QUALITY ASSURANCE PROGRAM PLAN

WESTINGHOUSE ELECTRIC CORPORATION

NUCLEAR SERVICES DIVISION

NUCLEAR WASTE TECHNOLOGY

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1.0 ORGANIZATION

1.1 General

This section describes the major organizational units within Nuclear Waste Technology (NWT) relative to their responsibilities and authorities in assuring the overall quality of the design activities and deliverables to be provided.

The NWT Quality Assurance Program is structured to comply with the requirements of 10CFR60, Subpart G, "Quality Assurance;" 10CFR61, Subpart G, "Records, Reports, Tests, and Inspections;" 10CFR71, Subpart H, "Quality Assurance," 10CFR72, Subpart G, "Quality Assurance;" and 10CFR50, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," by invoking a program in compliance with ANSI/ASME NQA-1-1986, "Quality Assurance Program Requirements for Nuclear Facilities." Measures are provided to assure that individuals or groups assigned the responsibility for checking, auditing, inspecting or otherwise verifying that activities important to safety and other activities affecting quality have been correctly performed are independent of individuals or groups responsible for performing the specific activity. The NWT Quality Assurance Program is structured such that, unless specifically identified and excluded, all activities and items are treated as if they are important to safety or could affect quality.

1.2 NWT Organization

Management of Nuclear Waste Technology is the overall responsibility of the NWT Manager, as depicted in Figure 1-1. This responsibility includes design, procurement, fabrication and the assurance of quality of the items and services provided by the engineering and related project activities of NWT. Quality Assurance and Purchasing functions are performed by Westinghouse organizations which are independent of Nuclear Waste Technology.

Legend:
---- Indicates reporting on a matrix basis from Westinghouse organizations outside Nuclear Waste Technology

Figure 1-1

Quality Assurance Program Organization

The following paragraphs describe the assigned managerial responsibilities and principle functions supporting a project within NWT.

1.2.1 Quality Assurance Manager

The Nuclear Services Division (NSD) Quality Assurance Manager is responsible for establishing systems to assure that activities which affect the quality of services or items for which NWT is contractually responsible to deliver are systematically performed and verified in a manner commensurate to safety and reliability.

The NSD Quality Assurance Manager has the overall responsibility for the administration of the NWT Quality Assurance Program described in this Quality Assurance Program Plan.

The NSD Quality Assurance Manager has the authority to enforce compliance with the provisions of NWT's Quality Assurance Manual, including the authority to disapprove drawings, specifications or other documents where quality requirements are not met. He also has the authority to stop work or to control further operations where significant conditions adverse to quality are identified and immediate corrective actions are required.

Qualification requirements for the position of Quality Assurance Manager are:

a. Bachelors Degree in a technical field (or equivalent);

b. At least ten (10) years experience in nuclear design, quality assurance, or manufacturing, with at least one of these years in quality assurance;

c. At least five (5) years experience in management of above disciplines;

d. Knowledge of applicable quality-related codes, standards, regulatory and statutory requirements; and

e. Demonstrated ability to prescribe, apply and assess compliance with applicable requirements.

1.2.2 Project Manager

The Project Manager is responsible for: overall project management direction and coordination; system development; project control; design, fabrication and testing of special equipment and tooling; operations; and project interfaces within NWT.

1.2.3 Engineering

The Engineering function is performed by Cognizant Technical Managers who functionally report to the Project Manager, and are responsible for the overall direction and coordination, system development, design, fabrication, and testing of special tooling, operations, and design interfaces within NWT and other Westinghouse divisions to support the engineering efforts.

1.2.4 Purchasing

Purchasing is an "as required" support service to NWT. As depicted in Figure 1-1 a Westinghouse organization outside of NWT performs the procurement services for the NWT. As part of that NWT responsibility, Purchasing is responsible for the procurement of materials, items or services in accordance with its procurement control procedures, and is responsive to the requirements of procurement documents prepared and processed by NWT.

2.0 QUALITY ASSURANCE PROGRAM

2.1 General

This section provides a general description of the Nuclear Waste Technology (NWT) Quality Assurance Program. This section also discusses the applications of the NWT Quality Assurance Manual relative to the policies and provisions of this Plan.

Also presented herein are the basic policies regarding the indoctrination and training of the Westinghouse personnel and the methods for periodic assessments of the effectiveness of the Quality Assurance Programs and Plans.

2.2 Quality Assurance Program Plan

This Quality Assurance Program Plan describes NWT's Quality Assurance policies and general practices for a disciplined approach to the achievement of quality, safety and performance. Its implementation is reviewed periodically by NWT management through consideration of audit reports and other periodic management assessments, and it is updated as necessary to incorporate new requirements or considerations or to reflect significant changes in applicable Westinghouse or regulatory quality assurance policies or procedures.

The procedures referenced in the Quality Assurance Program Plan take the following considerations into account in establishing requirements:

- The impact of failure or malfunction of the item on safety;
- The uniqueness or complexity of design and fabrication of the item;
- The need for special process controls for the item;
- The demonstrability of functional compliance for the item; and
- The degree of standardization and quality history of the item.

2.3 Contract Administration

The NWT Project Manager initiates appropriate actions within NWT by issuing Project Control Releases (PCR's). PCR Change Notices are issued to implement changes and additions to those actions.

NWT Project Management directions assigning contractual scopes of work to other participating Westinghouse Divisions are defined on standard Westinghouse control documents which are reviewed and approved by Quality Assurance prior to being issued. Such documents include appropriate Quality Assurance provisions.

2.4 Implementing Procedures

Westinghouse activities are conducted in accordance with documented procedures that require performance in a planned, controlled and disciplined manner. These procedures provide instructions to personnel who, in the course of performing their assigned duties, engage in activities important to safety and other activities affecting quality.

Table 2-1 lists the principal procedures that are applied in implementing the Quality Assurance Program.

The types of procedures and the responsibilities for their issuance and maintenance are described below.

2.4.1 NWT Quality Assurance Manual

The Quality Assurance Manual contains Quality Assurance Procedures (QAP's) which provide direction to all cognizant personnel in conducting specific Quality Assurance activities. These procedures are designated by the letters QAP and a unique identifying number between 1 and 18 corresponding to the eighteen criteria of ANSI/ASME NQA-1-1986, inclusively (e.g. QAP 1).

