components, and services.
- F. Procurement document control.
- G. Control of purchased material, equipment, and services.
- H. Identification and control of materials, parts, and components.

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. Inspection, test, and operating status.
 10. Conditions adverse to quality (CAQs).
 11. Stop work.
 12. Trending.
 13. Auditing.
 14. Indoctrination, training, qualification, and certification.
 15. 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 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 4.1.9.

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 (Fire Protection, Nuclear Security)
- c. Emergency Preparedness
- d. Radiological Control

e. Radioactive Waste Management

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 and evaluation program to assess activities associated with engineering and design, construction, and operation of TVA's 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, NQA is responsible for:

- A. 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.
- 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 Senior Vice President, Nuclear Power, affected vice presidents, and site directors.
- 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
Inspection Services Manager
Special Programs 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 with five years' experience in nuclear quality assurance.

The NQA 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. Conduct in-depth technical audits to assess the technical adequacy of TVA engineering activities.
- c. Perform audits of engineering, construction and operations activities to determine compliance with QA program requirements.
- 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.
- f. Perform audits of onsite contractors who perform engineering services.

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. Developing and maintaining the Acceptable Supplier List (ASL) of approved vendors.

- b. Develop and maintain the QA program for receipt inspection at each plant site.
- c. Develop, review, and maintain upper-tier nuclear QA program requirement documents that include the Nuclear Quality Assurance Plan and the Nuclear Quality Assurance Manual for ASME Section III Nuclear Power Plant Components.
- 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, except for suppliers of nuclear fuels and fuel-related components and services.
- f. Establish requirements for selection, training, and certification of personnel performing NQA activities.
- g. Manage a program for tracking and trending CAQs.
- h. Develop and maintain quality control and nondestructive examination inspection methods and programs.
- i. Monitor NDE, Quality Engineering, Quality Control and QA activities.
- j. Develop and maintain the corporate quality assurance requirements for welding and other applicable special processes.
- k. Perform in-depth technical monitoring of corporate NE to assess the effectiveness of engineering work.
- l. Review corporate procurement documents for QA requirements except for those related to nuclear fuels and fuel-related components and services.
- m. Overview of procured engineering services (offsite) including the review of procurement documents for QA requirements, 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.
- n. Reviews and concurs with TVA nuclear fuel QA program and TVA quality-related programs.

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 reviews to assess the adequacy of work control documents.
- c. Evaluating the effectiveness of the nuclear quality assurance program through the review of audit, monitoring, 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.
- h. Monitoring and performing in-depth technical surveillances to determine the effectiveness of engineering work (onsite).
- i. Reviewing of procurement documents, including engineering services (onsite) for QA requirements.

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.

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

4. Inspection Services Manager

The Inspection Services Manager is responsible for:

- a. Providing resources for outage and recovery support to the nuclear plants.
- b. Planning and implementing the ASME Section XI NDE inspection program.

5. Special Programs Manager

The Special Programs Manager is responsible for:

- a. Managing the investigation of NQA sensitive personnel or management issues.
- b. Advising the Manager, NQA on matters related to the development and implementation of the QA program.

4.1.10 Nuclear Power Production

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

- A. Ensuring that activities at licensed units are conducted in a safe, efficient, reliable, and quality manner.
- B. Developing maintenance program requirements and implementing 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. Line verification activities.
 2. Test control.
 3. Inspection, test, and operating status.

4. Control of maintenance.
5. Control of M&TE and installed I&C devices.
6. Control of special processes.

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 for 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, New Projects shall provide notification to the Vice Presidents of NPP and NA&S of those activities affecting the unit that have been transitioned to Operations.

The Vice President, NTD 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 Interoffice 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. 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. 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.

- C. To facilitate proper application and implementation of the NQAP, the Vice President, NE in coordination with the Vice President, New Projects 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 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.
- 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 NQA Plan contains regulatory and management QA requirements and responsibilities that other Nuclear Procedure System 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 III 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.

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 NQA review and concurrence.

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, 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 incorporation of QA requirements. These reviews are by NQA 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. 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 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, NA&S as delegated to the Manager, NQA shall:
 1. Approve or concur with corporate-level NPS documents (directives and standards) which establish the NQAP,
 2. Review those procedures that implement the NQAP through monitoring activities and utilizing graded approach criteria and,
 3. Ensure that these 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" (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 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 N45.2.9-1974, "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.
- 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 (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 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.

5.2.2 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.

