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- 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 <u>receipt inspection and</u> 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.

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G. Maintaining Disposition of Received Items

- 1. <u>A quality control method for identifying the status of</u> <u>items (e.g., an inventory system, tagging, labeling,</u> <u>color code) shall be employed that indicates whether</u> <u>items received are acceptable or unacceptable for</u> <u>installation.</u>
- 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 NA&S as delegated to the Manager, NQA, and the Vice President, <u>NTD</u> 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).

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- 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 Flectric 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 O-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 Deletion Pressure Vessel (B&PV) Code, Section III, Division 1, Q-16.F "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.

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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, <u>NTD</u> 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 addre. sed 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.

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- 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."

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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
 - 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.
 - 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.

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- 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.
- 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. <u>The requirements</u> Q-33 <u>criteria shall be approved by NQA through the procedure</u> <u>review process.</u>
- 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.

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- 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 acceptatility 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 (A program elements in section 9.1.2 and the related source requirements found ir 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 N45.2-19/1, "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/IEEL 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 "ower Plants" (sections 3, 4, and 5), and Regulatory Guide 1.116, Revision O-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.

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- 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 |Q-6 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.
- Monitoring frequencies shall be based on such factors as the **B**. 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.
- Follow-up verifications or additional monitoring shall be Ε. 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.

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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, and NDE. Q-16.F

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- 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, <u>New Projects</u>, <u>NPP</u>, 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 <u>identification of quality requirements</u> for the special processes program development and qualification or certification of special process procedures, equipment, and NQA personnel related to NDE.
- D. The Vice President, <u>New Projects and Nuclear Power Production</u> is 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.
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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."

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- 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.

9.4 Test Control

9.4.1 General

The QA program requires that controls shall be established to ensure that required testing is identified and performed in accordance with procedures which incorporate engineering requirements.

- 9.4.2 Program Elements
 - A. The following types of tests, as a minimum, shall be included:
 - 1. Design qualification tests.
 - 2. Product acceptance tests.
 - 3. Proof tests (prior to installation).
 - 4. Preoperational tests.
 - 5. Construction tests.
 - 6. Start-up tests.
 - 7. Surveillance tests.
 - 8. Functional tests.
 - 9. Postmaintenance tests.
 - 10. Postmodification tests.
 - 11. Special tests.
 - B. Test Performance
 - 1. Tests shall be accomplished in accordance with fitten and approved test procedures which include the requirements and acceptance criteria of technical specifications, drawings, specifications, codes, standards, regulatory requirements, and scoping documents as applicable.

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- Tests performed following plant repairs, replacements, maintenance, or modifications shall be conducted in accordance with the original design and testing requirements or approved documented alternatives. Tests shall be sufficient to confirm that the changes produce expected results and do not reduce safety of operations.
- 3. Test procedures or instructions include the following, as applicable:
 - a. Description of test objective.
 - b. Instructions for performing the test.
 - c. Test prerequisites such as calibrated instrumentation, adequate test equipment and instrumentation including their accuracy requirements, completeness of the item to be tested, suitable and controlled environmental conditions, provisions for data collection and storage, and qualified personnel.
 - d. Provisions to assure test prerequisites have been met.
 - e. Mandatory inspection hold points.
 - f. Acceptance or rejection criteria.
 - g. Methods of recording, documenting, and reviewing test data and results.
- C. Test Results

Test results shall be documented in a suitable test results package that contains:

- 1. The identification of the item to which it applies.
- 2. The identification of instructions followed in performing the test.
- 3. Pertinent inspection and test data.
- 4. Significant dates and times.
- 5. Signature of inspector and test director.
- 6. Conditions encountered which were not anticipated, including identification of deviations or CAQs, and actions taken to resolve the condition.

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D. Results Evaluation

The technical acceptability of the results shall be evaluated by an appropriate authority to ensure that the test requirements have been satisfied.

E. Records of test results shall be retained in accordance with section 6.3 of this plan.

9.4.3 Responsibilities

- A. The Vice Presidents, <u>Now Projects</u>, NPP, and NA&S as delegated to the Manager, NQA are responsible for the development of test control programs. The program elements in section 9.4.2 and the related source requirements contained within the documents listed in section 9.4.4 shall be addressed.
- B. The Vice President, NE is responsible for specifying through design output documents the acceptance criteria for tests necessary to demonstrate an item's compliance with design parameters.
- C. The Vice President, <u>New Projects</u> is responsible for the development and conduct of installation tests (construction phase) which incorporate engineering requirements.
- D. The Vice President, NPP is responsible for the development of tests (operations phase) which incorporate engineering requirements and for the conduct of tests, including leak tests (operations phase).
- E. The Vice President, NA&S as delegated to the Manager, NQA is responsible for monitoring tests and test results, utilizing graded approach criteria attesting to the acceptability of inspection and tests.

9.4.4 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 tests.

- A. 10 CFR 50, Appendia B, Criterion XI, "Test Control."
- B. ANSI N18.7-1976/ANS 3.2, "Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants" (section 5.2.8 and section 5.2.19 and subparagraphs), and Regulatory Guide 1.33, Revision 2, February 1978.
- C. ANSI N45.2-1971, "Quality Assurance Program Requirements for Nuclear Power Plants" (section 12), 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 2.3 and 2.5), 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 (IEEE-336-1971)," 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," 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," and Regulatory Guide 1.116, Revision 0, June 1976.
- I. American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components."
- 9.5 Control of M&TE and Installed Compliance I&C Devices
 - 9.5.1 General

Measures shall be established to control equipment which is used to conduct measurements or tests related to determining the <u>functionality</u> or quality of structures, systems, and components within the scope of the QA program.

- 9.5.2 Program Elements
 - A. Requirements Common to M&TE and Installed I&C Devices
 - 1. Procedures or instructions for administrative controls shall establish:
 - a. Controls for calibration, <u>selection</u>, identification, and utilization of M&TE and installed I&C devices.
 - b. The scope of the various quality-related calibration and control programs.
 - c. The types of equipment to be controlled.

- 2. M&TE and installed I&C devices shall be conspicuously labeled, tagged or otherwise controlled to ensure performance of required calibrations on or before the established due date.
- 3. Intervals shall be established for calibration and adjustments of M&TE and installed I&C devices. These intervals shall be based on required accuracy, purpose, degree of usage, stability characteristics, and other conditions which may affect the measurement or output data.
- 4. An index, listing, or log shall be procedurally maintained and shall identify each piece of M&TE and installed I&C device within the calibration program.
- 5. Methods shall be established to identify previous usage of M&TE or installed I&C devices when found to be out of calibration. These methods shall require that inspections or tests be repeated or a documented evaluation be performed when the integrity of past measurements obtained with the suspect equipment or device cannot be demonstrated.
- 6. M&TE and installed I&C devices which are consistently found out of calibration shall be identified as nonconforming, removed from service, and repaired or replaced.

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- 7. Reference standards shall be traceable to nationally recognized standards or physical constants. When national standards do not exist, the basis for calibration shall be documented and approved by designated responsible management.
- B. Unique Requirements for M&TE

Controls for M&TE shall include the following requirements. These requirements are in addition to those noted in section 9.5.2.A.

- M&TE prior to use, shall be identifiable and traceable to applicable calibration records.
- 2. M&TE shall be stored, calibrated, and used in environments that will not adversely affect its accuracy.
- 3. M&TE shall be identified to indicate the date of the last calibration, by whom it was calibrated, and when the next calibration is due.

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- 4. Calibration standards, including test stands, that are used as a standard (i.e., multiple M&TE) shall have an accuracy of at least four times the required accuracy of the equipment being calibrated. When this is not possible, standards shall have an accuracy that ensures the equipment being calibrated will be within required tolerances. The basis of acceptance shall be documented and authorized by identified responsible management.
- C. Unique Requirements for Installed Compliance I&C Devices

Controls for installed I&C devices shall include the following requirements. These requirements are in addition to those noted in section 9.5.2.A.

- 1. The calibration of installed I&C devices that provide final measurements data or controls shall be against M&TE that have an accuracy equal to <u>or better than</u> the required accuracy of the devices being calibrated.
- 2. Environmental <u>qualification</u> controls for I&C devices shall be established in applicable design documents. These controls shall be maintained when I&C devices are opened in place or removed for calibration in a laboratory.
- D. Calibration Procedures and Instructions

Calibration procedures and instructions as a minimum shall include:

- 1. The identity of the item to be calibrated.
- 2. Calibration equipment and reference standards to be used.
- 3. Checks, tests, measurements, and acceptance tolerances.
- 4. Sequence of operations.
- 5. Special instructions, when necessary.
- 6. Means for traceability between M&TE and calibration records.
- 7. Recording of performer and applicable procedure or instruction.
- 8. Recording of as-found and as-left accuracy.

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9.5.3 Responsibilities

- A. The Vice President, NPP is responsible for the development of controls for M&TE and installed I&C devices. The program elements in section 9.5.2 and the related source requirements contained within the documents listed in section 9.5.4 shall be addressed.
 - B. The Vice President, NE is responsible for providing qualitative/quantitative criteria in design output documents.
- 9.5.4 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 M&TE and installed I&C devices.

