1 ORGANIZATION

1.1 GENERAL

Organizational structuring and functional responsibility assignments in the NEBG are based on recognition of QA as an interdisciplinary function with quality-related activities being performed by many organizational components and individuals from top-level management down to individual contributors.

The authorities and responsibilities of persons and organizations performing quality-related activities are established, assigned, and documented in formal document systems. Persons and organizations assigned QA functions are given appropriate and sufficient authority and organizational freedom to: identify quality problems; initiate, recommend, or provide solutions to quality problems; verify implementations of the solutions, and prevent further processing, delivery, installation, or utilization of nonconforming items until proper dispositioning has occurred.

The organizational structure and functional responsibility assignments are such that: (1) attainment of quality objectives is accomplished by individuals assigned responsibility for specifying quality requirements or performing work to specifications, (2) verification of conformance to established quality requirements is accomplished by those who do not have direct responsibility for specifying, producing, or expediting products; and (3) personnel in key QA functions have direct access to top-level NEBG management. 1

1.2 ORGANIZATIONAL FUNCTIONS

An abbreviated organization chart showing the NEBG, and specifically those organizational components concerned with supplying BWR systems and components, is shown as Figure 1-1. Figures 1-2 through 1-7 provide additional detail structuring of the NEBG organizations performing QA activities during design, procurement, manufacturing, site construction, and testing.

The Manager of P&QAO and the General Managers of the Nuclear Engineering Division (Engr. Div.), the Nuclear Power Systems Division (Pwr. Sys. Div.), the Nuclear Products Division (Prod. Div.), and the Nuclear Fuel and Services Division (Fuel & Svcs. Div.) all report directly to the Senior Vice President and Group Executive of the NEBG. 1

The P&QAO is a staff organization assigned responsibility for establishing the NEBG-level quality-related policies, instructions, and procedures, and for integrating, measuring, and auditing the various functional organizations involved in the BWR business. Procedures and practices are evaluated to assure conformance with applicable GE Corporate and NEBG quality-related policies, instructions, and procedures, and to assure integration of individual quality planning into an overall QA Program. The P&QAO is responsible for auditing compliance of the overall QA Program with applicable codes, standards, and regulations. The P&QAO is also assigned the responsibility for monitoring the technical excellence of the GE BWR by participating in management review boards independent of the comprehensive design verification and review programs carried out by the line organizations. The Manager, P&QAO, is further assigned responsibility for QA communication to the QA line organizations within the NEBG by providing technical guidance, advice, and counsel based on current QA technology as it relates to the BWR business. This technical guidance, advice, and counsel is directed toward specifying how the line organizations are to comply with the NEBG Product Quality Policy and related instructions and procedures. The QA communications relationships for the BWR business are shown in Figure 1-8.

The NEBG Senior Vice President and Group Executive has established a BWR Quality Council to aid in fulfilling the assigned integration and QA communications responsibilities and to provide a communications medium within the NEBG and to the NEBG Senior Vice President and Group Executive on BWR quality-related matters. One of the primary objectives of the Council is to assure total quality system coverage, uniformity, consistency, and continuity, while eliminating system deficiencies and redundancies. The Council is chaired by the Manager-P&QAO and consists of the managers responsible for QA in each of the major organizations within the NEBG. The Council normally meets quarterly to review the status of quality-related programs and projects and to plan future efforts. The Council provides QA managers in the line organizations with direct access to top-level management and provides a forum for the review of quality problems and corrective actions. Membership in the BWR Quality Council is shown in Figure 1-8. 1

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The Engr. Div., Pwr. Sys. Div., Prod. Div., and Fuel & Svcs. Div. are line organizations with responsibility for planning and implementing the QA functions performed within their areas of responsibility. Procedures require that the detailed QA program planning and implementation performed by these line organizations comply with the overall quality system requirements which are established by P&QAO in the NEBG Product Quality Policy and quality-related Instructions and Procedures. The QA activites related to design, procurement, manufacture and project management, as they are performed by the line organizations, are described in the succeeding paragraphs.

Administrative control (salary review, hire/fire, position assignment) and technical QA direction of the activities of each department-level organization are the responsibility of the individual department-level managers. The individual QA managers have the authority, independence, and organizational freedom to identify quality-related problems; initiate, recommend, or provide solutions to conditions adverse to quality; and to verify implementation of such solutions. Each QA manager is provided a direct line of communication to his department-level manager on all quality-related matters (Figure 1-8).

The overall BWR system design and the detail design of items of equipment manufactured by the NEBG organizations are provided by the NEBG engineering organizations. Detailed design of items of equipment fabricated by subcontractors for direct shipment to the reactor site is provided by NEBG engineering or by a subcontractor, subject to NEBG approval. Detail design of the NEBG-supplied systems and components, whether fabricated by the NEBG or its subcontractors, is required to meet NEBG specified system design requirements by application of appropriate specifications and design controls. A continuity of engineering control is maintained from the conceptual design phase through material procurement, manufacturing, field installations, and preoperational and startup testing. To assure compatibility with Owner*/AE design scope, GE has identified specific interface requirements needed for input to GE designs in a series of fill-in questionnaire documents which are furnished to the Owner/AE for completion and return to GE engineering organizations during the design phase. The NEBG engineering organizations have design change control responsibility for all NEBG-designed systems and components. Development engineering organizations contribute to the overall quality system by providing basic technical information and advanced inspection techniques resulting from planned development programs and through performance of necessary development and qualification tests.

The QA activities related to NEBG-manufactured products are under the direction of the various managers of QA. The Manager, Quality Assurance, Wilmington Manufacturing Department (WMD), is responsible for providing QA planning and QA program implementation for equipment such as control rods, control rod drives (CRD's), steam separators, CRD hydraulic control modules, fuel bundles, channels, and fuel assembly components, which are manufactured in Wilmington, North Carolina. He is also responsible for providing QA planning and QA program implementation for purchased material and equipment used in the manufacture of WMD products. The Manager, Quality Assurance, Nuclear Control and Instrumentation Department (NC&ID), is responsible for providing QA planning and QA program implementation for equipment such as sensors, instrument panels and racks, peripheral electrical sensing and control equipment, and reactor servicing tools and equipment which are manufactured by NC&ID in San Jose, California. He is also responsible for providing QA planning and QA program implementation for purchased material and services applied to the manufacture of NC&ID products. These QA managers report directly to their respective department general managers and are at the same organizational level as other managers who have product scheduling, expediting, and fabricating responsibilities; however, the QA manager's responsibilities are separate and independent from these other managers. Products are not released for shipment without the approval of the QA manager or his designee.

The QA Program for procured engineered equipment is under the direction of the Manager, Quality Assurance Engineered Equipment and Installation (QAEE&I), who reports directly to the Manager, Engineered Equipment Procurement Operation (EEPO), and is at the same organizational level as managers with procurement, product scheduling, and expediting responsibilites. The QA manager's responsibilities, however, are separate and independent from these other organizations. The Manager — QAEE&I is responsible for defining QA requirements to suppliers of engineered equipment and services and for assuring supplier compliance with NEBG requirements through surveillance, audits, and review and approval of quality-related documentation. The NEBG quality reviews of Owner/AE/Constructor field installation activities are performed by the QC Site Representative, under the direction of the Manager, QAEE&I. The purpose of such reviews is to

*The Owner of the nuclear power plant, also designated as "applicant" in Appendix B of 10CFR Part 50.

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verify that NEBG systems and components are properly received, handled, stored, and installed in compliance with NEBG requirements. These reviews are intended to satisfy NEBG interests relative to warranty fulfillment. When NEBG is responsible for implementation of changes, modification, completion of manufacturing actions, or other field construction activity with respect to equipment supplied by NEBG, the QC Site Representative provides surveillance, monitoring, auditing, and other QA/QC activities. 1

The QA Program for Spent Fuel Services Operation (SFSO) designed or procured equipment is under the direction of the Manager, Quality Assurance Programs, SFSO, who reports directly to the Manager, SFSO. The QA Manager is responsible for providing QA planning, for assuring that appropriate quality requirements are included in the design, procurement, and installation of SFSO equipment, such as high density spent fuel storage racks; and, for assuring that all applicable regulatory, customer, and GE quality requirements are met in SFSO products. 1

Liaison between the Owner and NEBG on all NSSS or STRIDE quality-related matters is through the appropriate Project Manager. Liaison between the Owner and NEBG on nuclear fuel quality-related matters is through the Fuel Project Manager. The NSSS, STRIDE, and Fuel Project Managers are responsible for assuring that unique contract requirements involving quality-related matters are transmitted to the affected line organizations within the NEBG for planning and implementation. The Nuclear Safety and Licensing Operation of the Pwr. Sys. Div. has the primary responsibility for defining the BWR product safety standards and for assuring that applicable new regulatory requirements related to quality and safety are made known to the responsible functional organizations within the NEBG. When the Owner is responsible for installation and testing of NEBG-supplied systems and components, technical direction* during field installation and preoperational and startup testing is provided to the Owner by the NEBG Resident Site Manager and staff. Quality assurance planning and services are provided to the NEBG Resident Site Manager by the assigned NEBG QC Site Representative from QAEE&I and other QA organizations, as needed. Installation, preoperational, and startup testing engineers and specialists assigned to the NEBG Resident Site Manager have the responsibility for planning and providing technical direction for the installation, preoperational, and startup testing activities. Changes to plant design, resulting in changes to delivered equipment or systems, are handled in one of two ways. First, if the Owner is responsible to implement the change, where NEBG has provided the design and/or hardware required by the change, NEBG supplies technical direction and quality reviews of the implementation of the change. Second, if the change results in a responsibility by NEBG for incorporation of the change, NEBG provides or procures implementation services and also provides inspection or surveillance at the point of implementation to verify acceptable implementation of the change requirements. Manufacturing and testing work which is normally done in the manufacturing facilities of NEBG, or its suppliers, but which has been deferred for field implementation, is provided or obtained by NEBG. Inspection or surveillance is provided by NEBG to verify acceptable implementation of work requirements. 1 1 1 1

Established QA communication relationships within the NEBG, including a channel of communications directly between each of the QA line organizations and their department-level managers are shown in Figure 1-8. A separate channel of communications is also available for line QA managers to the Manager, P&QAO, through the BWR Quality Council. This communication channel is established for developing common solutions to quality-related problems, and for providing a second line of communication to NEBG management on such quality-related matters as stop-work actions. 1

The tabulation in Table 1-1, "BWR Quality Assurance Organizational Responsibilities," identifies the NEBG organizations having line responsibilities for specifying, attaining, and verifying quality requirements for NEBG-supplied systems, components, and services. Additional detail responsibilities are further identified in other sections of this program description.

A summary of prime and contributing functional responsibilities for each of the NEBG division-level organizations is shown in Table 1-2. A further breakdown of functional responsibilities for NEBG QA organizations and other major organizations performing quality-related functions for BWR systems and components is detailed in Subsection 1.3.

*Technical direction is defined as technical guidance, advice, and counsel based on current engineering and installation practices, which is provided to the Owner's staff.