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 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 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."
- 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, N&S as delegated to the Manager, MP 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 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" (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.
- 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 (Section 6).

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.
- C. Measures shall be established and implemented to ensure that design output documents appropriately identify applicable requirements to be incorporated into procedures and instructions for plant activities. This will ensure that responsible plant personnel are made aware of design changes and modifications that could affect the performance and scope of their responsibilities prior to planned maintenance or modification being 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.
 3. Proof.
 4. Preoperational.
 5. Construction.
 6. Start-up.
 7. Surveillance.
 8. Functional.
 9. Postmaintenance.
 10. 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 critical structures systems, and components (CSSC) are compatible geometrically, functionally, and with plant processes and environments.

7.2.5 Design Output

- A. Design output documents shall appropriately identify requirements to be incorporated into procedures and instructions for plant activities.
- 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.
- 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 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.

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, NE 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 0, June 7, 1972.
- 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."

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.

8.1.2 Program Elements

A. Procurement Document Planning

The procurement process, as documented in NP procedures, shall identify each activity in the process, who accomplishes the activity, how, and when the activity is performed. The process shall be planned to integrate the following activities as a minimum:

1. Document preparation, review, and change control.
2. Selection of procurement sources.
3. Bid evaluations and award.
4. Purchaser control of supplier performance.
5. Verification activities of purchaser.
6. Control of nonconformances.
7. Corrective actions.
8. Acceptance of item or service.
9. QA records.
10. Audit of procurement program.

B. Procurement Document Content

In the preparation of procurement documents responsible organizations shall, as applicable:

1. Specify or reference applicable design basis technical requirements, such as regulatory requirements (including 10 CFR 50.49 and 10 CFR Part 21, as applicable); material and component identification requirements; drawings; specifications; inspection and test requirements (including acceptance criteria); calibration, handling, storage, packaging, and shipping requirements; and special process instructions. All such technical requirements shall be prepared, reviewed, and released under the requirements established by Section 7.0 of this plan.
2. For commercial grade replacement items intended for safety-related use, NE shall determine critical characteristics and specify inspection and acceptance criteria to ensure that items dedicated after receipt are acceptable for use as replacement parts.

3. As appropriate, require that suppliers have a documented QA program that implements applicable requirements of the NQAP.
4. As appropriate, require that NQAP requirements be imposed on subvendors and subcontractors in subtier procurement documents.
5. Identify the documentation to be prepared and/or maintained by the supplier and submitted to TVA for review and approval.
6. Identify records to be retained, maintained, and controlled by the vendor or contractor, and those documents and records that the vendors or contractors shall transfer to TVA prior to installation or use of an item or service as applicable.
7. Include provisions for right of access to the facilities and records of vendors, contractors, and subtier vendors and contractors for source inspections and audits.
8. Include requirements to ensure that spare and replacement materials and components are purchased to the applicable requirements of the NQAP and to: (1) specifications and codes equivalent to those specified for the original equipment, or those specifications and codes specified by an NE-approved revision, or (2) in cases where the original item or part is found to be commercially "off the shelf" or without specifically identified quality assurance requirements, spare and replacement parts may be similarly procured but, at the very least, equivalent performance is ensured, or (3) in those where the QA requirements of the original item cannot be determined, NE conducts a documented evaluation to establish the requirements and controls.
9. Include requirements for reporting nonconformances and for approving corrective actions and nonconformance dispositions.

C. Procurement Document Review and Approval

The review and approval of procurement documents shall include a documented technical and QA review, as appropriate, utilizing a graded approach to ensure that technical, quality, and administrative requirements are included in procurement documents prior to their use.

D. Procurement Document Change Control

Changes in procurement documents shall be subject to the same degree of control as was utilized in the original documents. Changes such as typographical corrections, quantity, or monetary changes do not require technical or QA approval.

8.1.3 Responsibilities

The Vice President, NBC and the Vice President, NTD for nuclear fuels and fuel-related components and services are responsible for the development of a procurement document control program. The program elements in Section 8.1.2 and the related source requirements contained within the documents listed in Section 8.1.4 shall be addressed.

8.1.4 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 and procedures for control of procurement documents.