- A. 10 CFR 50, Appendix B, Criterion XII, "Control of Measuring and Test Equipment."
- B. ANSI N18.7-1976/ANS-3.2, "Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants" (Section 5.2.16), and Regulatory Guide 1.33, Revision 2, February 1978.
- C. ANSI N45.2-1971, "Quality Assurance Program Requirements for Nuclear Power Plants" (Section 13), and Regulatory Guide 1.28, Revision 0, June 7, 1972.
- D. 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.
- E. ANSI N45.2.2-1972, "Packaging, Shipping, Receiving, Storage and Handling of Items for Nuclear Power Plants" (Section 2.5), 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 2.5), and Regulatory Guide 1.30, 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 2.5), and Regulatory Guide 1.94, Revision 1, April 1976.

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- 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 2.8), and Regulatory Guide 1.116, Revision O-R.
- I. ANSI N45.2.13-1976, "Quality Assurance Requirements for Control of Procurement of Items and Services for Nuclear Power Plants" (Sections 7.4), and Regulatory Guide 1.123, Revision 1, July 1977.

Deletion Q-16.F

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

9.6.1 General

Measures shall be established such that items, including consumables, under the scope of the QA program are handled, stored, and shipped by qualified individuals in a manner to prevent deterioration, contamination, damage, or loss of identification in accordance with approved engineering and procurement documents.

- 9.6.2 Program Elements
 - A. Marking

Items and/or their containers shall be adequately marked so that the items may be properly identified, maintained, and preserved during shipping, receiving, and storage. Marking shall also indicate the presence of special environments or the need for special controls.

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- B. Packaging and Cleaning
 - Packaging shall be adequate to provide protection against effects such as corrosion and contamination which would lower the quality of items or cause deterioration beyond specified limits.
 - 2. Special coverings, special equipment, and special protective environments shall be provided and maintained as required by procurement documents and vendor instructions determined to be applicable by the responsible engineer.

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3. Cleaning operations shall be performed as required prior to coating, packaging, storing, or installing items.

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C. Shipping and Handling

Special protection required for shipping shall be provided and maintained as specified by procurement documents or vendor instructions. Specified instructions and precautions for handling shall be followed.

- D. Storage
 - 1. Methods of controlling stored items, including shelf life, shall be established to minimize the potential for damage or deterioration during storage.
 - 2. Appropriate facilities shall be provided for storage of items requiring special environmental conditions.
 - 3. Periodic monitoring of storage areas and stored items shall be performed and documented to verify compliance with storage requirements.
 - 4. Proper maintenance shall be provided for stored items where necessary to prevent deterioration.

9.6.3 Responsibilities

- A. The Vice Presidents of NBO, <u>New Projects</u>, and NE are responsible for the development of <u>program</u> controls for handling, storing, and shipping. The program elements in section 9.6.2 and the related source requirements contained within the documents listed in section 9.6.4 shall be addressed.
- B. The Vice President, NBO and the Vice President, <u>NTD</u> for nuclear fuels and fuel-related components are responsible for developing and defining implementation responsibilities to control the receipt, storage, shipping, and issuance of materials.
- C. The Vice President, <u>New Projects</u> is responsible for developing programs for controlling material in support of construction phase activities.
- D. The Vice President, NE is responsible for establishing storage, handling, and shipping requirements and preventive maintenance requirements during storage.

9.6.4 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 handling, storage, shipping, cleaning, and preservation of items.

- A. 10 CFR 50, Appendix B, Criterion XIII, "Handling, Storage, and Shipping."
- B. ANSI N18.7-1976/ANS-3.2, "Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants" (Section 5.2.13.4), and Regulatory Guide 1.33, Revision 2, February 1978.
- C. ANSI N45.2-1971, "Quality Assurance Program Requirements for Nuclear Power Plants" (Section 14), 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," 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 3.3), 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 2.2), 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," 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" (Section 2.5), and Regulatory Guide 1.116, Revision O-R.

Deletion Q-16.F

- J. American Society of Mechanica' Engineers Boiler and Pressure Vessel Code, Section III, Di'ision 1, "Nuclear Power Plant Components," Article NCA-4000, "Quality Assurance."
- 9.7 Inspection, Test, and Operating Status
 - 9.7.1 General

Measures shall be established and documented to ensure that the operating status is current and the acceptability of items is known throughout fabrication, storage, construction, installation, operation, maintenance, and modification.

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9.7.2 Program Elements

- A. Inspection and Test Status
 - 1. The status of inspections and tests shall be identified either on the items or in documents traceable to the items to ensure that required inspections and tests are performed and to preclude inadvertent bypassing.
 - 2. The status of inspections and tests shall be maintained through the use of indicators such as tags, markings, shop travelers, routing cards, stamps, inspection records, or other suitable means.
 - 3. The authority for application and removal of tags, markings, labels, and stamps shall be specified.
 - 4. Deletions or alterations of required inspections, tests, and other critical operations shall be controlled through appropriate changes to applicable procedures. These changes shall be handled in accordance with section 6.1.2F of this plan.
- B. Operating Status
 - 1. The operating status of items (including temporary alterations) shall be indicated by status indicators, such as tags on valves and switches, to prevent inadvertent operation.
 - 2. Plant instructions that require items to be removed from service for maintenance, testing, or modification shall require designated personnel permission and the completion of the appropriate clearance (hold order or approved plant procedures) before commencement of the activity.

9.7.3 Responsibilities

- A. The Vice Fresidents, NE, <u>New Projects</u>, NPP, and NA&S as delegated to the Manager, NQA are responsible for the development of controls to maintain inspection, test, and operating status. The program elements in section 9.7.2 and the related source requirements contained within the documents listed in section 9.7.4 shall be addressed.
- B. The Vice President, NE is responsible for establishing applicable inspection and test acceptance criteria to ensure the acceptability of items is maintained.
- <u>C.</u> The Vice President, <u>New Projects</u> is responsible for the implementation of programs for maintaining inspection, test, and operating status at unlicensed units.

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- D. The Vice President, NPP is responsible for development of the inspection, test, and operating status programs and implementation of the programs for maintaining inspection, test, and operating status at licensed units.
- 9.7.4 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 the control of inspection, test, and operating status.

- A. 10 CFR 50, Appendix B, Criterion XIV, "Inspection, Test, and Operating Status."
- B. ANSI N18.7-1976/ANS-3.2, "Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants" (Sections 5.2.6, 5.2.8, and 5.2.14), and Regulatory Guide 1.33, Revision 2, February 1978.
- C. ANSI N45.2-1971, "Quality Assurance Program Requirements for Nuclear Power Plants" (Section 15), and Regulatory Guide 1.28, Revision 0, June 7, 1972 (Design and Construction).
- D. ANSI N45.2.4-1972, "Quality Assurance Requirements for the Installation, Inspection, and Testing of Instrumentation and Electric Equipment," 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 3, 4, and 5), 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 4.2 and 5.1), and Regulatory Guide 1.116, Revision 0-R.
- 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. American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components."
- I. Plant Technical Specifications (section 6).

9.8 Control of Maintenance

9.8.1 General

The nuclear maintenance program, including corrective and preventive maintenance, shall ensure that quality-related structures, systems, and components are maintained (including appropriate equipment qualification maintenance) at a level sufficient to perform their intended functions.

9.8.2 Program Elements

A. Preventive Maintenance

A preventive maintenance program prescribing the frequency and type of maintenance activities to be performed shall be established and maintained.

B. Procedures and Instructions

Maintenance shall be carried out in accordance with procedures or instructions to ensure quality at least equivalent to that specified in the approved design basis or approved alternatives. Procedures or instructions shall be written to the level of detail that is normally expected of the user group. Training, experience, and the technical complexity of the work are factors which should be considered in determining the level of detail the procedure or instruction should contain. Guidelines shall be established for the use of these procedures or instructions.

C. Maintenance Preplanning

Maintenance shall be preplanned to include as appropriate:

- 1. Review of work-initiating documents to ensure quality requirements have been addressed.
- 2. Evaluation of the use of special processes, equipment and materials including potential hazards to personnel and equipment and ALARA considerations.
- 3. The potential for common-mode failures when working on similar multiple or redundant systems and components.
- 4. Documented approval by designated personnel to release equipment or systems for maintenance.

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5. Inspection and testing as appropriate to ensure a suitable level of confidence. This includes postmaintenance testing commensurate with the maintenance performed to ensure that the equipment is capable of being returned to service, that the original deficiency (if any exists) has been corrected, and that no new deficiency has been created.

D. Malfunctions

The cause of malfunctions shall be evaluated and documented in accordance with TVA's nuclear corrective action program.

E. Trending

The Maintenance Program shall establish the parameters for trending maintenance activities and describe the methods for evaluating and documenting adverse trends.

9.8.3 Responsibilities

- A. The Vice President, NPP is responsible for the development of the Nuclear Maintenance Program. The program elements in section 9.8.2 and the related source requirements contained within the documents listed in section 9.8.4 shall be addressed.
- B. The Vice President, <u>New Projects</u> is responsible for the implementation of the Nuclear Maintenance Program during construction phase activities.
- C. The Vice President, NPP is responsible for the implementation of the Nuclear Maintenance Program during operations phase activities.