1.3 QA FUNCTIONAL RESPONSIBILITIES

1.3.1 Staff QA Organizations

- *Quality Assurance Section (P&QAO)*

  For the NEBG, the Quality Assurance Section (QAS) of P&QAO has the responsibility for coordinating and integrating the BWR QA Program as it relates to manufacturing, procurement, and construction, by appropriate means including:

  - Developing the NEBG policies, instructions, and procedures related to manufacturing, procurement, and construction QA.
  - Representing the NEBG to customers, the NRC, and other government authorities on matters regarding the manufacturing, procurement, and construction aspects of the overall BWR QA Program.
  - Auditing the NEBG manufacturing, procurement, and construction organizations for compliance with their approved quality-related procedures and instructions.
  - Providing assistance to the NEBG marketing and legal organizations on manufacturing, procurement, and construction-related quality system matters, as requested.
  - Administering a lending library of the various NEBG organizations' key QA manuals and quality-related procedures manuals for loan to customers and potential customers.
  - Providing technical support and consultation to the NEBG licensing activities, as requested.
  - Providing quality system and auditing consultation services to the NEBG organizations, as requested.
  - Initiating stop-work recommendations to the affected NEBG manager, as necessary, to prevent further processing, delivery, installation, or utilization of nonconforming or suspect items until proper dispositioning has occurred.

- *Product Assurance Section (P&QAO)*

  For the NEBG, the Product Assurance Section (PAS) of P&QAO has the responsibility for coordinating and integrating the BWR QA Program as related to project management and engineering by appropriate means, including:

  - Developing the NEBG policies, instructions, and procedures related to project management and engineering QA activities.
  - Representing NEBG to customers, the NRC, and other governmental authorities on matters regarding project management and engineering aspects of the overall BWR QA Program.
  - Auditing the NEBG engineering and project management organizations for compliance with approved quality systems, procedures, and instructions.
  - Providing assistance to the NEBG marketing, legal, and projects organizations on engineering-related quality system matters, as requested.
  - Initiating stop-work recommendations to the affected NEBG manager, as necessary, to prevent further processing, delivery, installation, or utilization of nonconforming or suspect items until proper dispositioning has occurred.

- Providing guidance to line organizations on matters related to engineering or project management QA activities. 1

- Participating in selected design reviews.

1.3.2 Line Organizations — QA

- *Quality Assurance — NC&ID, [illegible]MD, and SFSO* 1

For their assigned product scope, each line QA organization has the responsibility for assuring conformance with applicable design and QA requirements by appropriate means, including: 1

- Developing and documenting a quality system in compliance with the NEBG policies, procedures, and instructions, and applicable codes, standards, and regulatory requirements.

- Conducting preproduction reviews with engineering to assure mutual understanding of design requirements and manufacturing capability.

- Preparing product and process quality planning to assure conformance with applicable drawings, specifications, and special instructions issued by design engineering organizations.

- Providing control of purchased material and services, including necessary surveillance of suppliers to assure that purchased materials and components are provided at proper quality levels and that quality-related procurement document requirements are satisfied.

- Providing product and process control to assure that quality planning is properly interpreted and implemented.

- Providing required receiving, in-process, and final inspection and testing in accordance with QA documented inspection and test procedures.

- Providing for the calibration and control of measuring and test equipment.

- Providing for the effective control of nonconforming materials, parts, and components, including stop-work authority.

- Assuring provision of programs for the required training, qualification, and certification of personnel.

- Assuring provision for control of handling, storage, and shipping.

- Assuring provision of a formal corrective action system.

- Assuring provisions for generation, collection, transmittal or storage, maintenance and retrieval of all necessary quality records.

- Assuring provisions for audit and other measurements of the effectiveness of the quality system, including supplier quality systems.

- Providing product release control and certification of product quality.

- Providing product quality-related problem analyses and initiating or recommending appropriate action.

- Providing quality assurance planning and requirements for inspection and testing for field implementation of product changes or completion of manufacturing actions, which will provide assurance of specified product quality. 1

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- Providing for qualification of suppliers of services necessary for field implementation of the design changes or completion of the manufacturing actions deferred for field implementation.

- Providing, or obtaining provision for, quality assurance and control actions necessary to assure acceptable compliance with the quality assurance planning, inspection, and testing requirements established in change documentation and services purchase orders.

- *Quality Assurance — Engineered Equipment and Installation (QAEE&I)*

For procured engineered equipment and design services other than for controls and instrumentation, assure supplier conformance with applicable design and QA requirements by appropriate means, including:

- Developing and documenting a quality system in compliance with the NEBG quality policies, procedures and instructions, and applicable codes, standards, and regulatory requirements.

- Reviewing supplier QA Programs for adequacy.

- Conducting pre-award evaluations to establish supplier qualification.

- Conducting pre-procurement review with engineering and procurement, as necessary, to assure clear understanding of quality requirements.

- Providing quality planning which defines supplier QA program requirements and check lists which define audit requirements.

- Providing audit/surveillance of supplier quality-system and activities during manufacturing.

- Reviewing and approving identified supplier fabrication, test, and inspection procedures.

- Providing for the accumulation, review, approval, and transmittal of supplier QA records to be transmitted to or retained for the Owner.

- Providing for the review and approval or disapproval of supplier deviations from specified quality requirements.

- Assuring that all required supplier documentation has been reviewed, approved, and shipped to the site or stored, as required.

- Initiating stop work orders through procurement to prevent further processing, utilization, or shipment of nonconforming or suspect items until proper dispositioning has occurred.

- Providing quality assurance planning and requirements for inspection and testing for field implementation of product changes or completion of manufacturing actions which will provide assurance of specified product quality.

- Providing surveillance, monitoring, inspection, auditing, and other activities as necessary to assure acceptable implementation of NEBG provided or procured services for changes, modifications, or manufacturing completion of systems or components in the field.

For NSSS equipment QAEE&I assures that the Owner conforms with applicable NEBG installation requirements by appropriate means, including:

- Reviewing and approving selected Owner/AE/Constructor installation procedures.

- Providing site surveillance planning for implementation by the NEBG Quality Control Site Representative.

- Performing surveillance of Owner/AE/Constructor conformance with NEBG-supplied installation and test documents. 1

- Providing feedback and analysis of installation quality problems and implementation of preventive or corrective action to assure Owner/AE/Constructor compliance with NEBG requirements. 1

- *Quality Assurance — Nuclear Services Department (NSD)*

  For NSD, develop, document, and maintain quality systems for quality-related activities which effectively meet the requirements of the overall BWR QA Program by appropriate means, including:

  - Providing functional guidance and direction to NSD managers and engineers in implementing applicable portions of the BWR QA Program, and in responding to both internal and external QA audits of NSD activities.

  - Planning and directing preparation of the QA input to customer bid specifications and purchase orders for NSD scope. 1

  - Integrating and coordinating the NSD QA responsibilities for material, equipment, and services supplied by NSD.

  - Recommending indoctrination and training programs to NSD management to assure suitable proficiency is achieved and maintained by NSD personnel for activities affecting quality.

  - Planning, directing, and executing periodic audits of NSD quality-related activities and reporting findings to management, including recommended corrective action.

- *Quality Assurance — Engineering Organizations*

  For the BWR scope of supply, the NEBG engineering organizations are responsible for product design and design control by appropriate means, including:

  - Developing and documenting a quality system for engineering work in compliance with NEBG quality policies, instructions, procedures, contractual commitments and applicable regulatory requirements.

  - Providing quality planning for engineering which defines engineering QA program and audit requirements.

  - Assuring incorporation of applicable regulatory requirements, codes, standards, criteria, and design bases in the design.

  - Assuring incorporation of project design requirements into the design.

  - Translating the design information onto the appropriate design documents.

  - Verifying design adequacy either through independent design review, the use of alternate or simplified calculational methods, or by the performance of a suitable testing program.

  - Coordinating design activities among interfacing design engineers and design organizations.

  - Reviewing, approving, issuing, and distributing design documents under a controlled document system.

  - Controlling design changes and changes to design documents in accordance with documented procedures.

  - Providing for the retention, storage, control and retrievability of design record documents.

- Taking corrective action as necessary to correct design errors and to improve the design control function.
- Conducting periodic audits of design activities that affect product quality.
- Reviewing and approving proposed deviation dispositions to NEBG-supplied equipment as documented on Field Deviation Disposition Requests (FDDR's) or providing an alternate acceptable disposition for field identified equipment problems.
- Assuring that approved solutions to field identified equipment problems contain quantitative or qualitative engineering quality requirements that can be measured and verified in the field.
- Issuing Field Disposition Instructions (FDI's) which clearly identify required work to be performed on equipment or systems that have been delivered to the sites.
- Assuring that issued FDI's contain quantitative or qualitative engineering quality requirements that can be measured and verified in the field.
- Assuring that FDDR's and FDI's are reviewed by quality assurance organizations for identification of quantitative or qualitative quality requirements before release to the field for implementation.

- *Quality Assurance — Projects Organizations*

For Pwr. Sys. Div. coordinate and integrate those QA-related activities essential for support of Project Management and resolution of Owner quality-related problems by appropriate means, including:

- Providing Pwr. Sys. Div. Policies and Procedures concerning quality-related activities within the Division scope of responsibility.
- Assuring that utility Owners and AE's are apprised of the BWR QA program during audits and that the GE responses to customer audit reports adequately describe the systems meeting the requirements of 10CFR50, Appendix B, and that appropriate corrective action is initiated when necessary.
- Conducting periodic audits of project activities that affect product quality.
- Monitoring initiated corrective action for completion by the affected Pwr. Sys. Div. organization.
- Providing quality system services for project organizations.

1.3.3 Project Management Organizations

- *Project Management — NSSS or Standard Reactor Island Design (STRIDE)*

The NSSS or STRIDE Project Manager maintains interface relationships with the Owner, Architect Engineer and Constructor, as well as cognizant GE personnel to assure provision of licensing, engineering, QA, and equipment supply activities by appropriate means, including:

- Directing the NEBG performing organizations and others, as applicable, as to the contract scope of supply and the basis definition, and changes thereto.
- Providing control of design interfaces with engineering, the AE, Constructor, the Owner, and in the case of STRIDE contracts, with the subcontractor-designer through STRIDE project management.
- Monitoring to assure contract commitments are satisfied.

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- Providing for coordination, integration, and project management of requisition activities performed by contributing NEBG organizations.

- Maintaining recognition of quality requirements for systems and components, and taking appropriate action to maintain consistent requirements.

- Identifying the organization (NEBG or Owner) responsibile to implement the requirements of the FDDR's or FDI's.

- Providing technical direction to the Owner for field installation and preoperational and startup testing of NEBG-supplied systems and components. 1

- Providing site management and coordination of quality assurance planning and services received from the QAEE&I Site QC representative for installation and testing of NEBG-supplied equipment and systems.

- Providing confirmation of acceptable completion of changes, modifications, or completion of manufacturing of systems or components as identified on FDDR's or FDI's.

- Providing the Owner with appropriate information as to the status of the project and applicable revisions of project documentation as required by contract.

- *Project Management — Fuel Projects*

The Fuel Project Manager maintains interface relationships with the Owner for nuclear fuel contracts and assures provision of engineering, QA, and equipment supply activities by appropriate means, including:

- Directing NEBG performing organizations and others, as applicable, as to the contract scope of supply and the basis definition, and changes thereto.

- Monitoring to assure contract commitments are satisfied.

- Providing for coordination, integration, and project management of fuel requisition activities performed by contributing NEBG organizations.

- Maintaining recognition of fuel quality requirements and taking appropriate action to maintain consistent requirements.

- Providing the Owner with appropriate information as to the status of the project and applicable revisions of project documentation as required by contract.

- *Project Management — Spent Fuel Services* 1

The Project Manager maintains interface relationships with the Owner and assures provision of engineering, QA, and equipment supply activities by appropriate means, including:

- Directing NEBG performing organizations and others, as applicable, as to the contract scope of supply and the basis definition, and changes thereto.