- A. 10 CFR 50, Appendix B, Criterion IV, "Procurement Document Control."
- B. 10 CFR 50.49, "Environmental Qualification of Electrical Equipment Important to Safety for Nuclear Power Plants."
- C. ANSI N18.7-1976-ANS 3.2, "Administrative Controls and Quality Assurance Program Requirements for the Operational Phase of Nuclear Power Plants" (Sections 5.2.13 and 5.2.13.1), and Regulatory Guide 1.33, Revision 2, February, 1978.
- D. ANSI N45.2-1971, "Quality Assurance Program Requirements for Nuclear Power Plants" (Section 5), and Regulatory Guide 1.28, Revision 0, June 7, 1972.
- E. ANSI N45.2.13-1976, "Quality Assurance Requirements for Control of Procurement of Items and Services for Nuclear Power Plants," and Regulatory Guide 1.123, (Section 3.0) Revision 1, July 1977.
- F. American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section III, Division 1, "Nuclear Power Plant Components," Article NCA-4000, "Quality Assurance."

8.2 Control of Purchased Material, Equipment, and Services

8.2.1 General

The QA program requires that measures shall be established to assure that purchased material, equipment, and services, whether purchased directly or through contractors, conform to the procurement documents.

8.2.2 Program Elements

A. Evaluation and Selection of Suppliers

1. Evaluations of prospective suppliers shall be conducted and documented to demonstrate that their qualifications and capabilities are adequate to meet procurement document requirements. Supplier evaluations shall include supplier performance monitoring as appropriate.
2. Evaluations and selection of procurement sources shall include, as appropriate, the use of historical quality performance data, source surveys or audits, or source qualification programs.
3. A list of approved suppliers shall be maintained.

B. Bid Evaluation and Award

A documented system for reviewing and evaluating bids and correcting bid discrepancies shall be established to ensure suppliers' conformance to procurement document requirements.

C. Effectiveness Assessments

1. The effectiveness of the suppliers' control of quality shall be assessed through periodic audits and/or surveillances utilizing a graded approach consistent with the importance, complexity, and quantity of the items and services procured.
2. The assessments shall consist of, as appropriate, checks, reviews, verifications, examinations, and witnessing of activities related to the fabrication, testing, inspection, and shipment of material, including periodic assessments of suppliers' certificates of conformance.
3. Records, qualifications, and process specifications or procedures shall be documented and verified to be in accordance with contract requirements.

D. Acceptance of Procured Services

Procured services shall be accepted, as appropriate, by:

1. Technical verification of product/data produced.
2. Monitoring and/or audit of the activity.
3. Review of objective evidence, such as certifications.

E. Acceptance of Procured Items

Procured items shall be accepted by receipt inspection and any combination of the following, as appropriate, based on the item's degree of complexity, uniqueness, and safety classification.

1. Source verification.
2. Preinstallation testing inspection.
3. Supplier certificate of conformance.
4. Post installation testing.

F. Receipt Inspection

1. Receipt inspection shall be performed to ensure that material and equipment is properly identified to the purchase document and receiving documentation and meets requirements of procurement documents.
2. Deficiencies, such as damage, shall be documented and resolution of the deficiency shall be in accordance with approved documents.
3. Records, such as inspection and test records, shall be available at the site prior to installation or use of the material or equipment.

G. Maintaining Disposition of Received Items

1. A quality control method for identifying the status of items (e.g., an inventory system, tagging, labeling, color code) shall be employed that indicates whether items received are acceptable or unacceptable for installation.
2. Items may be installed prior to final disposition of a deficiency. Nonconforming items shall be controlled in accordance with Section 10.2.1.

8.2.3 Responsibilities

- A. The Vice Presidents, NBO and N&S as delegated to the Manager, NQA, and the Vice President, NTD for nuclear fuels and fuel-related components and services are responsible for the development of programs to control purchased material, equipment, and services. The program elements in Section 8.2.2 and the related source requirements contained within the documents listed in Section 8.2.4 shall be addressed.

- B. The Vice President, NA&S as delegated to the Manager, NQA is responsible for evaluation and selection of suppliers, acceptance of procured items, and periodic effectiveness assessments of suppliers utilizing graded approach criteria.
- C. The Vice President, NA&S as delegated to the Manager, NQA is responsible for maintaining an approved suppliers list.