9.8.4 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 Nuclear Maintenance Program.

- A. 10 CFR 50.49(j) and (1).
- B. ANSI N18.7-1976/ANS 3.2, "Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants" (Sections 5.2.7 and 5.3.5), and Regulatory Guide 1.33, Revision 2, February 1978.
- C. ANSI N45.2.2-1972, "Packaging, Shipping, Receiving, Storage, and Handling of Items for Nuclear Power Plants" (Section 6), and Regulatory Guide 1.38, Revision 2, May 1977.

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- D. American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section III, Division 1, "Nuclear Power Plant Components," Article NCA-4000, "Quality Assurance."
- E. ANSI N45.2.8-1975, (Sections 3.1, 3.5[h] and 4.5-b,c) "Supplementary Quality Assurance Requirements for Installation, Inspection, and Testing of Mechanical Equipment and Systems for the Construction Phase of Nuclear Power Plants"
- 10.0 Conditions Adverse to Quality

10.1 General

Measures shall be established to ensure that items that do not conform to requirements are controlled to prevent their inadvertent installation or use. CAQs, including nonconforming items or nonhardware problems such as failure to comply with operating license, technical specifications, or procedures, shall be identified, evaluated, corrected, tracked, trended, and when required, reported to appropriate levels of management. Procedures or instructions implementing the corrective action program shall establish the criteria for documenting and tracking CAQs.

- 10.2 Program Elements
 - 10.2.1 Control of Nonconforming Items
 - A. Organizations responsible for items determined to be nonconforming during receipt inspection, construction, maintenance, modifications, or operations shall identify (physical identification) and segregate the nonconforming items from acceptable items to prevent further processing, delivery, installation, or inadvertent use. When segregation is not practical, tagging, marking, or other means of identification is acceptable.
 - B. Disposition actions for nonconforming items may be accept-as-is, repair, rework, scrap, or return to vendor. Dispositions of accept-as-is or repair shall be independently reviewed and approved. Reworked or repaired, and replaced items shall satisfy the original inspection and test requirements or acceptable alternatives.
 - 10.2.2 Corrective Action For CAQs
 - A. NP organizations and onsite non-NP service organizations performing quality-related activities at nuclear facilities shall promptly identify and resolve CAQs.
 - B. Minor deficiencies identified during the course of QA verifications which may be brought into compliance within an acceptable timeframe shall be corrected on the spot in accordance with established instructions.

- C. CAQs shall be dispositioned by organizations with defined responsibility and authority and shall be corrected in accordance with documented plans.
- D. Items which are nonconforming may be dispositioned accept-as-is, scrap, return to vendor, repair, or rework.
- E. The cause of significant CAQs shall be determined and corrective action taken to preclude recurrence.
- F. Significant CAQs shall be reported to appropriate levels of management.
- G. The satisfactory completion of corrective actions shall be verified and documented by the appropriate organization.

10.2.3 Escalation of CAQs

Commensurate with their importance to quality or safety, CAQs which are not being effectively or timely resolved shall be escalated to appropriate levels of management in a timely manner.

10.2.4 Tracking

Procedures describing the corrective action program shall establish the requirements for those CAQs which shall be tracked.

10.2.5 QA Trending

Trend analysis shall be performed on CAQs and quality indicators associated with QA verification activities. Trend results shall be used to advise management of the quality status, identify adverse trends that need increased management attention, and compare quality of performance among organizations and, where applicable, with industry standards. The trend analysis program shall be described in procedures or instructions and shall include the following items as a minimum.

- A. Identify the quality indicators to be trended.
- B. Specify the methods of data handling such as gathering, collecting, sorting, grouping, and coding.
- C. Specify the statistical processes to be used such as type of charts, normalizing to remove bias, weighting, control limits, and linear regression lines.
- D. Specify the methods to be used in analyzing data and trend determination.
- E. Describe the actions to be taken when an adverse trend is identified.

F. Describe the type, distribution, and frequency of issue of trend results reporting.

10.2.6 Stop Work

Work shall be stopped under any of the following conditions:

- A. Work is proceeding in violation of approved and controlling documents.
- B. A condition which clearly indicates that cessation of an activity is the only means available to protect the health and safety of the public and/or plant personnel.
- C. An activity which if continued will require extensive rework or repair for corrective action.

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- D. An activity which if continued may jeopardize nuclear safety.
- E. <u>A condition</u> that represents <u>conduct</u> failure to comply with technical or administrative <u>conduct</u> ols.

10.3 Responsibilities

- A. The Vice President, NA&S as delegated to the Manager, NQA is responsible for the development of the Corrective Action Program. The program elements in section 10.2 and the related source requirements contained within the documents listed in section 10.4 shall be addressed.
- B. Line managers are responsible to stop any work within their areas of responsibility when a continuation of activities could meet the criteria of section 10.2.6.
- C. NQA is responsible to issue a formal Stop Work Order, as required, if a line manager fails to act on a stop work condition. Stop Work Orders shall remain in effect until proper evaluation can be made and adequate corrective action can be applied.
- D. NQA is responsible to establish and maintain trend analysis procedures for the quality indicators generated by QA verification activities such as audits, monitoring, inspection, and vendor audits and surveillances.
- E. NQA is responsible to establish and maintain trend analysis procedures for CAQs documented in nonadministratively controlled programs.
- F. Other organizations such as maintenance, radiological control, site technical support, and operations are responsible to establish and maintain trend analysis procedures for administratively controlled CAQ programs.

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10.4 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 corrective action program.

- A. 10 CFR 50, Appendix B, Criterion XV, "Nonconforming Materials, Parts, and Components," and Criterion XVI, "Corrective Action."
- B. 10 CFR 50.55(e), "Conditions of Construction Permits."
- C. 10 CFR 21, "Reporting of Defects and Noncompliance."
- D. 10 CFR 50.59, "Changes, Tests, and Experiments."
- E. 10 CFR 50.72, "Immediate Notification Requirements for Operating Nuclear Power Reactors."
- F. 10 CFR 50.73, "License Event Report System."
- G. 10 CFR 73.71, "Reporting of Security Incidents."
- H. ANSI N18.7-1976/ANS 3.2, "Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants" (Sections 5.2.11 and 5.2.14), and Regulatory Guide 1.33, Revision 2, February 1978.
- ANSI N45.2-1971, "Quality Assurance Program Requirements for Nuclear Power Plants" (Sections 16 and 17), and Regulatory Guide 1.28, Revision 0, June 7, 1972.
- J. American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section III, Division 1, "Nuclear Power Plant Components," Article NCA-4000, "Quality Assurance."
- K. American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components."
- L. Plant Technical Specifications (section 6).
- 1..0 Indoctrination, Training, Qualification, and Certification

11.1 General

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

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11.2 Program Elements

11.2.1 Indoctrination and Training

A. Personnel performing quality-related activities shall receive training related to administrative controls and the purpose, scope, and implementation of the NQAP.

B. For personnel performing quality-related activities, proficiency shall be maintained and demonstrated through activities such as annual performance evaluation, retraining, reexamining, or recertifying.

- C. Training of employees involved in ASME Section III activities shall be conducted when new programs or procedures affect the scope of their work and whenever changes in their duties or responsibilities occur.
- D. The scope, method, and objectives of formal training for quality-related activities shall be documented.
- E. Records documenting the date, attendance, content, instructor, and duration of training sessions shall be prepared and maintained to demonstrate individual qualification and training program implementation for employees performing quality-related activities.

11.2.2 Qualification and Certification

Qualification and certification programs shall be established and maintained to include the following:

- A. Certification of personnel, as needed, to perform inspections, tests, examinations, special processes, or lead audits prior to performance of the activity. Certifications shall delineate the functions personnel are qualified to perform and the criteria used for qualification.
- B. Personnel qualification criteria for applicable inspection, test, or examination techniques, audits, special processes, and capabilities necessary to perform the activity safely and in compliance with applicable requirements.
- C. A method to monitor the performance of certified individuals and the qualifications of employees performing quality-related activities, to determine their initial and continued acceptability for performing their duties and to provide an assessment of the current level of qualification and certification.
- D. Development and maintenance of qualification and certification records and documents in accordance with applicable commitments and regulatory requirements.

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11.3 Responsibilities

- A. The Vice President, NA&S as delegated to the Manager, NT is responsible for the development of the prc;ram for indoctrination and training.
- B. Other NP Vice Presidents are responsible for delineating training requirements in their applicable areas of responsibility and providing these requirements to the Vice President, NA&S as delegated to the Manager, NT.
- C. The Manager, Nuclear Human Resources is responsible for establishing a position qualification documentation and validation program.
- D. Vice Presidents, as appropriate, are responsible for developing a certification program and implementing the certification requirements in their area of responsibility.
- E. The program elements in section 11.2 and the related source requirements contained within the documents lister in section 11.4 shall be addressed in the development and implementation of indoctrination, training, qualification, and certification activities.

11.4 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 indoctrination, training, qualification, and certification program.