- Monitoring to assure contract commitments are satisfied.

- Maintaining recognition of applicable quality requirements and taking appropriate action to maintain consistent requirements.

- Providing the Owner with appropriate information as to the status of the program and applicable revisions of program documentation as required by contract.

1.4 QA PERSONNEL RESPONSIBILITIES AND QUALIFICATIONS

The responsibilities, educati and experience requirements of individuals assigned to QA-related managerial and individual contributor positions are formally documented in the NEBG position guides which are approved and periodically reviewed by designated levels of management. The responsibilities and qualification requirements of individuals performing inspection and testing operations are formally documented in job descriptions, which are also approved and periodically reviewed by designated levels of management. Qualification requirements for managers responsible for QA activities on BWR projects are shown below:

Staff Organizations

Titles	Qualification Requirements
... er, Quality Assurance, P&QAO; Manager, Product Assurance, P&QAO	BS or equivalent qualifications; at least 15 years in responsible managerial or project-type assignments, 10 years of which have been in qu... y-related work or equivalent experience in the design, construction or operation of a nuclear facility; thorough knowledge of all aspects of the BWR QA Program.
Manager, Quality Systems, P&QAO; Manager, Quality Audits, P&QAO; Manager, Engineering Systems, P&QAO; Manager, Engineering Systems Audits, P&QAO	BS or equivalent qualifications; at least 12 years in responsible managerial or project-type assignments, 7 years of which have been in quality-related work or equivalent experience in the design, construction or operation of a nuclear facility; thorough knowledge of the BWR QA Program.

Line Organizations

Titles	Qualification Requirements
Manager QAEE&I, NEEPO, Engr. Div. Manager, QA, NC&ID, Prod. Div. Manager, QA, WMD, Prod. Div. Manager, QA, NREO, Engr. Div. Manager, QA, NESO, Engr. Div. Manager, T&AP, NPCO, Pwr. Sys. Div. Manager, QAP, SFSO, Fuel & Svcs. Div.	BS or equivalent qualifications; at least 10 years in responsible managerial or project-type assignments, 5 years of which have been in quality-related work, or equivalent experience in the design, construction, or operation of a nuclear facility; thorough knowledge of the QA Program for his area of responsibility.

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Table 1-1
BWR QUALITY ASSURANCE ORGANIZATIONAL RESPONSIBILITIES

Type of Equipment	Design Quality Requirements	Manufacturing Process Procedures	Manufacturing Compliance Verification
Procured Engineered Equipment and Design Services	NPSED	Supplier*	QAEE&I
Nuclear Fuel	NF&SED	Fuels Process Technology (WMD)	WMD-QA
Manufactured Reactor Equipment	NPSED	Fuels Process Technology (WMD)	WMD-QA
Manufactured Controls and Instrumentation	NC&ID Engineering	NC&ID Manufacturing	NC&ID-QA
Procured Controls and Instrumentation	NC&ID Engineering	Supplier*	NC&ID-QA
Spent Fuel Storage Equipment	Fuel Storage Project Engineering	Supplier*	SFSO-QAP

1

*Designated supplier manufacturing procedures and design documents are reviewed and approved by GE engineering or QA organizations in accordance with documented procedures.

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Table 1-2
BWR RESPONSIBILITIES/RELATIONSHIPS MATRIX

	Activity	P&QAO	Engr. Div.	Pwr. Sys. Div.	Prod. Div.	Fuel & Svcs. Div.
1.	Initial contract negotiation	C	C	P	C	P**
2.	Design specifications		P	C	P*	P**
3.	Design verification		P		P*	P**
4.	Project schedules (design)		C	P	C*	P
5.	Project schedules (delivery)		C	P	C	P
6.	PSAR technical description	C	C	P	C	P
7.	NSSS design and development		P		P*	P**
8.	Fuel design and development		P		C***	
9.	NEBG quality policy	P	C	C	C	C
10.	Product quality	C	P	P	P	P
11.	Quality systems		P	P	P	P
12.	Product audits	P	P	P	P	P
13.	Quality system audits	P	P	P	P	P
14.	Manufacturing (WMD)		C		P	
15.	Manufacturing (NC&ID)		C		P	
16.	Engineered equipment procurement		P			
17.	Installation Engineering		C	P	C	P**
18.	Preoperational & startup services		C	C	C	P
19.	Quality assurance records		P	C	P	P**
20.	Implement FDDR's/FDI's (NEBG responsibility)		C	P	C	P**

P Prime responsibility
C Contributing responsibility/relationship

†Each functional organization in the NEBG is responsible for the quality of its own output.
*NC&ID scope only.
**Fuels & Services scope only.
*** WMD scope only.

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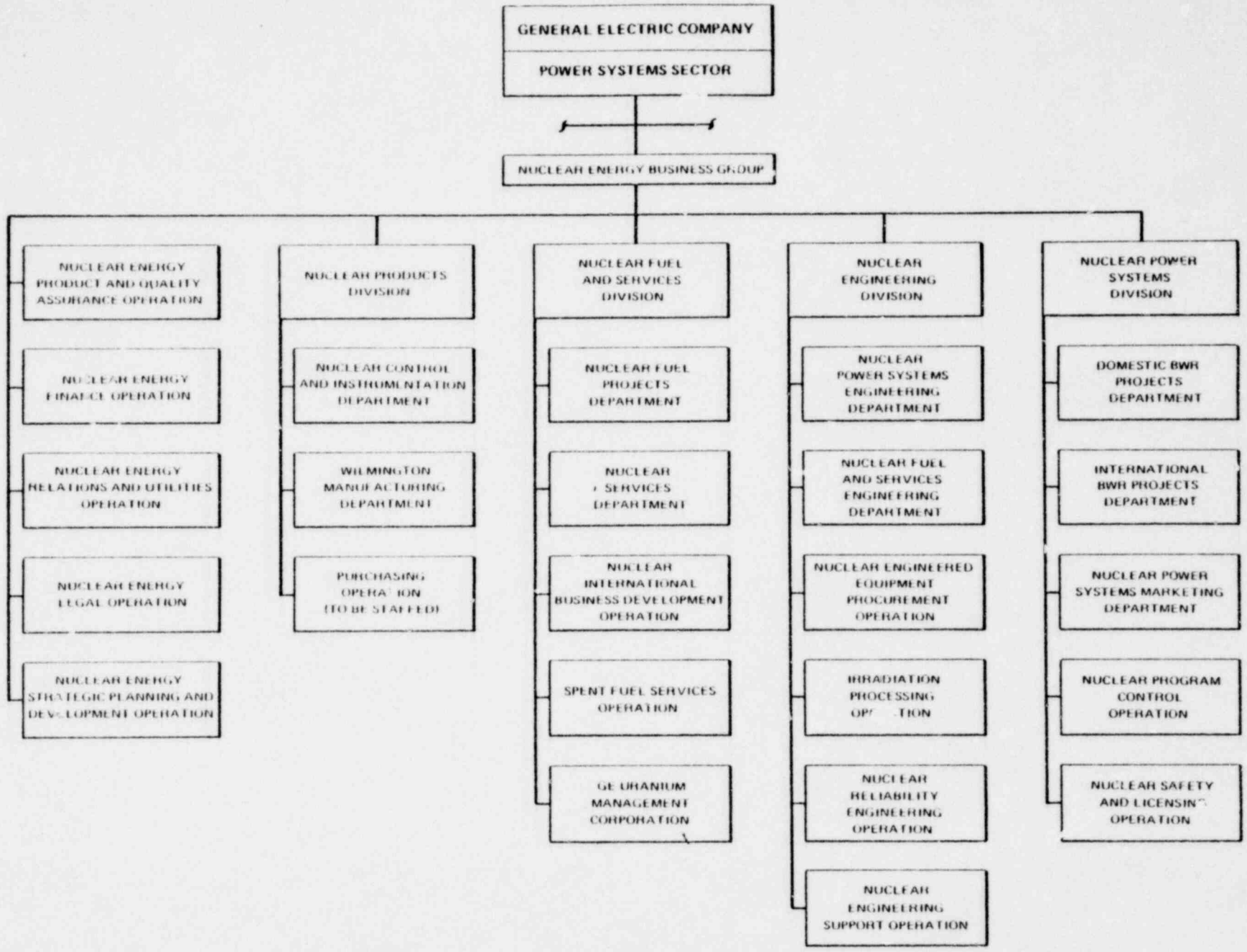