Table 2-1
Quality Assurance Program Procedures

BDA 1 CRITERION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
BAP 1 ORGANIZATION	●																		
BAP 2.1 QUALITY ASSURANCE PROGRAM	○	●																	
BAP 2.2 TRAINING AND QUALIFICATION REQUIREMENTS FOR INSPECTION AND TEST PERSONNEL		●								○									
BAP 2.3 QUALIFICATION OF AUDITORS		●																	
BAP 2.4 QUALITY ASSURANCE MANUAL		●																	
BAP 3 DESIGN CONTROL	○		●																
BAP 4 PROCUREMENT DOCUMENT CONTROL	○	○	○	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
BAP 5 INSTRUCTIONS PROCEDURES AND DRAWINGS					●	○			○										
BAP 6 DOCUMENT CONTROL						●													
BAP 7 CONTROL OF PURCHASED ITEMS AND SERVICES	○						●		○	○									
BAP 8 IDENTIFICATION AND CONTROL OF ITEMS								●											
BAP 9 CONTROL OF PROCESSES									●										
BAP 10 INSPECTION							○			●									
BAP 11 TEST CONTROL			○								●								
BAP 12 CONTROL OF MEASURING AND TEST EQUIPMENT												●							
BAP 13 HANDLING STORAGE AND SHIPPING													●						
BAP 14 INSPECTION TEST AND OPERATING STATUS														●					
BAP 15 CONTROL OF NONCONFORMING ITEMS				○			○			○					●	○			
BAP 16 CORRECTIVE ACTION							○									●			
BAP 17 QUALITY ASSURANCE RECORDS			○					○	○								●		
BAP 18 AUDITS		○					○											●	

● PRIMARY COMPLIANCE ○ SECONDARY INVOLVEMENT

Table 2-1 (Con't) Quality Assurance Program Procedures

NQA 1 CRITERION	1 QUALITY ASSURANCE ORGANIZATION	2 QUALITY ASSURANCE PROGRAM	3 DESIGN CONTROL	4 PROCUREMENT DOCUMENT CONTROL	5 INSTRUCTIONS, PROCEDURES AND DRAWINGS	6 DOCUMENT CONTROL	7 CONTROL OF PURCHASED MATERIAL, EQUIPMENT AND SERVICES	8 IDENTIFICATION AND CONTROL OF MATERIALS, PARTS AND COMPONENTS	9 CONTROL OF SPECIAL PROCESSES	10 INSPECTION	11 TEST CONTROL	12 CONTROL OF MEASURING AND TEST EQUIPMENT	13 HANDLING, STORAGE AND SHIPPING	14 INSPECTION, TEST AND OPERATING STATUS	15 NONCONFORMING MATERIALS, PARTS OR COMPONENTS	16 CORRECTIVE ACTION	17 QUALITY ASSURANCE RECORDS	18 AUDITS	18C7811
P 2.1 INDOCTRINATION TRAINING AND QUALIFICATION OF PERSONNEL		●																	
P 2.4 SIGNIFICANT QUALITY PROBLEMS AND UNUSUAL OCCURRENCES		●																	
P 3.1 TECHNICAL REPORTS			●																
P 3.2 INTERFACE CONTROL DRAWINGS			●																
P 3.4 DESIGN REVIEWS			●																
P 3.5 VERIFICATION BY QUALIFICATION TESTING			●																
P 3.6 ENGINEERING CHANGE NOTICES			●																
P 3.8 DESIGN DOCUMENTATION REPORTS			●																
P 3.9 VERIFICATION DOCUMENTATION AND CONFIGURATION CONTROL OF TECHNICAL COMPUTER PROGRAMS			●																
P 3.10 ADMINISTRATION OF ENGINEERING AND SCIENTIFIC COMPUTER PROGRAMS			●																
P 3.11 TECHNICAL RECORD BOOKS			●																
P 3.13 QUALITY ASSURANCE REVIEW OF ENGINEERING DRAWINGS AND SPECIFICATIONS			●																
P 3.16 REPORTS AS ATTACHMENTS TO LETTERS			●																
P 4.1 PURCHASE REQUISITIONS	○	○	○	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
P 5.1 CUSTOMER CONTRACT MANAGEMENT AND CONTROL					●														
P 5.2 PROJECT CONTROL RELEASES					●														
P 5.3 PREPARATION AND CONTROL OF DRAWINGS					●														
P 5.4 ENGINEERING SPECIFICATIONS					●														
P 5.5 QUALITY ASSURANCE INSTRUCTIONS					●														
P 5.6 QUALITY ASSURANCE MANUAL PROCEDURES					●														
P 5.7 PROCEDURES MANUAL PROCEDURES		○			●														

● PRIMARY COMPLIANCE

○ SECONDARY INVOLVEMENT

Table 2-1 (Con't) Quality Assurance Program Procedures

10 CFR 50 CRITERION	1 QUALITY ASSURANCE ORGANIZATION	2 QUALITY ASSURANCE PROGRAM	3 DESIGN CONTROL	4 PROCUREMENT DOCUMENT CONTROL	5 INSTRUCTIONS PROCEDURES AND DRAWINGS	6 DOCUMENT CONTROL	7 CONTROL OF PURCHASED MATERIAL EQUIPMENT AND SERVICES	8 IDENTIFICATION AND CONTROL OF MATERIALS PARTS AND COMPONENTS	9 CONTROL OF SPECIAL PROCESSES	10 INSPECTION	11 TEST CONTROL	12 CONTROL OF MEASURING AND TEST EQUIPMENT	13 HANDLING STORAGE AND CONTROL	14 INSPECTION TEST AND OPERATING STATUS	15 NONCONFORMING MATERIALS PARTS OR COMPONENTS	16 CORRECTIVE ACTION	17 QUALITY ASSURANCE RECORDS	18 AUDITS	19 (RESERVED)
P 6.2 CONTROLLED DISTRIBUTION OF ENGINEERING DOCUMENTS						●													
P 6.4 REVIEW RECORD						●													
P 7.1 DOCUMENT SUBMITTAL FORMS							●												
P 7.2 RECEIVING PURCHASED SERVICES							●												
P 7.3 RECEIVING SHIPPED OR CUSTOMER FURNISHED MATERIAL							●												
P 10.1 PRODUCT INSPECTION										●									
P 11.1 PERFORMANCE OF TESTS											●								
P 15.1 VARIANCE REQUESTS															●	○			
P 15.2 MATERIAL DISPOSITION REPORTS															●	○			
P 15.3 SAFETY REVIEW GUIDELINES															○				●
P 17.1 ENGINEERING RECORDS MANAGEMENT																	●		
P 17.4 QUALITY ASSURANCE DEPARTMENT RECORDS MANAGEMENT																	●		
P 18.2 EXTERNAL AUDITS																○		●	
P 18.3 EXTERNAL AUDITS																○		●	
P 18.4 SUPPLIER AUDITS																○		●	

● PRIMARY COMPLIANCE ○ SECONDARY INVOLVEMENT

All procedures in this Manual are approved by the Quality Assurance Manager. Issuance and control of this Quality Assurance Manual is the responsibility of Quality Assurance.