8.2.4 Source Requirement Documents

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

- A. 10 CFR 50, Appendix B, Criterion VII, "Control of Purchased Material, Equipment and Services."
- B. 10 CFR 21, "Reporting of Defects and Noncompliance."
- C. ANSI N18.7-1976/ANS-3.2, "Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants" (Section 5.2.13.2), and Regulatory Guide 1.33, Revision 2, February 1978.
- D. ANSI N45.2-1971, "Quality Assurance Program Requirements for Nuclear Power Plants" (Section 8), and Regulatory Guide 1.28, Revision 0, June 7, 1972 (Design and Construction).
- E. ANSI N45.2.2-1972, "Packaging, Shipping, Receiving, Storage and Handling of Items for Nuclear Power Plants" (Section 5), and Regulatory Guide 1.38, Revision 2, May 1977.
- F. ANSI N45.2.4-1972, "Installation, Inspection, and Testing Requirements for Instrumentation and Electric Equipment During the Construction of Nuclear Power Generating Stations" (Section 2.2), and Regulatory Guide 1.30, Revision 0, August 11, 1972.
- G. 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.
- H. 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.

- I. ANSI N45.2.13-1976, "Quality Assurance Requirements for Control of Procurement of Items and Services for Nuclear Power Plants," and Regulatory Guide 1.123, Revision 1, July 1977.
- J. American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section III, Division 1, "Nuclear Power Plant Components," Article NCA-4000, "Quality Assurance."

8.3 Identification and Control of Materials, Parts, and Components

8.3.1 General

The QA program shall ensure that only correct and accepted items are installed and used, and that an item can be related to applicable drawings, specifications, or technical documents at any stage of construction, maintenance, or modification as required.

8.3.2 Program Elements

A. Identification

Identification of quality-related items shall be verified and documented prior to release for fabrication, assembly, shipping, and installation. Identification requirements shall be specified in applicable design and procurement documents. Determination of identification requirements shall be based on the item importance to safety, quality or potential hazards.

B. Traceability

Traceability of materials, parts, or components to specific manufacturing, installation, maintenance, and/or test records shall be provided as required by codes, standards, or specifications and shall be accomplished through the recording of heat, batch, lot, part, or serial numbers, or other appropriate identification, either on the item or on records traceable to the item.

8.3.3 Responsibilities

The Vice President, NBO, and the Vice President, NTD for nuclear fuel and fuel-related components and services are responsible for the development of the material management program for identification and control of materials, parts, and components. The program elements in Section 8.3.2 and the related source requirements contained within the documents listed in Section 8.3.4 shall be addressed.

8.3.4 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 identification and control of items:

- A. 10 CFR 50, Appendix B, Criterion VIII, "Identification and Control of Materials, Parts, and Components."
- B. ANSI N18.7-1976/ANS 3.2, "Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants" (Section 5.2.13.3), and Regulatory Guide 1.33, Revision 2, February 1978.
- C. ANSI N42.2-1971, "Quality Assurance Program Requirements for Nuclear Power Plants" (Section 9), and Regulatory Guide 1.28, Revision 0, June 7, 1972 (Design and Construction).
- D. ANSI N45.2.2-1972, "Packaging, Shipping, Receiving, Storage, and Handling of Items for Nuclear Power Plants (During the Construction Phase)," and Regulatory Guide 1.38, Revision 2, May 1977.
- E. ANSI N45.2.4-1972, "Installation, Inspection, and Testing Requirements for Instrumentation and Electric Equipment During the Construction of Nuclear Power Generating Stations," and Regulatory Guide 1.30, Revision 0, August 11, 1972.
- F. 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," and Regulatory Guide 1.94, Revision 1, April 1976.
- G. 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," and Regulatory Guide 1.116, Revision 0-R, June 1976.
- H. American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section III, Division 1, "Nuclear Power Plant Components," Article NCA-4000, "Quality Assurance."

9.0 Control of Plant Activities

9.1 Inspection and Line Verification

9.1.1 General

The QA program requires that inspection and line verification procedures and instructions include provisions for inspections and line verifications to ensure quality.

9.1.2 Program Elements

A. Line Verification

1. Line verifications shall be performed and documented to substantiate and ensure that an activity or condition has been implemented and accomplished in conformance with specific requirements.
2. Requirements for line verification identified by design output documents shall be included in implementing documents.
3. Qualification of personnel performing line verifications shall be contained in procedures and instructions developed by the organization performing the line verification.

B. Inspection Plans and Instructions

Inspections shall be controlled by plans or instructions which implement requirements, assign responsibilities, and identify acceptance criteria derived from design output documents, as appropriate.