Figure 1-1. Nuclear Energy Business Group

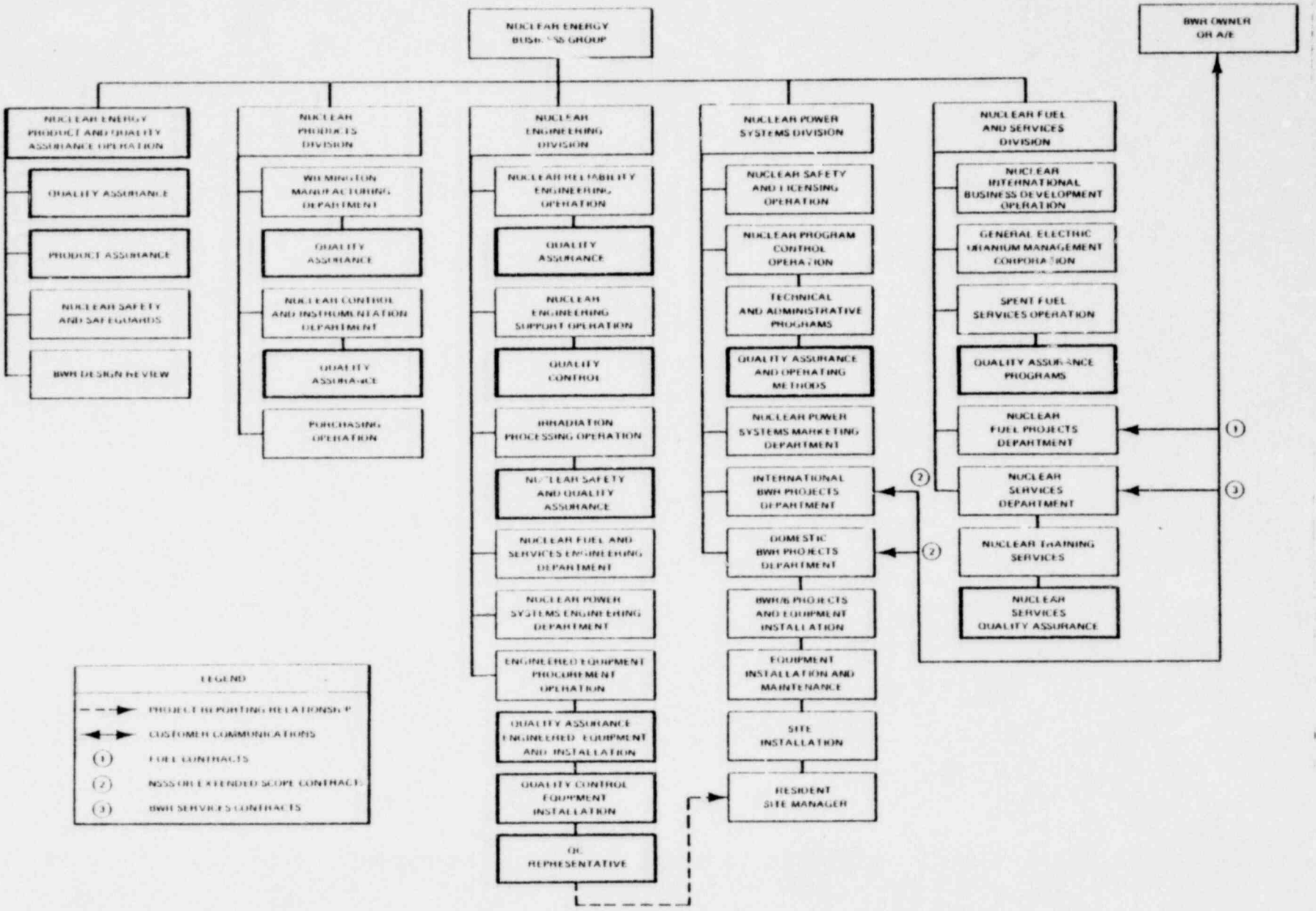

Figure 1-2. NEBG QA Organizations and Customer Contact Points

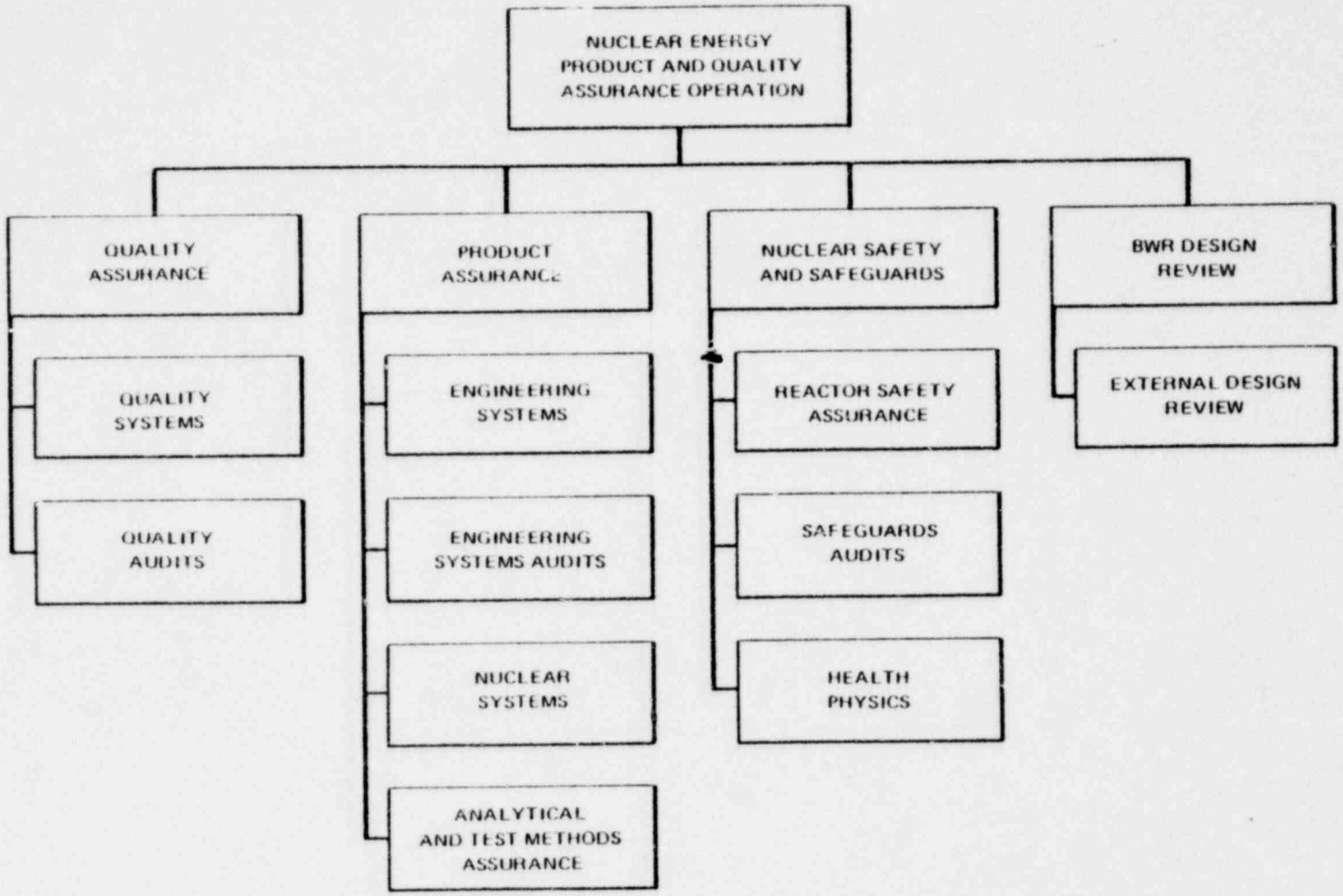

Figure 1-3. Nuclear Energy Product and Quality Assurance Operation

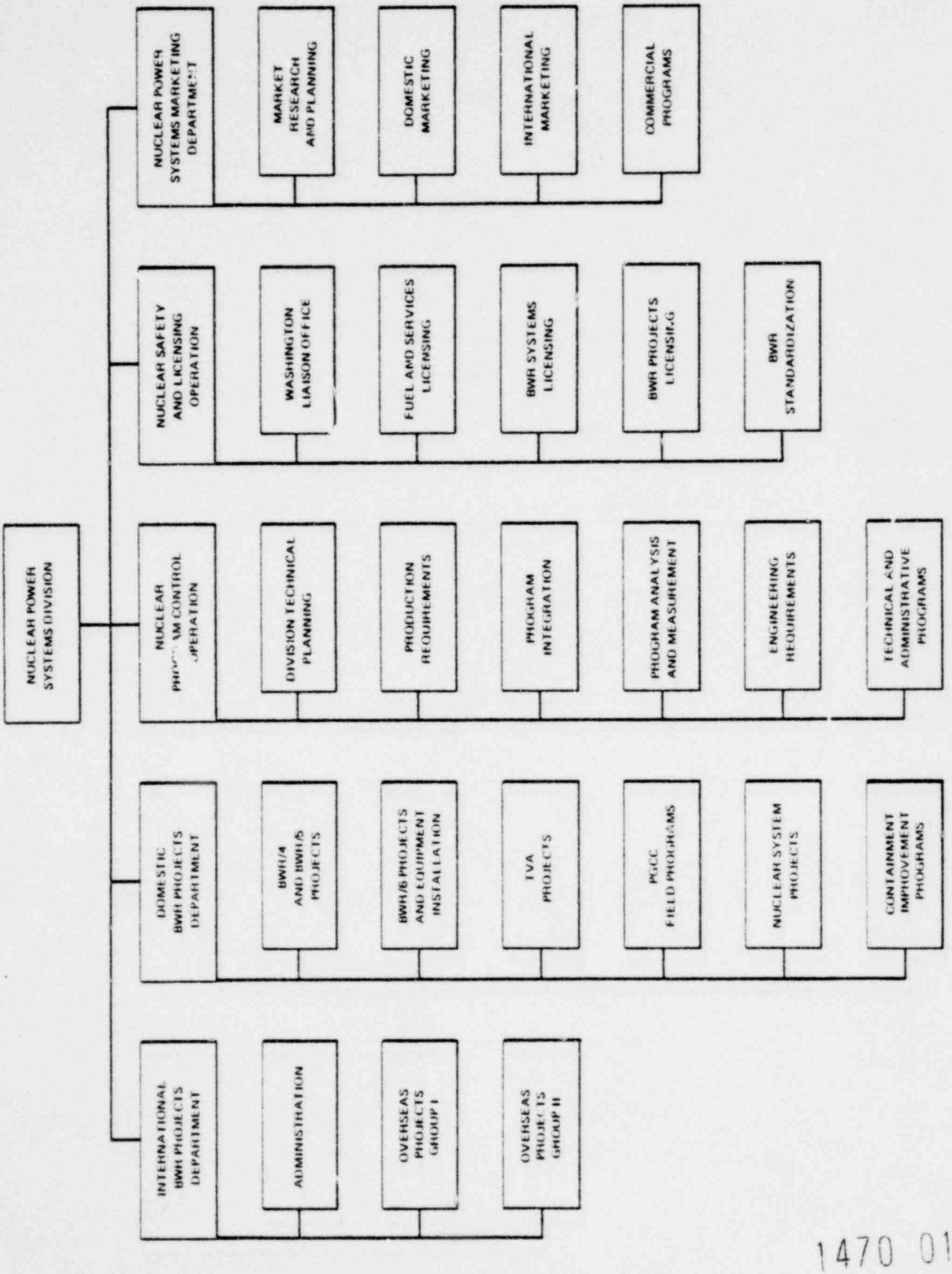

Figure 1-4. Nuclear Power Systems Division

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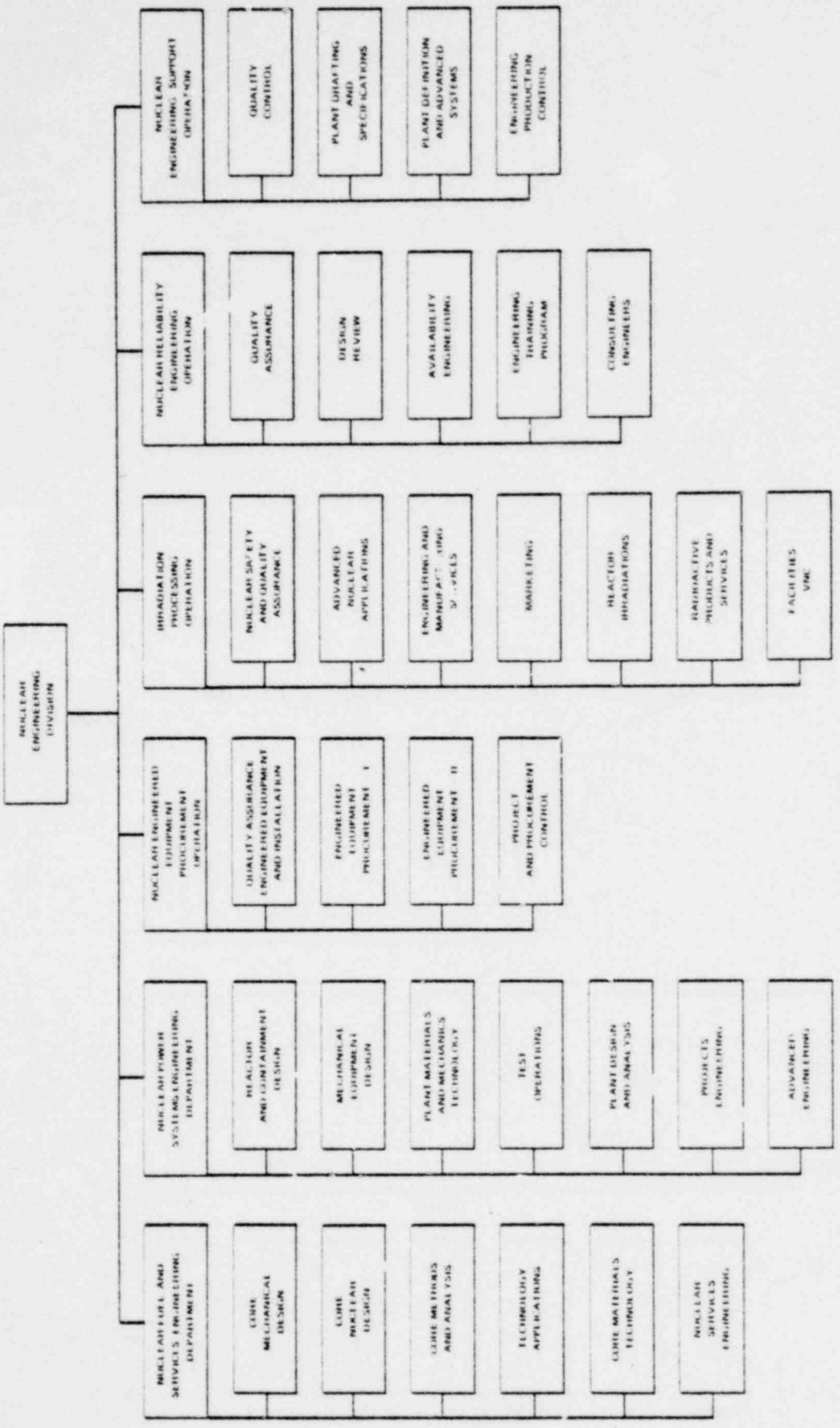