2.4.2 NWT Procedures

Detailed implementation of specific activities important to safety and other activities affecting quality is accomplished through NWT Procedures. These detailed procedures are contained in the NWT Procedures Manual and are designated by the letter P and a unique identifying number between 1 and 18, inclusively. The NWT Procedures are referenced in the QAP's. Quality Assurance is responsible for ensuring that applicable Quality Assurance policy requirements are reflected in these detailed procedures. These procedures are approved by the NWT Manager and the Quality Assurance Manager.

2.5 Training and Indoctrination

Management is responsible for defining required training and for ensuring that personnel are adequately indoctrinated and trained in the skills and disciplines necessary to carry out their functions in a manner to achieve appropriate levels of quality. This includes documented indoctrination in overall Quality Assurance Program requirements. Training includes, as applicable, relevant industry codes and standards, relevant government regulations, procedures, special skills including special processes, and technical specifications related to the work to be performed. Proficiency is maintained by on-the-job experience and periodic retraining when necessary.

Quality Assurance is responsible for assisting with the indoctrination and training of cognizant Division personnel in the provisions of the Quality Assurance Manual. Quality Assurance is responsible for documenting the training of its cognizant personnel in functional methods such as audits, quality engineering, inspections, surveillance of field services, and any special processes such as nondestructive examination. Quality Assurance is also responsible for auditing the indoctrination and training records of Nuclear Waste Technology.

2.6 Management Review

The implementation of NWT's Quality Assurance Program is periodically (usually annually) reviewed, and the results of these reviews are provided to the NWT Manager. These reviews constitute management assessments of the effectiveness of the program including its compliance with applicable regulatory requirements and industry standards. These reviews are accomplished by one or more of the following methods:

A. Assessments by Quality Assurance management, including reviews of quality problems and associated underlying causes, analysis of trends, and reviews of other program assessment actions such as audits (internal and customer) and applicable corrective actions. Such assessments are presented in written reports to the NWT Manager for review and further action as necessary.

B. Topical internal audits or management assessments, which may be directed by the NWT Manager's staff, to assess the effectiveness of particular aspects of the overall program.

C. Documented reviews of the effectiveness of the Quality Assurance Program by Westinghouse corporate audit teams or evaluation groups with formal reports to the NWT Manager.

3.0 DESIGN CONTROL

3.1 General

This section contains the provisions for controlling designs and changes to designs so that all license and contract requirements, including functional requirements, regulatory requirements, codes and standards are correctly incorporated into specifications, drawings, test plans, procedures and other engineering documents. Design activities and interfaces are governed by written procedures that provide necessary design control. Changes to approved designs are subject to control measures commensurate with those applied to the original design. The procedures provide methods for controlling design-related activities such as: review of customer requirements; establishment of functional specifications; selection of codes and standards; design processes; verification of design adequacy, design changes, design interfaces; and, where applicable, a description of the design interfaces with design contractors. Customer documented design input data and changes thereto are supplied to engineering by the Project Manager via PCR's.

3.2 Design Process

The design process is governed by procedures and implemented by the Project Manager. The process normally starts with the development of functional requirements (usually in the form of functional design criteria and preliminary drawings) prepared to meet the design input requirements either defined or referenced in a contract technical specification. The functional requirements include technical, regulatory, maintenance, customer, etc., requirements. These design requirements, criteria, bases, etc., are documented in the form of specifications, drawings, procedures or instructions. Materials, parts, equipment or processes essential to the maintenance of safety-related functions are reviewed for suitability of application.

Data collected from others for use in the design process, other than that acquired from nationally recognized standards and specifications (ASTM, ANSI, IEEE, ASME, etc.), is acquired or produced under a quality assurance program that meets the requirements of ANSI/ASME NQA-1-1986 with supplements or is subjected to the design verification process (Section 3.3) prior to being finally accepted as valid. Data not validated at the time of collection is identified.

Engineering Specifications (E-Specs), when required, are prepared in accordance with documented procedures.

E-Specs are reviewed and approved by cognizant departments including Quality Assurance.

3.3 Design Verification

Designs are verified by one or more of the following methods, as appropriate to the circumstance:

A. Documented design reviews conducted in accordance with procedures.

B. Alternate calculation method(s) and independent review(s) by a qualified individual(s) other than those who performed the original calculations.

C. Tests to verify adequacy of the design to perform under most adverse conditions specified for the design. Tests are controlled in accordance with Section 11.0 of this QAPP.

The selection, review and approval of design verification methods for a specific design is the responsibility of, and is documented by, the cognizant technical manager.

3.4 Design Reviews

Design reviews may be employed as a means of design verification for a design or part of a design. Design reviews typically consider the design's ability to meet functional requirements, safety, quality level requirements, reliability and practicality of fabrication, utilization and maintenance.

The scope and the scheduling of the reviews are based on many considerations, including whether or not the equipment is of a new design; the importance of the item to safety; availability and performance and previous experience with the equipment or similar types of equipment; and the quality level of the item. The responsibility for determining the need for a design review rests with the Project Manager with input from other departments, as appropriate.

Design reviews are conducted and documented in accordance with written procedures which require assignment of responsibilities for action on open items and resolution of open items. Formal documented follow-up is performed by the design review chairman.

3.5 Design Analysis

Design analyses are performed in a planned and controlled manner to assure that the analyses support the design effort. Essential computer software used in design analyses are controlled per department procedures. This control includes verification, administration, documentation and configuration control of computer codes and programs. Design analyses are documented in accordance with the requirements of department procedures which meet the requirements of ANSI/ASME NQA-1-1986, Supplement 3S-1, paragraph 3.1.

