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*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.

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.

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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.

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.

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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

Proce . instruments which are used to determine or verify compliance with plant technical specification requirements for parameters such as flows, pressures, temperatures, levels, voltages, and currents.

Item

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

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

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(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 may proceed after contacting and receiving concurrence from the organization responsible for the notification point.

Nuclear Plant Security

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

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.

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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 corponents. 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).

Significant Condition Adverse to Quality (CAQ)

A CAQ documented on a condition adverse to quality report (CAQR) that is determined to be a QA programmatic deficiency or reportable to the NRC.

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/NRC 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.

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*Storage

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 testing requirements.

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

An act of confirming, 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 Nuclear Assurance and Services (NA&S), New Projects, Nuclear Technical Director (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 S'andards as delineated in Appendix B of this plan, and TVA identified quality-related programs. 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), New Projects, 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 E 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 Identified 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, New Projects, 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 Presidents, NPP, New Projects, NA&S, and NE

2.6.1 Ensure Browns Ferry operators receive training by December 31, 1989, 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.
- 2.6.3 Involved personnel who use computer software and its outputs to make decisions which could impact the criteria of items 4, 6, and 7 of Appendix E will be trained on the list of computer software that may be used without further verification by December 31, 1989.

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.
- Levels of verification and NPS document development for TVA identified quality-related programs and features (Section 5.1.B).
- 5. Computer Software, except as specified in Section 2.6 of this appendix.

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, 4, and 5 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

NRC Regulatory Guide 1.8 - "Personnel Selection and Training," Revision 2 4/87, endorses ANSI N18.1-1971 and ANSI/ANS 3.1-1981.

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

- 1. TVA will meet the requirements of Regulatory Guide 1.8, Revision 2 (4/87) for all new personnel qualifying on positions identified _ 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.
 - 3. TVA uses the methodology for equating education and experience contained in ANSI 3.1-1987 for guidance to evaluate equivalent related experience for a degree.

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.

NRC Regulatory Guide 1.30 - "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.
- 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 engineers, as appropriate, based upon the equipment or system functions that could be impacted by the work performed.

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REGULATORY GUIDE CONFORMANCE STATUS

- 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.
- 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.

NRC Regulatory Guide 1.33 - "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.
- 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.

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- 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.
- 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 will comply with regulatory position C.4 except that audit frequencies will be consistent with plant specific technical specification requirements.

NRC Regulatory Guide 1.37 - "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 10⁶ rads.

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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).
- 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.

NRC Regulatory Guide 1.38 - "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:

- 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.

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- 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.
- 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. These materials are required to be in a visually clean condition and free of visually detectable defects prior to installation.
- 5. Section 6.4.1 TVA will meet this section through periodic inspection of randomly selected stored items by QC inspection personnel certified to ANSI N45.2.6. The criteria and factors regarding frequency and 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 deliverating appropriate maintenance requirements if different than vendor requirements, will be followed. Engineering evaluations and engineering requirement documents will consider vendor recommendations/requirements.

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- 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.
- 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.

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NRC Regulatory Guide 1.58 - "Qualification of Nuclear Power Plant Inspection, 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.
- TVA determines initial capability from the following criteria as defined in procedures: candidate's education, experience, training, examination, and/or capability demonstration. On-the-job participation in the work discipline is required for all candidates.
- 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.

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

The NQAP follows this Guide with applicable alternatives noted in Section 15 of this plan.

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

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.

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

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. Records will be afforded the protection of a two-hour rated 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, lighting, temperature, humidity control, or communications.
 - 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 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.

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NRC Regulatory Guide 1.94 - "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.

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.
- 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."
- 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.

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11. TVA implements the requirements of N45.2.5 Sections 3, 4, and 5 with a performance-based graded QA verification program consisting of quality control inspection, independent verification, and quality monitoring.

NRC Regulatory Guide 1.116 - "Quality Assurance Requirements for the Installation, Inspection, and Testing of Mechanical Equipment and Systems," 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 N45.2.8-1975 is considered for applicability.
- 3. TVA implements the requirements of N45.2.8 Section 4.4 with a performance-based, graded QA verification program consisting of quality control inspection, 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 requirements (special receipt inspection requirements, special tests, or functional tests) specific to the item being procured. The acceptance (dedication) of commercial grade items intended for safety-related applications meets the intent of EPRI NP-5652 as accepted by the NRC.