1. Inspections to verify conformance to codes, standards, and design output shall be required for each operation. Factors used to determine the extent of inspections to be performed are listed in Section 5.2 of this plan.
2. Inspection hold points, witness points, and notification points shall be used as required or needed to verify in-process or final achievement of quality. When graded approach criteria is applied to inspection activities, independent verification will be required.
3. Indirect control by monitoring of processing methods, equipment, and personnel shall be specified when direct inspection is impossible or disadvantageous.
4. Instructions for activities such as sampling, monitoring, and independent inspections shall be included.

5. Persons responsible for performing sampling, monitoring, and independent inspections shall be specified.

C. Inspection Performance

Inspections shall be performed by NQA, or other qualified individuals approved by NQA, utilizing graded approach criteria in accordance with controlled plans or instructions which specify attributes to be verified in accordance with requirements and acceptance criteria.

1. Inspections shall be performed by individuals (NQA or those approved by NQA) other than those who performed or directly supervised the activity being inspected.
2. Personnel performing inspections shall be trained, qualified, and certified, as required, within their discipline in accordance with established requirements. The requirements criteria shall be approved by NQA through the procedure review process.
3. M&TE used to perform inspections shall be controlled, calibrated, and maintained as required in Section 9.5 of this plan. The identification of M&TE shall be documented.
4. Work shall not proceed beyond designated hold points prior to release by authorized personnel.

D. Results

Records of inspection results and personnel performing the inspection shall be retained as required in Section 6.3 of this plan.

1. Inspection records shall be identified as such and shall be retrievable.
2. Inspection records shall contain a description of the type of inspection, the date performed, inspection or verification of corrective action results, and identification of the inspector and data recorder as well as the person approving the inspection results including the date of approval.
3. Inspection records and/or data sheets shall include a statement attesting to the acceptability of results and provide for identifying the individual who performed the evaluation.
4. Periodic trending of inspection results shall be performed and reported to appropriate management.

5. Records shall be kept in sufficient detail to permit adequate evaluation of inspection activities.

9.1.3 Responsibilities

- A. The Vice President, NA&S as delegated to the Manager, NQA is responsible for including the applicable QA program elements in Section 9.1.2 and the related source requirements found in the documents listed in Section 9.1.4, within both the inspection program and the line verification program.
- B. The Vice Presidents, New Projects and NPP are responsible for including the program elements in Section 9.1.2 and the related source requirements contained within the documents listed in Section 9.1.4 as applicable, within the line verification program.
- C. The Vice President, NE is responsible for providing qualitative/quantitative criteria in design output documents which are incorporated in implementing procedures.

9.1.4 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 and procedures for inspection.

- A. 10 CFR 50, Appendix B, Criteria X, "Inspection."
- B. ANSI N18.7-1976/ANS-3.2, "Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants" (Sections 5.2.8 and 5.2.17), and Regulatory Guide 1.33, Revision 2, February 1978.
- C. ANSI N45.2-1971, "Quality Assurance Program Requirements for Nuclear Power Plants" (Section 11), 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," 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 5.2 and 7.4), and Regulatory Guide 1.38, Revision 2, May 1977.
- F. ANSI N45.2.3-1973, "Housekeeping During the Construction Phase of Nuclear Power Plants," 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" (Section 5.1), 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 4, 5 and 6), and Regulatory Guide 1.94, Revision 1, April 1976.
- I. ANSI N45.2.6-1978, "Qualification of Inspection, Examination, and Testing Personnel," 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" (Sections 3, 4, and 5), and Regulatory Guide 1.116, Revision 0-R.
- K. ANSI N45.2.13-1976, "Quality Assurance Requirements for Control of Procurement of Items and Services for Nuclear Power Plants" (Sections 7 and 10), and Regulatory Guide 1.123, Revision 1, July 1977.
- L. American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI, "Rules For Inservice Inspection of Nuclear Power Plants."
- M. American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section III, Division 1, "Nuclear Power Plant Components," Article NCA-4000, "Quality Assurance."

9.2 Nuclear Quality Assurance (NQA) Monitoring

9.2.1 General

Monitoring by NQA is performed as a type of verification which supplements the quality program's assessment process in ensuring that observed quality-related activities are performed in accordance with requirements and desired results are achieved.

9.2.2 Program Elements

- A. Monitoring procedures and instructions shall address monitoring techniques.
- B. Monitoring frequencies shall be based on such factors as the status and safety significance of the activity or process, frequency of occurrence, degree and acceptability of previous experience, adverse trends, and testing or operation sequences.