3.6 Design Change Control

Following initial review and approval, all documentation describing design inputs, quality requirements, final design configuration, design analyses and design verification is placed under change control. The revision to approved

design documents is reviewed and approved by the same organizations which approved the original release or by those to whom this responsibility has been transferred.

Design change is initiated in accordance with procedures by the engineer recognizing the need for change. If the change impacts the conditions specified in the NRC approval of this Quality Assurance Program Plan, then NRC approval of the change will be obtained prior to implementation.

The Cognizant Technical Manager is responsible for evaluating and executing design changes and for maintaining design descriptions current by incorporation of changes into drawings, specifications and other documents.

4.0 PROCUREMENT DOCUMENT CONTROL

4.1 General

This section describes the policies for generating and controlling procurement documents to ensure the incorporation of applicable technical and quality requirements. These policies include provisions for independent reviews and documentation thereof to assure that requirements are properly specified; determine the need for changing design criteria; and resolve exceptions taken by the supplier.

4.2 Procurement Documents

NWT procurement actions are initiated by means of purchase requisitions in accordance with established procedures. Changes to procurement documents are initiated by purchase requisition change notices and are reviewed and approved in the same manner as the original purchasing document.

4.3 Purchase Requisition Requirements

In addition to defining the scope of work to be performed by the supplier, procurement documents include the following requirements, as applicable:

4.3.1 Supplier Quality Assurance Program Requirements

The supplier is required to have a documented quality assurance program to the extent appropriate for the type and use of the item or service being procured. NWT reviews the documented supplier quality assurance program to establish that the program is sufficient to meet the needs of the item or service being procured per Quality Assurance documented procedures.

4.3.2 Technical Requirements

Procurement documents specify, as applicable, a) drawings, specifications, industry codes and standards with applicable revision dates; b) test, inspection, and acceptance requirements; and c) special instructions and requirements for designing, verifying, fabricating, cleaning, erecting, mockup testing, packaging, handling and shipping.

4.3.3 Documentation Requirements

Procurement documentation requirements include provisions for the preparation, maintenance and availability for review (or submittal) of records such as: drawings; specifications; procedures; procurement documents; inspection and test records; personnel, procedure and equipment qualifications; and chemical and physical test results. Procurement documentation identifies documentation to be submitted to NWT for information, review, or approval, and the schedules for such submittals. Provisions are also made for suppliers reporting nonconformances to procurement requirements for NWT disposition. Where data are important, procurement documentation requirements also include provisions for instructions on record retention and disposition.

4.3.4 Lower Tier Procurement

This provision involves the extension of applicable requirements of procurement documents to lower tier subcontractors and suppliers, including right of access by Westinghouse and its customers to facilities and records for surveillance or audit purposes.

4.3.5 Spare and Replacement Parts

Where appropriate, the procurement documents require the supplier to identify the need for adequate spare and replacement parts, including all technical and quality-related specifications for ordering such parts.

5.0 INSTRUCTIONS, PROCEDURES AND DRAWINGS

5.1 General

Activities affecting quality of products and services are carried out in accordance with written instructions, procedures and drawings.

5.2 Scope and Applicability

Written procedures, instructions or drawings are prepared to cover work within the scope of the contract. For each of the eighteen (18) ANSI/ASME NQA-1-1986 quality assurance criteria, the primary procedural requirements involved are listed in Table 2-1 of Section 2.0. These documents provide direction for activities affecting quality to be performed in proper sequence and under controlled conditions. They provide for independent verification for acceptability against documented quantitative and qualitative acceptance criteria to demonstrate satisfactory accomplishment. Quality requirements are contained in documents such as engineering specifications, drawings, purchase orders and technical procedures (which include equipment test procedures, equipment preparation and maintenance procedures).

Controls over issuance, approval, change and distribution of instructions, procedures and drawings are covered under Section 6.0, Document Control.

5.3 NWT Instructions, Procedures and Drawings

Throughout the design, manufacturing, inspection and testing phases, activities and operations affecting quality are controlled through the use of approved drawings, specifications, instructions and procedures which are generated in accordance with procedures contained in the Procedures Manual, and the Quality Assurance Manual.

Drawings, specifications, instructions and procedures define appropriate qualitative and quantitative acceptance criteria consistent with specific

items and services, and applicable parametric limits for processes and test methods with respect to dimensions, tolerances and operating limits.

5.3.1 Quality-related Activities

Quality-related activities are conducted in accordance with the Quality Assurance Manual to assure that actions are planned and accomplished in a systematic manner as necessary to provide items, services, activities and valid test and program data that are in compliance with applicable requirements. These responsibilities include reviewing, approving and auditing the implementation of procedures, drawings and other documents.

5.3.2 Product Inspection Activities

Inspections of components and equipment are performed by qualified organizations for NWT. NWT requires that inspections be performed and documented per written procedures which meet the requirements of ANSI/ASME NQA-1-1986, Supplement 10S-1. These requirements for the inspection processes are passed on to suppliers via purchase orders.

Quality Assurance Instructions (QAI's) may be issued to direct general inspection of items and services. QAI's define, where applicable, the characteristic or detail to be inspected, and the tools, gauges or test equipment necessary to perform the inspection.

5.3.3 Project Management Activities

NWT project management-related activities are governed by appropriate procedures, including those directing preparation, review, approval and distribution of documents pertinent to the receipt and dissemination of contractual requirements.

5.3.4 Engineering Activities

Engineering activities are governed by NWT Procedures. Review and approval of design details and information, design analyses, test reports, drawings and specifications, and changes thereto, are utilized as a means of assuring that required activities have been completed and have been performed in accordance with requirements.

5.3.5 Purchasing Activities

Purchasing activities are governed by the applicable Purchasing Department Procedures and are documented in the Purchasing Department Manual.

6.0 DOCUMENT CONTROL

6.1 General

NWT Quality Assurance Procedures (QAP's) delineate the systems for preparing, reviewing, approving, releasing and distributing documents affecting quality, including changes, by identified authorized personnel. The Project Manager specifies those documents requiring a controlled distribution. Changes are approved by the same groups that reviewed and approved the original or by those to whom the responsibility has been transferred.