- A. 10 CFR 50, Appendix B, Criterion II
- B. ANSI N18.7-1976/ANS 3.2, "Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants" (Section 3.3), and Regulatory Guide 1.33, Revision 2, February 1978.
- C. ANSI N45.2-1971, "Quality Assurance Requirements for Nuclear Power Plants (Construction)" (Section 2), and Regulatory Guide 1.28, Revision 0, June , 1972.
- D. ANSI N45.2.6-1978, "Qualifications of Inspection, Examination, and Testing Personnel for Nuclear Power Plants," and Regulatory Guide 1.58, Revision 1, Septemb r 1980.
- E. ANSI N45.2.23-1978, "Qual tions of Quality Assurance Program Audit Personnel for Nuclear Power Plants," and Regulatory Guide 1.146, Revision 0, August 1980.
- F. ANSI N18.1-1971, Personnel Selection and Training," and Regulatory Guide 1.8, Revision 2, April 1987.

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

12.0 Auditing

12.1 General

Measures shall be established to implement a comprehensive audit program which consists of internal <u>audits including Auclear</u> Power and other <u>TVA organizations which support the nuclear program</u> and contractor/ supplier audits to determine and assess the adequacy and effectiveness of the QA program.

12.2 Program Elements

- A. An audit plan shall be prepared identifying the audits to be performed and their frequencies and schedule.
- B. Audits shall include: a determination of the effectiveness of QA program elements; evaluation of work areas, activities, processes, a d items; review of documents and records, review of audit results with responsible management; and follow-up on corrective action taken for deviations identified during the audit.
- C. Audits shall be performed in accordance with written procedures or checklists by qualified, certified, and appropriately trained personnel not having direct responsibilities in the areas being audited.
- D. Audited organizations shall provide access to facilities, documents, and personnel needed to perform the audits. They shall take necessary action to correct deviations identified by the audit in a timely manner.
- E. Internal Audits
 - 1. The scope of an audit shall be determined by considering such factors as work areas, activities, processes, or items and the specific organizations involved.
 - 2. Auditing organizations shall ensure that audit procedures and instructions adequately cover applicable elements of the NQAP. Audits shall be scheduled in accordance with plant technical specifications and regulatory requirements and to the extent possible based upon the status and importance to safety of the activities being performed.
- F. Contractor/Supplier Audits
 - 1. Audits of selected suppliers shall be conducted to verify implementation and adequacy of specified QA requirements.

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- Contractors/suppliers to be audited shall be selected on the basis of the importance of their products or services to safety, status of contract activity, historical performance of the supplier, and potential QA problems that may be discovered during source surveillance inspection activities or earlier audits.
- 3. Audit schedules shall be prepared and audits shall be conducted in accordance with the schedules.
- 4. Audit reports shall be prepared and reviewed by the audit team, approved by management, and transmitted to the supplier and appropriat management within TVA.

12.3 Responsibilities

- A. The Vice President, NA&S as delegated to the Manager, NQA is responsible for the development of the audit program. The program elements in section 12.2 and the related source requirements contained within the documents listed in section 12.4 shall be addressed.
- B. NQA is responsible to conduct audits, including audits of selected suppliers to verify implementation and adequacy of specified QA requirements.
- 12.4 Source Requirement Documents

The following source requirements 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 audits.

- A. 10 CFR 50, Appendix B, Criterion XVIII, "Audits."
- B. ANSI N18.7-1976-ANS 3.2, "Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants" (Section 4.5), and Regulatory Guide 1.33, Revision 2, February 1978.
- C. ANSI N45.2-1971, "Quality Assurance Program Requirements for Nuclear Power Plants" (Section 19), and Regulatory Guide 1.28, Revision 0, June 7, 1972.
- D. ANSI N45.2.12-1977, "Requirements for Auditing of Quality Assurance Programs for Nuclear Power Plants," and Regulatory Guide 1.144, Revision 1, September 1980 (Design and Construction).
- E. ANSI N45.2.13-1976, "Quality Requirements for Control of Procurement of Items and Services for Nuclear Power Plants," and Regulatory Guide 1.123, Revision 1, July 1977.

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- F. ANSI N45.2.23-1978, "Qualification of Quality Assurance Program Audit Personnel for Nuclear Power Plants," and Regulatory Guide 1.146, Revision 0, August 1930.
- 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. Flant Technical Specifications (section 6).
- 13.0 Computer Software and Data
- 13.1 General

Measures shall be established to ensure that the requirements for procurement, <u>development</u>, and use of software are commensurate with their importance to nuclear safety.

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- 13.2 Program Elements
 - A. The computer software development process, documentation requirements, coding conventions, and qualification and approval requirements shall be established.
 - B. Standard methods shall be established and implemented to ensure a complete and well-documented software design specification.
 - C. Requirements shall be established and implemented for the control of changes to approved computer software.
 - D. Controls shall be established for the issue, use, and distribution of computer software and associated documentation in accordance with section 6.2 of this plan.
 - E. Requirements shall be established for the maintenance and retention of computer software and associated documentation in accordance with section 6.3 of this plan.
 - F. Documentation shall be provided for computer software describing the correct usage.
 - G. A central list of computer software with appropriate levels of classification shall be established and maintained.

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- H. Prior to full implementation, computer software shall be qualified through:
 - Documented source code evaluation (code walk-through). (If purchased software, the supplier shall have documentation to support walk-through.)
 - 2. Documented tests performed to an approved test plan. The results of qualification tests shall be reviewed and approved by a qualified independent reviewer (not the program originator or the immediate supervisor of the originator).

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I. Currently Active Software

Only the requirements of 13.2C, F, G, and H.2 apply to currently active software developed or purchased prior to October 16, 1986.

J. Data Verification

Controls shall be established to verify the accuracy and integrity of data input into automated computer data bases used in applications meeting the criteria of Appendix E of this plan.

13.3 Responsibilities

The Vice President, NA&S as delegated to the Manager, MP is responsible for the development of computer software and data. The program elements | in section 13.2 and the criteria of Appendix E of this plan shall be addressed.

14.0 REFERENCES

NOTE: The reference TVA documents are subject to change due to transition to the NPS.

14.1 Regulations

10 CFR 20, "Standards for Protection Against Radiation."

10 CFR 21, "Reporting of Defects and Noncompliance."

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

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

- 10 CFR 50.54, "Conditions of Licenses."
- 10 CFR 50.55, "Conditions of Construction Permits."
- 10 CFR 50.55a, "Codes and Standards."
- 10 CFR 50.55e, "Conditions of Construction Permits."

10 CFR 50.59, "Changes, Tests, and Experiments."

10 CFR 50, Appendix A "General Design Criteria for Nuclear Power Plants."

10 CFR 50, Appendix B, "Quality Assurance Requirements for Nuclear Power | Plants and Fuel Reprocessing Plants."

10 CFR 50, Appendix R "Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979."

10 CFR 50.62, "Requirements for Reduction of Risk From Anticipated Transients Without Scram (ATWS) Events for Light-Water-Cooled Nuclear Power Plants."

10 CFR 71, Subpart H, "Quality Assurance (Criteria for Packaging and Transportation of Radioactive Material)."

10 CFR 50.72, "Licensing Requirements for the Storage of Spent Fuel in an Independent Spent Fuel Storage Installation (ISFSI)."

10 CFR 50.73, "Physical Protection of Plants and Materials."

10 CFR 73.55, "Requirements for Physical Protection of Licensed Activities in Nuclear Power Reactors Against Radiological Sabotage."

10 CFR 73.71, "Reporting of Safeguards Events."

14.2 Regulatory Guidance

Refer to listing in Appendixes B and C of this plan.

14.3 TVA Licensing Submittal Documents

Browns Ferry Nuclear Plant Technical Specifications, Section 6.0, "Administrative Controls."

Sequoyah Nuclear Plant Technical Specifications, Section 6.0, "Administrative Controls."

TVA Nuclear Performance Plan - Corporate, Volume I.

14.4 QA Manuals

TVA Quality Assurance Manual for ASME Section III Nuclear Power Plant Components (NCM).

14.5 Other

INPO 84-010, "Vendor Equipment Technical Information Program (VETIP)," March 1984.

NRC letter from H. J. Thompson Jr. dated April 16, 1985, "Quality Assurance Guidance for ATWS Equipment That Is Not Safety Related," Generic Letter 85-06 (A02 850422 044).

NRC letter from D. G. Eisenhut dated April 24, 1986, "Implementation of Fire Protection Requirements," Generic Letter 86-10 (A02 860512 005).

NUREG 0800, Section 9.5.1, Branch Technical Position, CMEB 9.5-1 (formerly BTP ASB 9.5-1), Rev. 2, July 1981, "Fire Protection for Nuclear Power Plants."

Appendix A to Branch Technical Positions APCSB 9.5-1, August 23, 1976.

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15.0 DEFINITIONS

<u>The terms and definitions identified in this section are important in</u> <u>order to have a consistent understanding of requirements of the NQAP.</u> <u>Regulatory Guide 1.74, which endorses ANSI N45.2.10, contains terms and</u> <u>definitions applicable to the nuclear industry. This section identifies</u> acceptable alternatives to these definitions with an asterisk(*).