Figure 1-5. Nuclear Engineering Division

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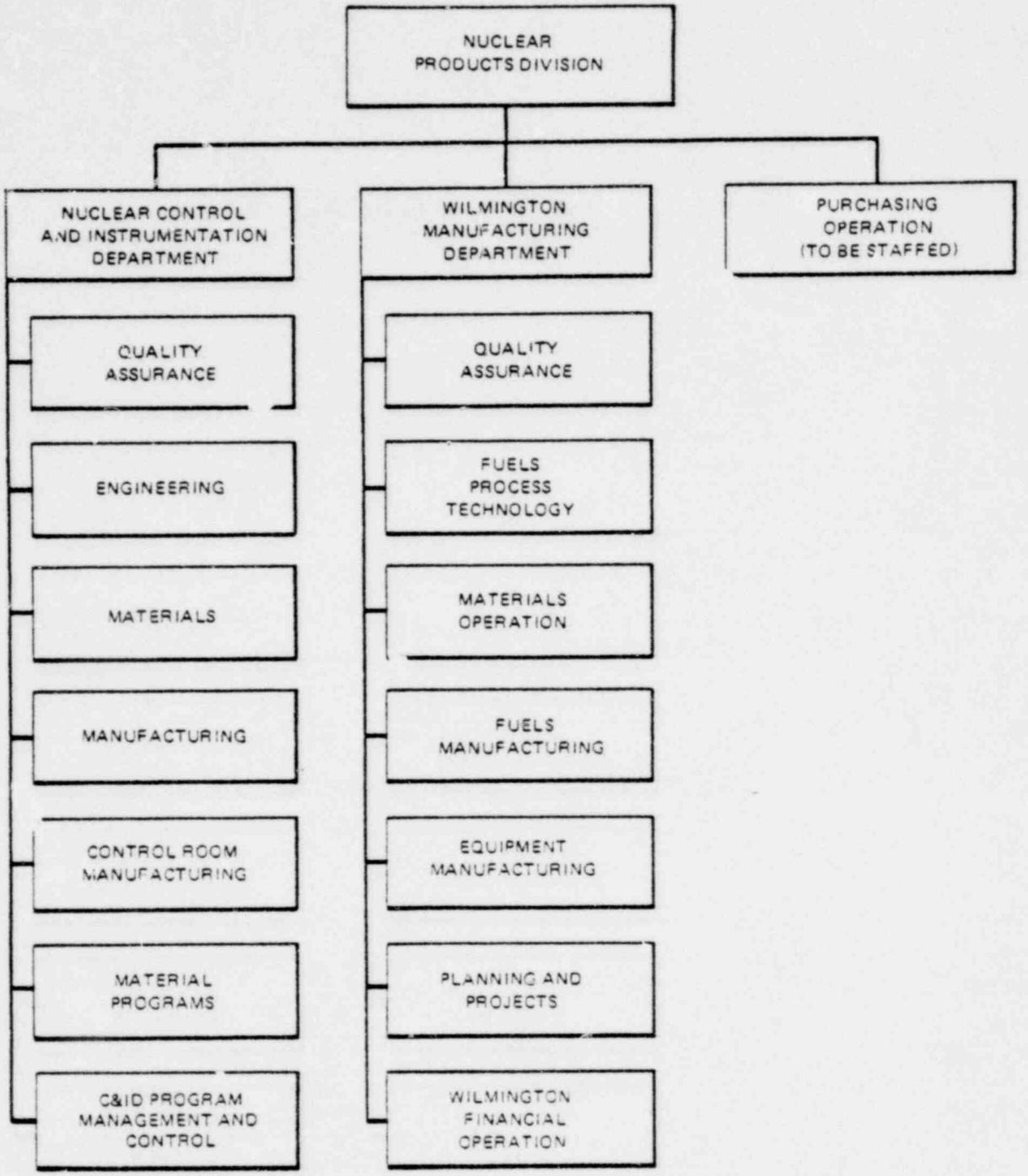

Figure 1-6. Nuclear Products Division

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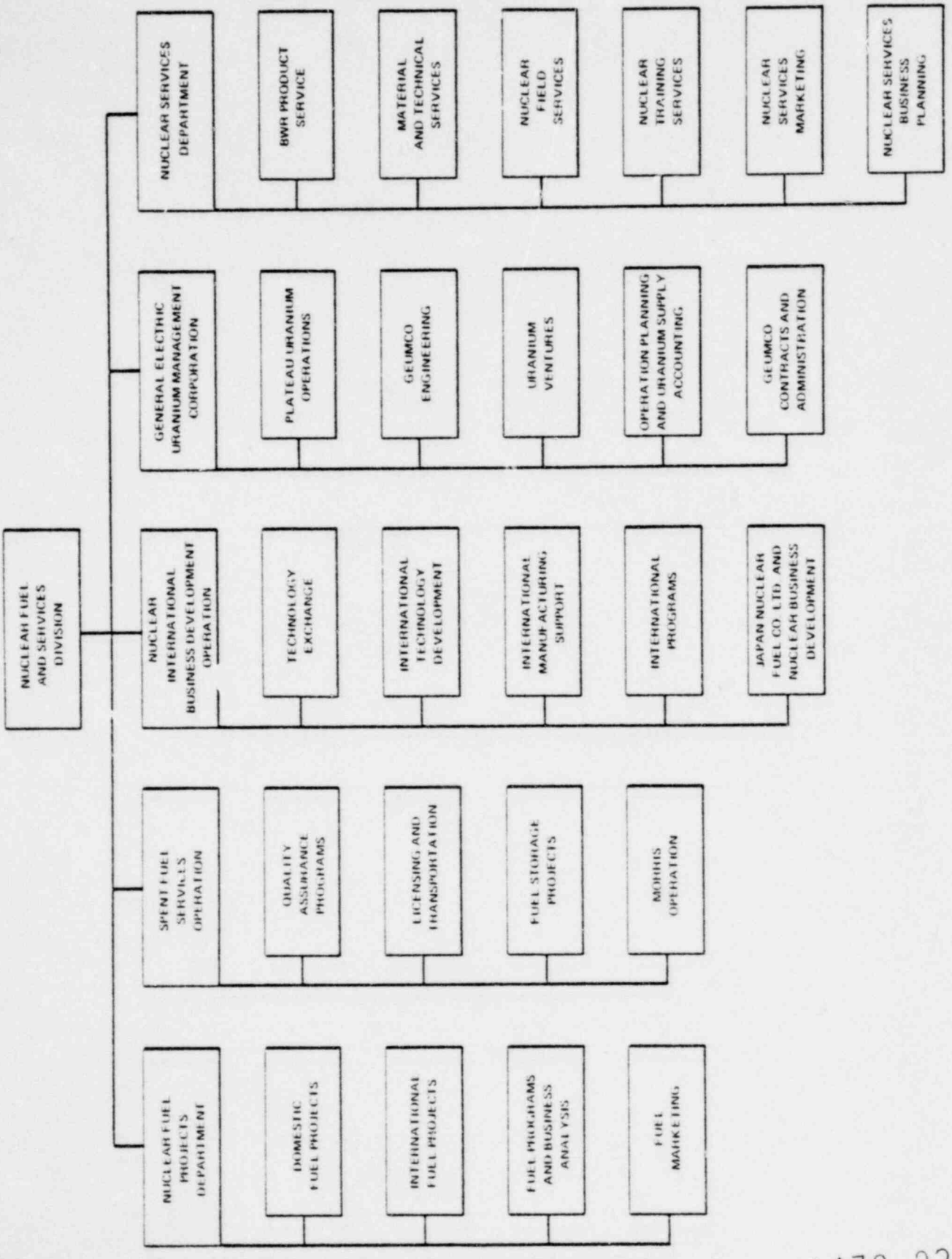

Figure 1-7. Nuclear Fuel and Services Division

1

1470 021

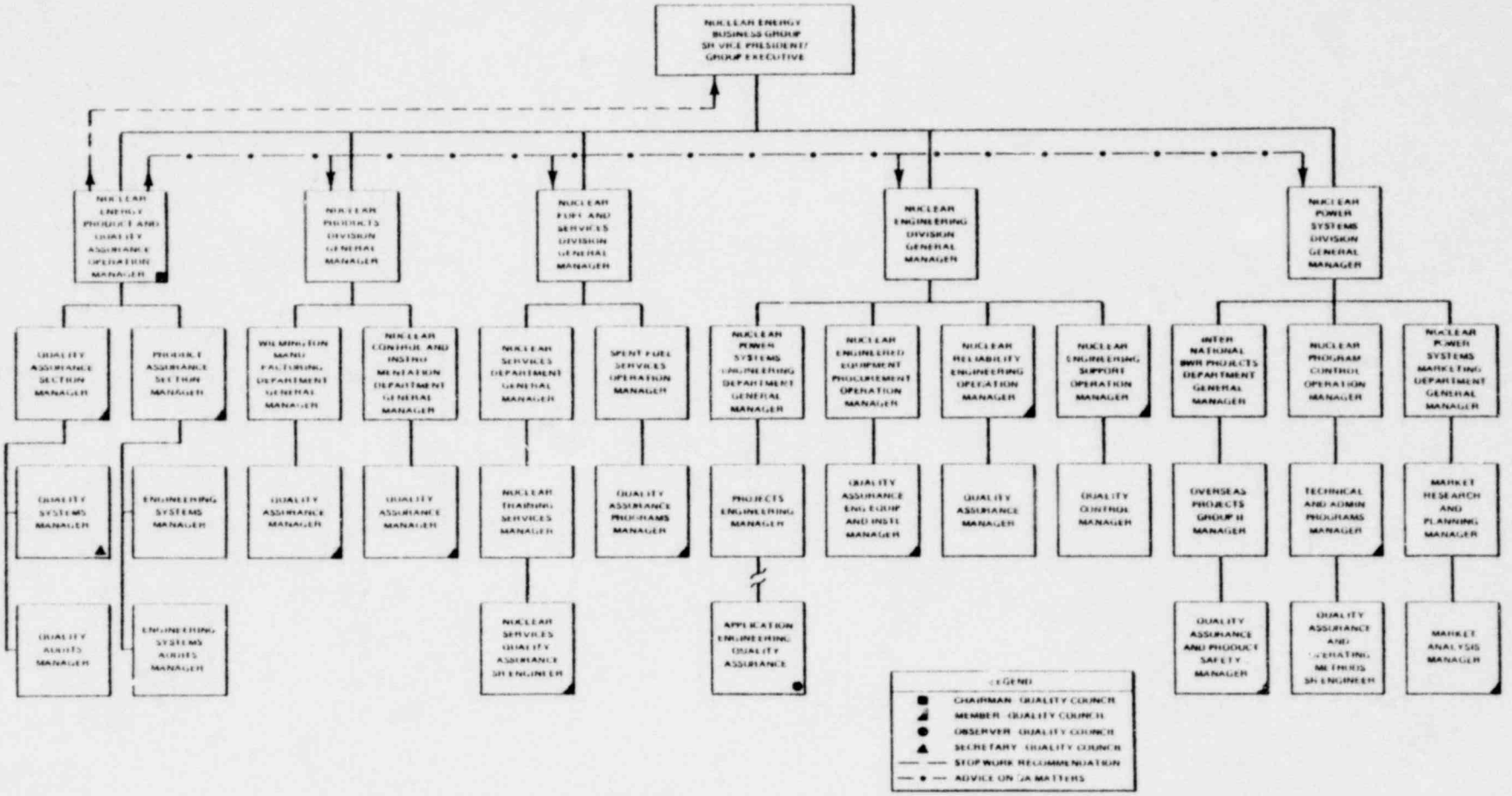

Figure 1-8. Abridged Organization Chart Showing Key QA Positions and Relationships in the NEEG BWR Business

2 QUALITY ASSURANCE PROGRAM

2.1 GENERAL

An overall QA program is established, documented, and implemented which encompasses the collective activities and events with their associated responsibilities, efforts, equipment, procedures, interfaces, and management which are necessary to provide the means to meet product quality objectives.