Applicable control documents such as instructions, procedures, and drawings are available at the location where the activity is being performed.

6.2 Control Responsibilities

Document control is vested in the functional groups of the organization. Each of these groups controls the distribution of documentation that originates within its functional area of responsibility. In addition, the functional group reviews and approves documents which originate in other organizations and contain matters affecting that functional group. Approved changes are incorporated into controlled documents prior to use.

Quality Assurance reviews and approves documents pertinent to this QAPP, including drawings, specifications, procedures, purchasing requisitions and inspection and test documents used in the design, procurement, manufacture, testing and delivery of items to be delivered.

6.3 Use of Proper and Current Documents

Engineering drawings and document lists are issued under the direction of the Cognizant Technical Manager. These master lists are updated and distributed to predetermined, responsible personnel as required to preclude the use of superseded documents. For the purposes of document and item effectivity and configuration control, each document list identifies revisions of documents to be used in specific applications.

7.0 CONTROL OF PURCHASED ITEMS AND SERVICES

7.1 General

This section describes the measures that assure items and services purchased by NWT conform to contractual, regulatory and quality requirements.

These measures include, as appropriate, procurement planning, source evaluation and selection, review of objective evidence of quality furnished by the supplier, inspection and audit at the source, and receiving inspection of the items upon delivery, and apply to procurements initiated by NWT as well as procurements initiated by NWT's suppliers. Quality Assurance in NWT plans and executes the quality assurance actions necessary to assure that material, equipment and services procured meet the specified requirements. In executing these actions, Quality Assurance either performs the action (as for supplier qualification and audit) or overviews the actions of others (review of purchase requisitions, overview of inspection, review of plans, procedures, instructions, etc.) to verify appropriate content.

The provisions of this section apply to the procurement of material, equipment and services, except for: a) standard supplies or services of a non-complex nature or considered non-critical with respect to quality of Westinghouse services or equipment; and b) services of personnel where no special skills apply.

7.2 Procurement Planning

Procurement activities are planned and documented to assure a systematic approach to the procurement process. As appropriate, the planning activities identify the procurement methods to be used, the sequence of actions and milestones indicating completion, and the preparation of applicable procedures for the following:

- Procurement document preparation, review and change control;
- Source and bid evaluation and award;

- o Control of supplier performance;
- o Surveillance, inspection or audit activities, including hold and witness points;
- o Control of nonconformances and corrective action;
- o Acceptance criteria; and
- o Quality assurance records.

7.3 Selection of Suppliers

Materials, equipment and services for specific quality level items are procured only from suppliers capable of providing those items or services in accordance with the requirements of the procurement documents. Potential suppliers are evaluated prior to placement of a purchase order by personnel from cognizant Purchasing, Project Management, Engineering and Quality Assurance groups. The evaluation is conducted in accordance with documented procedures, and considers the supplier's personnel, production capability and past performance. Deficiencies or unacceptable quality conditions are resolved, or commitments for resolution are obtained, before a contract is awarded.

7.4 Supplier Surveillance

Surveillance of suppliers is performed, as appropriate for the requirements of the purchase order, to verify compliance. Surveillance may be carried out during fabrication, inspection, testing or shipment. Surveillance results, including any deficiencies identified, are documented and evaluated to assess the effectiveness of the supplier's quality assurance program.

7.5 Supplier-Generated Documents

Supplier-generated documents are controlled, handled and approved in accordance with written procedures. Measures are prescribed to provide for the acquisition, processing and recorded evaluation of technical, inspection and test data against acceptance criteria.

7.6 Acceptance of Items

The acceptability of procured items is established by means of a Supplier Certificate of Conformance, source verification, receiving inspection or post-installation testing, or any combination thereof.

7.6.1 Certificate of Conformance

The Certificate of Conformance identifies: a) the purchased items and specific requirements to which they conform; b) any nonconformances, together with reference to the documented disposition of the nonconformance; and c) the certification system and related administrative procedures for preparation, review and approval of the certificates. The validity of Certificates of Conformance and the effectiveness of the certification system will be verified at intervals commensurate with the supplier's past quality performance.

7.6.2 Source Verification

Source verification is used, commensurate with the importance and complexity of the item, to monitor, witness or observe inspections, tests, examinations or other specified activities. Results are documented, and provided to NWT management and the supplier.

7.6.3 Receiving Inspection

Purchased items are inspected upon receipt, as necessary, to verify conformance to procurement requirements. This inspection is performed in accordance with written instructions or procedures, and includes verification of the receipt and adequacy of supplier documents, proper item identification and freedom from visible shipping damage. Additional inspections, such as dimensional and other physical characteristics, are performed when warranted, based on the results of source verification and audit activities, and on the quality performance demonstrated by the supplier.

7.6.4 Post-Installation Tests

Requirements and associated documentation for post-installation testing are specified in the appropriate procurement documents.

7.7 Acceptance of Services

Services are accepted on the basis of: a) technical verification of data produced; b) surveillance or audit, or both, of the activity; c) a review of objective evidence for conformance to the procurement documents; or d) any combination thereof.

7.8 Supplier Nonconformances

Procedures are established, requiring each supplier to identify and document items and services that do not conform to procurement requirements, and to submit them in writing to NWT for evaluation of the disposition.

7.9 Commercial Grade Items

Commercial grade items, where used, are identified in approved design and procurement documents. Alternate commercial grade items proposed by the supplier are submitted to the cognizant design organization for approval. Commercial grade items are procured, where warranted by their complexity and importance, from suppliers selected on the basis of evaluations described in 7.3, and are inspected on receipt as described in 7.6.3.

8.0 IDENTIFICATION AND CONTROL OF MATERIALS, PARTS AND COMPONENTS

8.1 General

Requirements for identification and control of materials, parts, equipment and components to meet identification requirements are directed by engineering drawings, specifications and test plans, and are implemented through use of procedures.

8.2 In-Process Identification and Control

8.2.1 Hardware Identification and Control

Identification systems provide for the marking or tagging of individual items, containers or accompanying documents with pertinent identity in a manner to permit traceability of each item to its applicable material and release status, drawings, specifications and other appropriate technical information. The location and the method of identification do not affect the fit, function or quality of the item being identified. Permanent markings directly on parts of assemblies are controlled by specifications which direct the use of suitable marking materials and methods and placements, consistent with quality and service requirements of the item. When lots are subdivided during processing, each subdivision is identified to its parent lot.