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

The NOAP follows this Guide with the following alternatives:

- 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.
- 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. Real-time adjustments allow emphasis to be placed in areas where performance is weak and decrease emphasis where performance is evaluated to be good.
- 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 to 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.

NRC Regulatory Guide 1.152 - "Criteria For Programmable Digital Computer System Software in Safety-Related Systems of Nuclear Power Plants," November 1985, endorses ANSI/IEEE-ANS-7-4.3.2-1982.

The NQAP follows this Guide consistent with Section D of the Guide, with the following alternatives:

- 1. For quality-related software, TVA's alternatives to the requirements of Regulatory Guide 1.152 are:
 - a. Software design and code are independently reviewed for conformance to system requirements.
 - b. Completed software is tested by an approved test plan, and the test and results are validated by qualified independent reviewer.
- For programmable digital computer system software installed in safety-related protection systems after NRC acceptance of the NQA Plan, TVA will follow this guide for the qualification and verification program elements specified in Sections 13.2H and 13.2J of the NQA Plan.

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GUIDELINES FOR DETERMINATION OF TVA IDENTIFIED QUALITY-RELATED CLASSIFICATIONS

1.0 INTRODUCTION

The guidelines for classifying components, systems, and activities as quality-related depend on the relationship of the terms quality-related and safety-related as discussed in 2.0 and 3.0 below. The guidelines are contained in Section 4.0 of this Appendix.

2.0 QUALITY-RELATED

Quality-related (QR) 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. It encompasses the broad class of plant features covered (not necessarily explicitly) in the General Design Criteria that contribute in important ways 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).

Quality-related is more encompassing than the term safety-related. Appendix D shows the scope of the NQAP. All quality-related items and activities are not necessarily safety-related. Appendix D illustrates the programmatic relationships.

3.0 SAFETY-RELATED

Use of the term safety-related (or variations thereof) and the methodology for classifying items and activities as safety-related has been established in the General Design Criteria and Safety Analysis Report for TVA's Browns Ferry, Sequoyah, Watts Bar, and Bellefonte Nuclear Plants. The term safety-related as used in this Appendix, this plan and in NQAP documents is generic in nature.

Items and activities classified as safety-related are subject, without exception, to the requirements of 10 CFR 50, Appendix B. All safety-related items and activities are also quality-related.

4.0 GUIDELINES

Some items and activities are classified as quality-related but not safety-related. However, because some items and activities classified as quality-related are considered important to the continued reliable operation of TVA's nuclear facilities, TVA shall apply the requirements of all or selected parts of the NQAP to such items and activities.

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- 4.1 Structures, systems, and components shall be classified as qualityrelated but not safety-related if they fit one or more of the following categories:
 - A. Contain radioactive material and have not been identified as safetyrelated.
 - B. Are required by ANS 3.2/ANSI N18.7-1976, "Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants," and are not identified as safety-related (e.g., plant security system).
 - C. Are fire protection features that provide protection for safetyrelated structures, systems, or components.
 - D. Are structures, systems, and components that have environmental or operability requirements important to the safe operation of the unit (as specified in the Plant Technical Specifications).
 - E. Are structures, systems, and components that could impact reliability and operability goals recommended by NE and NPP and approved by the Senior Vice President of Nuclear Power.
 - 4.2 Some components and systems have been identified as "non-nuclear safety" (NNS) in the FSAR for each TVA nuclear plant. Those components and systems identified as NNS in the FSARs shall be classified as quality-related.
 - 4.3 Those components or systems designated as Seismic Category I (L) in each nuclear plant FSAR shall be classified as quality-related. Seismic Category I (L) is the nonsafety-related portion of Seismic Category I. (Refer to Appendix D.)
 - 4.4 Additional components or systems, not identified in the FSARs as NNS or Seismic Category I(L,) can be designated as quality-related but not safety-related. Such additional components or systems could include the following:
 - A. Plant security system.
 - B. Plant radiological controls and radwaste systems.
 - C. Other structures, systems, and components which have special environmental or operability requirements.
 - D. Structures, systems, or equipment designated by NP management as requiring some level of quality control because of their importance to plant reliability or operability.