*Audit

A documented activity performed in accordance with written procedures or checklists to verify, by examination and evaluation of objective evidence, that applicable elements of the NQAP have been developed, documented, and effectively implemented in accordance with specified requirements. An audit should not be confused with monitoring or inspection for the sole purpose of process control or product acceptance.

Basic Component

A plant structure, system, component, or part thereof necessary to ensure: (1) the integrity of the reactor coolant pressure boundary, (2) the capability to shut down the reactor and maintain it in a safe shutdown condition, or (3) the capability to prevent or mitigate the consequences of accidents which could result in potential offsite exposures comparable to those referred to in paragraph 100.11 of Title 10, Chapter 1, Code of Federal Regulations - Energy. In all cases, "basic component" includes design, inspection, testing, or consulting services important to safety that are associated with the component hardware (10 CFR 21.3).

Commercial Grade Items

Items that are: (1) not subject to design or specification requirements that are unique to nuclear facilities or activities, (2) used in applications other than nuclear facilities and activities, and (3) to be ordered from the manufacturer/supplier on the basis of specifications set forth in the manufacturer's published product description (for example, a catalog).

Condition Adverse to Quality (CAQ)

Adverse conditions include nonconforming material, parts, or components; failures; malfunctions; deficiencies; deviations; hardware problems involving noncompliance with licensing commitments, specifications, or drawing requirements; abnormal occurrences; and nonhardware problems such as failure to comply with the operating license, technical specifications, licensing commitments, procedures, instructions, or regulations.

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Construction Tests

Those tests which are performed on safety-related and other plant components and systems on nuclear units which may satisfy prerequisites to the preoperational test program. Construction tests include pressure and other integrity tests; component and piping system cleaning and flushing, and equipment checkout, initial operation, and adjustments.

Critical Structures, Systems, and Components (CSSC)

See Safety-Related.

Corrective Action

The action taken to correct a CAQ. Corrective action includes interim measures and corrective and preventive actions.

Dedication

The point in time after which a commercial grade item is accepted for safety-related application(s) and deficiency reporting becomes the responsibility of the party performing the acceptance.

Emergency Preparedness

A program which ensures the preparation and implementation of plans and procedures to provide, in the event of an emergency, protective measures for health and safety of TVA personnel and the public.

Environmental Protection

A program that provides controls, mainly in association with Environmental Protection Agency (EPA) requirements, for nonradiological environmental monitoring and compliance activities. These include hazardous and nonradiological waste material (solid, liquid, and gas) which could be released to the environment.

Features

Refers to either individual structures, systems, and components specifically called out by the scope of this plan (such as seismic Category 1 [L] items) or structures, systems, and components that may be integral to, or associated with, the programs identified in section 5.1B of this plan.

Fire Protection

A program that provides controls necessary for the protection of the life and health of TVA plant personnel and the public, to limit damage of property, and to minimize loss of generating capacity resulting from fire or explosion.

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Functional Test

The manual operation or initiation of a system, subsystem, or component to verify that it functions within design tolerances (e.g., the manual start of a core spray pump to verify that it runs and that it pumps the required volume of water.)

Handling

The act of physically moving items by hand or by mechanical means but not including transport modes.

Hold Point

A designated stopping place during or following a specific activity at which inspection or examination is required before further work can be performed.

Independent Offsite Safety Review

Safety reviews performed by the Nuclear Safety Review Board (NSRB) which provide additional assurance that TVA licensed nuclear plants are operating without undue risk to the health and safety of plant personnel and the public.

Independent Verification

The act of verification utilizing a qualified individual who did not perform or directly supervise the work activity.

*Inspection

A phase of quality control performed by certified inspection personnel or other qualified individuals approved by NQA, that, by means of examination, observation, and/or measurement determines the conformance of materials, supplies, components, parts, appurtenances, systems, processes, or structures to predetermined quality requirements.

Installed Compliance Instrumentation and Control (I&C) Devices

Permanent plant items such as meters, gauges, relays, orifices, recorders, etc., which provide data necessary to the performance of Technical Specification Surveillance Testing and which may provide data for operating logs and other records, or provide information to operators to verify compliance with safety-related plant procedures.

Item

Any level of unit assembly, including structure, system, subsystem, subassembly, component, part, or material.

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Measuring and Test Equipment (M&TE)

Equipment or devices used to calibrate, measure, gauge, examine, compare, test, inspect, monitor, or control in order to acquire data to determine compliance with design, specification, licensing, or other established requirements. M&TE includes both laboratory and portable instruments, gauges, tools, fixtures, test or analytical test stands, reference and transfer standards, nondestructive examination equipment, etc., where data obtained will be used to determine acceptability or be the basis for design or engineering evaluations.

Monitoring

That function where ongoing tasks or activities are observed and related documentation reviewed:

- (1) To verify that the observed activity or program conforms to specified requirements, and
- (2) To evaluate the adequacy and effectiveness of the activity.

Nonsafety-Related Anticipated Transient Without Scram (ATWS)

Special features that, as referenced in 10 CFR 50.62, fall into a category of items which could be related to an expected operational transient (such as loss of feedwater, loss of condenser vacuum, or loss of offsite power to the reactor) which is not accompanied by the reactor trip system shutting down the reactor.

Notification Point

A specific preestablished point within a selected activity where work <u>may</u> proceed after contacting <u>and receiving concurrence from</u> the organization responsible for the notification point.

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Nuclear Plant Security

A program which provides controls to ensure continued operability of security equipment and the integrity of nuclear plant security. This includes prevention of sabotage, safeguard information and material, plant access, and physical security events.

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Operational Phase

That period of time during which the principal activity is associated with normal operation of the plant. This phase of plant life is considered to begin formally with receipt of the operating license onsite and ends with commencement of plant decommissioning. In addition, there are certain preoperational activities (for example, testing, training, maintenance) proceduralized in accordance with operations NQAP requirements and initiated by the operations staff prior to receipt of the operating license which are considered to be operational phase activities at the time these activities begin.

Postmaintenance Tests

Testing performed after completion of maintenance to verify the operational/functional acceptability of components/systems upon completion of maintenance.

Postmodification Tests

Tests performed after completion of a plant modification to demonstrate conformance with as-designed requirements and to determine the effect of the modification on the overall system.

Preoperational Tests

Tests identified in a facility's Safety Analysis Report and performed on any system or plant feature for the purpose of proving its ability to perform its designed function.

Procurement Documents

Contractually binding documents that identify and define the requirements that items or services must meet in order to be considered acceptable by the purchaser.

Programs

Programs which administer and control activities and associated features as identified in section 5.1.B of this plan that require control based on regulatory requirements or TVA commitments.

Quality Assurance Records

Those records which furnish documentary evidence of the quality of items and of activities affecting quality. A document is considered to be a QA record when the document has been completed.

Quality-Related

Quality-related is a term which encompasses quality assurance program requirements that describe activities which affect structures, systems, and components. These requirements provide reasonable assurance that the facility can be operated without undue risk to the health and safety of the public. In addition to safety-related structures, systems, components, and activities, the term "quality-related" encompasses the broad class of plant features covered (not necessarily explicitly) in the General Design Criteria of 10 CFR 50, Appendix A, that contribute in an important way to the safe operation and protection of the public in all phases and aspects of facility operation (i.e., normal operation and transient control as well as accident mitigation).

Radioactive Material Shipment

A program that provides controls for handling and/or shipping of radioactive material (NRC-licensed packages only).

Radwaste Management Systems, Structures, and Components

Special features containing radioactive materials (i.e., liquids, gases, or solids) that, by design or operating practice, provide a means of processing prior to final disposition.

Reference Standards

Standards (primary, secondary, and working standards where appropriate) used in a calibration program. These standards establish the basic accuracy limits for the calibration program.

Safety-Related Structures, Systems, and Components

Those items that are necessary to ensure:

- 1. The integrity of the reactor coolant pressure boundary.
- 2. The capability to shut down the reactor and maintain it in a safe condition.
- 3. The capability to prevent or mitigate the consequences of an incident which could result in potential offsite exposures comparable to those specified in 10 CFR 100.

Seismic Category I (L)

Special features, identified by NE, that apply to nonsafety-related systems, structures, and components which provide structural integrity in preventing damage to a safety-related system, structure, and component in case of a failure and/or damage during a safe shutdown earthquake (SSE).

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Special Nuclear Material Management

A program which provides for special nuclear material (SNM) control and accountability as required by 10 CFR 70, 74, and 75. This program includes SNM inventories and system reviews, inspections, records management, and DOE/NPC inventory and transfer reports.

Special Tests

A test that is (a) an engineering test initiated by or requested of NE including qualification testing for design verification or evaluation of components, structures, or systems, (b) a general test initiated by NE that is not specifically related to plant systems or features, such as the material testing and product testing that is normally performed by a testing lab, or (c) tests or experiments not described in the facilities Safety Analysis Report which may affect the operation of systems described therein (reference 10 CFR 50.59).

Startup Tests

Those tests as identified in the Final Safety Analysis Report that commence after receipt of an operating license allowing fuel loading and testing at ranges through zero power, power escalation, and 100% warranty run. Startup tests prove that the unit has been properly designed and constructed and will meet all licensing requirements and specific contractual criteria.