Identification requirements for suppliers are specified in purchase orders, and such identification together with the vendor certification and test records, as required, are verified by Quality Assurance during supplier surveillance or receiving inspection of purchased items.

8.2.2 Nonconformance Identification

Records of nonconforming disposition are identified on the controlling route cards, identification tags, stickers or batch records. Nonconforming items are marked and controlled as described in Section 15.0.

8.3 End Item Equipment Identification

All equipment delivered is identified in accordance with specified requirements.

9.0 CONTROL OF PROCESSES

9.1 General

Control of special processes, including welding, heat treating and nondestructive testing and cleaning is maintained through procedures contained or referenced in the Quality Assurance Manual.

9.2 Purchased Materials and Parts

When special processes are utilized by suppliers, the design or material specifications and the quality assurance requirements designated for the procurement require that critical processes be qualified by the suppliers and that the activities be conducted by qualified personnel, using qualified procedures in accordance with applicable codes, standards, specifications, criteria and other special requirements. When applicable, the purchase order contains requirements for NWT approval of such processes prior to production and for any changes to the processes after initial approval. When judged necessary by NWT, the requirements for pilot order or first-piece inspection, surveillance inspections and Quality Assurance audits during production are also specified.

10.0 INSPECTION

10.1 General

Activities affecting the quality of services, equipment and materials supplied by NWT are directly inspected, indirectly controlled or both, as necessary, to verify conformance to applicable codes, standards, instructions, drawings, specifications and other contractual requirements. Personnel performing inspection activities are qualified to perform the inspection, independent of those who perform the work, and their qualification is documented. They do not report to the management directly responsible for performing the work.

10.2 Inspection Planning

Inspection programs are conducted in accordance with documented procedures and requirements as defined by the Quality Assurance Manual. All pertinent engineering drawings, specifications and test plans are reviewed and approved by Quality Assurance for the inclusion of quality requirements, and are used as a basis for reviewing operations routings or test plans and procedures and establishing the necessary inspection (hold) points and requirements.

Inspection of material, equipment, components and assemblies is done to written procedures which list appropriate characteristics requiring inspection, the inspection techniques to be used, acceptance criteria and recording requirements. Inspection procedures are used in conjunction with drawings and specifications, as applicable, to perform the required inspection. Sampling techniques, when employed, are based on statistical standards and are in compliance with design requirements.

Characteristics with design-specified tolerances not amenable to direct verification inspection, such as assembly weldments, may be controlled as special processes described as in Section 9.0.

10.3 Personnel Indoctrination and Training

Material, part, assembly or facility acceptance inspections are performed by inspectors qualified in accordance with Supplements 2S-1 and 2S-2 of ANSI/ASME NQA-1-1986, as applicable, who function independently of production operations personnel.

Inspectors are qualified for specific inspection tasks by formal indoctrination and training, work experience and training by supervisors. This qualification is documented. Inspectors performing nondestructive tests are trained and qualified for competency in their specific work efforts as described in established procedures.

10.4 Inspection Records

Inspection records identify the item inspected, date and type of inspection, inspector, inspection results, and appropriate reference to actions taken in connection with nonconformances.

11.0 TEST CONTROL

11.1 General

Testing required by NWT to demonstrate satisfactory performance of services, equipment and material is conducted in accordance with written procedures. The following categories of testing are subject to this control:

A. Tests demonstrating that system design criteria and functional requirements are satisfied.

B. Tests ensuring operability, reliability, structural integrity or leak tightness of components.

Where a test program is used to verify the adequacy of a design feature in lieu of other verifying processes, such qualification testing shall be conducted under the most adverse design conditions.

11.2 Test Planning and Application

The Cognizant Technical Manager is responsible for defining needs for testing to demonstrate satisfactory performance of designed equipment or processes. For such tests, Cognizant Technical Managers establish and approve test plans, including test requirements and acceptance criteria, which are documented and are reviewed and approved by other cognizant departments, including Quality Assurance.

Requirements and acceptance criteria are stated by the engineering organization responsible for the design of the item or process (in conformance with functional specification parameters) to establish a basis for determining acceptability of test results.

NWT Procedures governing tests include provisions for assuring that prerequisites for the given test have been met, that adequate instrumentation is available and used, and that necessary monitoring is performed.

Prerequisites include such items as calibrated instrumentation, appropriate equipment, qualified personnel, condition of test equipment and the item to be tested, suitable environmental conditions and provisions for data acquisition.

Tests are conducted by organizations other than NWT in accordance with an NWT prepared or approved test plan. The test plan is used by the testing organization to develop the test procedures which include the specified requirements. In such cases the test procedures are reviewed and approved by NWT.

11.3 Documentation of Test Results

Test results are documented and evaluated by the individuals or groups responsible for the design of the item under test. In critical or important tests, such as qualifications, independent technical review of the test results may be conducted.

Test records identify, as a minimum, the item tested, date of test, tester or data recorder, type of observation, results and acceptability, actions taken in connection with deviations, and the person evaluating the test results.

In qualification and acceptance testing, the test results are reviewed against established criteria. Any deviations are resolved and the resolution documented prior to acceptance.

12.0 CONTROL OF MEASURING AND TEST EQUIPMENT

The control of measuring and test equipment to assure that tools, gages, instruments, and other measuring and testing devices used in activities affecting quality are properly controlled, calibrated and adjusted to maintain accuracy is imposed on subcontractors. The requirements of Supplement 12S-1 to ANSI/ASME NQA-1-1986 are imposed on subcontractors as specified in established procedures.

13.0 HANDLING, STORAGE AND SHIPPING

13.1 General

Handling, storage and shipping activities for which NWT is responsible are conducted in accordance with documented instructions, procedures and drawings as necessary to prevent damage and deterioration of items. These instructions are developed by the cognizant engineer or by suppliers where specified in procurement documents.