Since many projects are being processed by design, procurement, and manufacturing organizations simultaneously, QA activities which are described in the QA Program are continuously being applied in support of the total BWR scope of responsibility and are applicable to each of the projects throughout those phases of activity for which the NEBG is responsible.

The QA Program described herein applies those quality system elements necessary to provide assurance that NEBG-supplied systems and components meet the quality requirements of the Owner and applicable codes, standards, and regulatory agency requirements. This QA Program is documented in formally controlled document systems and is implemented throughout all phases of nuclear power plant design and construction. All BWR systems and components classified "important to safety" are supplied in accordance with this QA Program.

Training and experience qualifications are defined for each position in GE. In addition, the program provides for indoctrination and training of personnel performing activities affecting quality in order to provide assurance that appropriate proficiency is achieved and maintained. This indoctrination and training is carried out through various documented procedures, personnel contacts, and meetings. These training programs encompass inspectors, testers, shop personnel, and engineers, as appropriate. Quality assurance, manufacturing, engineering, and project organizations each develop their own requirements for training and establish their own training programs. The purpose of the training is to assure that personnel responsible for quality-related activities are instructed as to the purpose, scope, and implementation of the quality-related manuals, instructions, and procedures. 1

The QA Program provides for conducting activities affecting quality under suitably controlled conditions, including the use of appropriate equipment, suitable environmental conditions, and assurance that prerequisites for the given activity have been satisifed. These prerequisites include consideration of special process controls and skills and the need for special inspection and test equipment where required for the verification of quality.

The BWR quality system documentation derives its authority and is structured from the GE Corporate Product Quality Policy down through each organizational level of the NEBG. Responsibility for the final review and issuance of the overall BWR QA Program rests with the NEBG Group Executive. Responsible organizations and individuals within the NEBG are informed of the mandatory nature of the various quality policies, manuals, and procedures through the NEBG Product Quality Policy. Instructions and Procedures issued by the NEBG management. Quality-related instructions, manuals, and implementing procedures assign responsibilities making them mandatory for quality-related administrative functions. Shop travelers, work orders, or other planning documents relative to specific projects, processes, or work areas are mandatory directives for personnel involved in hardware-related activities, such as production, inspection, and test. 1

The QA Program provides for the regular management review, through audits or other appropriate means, of organizations participating in the BWR business, and of the status and adequacy of that part of the QA Program for which they have designated responsibility.

The BWR QA Program is structured to comply with the NEBG commitments to the quality-related regulatory guides and ANSI Standards as documented in Table 2-1. This QA Program provides for periodic modification and/or updating of NEBG commitments to comply with quality-related regulatory guides and ANSI Standards relating to the NEBG scope of supply. New or revised quality-related regulatory guides and referenced standards are evaluated and determinations are made as to when, how, and to what extent they will be implemented. The NEBG commitments to comply with regulatory positions, or NRC-approved alternate positions to quality-related regulatory guides, are then incorporated into the BWR QA Program documentation.

The NEBG commitments to comply with applicable regulatory guides not listed . ...e 2-1 are documented in the project licensing documents for each nuclear power plant. The NRC-approved licer ...g documents for a specific nuclear power plant project establish the NEBG regulatory guide or alternate position commitments for that project. The commitments to comply with regulatory guides issued or revised subsequent to NRC approval of the project licensing documents are documented in amendments to the NRC-approved project licensing documents.

Classification of structures, systems, and major components important to safety is documented in the project licensing documents and the Project Master Parts List (MPL), and is provided through controlled documents to affected NEBG organiations for implementation. Replacement parts not identified in the project licensing documents are classified relative to safety importance using either original or current classification criteria.

2.2 QUALITY SYSTEM DOCUMENTATION

The NEBG quality-related activities are documented in a series of planned and coordinated policies, procedures, manuals, and instructions defined as QA program documentation. Activities and events comprising the BWR QA Program appropriate to each NEBG organization are identified and documented in formally controlled document systems issued by each cognizant organization. Quality Assurance system documents, including QA manuals, are distributed to a predetermined list of key personnel as controlled copies. Revisions are distributed to the same list with appropriate instructions for replacement and disposition of obsolete documents.

Though the basic scope of the quality system utilized by the various organizations within the NEBG is essentially the same, each NEBG functional organization has its own system of guides, procedures, instructions, manuals, and other implementing documentation that prescribes the methods for carrying out its portion of the overall BWR QA Program. Each of these systems is unique, relates to the activities of the particular organizations involved, and is undergoing continuous review, upgrading, and improvement.

A cross-index table showing the relationship of the key BWR quality-related document systems or manuals with each of the criteria of 10CFR50, Appendix B, and identifying the system or manual section so related, is presented in Table 2-2. A brief description of the purpose and scope of each of the key document types governing QA activities which demonstrate the implementation of the QA Program is presented below:

General Electric Corporate Product Quality Policy (No. 20.9). The General Electric Corporate Product Quality Policy, issued by the Corporate Executive Office, states quality considerations and requirements applicable to all General Electric product-determining business components, and establishes the overall posture of the General Electric Company with regard to the quality of products and services provided. The policy specifically requires that each product-determining business component issue, maintain, and operate in compliance with a product quality policy. This policy must define the broad quality objectives of its products, identify the key elements of the product quality system, and assign prime responsibilities for their accomplishment. The product quality policy must identify and provide reference to the supporting procedures which implement the policy.

1 *Nuclear Energy Business Group Product Quality Policy (No. 70-1).* The NEBG Product Quality Policy, issued by the NEBG Senior Vice President and Group Executive, interprets the Corporate Product Quality Policy and provides implementing direction to the NEBG organizations. This document, which is a part of the NEBG Organization and Policy Guide (OPG) documentation system, establishes the quality policy for NEBG products and services, assigns quality-related responsibilities, and identifies interrelationships for policy implementation. The NEBG Product Quality Policy is applicable to all NEBG organizations and specifically requires that each NEBG organization be in full compliance with the applicable requirements of Company Policy 20.9, Product Quality, and applicable NEBG Instructions and Procedures referenced therein.

1 *NEBG Quality-Related Instructions and Procedures.* The NEBG Instructions and Procedures are issued by authority of the NEBG Senior Vice President and Group Executive and/or Division-Level managers to establish procedures and practices for those quality system elements requiring uniform consideration and application by several or all organizations within NEBG. These instructions and procedures are part of the NEBG OPG and are supplemental to the NEBG Product Quality Policy. They provide implementing direction in those areas where a standardized, uniform

approach is deemed necessary by the NEBG management. Listed below are the key quality-related NEBG Instructions and Procedures:

- *Standard Quality System Requirements (No. 70-11):*

  This instruction supplements NEBG Policy No. 70-1 and establishes the minimum quality system requirements to be implemented by NEBG organizations in fulfilling licensing commitments, contracts, and internal requisitions for the sale, lease, or transfer of NEBG products to a customer.

- *BWR Quality Assurance Records (No. 70-12):*

  This instruction supplements NEBG Policy No. 70-1 and establishes the basic QA records requirements to be implemented by NEBG organizations for BWR products and services.

- *Quality Measurements (No. 70-14):*

  This instruction supplements NEBG Policy No. 70-1 and establishes minimum NEBG-level QA program measurement requirements which must be implemented by the identified NEBG organizations.

- *Analytical and Testing Laboratory Council (No. 70-20):*

  This instruction describes the implementation of the NEBG Analytical and Testing Laboratory Council pursuant to the requirements of NEBG Policy 70-1 which direct P&QAO to establish uniform quality-related practices for NEBG organizations. | 1

- *Analytical Laboratory Control (No. 70-21):*

  This instruction supplements NEBG Policy No. 70-1 and establishes the requirements for the analytical laboratory control programs needed to fulfill NEBG quality and safeguards assurance requirements.

- *Quality Assurance, Nuclear Safety, and Nuclear Material Safeguards Audits (No. 70-29):*

  This procedure supplements NEBG Policy No. 70-1 and Instruction No. 70-11 and establishes the requirements for the audit programs to be implemented by P&QAO and identifies the responsibilities of other NEBG organizations in support of these audit programs.

- *Personnel Proficiency in Quality-Related Activities (No. 70-30):*

  This procedure supplements NEBG Policy No. 70-1 and Instruction No. 70-11 and establishes the minimum personnel proficiency requirements to be implemented within the NEBG in support of the BWR QA Program.

- *QA Shipment Release and Product Quality Certification (No. 70-39):*

  This procedure supplements NEBG Policy No. 70-1 and establishes basic guidelines to be followed by applicable NEBG organizations when releasing products for shipment and certifying product quality.

- *Reporting of Defects and Noncompliance (No. 70-42):* | 1

  This procedure provides direction for NEBG compliance with the requirements of NRC Regulation 10CFR21, Reporting Defects and Noncompliance. Standard practices are established for all NEBG organizations for identifying, documenting, evaluating, and reporting potential defects in any licensed nuclear facility or activity, or noncompliance with the provisions of an NRC regulatory requirement relating to a substantial safety hazard.

Quality Assurance Program Manuals and Document Systems. Documents describing the BWR QA Program and prescribing the detailed quality-related activities of individual organizations are prepared, issued, and maintained by the responsible organizations, such as: engineering, manufacturing, and quality assurance. Such documentation consists of, e.g., engineering operating procedures, QA plans and procedures, and inspection and test planning. Key manuals and document systems are:

1 • *ASME Quality Assurance Program Manual (NEBG) (NEDE-20387):*

This manual describes the controlled engineering system which meets all of the applicable requirements of Section III of the ASME Boiler and Pressure Vessel Code for engineering organizations. It has been accepted by the ASME as a basis for issuance of a Certificate of Authorization.

1 • *BWR Engineering Operating Procedures (NEDE-21109):*

This manual contains documentation of the BWR design control program. The criteria of 10CFR50, Appendix B, are addressed in the procedures to the extent that engineering activities are involved.

• *BWR Quality Assurance Manual (NEDE-20586):*

This manual describes the BWR QA Program for the NEBG functional organizations that have a direct impact on BWR product quality. This description addresses how each organization's quality system meets the requirements of each of the 18 NRC QA Criteria. This manual is structured such that each criterion is broken down into work elements and each of these work elements is addressed as to the method of accomplishment, followed by a listing of the implementing instructions.