*Storage

Q-16.H

The act of holding items at the construction or operating site in an area other than its permanent location in the plant.

Surveillance Tests

Periodic tests to verify that structures, systems, and components continue to function or are in a state of readiness to perform their functions.

Test Record Drawings

A set of as-constructed drawings which depict the configuration of a system as tested.

Test Scoping Documents

Documents which include descriptions of each test to be performed including safety precautions to be followed, specific identification of test objectives, the means of performing the test, prerequisites that must be completed, environmental conditions required for testing, justification for a proposed degree of simulation less than full simulation, and specific acceptance criteria or a description of the means of determining acceptance criteria from functional cesting requirements.

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Test Deficiency

Any condition during which the equipment or system being tested: (1) fails to operate (e.g., pump will not operate, no control room annunciation), (2) operates in a suspected adverse manner (e.g., motor operates but smokes, questionable vibration), or (3) operates outside limits of documented acceptance criteria (e.g., inadequate flow, slow valve closure time).

Trend Analysis

Evaluation of data that has been compiled or grouped onto charts, diagrams, reports, or other formats such that the prevailing tendency of selected parameters can identify areas that need improving and areas of past successes.

*Verification

Q-16.H

An act of conforming, substantiating, and ensuring that an activity or condition has been implemented and accomplished in conformance with specific requirements. This includes line verifications.

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NUCLEAR QUALITY ASSURANCE PROGRAM IMPLEMENTATION PLAN

1.0 INTRODUCTION

This appendix describes the actions to be taken by <u>Nuclear Assurance and</u> <u>Services (NA&S)</u>, <u>New Projects</u>, Nuclear Technical Direct<u>or</u> (NTD), Nuclear Power Production (NPP), Nuclear Business Operations (NBO), and Nuclear Engineering (NE) to develop program controls appropriate for performing "line verification," "graded approach," exceptions taken to applicable NRC Regulatory Guides and ANSI Standards as delineated in Appendix B of this plan, <u>and TVA identified quality-related programs</u>. This appendix also describes the transition of responsibility for applicable portions of the Nuclear Quality Assurance Manual (NQAM) from Nuclear Quality Assurance (NQA), to the appropriate organization.

2.0 NUCLEAR QUALITY ASSURANCE PLAN IMPLEMENTATION REQUIREMENTS

2.1 Line Verification

Vice Presidents, Nuclear Assurance and Services (NA&S), <u>New Projects</u>, and NPP

- 2.1.1 Develop implementing standards and/or procedures that delineate responsibilities and interfaces necessary to ensure organizations responsible for production activities perform verifications of product quality.
- 2.1.2 Ensure individuals performing line verification activities are appropriately trained.
- 2.2 Graded Approach

Vice President, NA&S

- 2.2.1 Develop implementing procedures that delineate responsibilities necessary to ensure organizations perform graded applications and verifications in a manner commensurate with the criteria of section 5.2 of this plan.
- 2.2.2 Ensure individuals performing graded approach activities are appropriately trained.
- 2.3 Quality Assurance Regulatory Guide Conformance Status

Vice Presidents, NA&S, New Projects, NTD, NPP, NE, and NBO

2.3.1 Ensure corporate and site implementing procedures, as appropriate, reflect the exceptions taken to applicable NRC Regulatory Guides and ANSI Standards as delineated in Appendix B of this plan.

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- 2.3.2 Ensure that impacted licensing documents are reviewed and revised, as applicable, to reflect NQAP changes.
- 2.4 TVA Identifed Quality-Related Programs

Vice Presidents, NA&S, New Projects, NTD, NPP, NE, and NBO

- 2.4.1 Specify the extent of applicable QA requirements.
- 2.4.2 Develop programs and implement documents to ensure proper application of requirements.
- 2.5 NQAM Transition

Vice Presidents, NA&S, <u>New Projects</u>, NPP, NBO, NE, Vice President and Nuclear Technical Director, and the Manager, Nuclear Human Resources (NHR)

- 2.5.1 Applicable sections of NQAM, Part I that contain requirements and commitments will be cancelled when this plan is made effective.
- 2.5.2 Other NQAM Sections
 - A. Other sections of NQAM, Part I which are not applicable to this plan and contain implementing requirements (example: ID-QAPs) along with applicable Parts II and III of the NQAM will be transferred to responsible organizations and placed within the Nuclear Procedures System (NPS) via interim documents.
 - B. It is recognized that the NQAM transition to interim documents will remain in effect until the NQAM requirements have been incorporated into the NPS.
 - C. These transitioned sections of the NQAM which establish and/or implement the QA program will either be approved or concurred with by NQA.
 - D. After the NQAM sections have been transitioned to the responsible organization, approved or concurred with by NQA, and placed in the NPS, these NQAM sections will be cancelled.

2.6 Computer Software Program

Vice President, NPP and New Projects

2.6.1 Ensure Browns Ferry operators receive training by years end that they are to verify computer information, obtained without use of a procedure, if they use it to make decisions which could impact the criteria of item 3 of Appendix E.

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2.6.2 By fuel load, Watts Bar will determine which computer software systems will directly interface with control room personnel and can be used by them without further verification to make decisions affecting the criteria of item 3 of Appendix E.

2.7 Effectivity

This NQA Plan encompasses TVA's current QA program which implements Revision 10 of TVA-TR75-1A, with the exceptions of the activities identified below.

- 1. Line Verification
- 2. Graded Approach
- 3. Clarification and update of committed Regulatory Guides and ANSI Standards.
- 4. Levels of verification and NPS document development for TVA identified quality-related programs and features (section 5.1.B).

Therefore, with the exception of the above-listed activities, this NQA Plan shall be effective upon the date the document is transmitted by Document Control for use.

The new activities, items 1, 2, 3, and 4, shall be effective no later than 180 days from the date this plan is formally transmitted for use.

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REGULATORY GUIDE CONFORMANCE STATUS

<u>MRC Regulatory Guide 1.8</u> - "Personnel Selection and Training," Revision <u>2</u> <u>4/87</u>, endorses ANSI N18.1-1971 and ANSI/ANS 3.1-1981. Q-16

The Nuclear Quality Assurance Program (NQAP) follows this Guide with the following alternatives:

- TVA will meet the requirements of Regulatory Guide 1.8, Revision 2 (4/87) for all new personnel qualifying on positions identified in regulatory position C.1 after January 1, 1990. Personnel qualified on these positions prior to this date will still meet the requirements of Regulatory Guide 1.8, Revision 1-R (5/77). As specified in regulatory position C.2, all other positions will meet the requirements of ANSI/ANS N18.1-1971.
- 2. Section 4.3.2 There may be occasions where TVA will utilize a composite crew (multidiscipline) during operations phase activities to efficiently perform a task. As such, a foreman may not have the experience required in one of the disciplines he supervises. In these instances, the foreman will meet the requirements of ANSI N18.1 in at least one of the disciplines, and additional technical support, procedure support, and/or discipline support will be available to the foreman for the task period.

NRC Regulatory Guide 1.28 - "Quality Assurance Program Requirements (Design and Construction)," Revision 3, 8/85, endorses ANSI N45.2-1971.

The NQAP follows this Guide.

<u>NRC Regulatory Guide 1.30</u> - "Quality Assurance Requirements for the Installation, Inspection, and Testing of Instrumentation and Electric Equipment," 8/72, endorses ANSI N45.2.4-1972.

The NQAP follows this Guide with the following alternatives:

- 1. ANSI N45.2.4 states that the Appendixes are not a part of the standard, therefore, TVA does not consider the Appendixes to be mandatory.
- 2. Section 2.1, "Planning" The intent of this section shall be met in different forms depending on magnitude and scope of work.
- 3. During the operational phase, tests are performed as determined by NE, modification, or maintenance engineering, as appropriate, based upon the equipment or system functions that could be impacted by the work performed.
- 4. TVA's alternative to the tagging of in-plant process instruments for calibration status (ANSI N45.2.4, section 6.2.1) is that each item of process control instrumentation is uniquely identified with an instrument number. This number is utilized in an instrument maintenance record so that the current calibration status and data attesting to the status of each item are documented along with the identification of the person performing the calibration. In addition, this record system provides a mechanism for evaluating equipment performance and adjusting calibration frequencies to ensure quality performance.

Q-16.B(1)

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- 5. Section 6.2.2 For modifications, TVA interprets this section as not requiring that an entire system be retested after modifications. Testing will be performed on equipment that has or could be impacted by the modification in accordance with applicable design and testing requirements to verify that operability requirements are met and that interfacing components and equipment functions have not been degraded.
- 6. TVA implements the requirements of N45.2.4 sections 6.1 and 7.1 with a performance-based graded QA inspection program. Some items traditionally inspected by quality control may be accomplished through independent verification and quality monitoring.

<u>NRC Regulatory Guide 1.33</u> - "Quality Assurance Program Requirements (Operations)," Revision 2, 2/78 endorses ANSI N18.7-1976/ANS 3.2.