13.2 Purchased Components Equipment and Materials

In preparing procurement documents, the cognizant engineer is responsible for including any necessary instructions or requirements for cleaning, coating, protective packaging, shipping and storage of the items purchased. The amount of detail of the specified requirements is dependent on the sensitivity of the item to the environment during fabrication, shipping and subsequent storage prior to use. General controls are specified on complex items or major procurements by invoking generic or specific quality assurance systems requirements, as appropriate. The methods used by the supplier for packaging, handling, shipping and storage are reviewed by the cognizant engineer. The supplier's procedures for control of the handling, storage and shipping functions are evaluated during pre-award surveys and monitored during source surveillance as stated in Section 7.0.

13.3 Handling, Storage and Shipping

Following procurement, items are handled, packaged, cleaned and stored in a manner to prevent damage, deterioration or loss. The amount of detail of the specified requirements is dependent on the sensitivity of the item to the environment during testing, fabrication, shipping or storage.

13.3.1 Handling

Components and assemblies are handled in such a manner as to minimize possible damage. Special lifting tools, as required, are inspected and functionally tested to drawing requirements. Handling and storage of assemblies during fabrication and test facility operations are conducted in accordance with operating instructions.

13.3.2 Preservation, Packaging and Storage

In-process or completed items, assemblies and test samples are packaged and stored in accordance with NWT requirements.

13.3.3 Cleaning

Components and hardware are thoroughly cleaned in accordance with established procedures and after cleaning and visual inspection, are appropriately packaged.

13.3.4 Classification and Planning

Appropriate shipping procedures and containers are developed for items susceptible to damage to provide protective measures to prevent damage, deterioration during packaging and shipping.

13.3.5 Implementation

The shipping containers are inspected prior to and after loading to assure proper packaging for storage and shipping. When required for items, assemblies or test samples, special equipment such as containers, shock absorbers and accelerometers and special protective environments, such as inert gas atmosphere, specific moisture content level and temperature levels shall be specified, provided and their existence verified.

14.0 INSPECTION, TEST AND OPERATING STATUS

14.1 General

In addition to requirements for controlling identification and traceability of items as described in Section 8.0, NWT provides for maintenance of inspection, test and operating status of equipment being assembled or items and services provided for use. This control is exercised by means of route cards, labels, tags, or other suitable means and provides assurance that the acceptability status of items, or components thereof, and services is known throughout the procurement, manufacturing, testing, installation and operation phases, as appropriate, so that the items, components and services as supplied to the customer meet all contract requirements.

14.2 Procured Equipment and Material

NWT procurement quality requirements specify that suppliers shall establish procedures to indicate the inspection, test and operating status of items, or components thereof, being supplied

Suppliers' procedures and implementation are monitored for compliance during surveillance activities.

Upon receipt, procured items and materials are subject to receiving inspection utilizing the purchase order and requirements referenced or contained therein as the basis for determining acceptability. Supplier packing lists, test and inspection certifications, and material and container markings are required and are verified as present and conforming to order requirements. Only acceptable items are released and are marked either directly or with tags with material identity.

15.0 CONTROL OF NONCONFORMING ITEMS

15.1 General

Equipment, components or materials which do not conform to documented requirements are identified and segregated (or if too large to segregate, identified as nonconforming and roped off or tagged as nonconforming) to prevent further use or processing. Procedures establish methods to assure positive identification of nonconforming products and services. These procedures require that nonconformances be documented and dispositioned on appropriate forms.

Nonconformances discovered at suppliers are documented and dispositioned on a Variation Request (VR) (or equivalent) by the responsible engineering organization with concurrence by Quality Assurance. Concurrence by Quality Assurance signifies that adequate support for the engineering organization disposition has been obtained and documented and that any reinspections or special controls required to correct the nonconformance are adequately specified.

Nonconformances involving "rework" or "repair" require reinspection to verify conformance. This reinspection is equivalent to the original inspection.

Records of nonconformances and disposition are maintained with the inspection records for the item involved to document the as-built condition, as required by contract.

16.0 CORRECTIVE ACTION

16.1 General

In addition to the immediate action required to disposition nonconformances covered in Section 15.0, corrective action programs to preclude recurrence of significant problems are in effect. Quality Assurance identifies areas requiring corrective action based on evaluation of problems identified from such sources as nonconformances, failures, malfunctions and other deviations from requirements. Problems are also identified during audit, inspection and surveillance activities. Corrective action emphasizes determining and correcting the underlying causes of problems, especially for any recurring conditions, as a major element in reducing costs and improving reliability. Quality Assurance has the authority to control work until effective corrective action has been taken in situations where it judges that existing conditions may compromise the quality of NWT work.

16.2 Corrective Action Program

The need for corrective action is formally communicated to the organization responsible and to appropriate management.

To preclude recurrence of significant deficiencies, the corrective action program provides for the following:

A. Description of the problem (and cause, if known).

B. Response by organization responsible for corrective action.

C. Recommended corrective action to preclude recurrence.

D. Assignment of responsibility for corrective action.

E. Periodic evaluation of the status and effectiveness of corrective action.

Where immediate corrective action is judged to be necessary by Quality Assurance to prevent conditions significantly adverse to quality, safety or reliability, a stop work order may be issued to place further operations on "hold," or special controls may be established to enable further operations to be conducted, until corrective action is completed and verified to be effective.

17.0 QUALITY ASSURANCE RECORDS

17.1 General

Records that furnish documentary evidence of quality on this contract are specified, prepared and maintained in accordance with established requirements. Records are required to be legible, identifiable and retrievable. Records are protected against damage, deterioration or loss. Responsibilities for record transmittal, distribution, retention and maintenance are established and documented.

17.2 Records Administration

17.2.1 Records System

A records system has been established which complies with the general requirements of ANSI/ASME NQA-1-1986, Element 17, "Quality Assurance Records," including Supplement 17S-1 and Appendix 17A-1. The records system is defined, implemented and enforced in accordance with written procedures and instructions.

The records procedures include control of records withdrawn from storage which may be required during the completion of work activity.

17.2.2 Generation of Records

Applicable design specifications, design verification documents, procurement documents, mockup test procedures and other documents will cause the records cited in 17.1 to be generated. Documents that are designated to become records are required to be legible, accurate and complete appropriate to the work accomplished.

17.2.3 Record Validation

Documents are considered valid records, subject to the record system Quality Assurance requirements cited in Section 17.2.1, only after being stamped, initialed or signed and dated by authorized personnel, or otherwise authenticated. This authentication may take the form of a statement by the responsible individual or organization. Handwritten signatures are not required if the document is clearly identified as a statement by the reporting individual or organization. Those records may be originals or reproduced copies.