• *Nuclear Services Department — Operating Policy and Procedure Manual:*

This manual contains documentation establishing uniform courses of action for quality-related NSD activities, and establishes interface requirements and responsibilities for activities related to the fulfillment of the NSD charter.

1

• *C&ID ASME Code QA Manual (NEDE-10912):*

This manual contains a detailed description of the NC&ID manufacturing quality assurance program established in compliance with the requirements of the ASME Boiler and Pressure Vessel Code, Section III. It has been accepted by the ASME as a basis for issuance of a Certificate of Authorization.

• *C&ID Manufacturing Procedures Manual:*

This manual contains documentation defining responsibilities and systems relative to NC&ID manufacturing activities where more than one section level NC&ID organization is concerned.

• *C&ID Quality Assurance Procedures Manual (NEDE-10969):*

This manual documents the QA Procedures utilized by NC&ID QA organizations. The criteria of 10CFR50, Appendix B, are addressed to the extent that they relate to the manufacture of control and instrumentation equipment.

1

• *Equipment Installation — Practices and Procedures:*

These practices and procedures document the basic business practices and procedures controlling the supply of technical direction and of site quality assurance surveillance, monitoring and auditing of NEBG provided or procured services for implementation of FDI's and FDDR's.

- *NPSD — Policies and Procedures:*

  These policies and procedures describe the Nuclear Power Systems Division organizational interfaces and responsibilities, as well as administrative and functional operating instructions, including product quality responsibilities.

- *P&QAO Practices and Procedures Manual:*

  This manual contains documentation describing specific requirements and controls for performing activities for which P&QAO is responsible.

- *QA Engineered Equipment and Installation — Quality Assurance Manual:*

  This manual contains documentation of the QA activities related to equipment procured for direct-to-site shipment. The criteria of 10CFR50, Appendix B, are addressed to the extent that they relate to this classification of equipment.

- *SFSO Practices and Procedures Manual:*

  This manual contains documentation of administrative procedures and specific requirements and instructions for accomplishing the quality-related activities associated with spent fuel storage racks and related equipment.

- *SFSO Quality Assurance Plan (NEDO-20776):*

  This QA Plan documents the QA program utilized by SFSO. The criteria of 10CFR50, Appendix B, are addressed to the extent that they relate to the design and manufacture of spent fuel storage racks and related equipment.

- *WMD — ASME Code Compliance Manual (NEDE-20910):*

  This manual contains a detailed description of the WMD QA Program established in compliance with the applicable requirements of ASME Boiler and Vessel Code, Section III and Section VIII. It has been accepted by ASME as a basis for issuance of Certificates of Authorization.

- *WMD — Practices and Procedures:*

  These practices and procedures document the basic business policies, assigned responsibilities and administrative instructions established by WMD management.

- *WMD — QA Section Administrative Routine :*

  These administrative routines or procedures document the activities assigned specifically to the WMD QA Section in order to control product quality.

Implementing Document Types. The document types listed below are representative of those used by the various NEBG organizations to implement the BWR QA Program.

Acceptance standards
Audit plans and procedures
Calibration procedures
Corrective action procedures
Design control procedures
Engineering drawings and specifications
Handling, storage, packing and shipping procedures

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Inspection instructions
Inspector and tester stamp control procedures
Material identification and control procedures
Measuring and test equipment control procedures
Nonconforming material control procedures
Preproduction quality evaluation procedures
Process and personnel qualification procedures
Process control procedures
Product/process quality plans
Purchased material quality control plans
Purchased service quality plans
Quality assurance document control procedures
Quality assurance records specifications and instructions
Quality control standard instructions
Receiving inspection plans
Shipment release control procedures
Supplier evaluation and selection procedures
Test instructions

A network of policies, document systems, manuals, and implementation documents is designed to provide the QA Program procedures, specifications, and documentation necessary to support the NEBG objectives of providing safe and reliable systems and components, and complying with the requirements of applicable codes, standards, laws and regulatory agency requirements.

1470 028

Table 2-1
NRC REGULATORY GUIDE POSITIONS

NRC Regulatory Guide	ANSI Standard	NEBG Position	
1.28 — June 7, 1972, "Quality Assurance Program Requirements (Design & Construction)"	N45.2-1971	Comply with the provisions of Regulatory Guide 1.28 (June 7, 1972) and the requirements and guidelines in ANSI N45.2-1971, except as follows: 1. Section 4.3, first paragraph, third sentence: This sentence is not considered applicable since the first paragraph of Section 4.3 identifies three alternate methods for verifying or checking the adequacy of design. All other sentences of Section 4.3 will be complied with. 2. Section 14, second paragraph, second sentence: This sentence is interpreted to mean that necessary handling tools and equipment will be *used* and controlled on work under GE jurisdiction. It does not mean that GE will necessarily *provide* handling tools and equipment. The provision of such tools and equipment is a contractual consideration. 3. Section 18, fourth paragraph, first sentence: To the extent required by contract, GE will maintain records which correctly identify the "as built" condition of items as furnished by GE for the life of the particular item, rather than for the life of the plant. 4. Section 18, fourth paragraph, second sentence: This sentence is not considered applicable. Refer to the committed GE position on Regulatory Guide 1.88. 5. Section 19, second paragraph, first sentence: This sentence is revised to read, "Audits shall be performed, as necessary: (1) to provide . . ." 6. Section 19, second paragraph, second sentence: This sentence revised to read, "Followup action shall be taken, as needed. This action may include reaudit of deficient areas."	1 1
1.30 — August 11, 1972, "Quality Assurance Requirements for the Installation, Inspection & Testing of Instrumentation & Electrical Equipment"	N45.2.4-1972	Implement regulatory position.	

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SUPPLEMENT TO THE ALTERNATE POSITION ON REGULATORY GUIDE 1.88 (Continued)

	Storage/Maintenance Responsibility*	NEBG Retention Classification*
Supplier's QA Program Manual	G	D
Welding Procedures	G	L
A.3 Manufacturing Records (NEBG Make)		
Applicable Code Data Reports	O**	L
As-Built Drawings and Records (Parts and Assembly Drawings)	G	L
As-Built Drawings and Records (Outline Drawings)	O**	L
ASME Code — Permanent Records Index	O**	L
Certificate of Inspection & Tests Personnel & Qualification	G	A
Certificates of Compliance (Product Quality Certification)	O**	L
Cleaning Procedures	G	10
Eddy-Current Examination Procedures	G	10
Eddy-Current Examination Final Results	G	L
Electrical Control Verification Test Results	G	L
Ferrite Test Procedures	G	10
Ferrite Test Results	G	L
Forming & Bending Procedure Qualifications	G	7†
Heat Treatment Procedures	G	10
Heat Treatment Records	G	L
Hot Bending Procedure	G	10
In-Process (Final) Inspection & Test Results	G	10
Insp. & Test Instr. & Tooling Calib. Procedures & Records	G	C
Liquid Penetrant Examination Procedure	G	10
Liquid Penetrant Examination Final Results	G	L
Location of Weld Filler Material	G	L
Magnetic Particle Examination Procedure	G	10
Magnetic Particle Examination Final Results	G	L
Major Defect Repair Records (except NC&ID Code Items)	G	L
Major Defect Repair Records (NC&ID Code Items)	O**	L
Materials Properties Records (except NC&ID Code Items)	G	L
Materials Properties Records (NC&ID Code Items)	O**	L
Nonconformance Reports	G	L
Packaging, Receiving, and Storage Procedures (except those contained in QA Manuals)	G	10
Performance Test Procedure & Results Records	G	L
Pipe and Fitting Location Report	G	L
Pressure Test Procedure	G	10
Pressure Test Results	G	L
Product Equipment Calibration Procedure	G	C
Product Equipment Calibration Records	G	C
Product Quality Checklist (WMD only)	O**	L
Purchase Orders for Material used on NEBG Make Items	G	10
Purchaser's (NEBG) Pre-Award QA Survey	G	B

SUPPLEMENT TO THE ALTERNATE POSITION ON REGULATORY GUIDE 1.88 (Continued)

	Storage/Maintenance Responsibility*	NEBG Retention Classification*	
QA System Audit Report	G	B	
QA Manuals, Procedures & Instructions	G	A	
Radiographic Procedures	G	10	
Radiographic Review Forms (except NC&ID Code Items)	G	L	
Radiographic Review Forms (NC&ID Code Items)	O**	L	1
Radiographs (except NC&ID Code Items)	G	E	
Radiographs (NC&ID Code Items)	O**	E	
Receiving Inspection Records	G	7†	
Safety-Related Items Log (NC&ID only)	G	L	1
Ultrasonic Examination Procedures	G	10	
Ultrasonic Examination Final Results	G	L	
Supplier Certificates of Conformance accompanied by Special Specified Data	G	L	
Supplier's QA Program Manual	G	D	
Welding Materials Control Procedures (except those contained in QA manuals)	G	10	
Welding Personnel Qualification	G	7†	
Welding Procedure Qualifications and Data Reports	G	7†	
Welding Procedures	G	L	
Work Processing and Sequencing Documents	G	10	

* See legend

** Where NEBG supplies QA records to the Owner, NEBG will normally retain copies as needed for NEBG business purposes. The NEBG records storage, however, should not be considered as Owner's second storage facility without NEBG agreement.

† For orders placed after June 1, 1978, this retention period is extended to 10 years from shipment of the product.

Legend

N/A	=	Not applicable to NEBG (Owner or AE scope of Responsibility)
G	=	Retained by or for GE-NEBG
O	=	Transmitted to Owner
L	=	Lifetime retention (life of the item)
7	=	7 years retention (from date of generation)
10	=	10 years retention (from date of generation)
A	=	Retained for 3 years after being superseded or invalidated
B	=	Retained until corrective action is completed or 3 years (whichever is later)
C	=	Retained until recalibrated
D	=	Retained until purchase order is closed out
E	=	Retained for lifetime per NRC request or until NRC permits their disposal

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Table 2-2

CROSS-INDEX TABLE SHOWING RELATIONSHIP OF KEY QUALITY-RELATED DOCUMENT SYSTEMS AND MANUALS WITH EACH OF THE CRITERIA OF 10CFR50, APPENDIX B

Legend for Titles of Document Systems and Manuals

Abbreviations

ASME — QAPM	ASME Quality Assurance Program Manual (NEBG)
BWR — EOP	BWR Engineering Operating Procedures
C&ID — ASME C/M	Nuclear Control and Instrumentation Department — ASME Code Quality Assurance Manual
C&ID — MPM	Nuclear Control and Instrumentation Department — Manufacturing Procedures Manual
C&ID — QAP	Nuclear Control and Instrumentation Department — Quality Assurance Procedures Manual
EI — P&P	Equipment Installation — Practices and Procedures
NEBG — OPG	Nuclear Energy Business Group — Organization and Policy Guide
NPSD — P&P	Nuclear Power Systems Division — Policies and Procedures
NSD — OP&PM	Nuclear Services Department — Operating Policy and Procedure Manual
QAEE&I — QAM	Quality Assurance Engineered Equipment and Installation — QA Manual
SFSO — P/P	Spent Fuel Services Operation — Practices & Procedures Manual
SFSO — QAP	Spent Fuel Services Operation — Quality Assurance Plan
WMD — ASME C/M	Wilmington Manufacturing Department — ASME Code Compliance Manual
WMD — P&P	Wilmington Manufacturing Department — Practices and Procedures
WMD — QASAR	Wilmington Manufacturing Department — Quality Assurance Section Administrative Routines