The NQAP follows this Guide with the following alternatives:

- 1. ANSI N18.7-1976 references certain other standards to which TVA takes exception. TVA's exception and appropriate alternatives to the other standards are listed in this Appendix in the appropriate location.
- 2. Section 5.2.2 The guidelines of this section are accepted with the following interpretations:
 - a. Temporary changes which clearly do not change the intent of the approved procedure shall as a minimum be approved by two members of the plant management staff, at least one of whom holds a Senior Reactor Operator License on the unit affected or as defined in Technical Specifications.
 - b. For facilities holding a construction permit where system(s) and/or components have been released to the operations organization, temporary changes to procedures, as described above, shall as a minimum be approved by two members of the plant management staff, at least one of whom shall be a designated member of the plant operations management staff.
- 3. Section 5.2.13.1 The statement that changes made to procurement documents be subject to the same degree of control as was used in the preparation of the original documents is applied consistent with the requirements of ANSI N45.2.11, Paragraph 7.2. Minor changes to documents, such as inconsequential editorial corrections or changes to commercial terms and conditions, may not require that the revised document receive the same review and approval as the original documents.
- 4. Section 5.2.15 Minor changes to documents are processed as delineated in section 6.1.2.F3 of this plan.

Q-16.C(1)

Q - 16.B(2)

Q = 16.B(3)

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- 5. Section 5.2.17 The statement that deviations, their cause, and any corrective action completed or planned shall be documented will apply to significant deviations. Other identified deviations will be documented and corrected. This interpretation is consistent with Appendix B to 10 CFR 50, Criterion XVI, "Corrective Action."
- 6. TVA's alternative to regulatory position C.4 is to comply with the audit requirements prescribed in the operating unit's technical specification.

<u>NRC Regulatory Guide 1.37</u> - "Quality Assurance Requirements for Cleaning of Fluid Systems and Associated Components of Water-Cooled Nuclear Power Plants," 3/73, endorses ANSI N45.2.1-1973.

The NQAP follows this Guide with the following alternatives:

- 1. The phrase "when applicable" used in Regulatory Guide 1.37, Paragraph C.2, leaves open to interpretations which specific requirements and recommendations contained in ANSI N45.2.1-1973 are applicable to and achievable during the construction or operation phase. The interpretation of "when applicable" will be made with appropriate concurrence in a written procedure before its application.
- 2. The second sentence of paragraph C.3 should be amended to read:

"The water quality for final flushes of fluid systems and associated components during the operations phase shall be at least equivalent to the quality required for normal operation. This requirement does not apply to dissolved oxygen or nitrogen limits nor does it infer that other additives normally in the system water will be added to the flush water."

3. Temporary ink markings placed by the fabricator as mill marks may remain on components that operate at temperatures greater than 140°F (normal or accident) and have a 40-year integrated radiation dose less than 10^6 rads.

Q-16.D(1)

- 4. Control of halogen, sulfur, or low-melting metal contents is not required for abrasive tools such as grinding wheels, cutoff wheels, sanding paper, and flapper wheels. Use of abrasive tools on corrosion-resistant alloys shall be followed by cleaning with an approved solvent. Particulate residue shall be removed by vacuum, brush, dry wiping cloth, or air, with special attention to crevices.
- 5. Temporary tape and markings (ink and paint) may remain on components that operate at temperatures less than 140°F (normal or accident). Q-16.D(3)

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- 6. Section 2.1, "Planning For operations phase activities, the required planning is frequently performed on a generic basis for application to many systems and component installations. This results in standard procedures for cleaning, inspection, and testing which meet the requirements of the standard. Individual plans for each item or system are not normally prepared unless the work operations are unique; however, standard procedures are reviewed for applicability in each case. Cleaning procedures are limited in scope to those actions or activities which are essential to maintain or achieve required quality. This is consistent with section 5.2.17, Paragraph 5, of ANSI N18.7-1976, which provides for examination, measurement, or testing to ensure quality or indirect control by monitoring of processing methods.
- 7. TVA intends to conform to the cleanness requirements of section 3.1 of ANSI N45.2.1-1973 with the exception of permissible particle sizes for cleanness Classes B and D. In these cases, TVA will conform to the requirements of ANSI N45.2.1-1980, section 3.2.2.1(b), which states, "There shall be no particles larger than 1/32 inches by 1/16 inches long (0.8 mm by 1.6 mm)" for cleanness Class B, and section 3.2.4.4 which states, "Particles no larger than 1/16 inch by 1/8 inch long (1.6 mm by 3.2 mm) on a 14-mesh (1.4 mm, ASTM E-11, "Specification for Wire Cloth Sieves for Testing Purposes) or finer filter, or the equivalent" for cleanness Class D.

<u>NRC Regulatory Guide 1.38</u> - "Quality Assurance Requirements for Packaging, Shipping, Receiving, Storage, and Handling of Items for Water-Cooled Nuclear Power Plants," Revision 2, 5/77 endorses ANSI N45.2.2-1972.

The NQAP follows this Guide with the following alternatives:

- 1. Storage requirements at the site are determined by the responsible engineering unit. This determination involves an evaluation of the complexity of the item and its importance to safety. The various types of storage are provided (yard, warehouse, humidity controlled, etc.) but the classification levels of N45.2.2 are not necessarily employed.
- 2. In accordance with ASME QA Case 78-N45.2.2-01-0, welding electrodes hermetically sealed in metal containers may be stored under conditions described for level C items unless other storage requirements are specified by the manufacturer.
- 3. Austenitic stainless steel and nickel alloy items may have markings applied directly to the bare metal surfaces provided the requirements of TVA internal procedures, which control the chemical content of the marking materials, are met.

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- 4. All tubing and piping shall have end caps while in storage. End caps are not mandatory on tube or pipe fittings provided the requirements of TVA internal procedures to store under cover with protection from the elements are met.
- 5. Section 6.4.1 TVA will meet this section through periodic inspection of randomly selected stored items by <u>QC inspection</u> personnel certified to ANSI N45.2.6. <u>The criteria and factors regarding frequency and</u> degree are established in section 5.2A and B of this plan.
- 6. TVA takes exception to ANSI N45.2.2, section 5.2.1. TVA's alternative is that shipping damage inspection shall be done before unloading if evidence of possible shipping damage would be lost in unloading, such as when the item is secured to the carrier, covered by tarpaulin, accompanied by a visible impact recorder, or when the contract requires any of the above. Personnel performing preliminary visual observations (prior to unloading) per section 5.2.1 need not be qualified to ANSI N45.2.6. Item inspections per section 5.2.2 are performed by personnel qualified to ANSI N45.2.6. The item inspections also ensure that no damage has occurred during shipping.
- 7. Section 6.4.2(8) TVA will follow vendor recommendations/ requirements for preventive maintenance, or provide an engineering evaluation or engineering requirements document delineating appropriate maintenance requirements, for items in storage. Engineering evaluations and engineering requirement documents will consider vendor recommendations/ requirements.
- 8. Section 6.5 (last sentence) During a period of installed storage or extended layup after release of an item from permanent storage, vendor recommendations/requirements for preventive maintenance, or an engineering evaluation or an engineering requirements document delineating appropriate maintenance requirements if different than vendor requirements, will be followed. Engineering evaluations and engineering requirements.
 Q-10
- 9. TVA's alternative to the requirements of section 6.6 of ANSI N45.2.2 is that Site Materials will maintain written records of pertinent information such as storage location and receipt inspection results and will take necessary action to provide packaging for items not suitably packaged for storage. Written records of personnel access to Power Stores are kept for entry during times when Power Stores personnel are not on duty. All other times, the storeroom is locked and admittance is controlled by stores personnel.

0-16.E(4)

Q-16.E(4)

Deletion

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- 10. TVA does not utilize specific levels for classification of items (ANSI N45.2.2, section 2.7); however, the specific requirements identified in the Standard are used as a guide with respect to protecting the equipment.
- 11. TVA does not utilize specific levels for packaging (ANSI N45.2.2, section 3.2). All purchased items have been properly packaged. Additionally, periodic storage inspections are conducted to ensure protective measures specified in the Standard to prevent damage or deterioration are complied with and are imposed until the item or component is issued for use. Purchased items undergo receiving inspection using the graded approach. This inspection verifies that items have been properly packaged for shipment and will ensure that any special protective measures specified in the Standard to prevent damage, deterioration, or contamination will be imposed until the item or component is issued for use.
- 12. TVA takes exception to the requirement (ANSI N45.2.2, section 6.2.4) that salt-tablet dispensers in any storage area shall not be permitted. TVA Site Materials stores salt-tablet dispensers in sealed containers for use outside of the storage area only.

NRC Regulatory Guide 1.39 - "Housekeeping Requirements for Water-Cooled Nuclear Power Plants," Revision 2, 9/77 endorses ANSI N45.2.3-1973.

The NQAP follows this Guide with the following alternative:

The zone designations of section 2.1 of N45.2.3 and the requirements associated with each zone are not consistent with the requirements for an operating plant. Instead, NP procedures or instructions for housekeeping activities which include the applicable requirements outlined in section 2.1 of N45.2.3 and which take into account radiation control considerations, security considerations, fire protection considerations, and personnel and equipment safety considerations are developed on a case basis.