- C. The results of monitoring shall be documented and reported to appropriate levels of management.
- D. Records shall be maintained in sufficient detail to provide adequate documentation of monitored activities.
- E. Follow-up verifications or additional monitoring shall be conducted as necessary to ensure that required corrective action has been taken.
- F. Monitoring shall be performed in accordance with written procedures and instructions by qualified and appropriately trained personnel not having direct responsibility in the areas being monitored.

9.2.3 Responsibilities

The Vice President, NA&S as delegated to the Manager, NQA is responsible for the development and implementation of the QA monitoring program.

9.2.4 Source Requirement Documents

None applicable.

9.3 Control of Special Processes

9.3.1 General

Those processes as determined by NE, which by their nature, make a direct inspection either impossible or disadvantageous are controlled as special processes.

Special processes shall be controlled and accomplished in accordance with approved process control documents by qualified personnel using qualified written procedures.

9.3.2 Program Elements

- A. Processes which are to be controlled as special processes shall be documented in design output documents and maintained current. These processes shall include but not be limited to welding, forming and bending, heat treating, chemical cleaning, protective coatings, and NDE.
- B. Measures shall be established, documented, and implemented, as appropriate, using specifications, procedures, and instructions to ensure that special processes are accomplished under controlled conditions and in accordance with applicable codes, standards, specifications, manufacturer instructions, or other special requirements. These measures shall include requirements for procedures, equipment, personnel, specifications, and control of consumable materials.

- C. When a special process is not covered by existing codes or standards, or when an item's quality requirements exceed the requirements of existing codes or standards, any special requirements necessary for controlling, implementing, and documenting the special process shall be defined as appropriate.
- D. Procedure, Equipment, and Personnel Qualification and Certification
1. Personnel performing special processes shall be qualified and, when required, certified in accordance with the applicable codes, standards, and any special requirements.
 2. Qualification or certification of procedures, equipment, and personnel required by codes, standards, or any special requirements shall be performed.
 3. Documentation shall be maintained for these qualifications and certifications. M&TE used in special processes shall be controlled in accordance with Section 9.5 of this plan.
- E. Results

Results of examinations associated with special processes shall be documented and evaluated for acceptability. Documentation shall provide for identifying the individual who performed the evaluation.

9.3.3 Responsibilities

- A. The Vice Presidents, NE, New Projects, NPP, and NA&S as delegated to the Manager, NQA are responsible for development of programs for control of special processes. The program elements in Section 9.3.2 and the related source requirements contained within the documents listed in Section 9.3.4 shall be addressed.
- B. The Vice President, NE, is responsible for coordinating with appropriate organizations and determining which processes are to be controlled as special processes.
- C. The Vice President, NA&S as delegated to the Manager, NQA is responsible for the identification of quality requirements for the special processes program development and qualification or certification of special process procedures, equipment, and NQA personnel related to NDE.
- D. The Vice Presidents, New Projects and NPP are responsible for the qualification or certification of special process procedures, equipment, and personnel for all areas other than NDE.

9.3.4 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 special processes.

- A. ANSI N18.7-1976/ANS-3.2, "Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants" (Sections 5.2.12 and 5.2.18), and Regulatory Guide 1.33, Revision 2, February 1978.
- B. ANSI N45.2-1971, "Quality Assurance Program Requirements for Nuclear Power Plants" (Section 10), and Regulatory Guide 1.28, Revision 0, June 7, 1972 (Design and Construction).
- C. ANSI N45.2.1-1973, "Cleaning of Fluid Systems and Associated Components During Construction Phase of Nuclear Power Plants" (Section 2.5), and Regulatory Guide 1.37, Revision 0, March 16, 1973.
- D. ANSI N45.2.6-1978, "Qualification of Inspection, Examination, and Testing Personnel," and Regulatory Guide 1.58, Revision 1, September 1980.
- E. 10 CFR 50, Appendix B, Criterion IX.
- F. American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section V, "Nondestructive Examination."
- G. American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section IX, "Welding and Brazing Qualifications."
- H. American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plants."
- I. American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section III, Division 1, "Nuclear Power Plant Components," Article NCA-4000, "Quality Assurance."
- J. American Welding Society (AWS), "Structural Welding Code D1.1."
- K. American Institute of Steel Construction (AISC), "Specification for the Design, Fabrication, and Erection of Structural Steel for Buildings."
- L. American Society for Nondestructive Testing (ASNT) Recommended Practice, SNT-TC-1A-1984.