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- 4.5 Items to which one or more of the following regulatory documents are applicable should be considered for classification as quality-related.
 - A. Regulatory Guide 1.143, "Design Guidance for Radioactive Waste Management Systems, Structures, and Components Installed in Light-Water-Cooled Nuclear Power Plants."
 - B 10 CFR 71, Subpart H, "Quality Assurance (Packaging and Transportation of Radioactive Material)."
 - C. Regulatory Guide 1.29, "Seismic Design Classification."
 - D. 10 CFR 73.55, "Requirements for Physical Protection of Licensed Activities in Nuclear Power Reactors Against Radiological Sabotage."
 - E. 10 CFR 50.62, "Requirements for Reduction of Risk From Anticipated Transients Without Scram (ATWS) Events for Light-Water-Cooled Nuclear Power Plants."
 - F. 10 CFR 50, Appendix R, "Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979."
 - G. ANS 3.2/ANSI N18.7-1976, "Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants."
 - H. Regulatory Guide 1.33, Revision 2, February 1978, "Quality Assurance Program Requirements (Operation)."
 - I. 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).
 - J. NRC letter from D. G. Eisenhut dated April 24, 1986, "Implementation of Fire Protection Requirements," Generic Letter 86-10 (A02 860512 005).
 - K. NUREG 0800, Section 9.5.1, Branch Technical Position, CMEB 9.5-1 (formerly BTP ASB 9.5-1), Revision 2, July 1981, "Fire Protection for Nuclear Power Plants."
- 4.6 New systems (or items being added as a result of approved modifications) shall be classified on the same basis as the existing components or systems.
- 4.7 Classification of components or systems as quality-related but not safety-related shall be performed in accordance with approved NE procedures or at NP management direction.

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This diagram displays the relationship of safety-related to qualityrelated items and activities. Examples of these items and activities are shown. It is not intended to show each specific item and activity within the scope of the Nuclear QA Program.

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COMPUTER SOFTWARE

The requirements of Section 13.0 apply to computer software that is used to:

- 1. Directly operate safety-related plant equipment.
- Generate design output which defines or prescribes activities affecting safety-related functions or equipment (e.g., cable pull slips).
- 3. Directly interface with cont-ol room personnel and is used by them without further verification to make decisions affecting: 1
 - a. The integrity of the reactor coolant pressure boundary.
 - b. The capability to shut down the reactor and maintain it in a safe condition.
 - c. The capability to prevent or mitigate the consequences of accidents that could result in potential offsite exposure comparable to the 10 CFR 100 guidelines.
- Perform calculations which are not subsequently verified and which result in acceptance of inspection or test data for quality-related equipment.¹
- 5. Design or aid in the design of quality-related structures, systems, or components.
- 6. Generate output that is used without further verification as input to the design of a quality-related item.¹
- 7. Generate output that is not verified for accuracy and is used to procure quality-related items.¹
- 8. Maintain or control descriptive information for output used in the procurement of quality-related items.
- Footnote (1) Computer software and its outputs that are subject to the controls of Section 13.0 and can be used without further verification shall be identified on a list a specified in Section 13.2.G. Involved personnel shall be trained on the contents of the list.

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DEFERRED PLANT QUALITY ASSURANCE PROGRAM

During the period of plant deferral, a QA program will be implemented which concentrates on the activities being performed and ensuring that the qualicy and licensability of the deferred plant are maintained.

The program which will be implemented is based on the guidance provided in NRC Generic Letter 87-15 dated November 4, 1987, and the NRC Policy Statement on "Deferred Plants" published in the Federal Register, Volume 52, No. 198, dated October 14, 1987. This program does not reduce 10 CFR 50, Appendix B requirements but focuses efforts where they are deemed necessary. A description of this program was submitted to the NRC on July 29, 1988.

Program Implementation

During the period of plant deferral, implementation of the following QA programmatic elements will be accomplished through written, reviewed, and approved procedures. These procedures will include as a minimum:

- 1. A description of the organizational structure for the plant showing functional relationships of personnel.
- 2. An indo ination and training program, including the qualifications, responsibilities, and duties of personnel performing quality-related activities. The range of training will be structured to that needed for ongoing activities during deferral.
- 3. A construction status when work was suspended, including control of deviations from the established status which occur during the deferral period.
- 4. Control of Measuring and Test Equipment (M&TE) used during deferral, including identification, calibration, and evaluation of out-ofcalibration equipment.
- 5. Control of work, including verification by the line organizations.
- Program for inspection by Quality Control/Quality Assurance personnel using a graded approach.
- 7. Program for operation of equipment and systems which continue in operation or must be operated periodically.
- 8. Program for maintenance and lay-up of systems including:
 - a. Establishment of acceptable conditions, periodic testing, and restoration of acceptable conditions during lay-up.