NRC Regulatory Guide 1.58 - "Qualification of Nuclear Power Plant Inspection, Q-16.F Examination and Testing Personnel," Revision 1, 9/80 endorses ANSI N45.2.6-1978.

The NQAP follows this Guide with the following alternatives:

- 1. Personnel performing preoperational testing or survey party chiefs are not within the scope of this Regulatory Guide.
- 2. TVA determines initial capability from the following criteria as defined in procedures: candidate's education, experience, training, examination, and/or capability demonstration. <u>On-the-job participation in the</u> work discipline is required for all candidates.

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- 3. Certifications may not correspond to the levels established in N45.2.6. Inspection, examination, and testing personnel may be classified by disciplines (mechanical, civil, electrical, instrumentation, hanger, etc.) and certified by procedure to perform the functions identified in N45.2.6, Table I, and L-I and L-II.
- 4. Qualified instructors and/or responsible supervisors in their respective areas perform the functions identified in N45.2.6, Table I, and L-III.
- 5. Medical eye examinations for inspection, testing, and examination personnel are made in accordance with TVA eye examination requirements.
- 6. ASNT recommended practice SNT-TC-1A-1984 will be used to qualify and certify nondestructive examination personnel.

NRC Regulatory Guide 1.64 - "Quality Assurance Requirements for the Design of Nuclear Power Plants," Revision 2, 6/76, endorses ANSI N45.2.11-1974.

The NQAP follows this Guide.

<u>NRC Regulatory Guide 1.74</u> - "Quality Assurance Terms and Definitions,"2/74, endorses ANSI N45.2.10-1973.

The NQAP follows this Guide with <u>applicable alternatives</u> noted in Q-16.H section <u>15</u> of this plan.

<u>NRC Regulatory Guide 1.88</u> - "Collection, Storage, and Maintenance of Nuclear Power Plant Quality Assurance Records," Revision 2, 10/76, endorses ANSI N45.2.9.-<u>1974</u>

The NQAP follows this guide with the following alternatives:

Section 2.2.1 - TVA may also define lifetime QA records to be "life of the nuclear liability policy, plus the subsequent 10 years during which claims may be covered by the policy." This definition is consistent with ANI/MAELU Information Bulletin 80-1A, Revision 2, and the requirements of our nuclear insurer.

Section 5.4.3 - In order to preclude deterioration, manufacturer's packaging and storage recommendations for special process records will be considered.

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Section 5.6 - TVA will provide two-hour minimum fire-rated protection for QA records and utilize one of the following alternatives as single storage facilities:

- 1. A fire-resistive vault or file room that meets the applicable requirements of ANSI N45.2.9-1974 with the following exceptions:
 - a. <u>Records will be afforded the protection of a two-hour rated</u> facility.
 - b. Records will be stored in fully enclosed cabinets.
 - c. Structure, doors, frames, and hardware shall be designed to fully comply with a minimum two-hour rating.
 - d. Pipes or penetrations will be allowed for fire protection.
 - e. Work not directly associated with records storage or retrieval will be prohibited in the facility.
 - f. Smoking and eating/drinking will be prohibited throughout the records facility.
- 2. One-hour fire-rated cabinets if the following conditions are met:
 - a. The records are recreatable, OR
 - b. Are contained within a facility of fire-resistive construction with adequate smoke detection or fire-suppression systems: OR
 - c. Are within a facility with a fuel loading less than 25 pounds/foot as defined by NFPA 232-1980.

QA records may be temporarily stored for 60 days or less in steel file Q-16.I cabinets or drawers if the following conditions are met:

- 1. The records are recreatable, OR
- 2. Are contained within a facility of fire-resistive construction with adequate smoke detection or fire-suppression systems: OR
- 3. Are within a facility with a fuel loading less than 25 pounds/foot as defined by NFPA 232-1980.

For storage of film and other processed records, humidity and temperature controls shall be provided to maintain a stable environment. Recommendations by the manufacturer will be considered in determining an acceptable range of tolerance.

<u>NRC Regulatory Guide 1.94</u> - "Quality Assurance Requirements for Installation, Inspection, and Testing of Structural Concrete and Structural Steel During the Construction Phase of Nuclear Power Plants," Revision 1, 4/76, endorses ANSI N45.2.5-1974.

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The NQAP follows this Guide with the following alternatives:

- 1. The qualification requirements for quality control (QC) inspectors are stated in our position on Regulatory Guide 1.58 in this table.
- 2. Testing frequency and QC acceptance criteria for concrete construction is described in Chapter 3 of the Safety Analysis Report for each plant.
- 3. The installation method for high strength bolting may be either the automatic cutoff impact wrench method, turn-of-nut method, or direct tension indicator method.
- 4. Torque wrench inspection of completed connections installed by the turn-of-nut method shall not be required but may serve to resolve disagreements concerning the results of inspection of bolt tension.
- 5. Torque wrench inspection of the load indicator washer type of direct tension indicator shall not be required.
- 6. Bolts shall be considered long enough if the bolt point is flush with or outside the face of the nut.
- 7. When specified by the NE design output document, TVA's alternative for visual welding acceptance criteria will be NCIG-01, May 7, 1985, Revision 2, "Visual Weld Acceptance Criteria for Structural Welding of Nuclear Power Plants."
- 8. For modifications or repairs to structures within the scope of N45.2.5-1974, the Nuclear Site Director (NSD) shall refer to NE for any design analyses.
- 9. Verification of preweld activities, including fit-up, will be verified through a graded QC inspection program, unless 100 percent inspection is specified by NE in design output documents.
- 10. Much of N45.2.5 applies to construction and preoperational testing. As a result, many of the listed tests are not appropriate in an operational plant. In lieu of this, TVA utilizes the appropriate engineering organizations to establish the need for specific tests or test procedures during the operational phase, and the guidance provided in ANSI N45.2.5-1974 is considered for applicability.
- 11. TVA implements the requirements of N45.2.5 sections 3, 4, and 6 with a performance-based graded QA inspection program. Some items traditionally inspected by quality control may be accomplished through independent verification and quality monitoring.

Q-16.J(1)

Q-16.J(2)

Q-16.J(3)

Q - 16.K(2)

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<u>NRC Regulatory Guide 1.116</u> - "Quality Assurance Requirements for the Installation, Inspection, and Testing of Mechanical Equipment and Syste."," 6/76, endorses ANSI N45.2.8-1975.

The NQAP follows this Guide with the following alternatives:

- 1. QA programmatic/administrative requirements included in the Regulatory Guide shall apply to construction, maintenance, and modification activities. Technical requirements associated with maintenance and modifications shall be the original requirements or better (e.g., code requirements, material properties, design margins, manufacturing processes, and types of inspection requirements).
- 2. Much of N45.2.8 applies to construction and preoperational testing. As a result, many of the listed tests are not appropriate in an operational plant. In lieu of this, TVA utilizes the appropriate engineering organizations to establish the need for specific tests or test procedures during the operational phase and the guidance provided in ANSI Q-16.K(1) N45.2.8-1975 is considered for applicability.
- 3. TVA implements the requirements of N45.2.8 paragraph 4.4 with a performance-based, graded QA inspection program. Some items traditionally inspected by quality control may be accomplished through independent verification and quality monitoring.

NRC Regulatory Guide 1.123 - "Quality Assurance Requirements for Control of Procurement of Items and Services for Nuclear Power Plants," Revision 1, 7/77, endorses ANSI N45.2.13-1976.

The NQAP follows this Guide with the following alternative:

Section 4.2 - In the special case of "commercial grade items: the supplier may not be evaluated by one of the methods identified; however, the procurement documents shall contain acceptance reuirements (special receipt inspection rquirements, special tests, or functional tests) specific to the item being procured. The acceptance (dedication) of commerial grade items intended for safety-related applications meets the intent of EPRI NP-5652 as accepted by the NRC.

<u>NRC Regulatory Guide 1.144</u> - "Auditing of Quality Assurance Programs for Nuclear Power Plants," Revision 1, 9/80, endorses ANSI N45.2.12-1977.

The NQAP follows this Guide with the following alternatives:

1. Paragraph 2.3 - Technical specialists who assist in performing audits in their area of special expertise will not be trained in auditing techniques; however, they will be accompanied by a trained, qualified auditor.

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- 2. TVA implements the requirements of Regulatory Guide paragraph C.3.a and sections 3.4 and 3.5 of ANSI N45.2.12 with a performance-based, graded QA audit program. Real time adjustments are made to the audit scope, depth, and frequency based on an item's or subject's importance to safety and performance history.
- 3. Section 4.5.2 Nuclear Quality Assurance will have a certified lead auditor or a manager of the auditor either conduct the required follow-up or attest 's the acceptability of the follow-up conducted by audit personnel.

NRC Regulatory Guide 1.146 - "Qualification of Quality Assurance Program Audit Personnel for Nuclear Power Plants," 8/80, endorses ANSI N45.2.23-1978.

The NQAP follows this Guide with the following alternative:

In addition to the State agencies and technical societies recognized by ANSI N45.2.23, section 2.3.1.3, TVA may grant two points for professional competency to those individuals licensed as either a Reactor Operator (RO) or Senior Reactor Operator (SRO) by the NRC.

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