17.2.4 Index

The records are indexed. The indexing system(s) includes record retention times and the location of the record within the record system.

17.2.5 Distribution

The records are distributed, handled and controlled, as required, in accordance with written procedures.

17.2.6 Identification

The records and indexing system provide sufficient information to permit traceability between the record and the item or activity to which it applies.

17.2.7 Classification

Records will be classified as "Lifetime" by NWT in accordance with ASME/ANSI NQA-1-1986, Appendix 17A-1.

17.2.8 Retention of Records

Records will be maintained for the life of the item or component or until such time as they are turned over to some higher authority (owner) for permanent retention.

17.2.9 Corrected Information in Records

Records may be corrected in accordance with procedures that provide for appropriate review or approval by the originating organization. The corrected documentation includes the date and identification of the person making such correction.

17.2.10 Lost or Damaged Records

If replacement or restoration of lost or damaged records is not practical, action is taken to assure the quality of items or activities affecting quality by alternate means (e.g., reexamination or investigation).

17.3 Receipt

The individual or organization responsible for receiving records provides protection from damage or loss during the time that records are in their possession.

17.4 Storage, Preservation and Safekeeping

17.4.1 Storage

Duplicate copies of records will be maintained and controlled in separate locations within NWT until such time as the records are transferred to the NRC approved Corporate Records Center or transferred to their designated owner.

17.4.2 Preservation

Records will be stored in a manner approved by the organization or organizations responsible for storage. To preclude deterioration of the records the requirements of (A) through (C) below shall apply.

A. Provisions will be made in the storage arrangement to prevent damage from moisture, temperature and pressure.

B. Records will be firmly attached in binders or placed in folders or envelopes for storage in steel file cabinets or on shelving in containers.

C. Provisions will be made for special processed records (such as radiographs, photographs, negatives, microform and magnetic media) to prevent damage from excessive light, stacking, electromagnetic fields, temperature and humidity.

17.4.3 Safekeeping

Measures will be established to preclude the entry of unauthorized personnel into the storage area.

Measures will be taken to provide for replacement, restoration or substitution of lost or damaged records.

17.4.4 Facility

NWT maintains duplicate records in separate locations. These records are stored in file cabinets within a 24-hour controlled-access, climate-controlled building.

17.5 Retrieval

Storage systems provide for retrieval of information in accordance with planned retrieval times based upon the record type.

A list is maintained designating those personnel who are permitted access to the files.

Records maintained by a supplier at his facility or other location are accessible to NWT.

17.6 Disposition

Records accumulated by NWT, prior to transfer to the owner or other higher authority, will be made accessible during the life of the item. The custodian will inventory the submittals, acknowledge receipt and process these records in accordance with this Quality Assurance Program Plan.

18.0 AUDITS

18.1 General

The audit program complies with ANSI/ASME NQA-1-1986 and is maintained and implemented to verify adequacy of systems and procedures and compliance to such systems and procedures. Quality Assurance audits subcontractors and also performs internal audits of NWT activities. These audits cover activities and areas which come under the provisions of this Quality Assurance Program Plan.

18.2 Audit Planning

Quality Assurance schedules and plans Quality Assurance audits of NWT and its subcontractors. Suggestions as to audit planning and scheduling from the Engineering, Project Management and other departments are considered in audit planning. Audits are conducted in those areas affecting the quality of NWT work. An overall Quality Assurance program audit schedule is maintained by Quality Assurance to assure that product line or department activities affecting quality are audited periodically. For internal audits, the audit schedule provides for audits of activities important to safety at least once a year, or once within the life of the activity, whichever is shorter. Audits of subcontractors or suppliers are planned to take place at times when there is sufficient work in progress to effectively evaluate the program.

Audit teams consist of personnel with appropriate training and experience to evaluate the adequacy and implementation of policies, systems and procedures, and to evaluate products and services as appropriate. To preserve objectivity in the audits, the audit team excludes members having direct responsibility for the area or activity being audited.

Audit plans are developed and documented in accordance with written procedures including identification of team leaders, functional areas to be audited, schedule and checklists. When available, prior audit results of the area being audited are considered in the audit plans to assure that previously

deficient areas are rechecked. Likewise, consideration is given to experience since the last audit, particularly in regard to deficiencies and nonconformances.

18.3 Auditor Training

Lead auditors are trained and certified to meet the qualification requirements of ANSI/ASME NQA-1-1986, Supplement 2S-3. Auditors receive training by accompanying experienced auditors during internal audits or on visits to suppliers and on-the-job practical application (e.g., developing checklists, conducting internal audits, preparing audit reports, responding to audit reports and following up on corrective actions) with senior personnel.

18.4 Audit Scope

Audits are conducted to evaluate control of activities affecting quality in a specific organizational unit or work area. The purpose is to determine that the methods, procedures, system or instructions used and interfaces are adequate to control the quality of the product or service and to determine compliance with procedural requirements.

Audits may include evaluation of products and special processes to assure they conform to specified drawings, specifications, codes and standards. These evaluations include, as appropriate, examination of records such as inspection reports, X-ray film, etc. They also include evaluations of personnel qualifications and procedures used in special processes such as nondestructive testing and welding.

18.5 Audit Reporting and Corrective Action

Within thirty (30) days following an audit, the assigned Quality Assurance representative prepares and distributes a written report of the audit. The report may be in letter form but must contain the following information as a minimum.

A. Description of the audit scope.

B. Identification of the audit team.

C. Identification of persons contacted during audit.

D. Summary of audit results including an assessment of the effectiveness of the audited QA Program elements.

E. Description of each adverse audit concern in sufficient detail to enable corrective action to be taken.

The reports require that the audited organization(s) reply within thirty (30) days following receipt of the audit report, identifying planned corrective actions for deficiencies and a schedule for implementing the corrective actions.

Quality Assurance follow-up of the corrective action is accomplished by the assigned lead auditor. Quality Assurance has the responsibility for determining that an indicated corrective action has been effectively implemented.

18.6 External Audits

Quality Assurance will coordinate customer, regulatory or other agency audits of the contract scope. Quality Assurance is also responsible for coordinating the preparation of responses to customer audits on a timely basis (usually within thirty (30) days of audit report receipt) and for following up on any indicated corrective action.