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- b. A listing identifying the location, storage level, and/or preventive maintenance requirement for all permanent plant equipment and materials important to safety.
- 9. Identification, reporting, and correction of conditions adverse to quality, including 10 CFR 21 and 10 CFR 50.55(e) items.
- 10. Collection, retention, and protection of records, including procedures, drawings, and controlled documents.
- 11. Scheduling and performance of audits and monitoring, concentrating on activities being performed and programs in place.
- 12. Program for plant security and access control.

Nuclear Quality Assurance (NQA) is responsible to ensure that the methods utilized by each organization responsible for the deferred QA program meet applicable QA program requirements.

Existing site procedures which are not being utilized during the period of deferral will be placed in an inactive status. Should an activity be required during deferral, the applicable procedure will be activated, reissued, and reviewed prior to the conduct of the activity.

At the end of the deferral period, the respective plant will be subject to the QA program described in this plan.

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TYPES OF CONTROLLED DOCUMENTS AND MANUALS

- 1. Design Specifications and Drawings
- 2. Nuclear Quality Assurance Manual
- 3. Safety Analysis Reports
- 4. Program Manuals
- 5. Plant Instructions
- 6. Nuclear Fuel Procedures Manual
- 7. Radiological Protection Plan
- 8. Nuclear Engineering Procedures Manual
- 9. NE Site Engineering Project Manuals
- 10. QA Manual for ASME Section III Power Plant Components (NCM)
- 11. Nuclear Procedures System Manuals
- 12. As-built Documents
- 13. Computer Programs
- 14. Nonconformance Reports
- 15. NQA Plan
- 16. System Descriptions
- 17. Topical Report

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NUCLEAR POWER NUCLEAR ASSURANCE AND SERVICES



 INDEPENDENT REPORTING TO THE SENIOR VICE PRESIDENT ON QUALITY STATUS AND ISSUES

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ORGANIZATION CHARTS

NUCLEAR POWER NUCLEAR ASSURANCE AND SERVICES NUCLEAR QUALITY ASSURANCE SITE QUALITY (TYPICAL)



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APPENDIX I

COMPARISON MATRIX OF QUALITY ASSURANCE PLAN REQUIREMENTS WITH THOSE OF 10 CFR 50, APPENDIX B AND SELECTED ANSI STANDARDS

10 CFR 50, Appx B		ANSI N45.2 - 1971		ANSI N18.7 - 1976	
Criterion	NQA Plan	Section	NQA Plan	Section	NQA Plan
I	4.0:4.1	2.0	5.0	3.1	4.1;5.0
II	5.0	3.0	4.0:4.1	3.2	4.0;4.1
III	7.0	4.0	7.0	3.3	11.0
IV	8.1	5.0	8.1	3.4	4.0;11.0
V	6.0;7.0	6.0	6.0;7.0	4.0	5.3;6.0
VI	6.0:7.0	7.0	6.0;7.0		7.2;12.0
VII	8.2	8.0	8.2	5.1	5.0
VIII	8.3	9.0	8.3	5.2.1	4.0
IX	9.3	10.0	9.3	5.2.2	6.0
X	9.1	11.0	9.1	5.2.3	5.0
XI	9.4	12.0	9.4	5.2.4	. 6.0
XII	9.5	13.0	9.5	5.2.5	6.0
XIII	9.6	14.0	9.6	5.2.6	6.0;9.7
XIV	9.7	15.0	9.7	5.2.7	6.0;9.8
XV	10.0	16.0	10.0	5.2.8	6.0;9.1;9.4
XVI	10.0	17.0	10.0	5.2.9	5.1;6.0
XVII	6.3	18.0	6.3	5.2.10	4.1.2;6.0
XVIII	12.0	19.0	12.0	5.2.11	6.0;10.0
				5.2.12	6.0;6.3
				5.2.13	6.0;8.0;9.6
				5.2.14	6.0;10.0
				5.2.15	6.0
				5.2.16	6.0;9.5
				5.2.17	6.0;9.1
				5.2.18	6.0;9.3
				5.2.19	6.0;9.4
				5.3	6.0
				5.3.1	6.0
	·			5.3.2	6.0
				5.3.3	6.0
				5.3.4	6.0
				5.3.5	6.0;9.8
				5.3.6	6.0;5.1
				5.3.7	6.0;9.5
				5.3.8	6.0;5.1
				5.3.9	6.0;5.1
				5.3.10	6.0;9.1;9.4