Document System or Manual and Applicable Section

I. **Organization**

• ASME — QAPM	• Section 2, Responsibility for QAP Organization
• BWR — EOP	• Section 20, Organization and Function
• C&ID — ASME C/M	• Section 1.0, General
• C&ID — MPM	• Section MP5, Quality Assurance

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Table 2-2

CROSS-INDEX TABLE SHOWING RELATIONSHIP OF KEY QUALITY-RELATED DOCUMENT SYSTEMS AND MANUALS WITH EACH OF THE CRITERIA OF 10CFR50, APPENDIX B (Continued)

Document System or Manual and Applicable Section	
I. Organization (Continued)	
• C&ID — QAP	• Section 2.1, Organization
• EI — P&P	• Section 1.0, Organization and Responsibility
• NEBG — OPG	• Section 70, Nuclear Safety & Quality Assurance • Section 150, Organization • Section 160, Functional Directives
• NPSD — P&P	• Section 12, Organization • Section 14, Functional Responsibilities • Section 80, Product Quality
• NSD — OP&PM	• Section 20, Organization • Section 40, Quality Assurance and Safety
• QAEE&I — QAM	• Organization Chart • QC Standing Instructions • QC Plans & Index
• SFSO — QAP	• Section 1.0, Organization
• SFSO — P/P	• Section 10, Practices and Procedures Systems • Section 20, Organization, Function, Responsibilities
• WMD — ASME C/M	• Section 1.0, Organization
• WMD — P&P	• Section 30, Management
II. Quality Assurance Program	
• ASME — QAPM	• Section 1, Introduction
• BWR — EOP	• All Sections
• C&ID — ASME C/M	• All Sections
• C&ID — QAP	• Section 2.2, Quality Assurance Program
• EI — P&P	• Section 6.0, General Site Administrative Procedures
• NEBG — OPG	• Section 70, Nuclear Safety & Quality Assurance • Section 150, Organization • Section 160, Functional Directives
• NPSD — P&P	• Section 12, Organization • Section 14, Functional Responsibilities • Section 80, Product Quality • Section 110, General

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Table 2-2

CROSS-INDEX TABLE SHOWING RELATIONSHIP OF KEY QUALITY-RELATED DOCUMENT SYSTEMS AND MANUALS WITH EACH OF THE CRITERIA OF 10CFR50, APPENDIX B (Continued)

Document System or Manual	Applicable Section
II. Quality Assurance Program (Continued)	
• NSD — OP&PM	• All Sections
• QAEE&I — QAM	• All Sections
• SFSO — QAP	• All Sections
• SFSO — P/P	• Section 70, Quality Assurance
• WMD — ASME C/M	• Section 2.0, Quality Assurance Program
• WMD — P&P	• Section 30, Management • Section 70, Quality Control
• WMD — QASAR	• Section 320-10, Organization and Administration • Section 320-40, Product and Process Quality Planning • Section 320-80, Personnel Training and Certification
III. Design Control	
• BWR — EOP	• Sections 15 through 75
• C&ID — QAP	• Section 2.3, Design Control
• NPSD — P&P	• Section 30, Project Definition • Section 35, Project Activities • Section 40, Project Funding and Work Control
• NSD — OP&PM	• Section 40, Quality Assurance and Safety • Section 60, Material and Technical Services
• QAEE&I — QAM	• QC Standing Instructions
• SFSO — QAP	• Section 3.0, Design Control
• WMD — ASME C/M	• Section 3.0, Design Control
• WMD — P&P	• Section 60, Procurement Control • Section 70, Quality Control • Section 80, Product Control
IV. Procurement Document Control	
• BWR — EOP	• Section 42, Technology and Design Control • Section 45, Procurement
• C&ID — ASME C/M	• Section 3.0, Procurement Control
• C&ID — QAP	• Section 2.4, Procurement Document Control
• NPSD — P&P	• Section 40, Project Funding and Work Control

Table 2-2

CROSS-INDEX TABLE SHOWING RELATIONSHIP OF KEY QUALITY-RELATED DOCUMENT SYSTEMS AND MANUALS WITH EACH OF THE CRITERIA OF 10CFR50, APPENDIX B (Continued)

Document System or Manual and Applicable Section	
IV. Procurement Document Control (Continued)	
• NSD — OP&PM	• Section 30, Generic Procedures • Section 40, Quality Assurance and Safety • Section 60, Material and Technical Services
• QAEE&I — QAM	• QA Requirements • QC Standing Requirements
• SFSO — P/P	• Section 50, Material and Facilities Management
• SFSO — QAP	• Section 4.0, Procurement Document Control
• WMD — ASME C/M	• Section 4.0, Procurement Document Control
• WMD — P&P	• Section 60, Procurement Control
• WMD — QASAR	• Section 320-40, Product and Process Quality Planning
V. Instructions, Procedures, and Drawings	
• BWR — EOP	• Section 15, Engineering Operating System • Section 42, Technology and Design Control • Section 60, Document Control • Section 75, Product Quality
• C&ID — ASME C/M	• Section 2.0, Drawing & Specification Control
• C&ID — QAP	• Section 2.5, Instructions, Procedures, and Drawings
• EI — P&P	• Section 6.0, General Site Administrative Procedures
• NEBG Drafting Manual	• All Sections
• NPSD — P&P	• Section 40, Project Funding and Work Control • Section 110, General
• NSD — OP&PM	• Section 40, Quality Assurance and Safety
• QAEE&I — QAM	• QA Requirements • QC Standing Instructions
• SFSO — QAP	• Section 5.0, Instructions, Procedures, and Drawings
• WMD — ASME C/M	• Section 5.0, Instructions, Procedures, and Drawings
• WMD — P&P	• Section 10, Structure • Section 30, Management • Section 70, Quality Control • Section 80, Product Control
• WMD — QASAR	• Section 320-40, Product and Process Quality Planning • Section 320-60, Quality Information Equipment • Section 320-100, Inspection and Test

Table 2-2

CROSS-INDEX TABLE SHOWING RELATIONSHIP OF KEY QUALITY-RELATED DOCUMENT SYSTEMS AND MANUALS WITH EACH OF THE CRITERIA OF 10CFR50, APPENDIX B (Continued)

Document System or Manual and Applicable Section

VI. Document Control

- BWR — EOP
  - Section 15, Engineering Operating System
  - Section 42, Technology and Design Control
  - Section 60, Document Control
- C&ID — ASME C/M
  - Section 2.0, Drawing & Specification Control
- C&ID — QAP
  - Section 2.6, Document Control
- EI — P&P
  - Procedure 2.4, Site Filing System
- NPSD — P&P
  - Section 30, Project Definition
  - Section 40, Project Funding & Work Control
  - Section 110, General
- NSD — OP&PM
  - Section 25, OP&P Administration
  - Section 40, Quality Assurance and Safety
- QAEE&I — QAM
  - QA Requirements
  - QC Standing Instructions
- SFSO — QAP
  - Section 6.0, Document Control
- WMD — ASME C/M
  - Section 6.0, Document Control
- WMD — P&P
  - Section 10, Structure
  - Section 30, Management
  - Section 70, Quality Control
  - Section 80, Product Control
- WMD — QASAR
  - Section 320-10, Organization and Administration
  - Section 320-40, Product and Process Quality Planning
  - Section 320-100, Inspection and Test

VII. Control of Purchased Material, Equipment, and Services

- BWR — EOP
  - Section 42, Technology and Design Control
  - Section 45, Procurement
- C&ID — ASME C/M
  - Section 3.0, Procurement Control
- C&ID — QAP
  - Section 2.7, Control of Purchased Material, Equipment and Services
- EI — P&P
  - Procedure 3.3, Site Procurement of Materials & Services
- NPSD — P&P
  - Section 80, Product Quality

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Table 2-2

CROSS-INDEX TABLE SHOWING RELATIONSHIP OF KEY QUALITY-RELATED DOCUMENT SYSTEMS AND MANUALS WITH EACH OF THE CRITERIA OF 10CFR50, APPENDIX B (Continued)

Document System or Manual and Applicable Section	
VII. Control of Purchased Material, Equipment, and Services (Continued)	
• NSD — OP&PM	• Section 30, Generic Procedures • Section 40, Quality Assurance and Safety • Section 60, Material and Technical Services
• QAEE&I — QAM	• QA Requirements • QC Standing Instructions
• SFSO — P/P	• Section 70, Quality Assurance
• SFSO — QAP	• Section 7.0, Control of Purchased Material, Equipment, and Services
• WMD — ASME C/M	• Section 7.0, Control of Purchased Material, Items and Services
• WMD — P&P	• Section 60, Procurement Control • Section 70, Quality Control
• WMD — QASAR	• Section 320-40, Product and Process Quality Planning • Section 320-50, Purchased Material • Section 320-100, Inspection and Test • Section 320-130, Quality Records and Certification
VIII. Identification & Control of Materials, Parts, and Components	
• BWR — EOP	• Section 30, Product Definition and Control • Section 42, Technology and Design Control
• C&ID — ASME C/M	• Section 4, Process Control
• C&ID — QAP	• Section 2.8, Identification & Control of Material, Parts and Components
• QAEE&I — QAM	• QA Requirements • QC Standing Instructions
• SFSO — QAP	• Section 8.0, Identification and Control of Materials, Parts, and Components
• WMD — ASME C/M	• Section 8.0, Identification and Control of Materials and Items
• WMD — P&P	• Section 30, Management • Section 70, Quality Control
• WMD — QASAR	• Section 320-40, Product and Process Quality Planning • Section 320-90, Product/Process Control • Section 320-100, Inspection and Test • Section 320-110, Nonconforming Material • Section 320-130, Quality Records and Certification

Table 2-2

CROSS-INDEX TABLE SHOWING RELATIONSHIP OF KEY QUALITY-RELATED DOCUMENT SYSTEMS AND MANUALS WITH EACH OF THE CRITERIA OF 10CFR50, APPENDIX B (Continued)

Document System or Manual and Applicable Section	
X. Control of Special Processes	
• BWR — EOP	• Section 40, Engineering Technology and Design • Section 42, Technology and Design Control • Section 75, Product Quality
• C&ID — ASME C/M	• Section 5.0, Welding/Brazing Quality Assurance • Section 6.0, Nondestructive Examination • Section 8.0, Heat Treatment
• C&ID — QAP	• Section 2.9, Control of Special Processes
• QAEE&I — QAM	• QA Requirements • QC Standing Instructions
• SFSO — QAP	• Section 9.0, Control of Special Processes
• WMD — ASME C/M	• Section 9.0, Control of Construction Processes
• WMD — P&P	• Section 30, Management • Section 50, Preproduction • Section 60, Procurement Control • Section 70, Quality Control • Section 80, Product Control • Section 90, Traffic
• WMD — QASAR	• Section 320-40, Product and Process Quality Planning • Section 320-80, Personnel Training and Certification
X. Inspection	
• BWR — EOP	• Section 35, Product Development
• C&ID — ASME C/M	• Section 4.0, Process Control
• C&ID — QAP	• Section 2.10, Inspection
• EI — P&P	• Section 6.0, General Site Administrative Procedures
• QAEE&I — QAM	• QA Requirements • QC Standing Instructions
• SFSO — QAP	• Section 10.0, Inspection
• WMD — ASME C/M	• Section 10, Examinations, Tests, and Inspections
• WMD — P&P	• Section 30, Management • Section 60, Procurement Control • Section 70, Quality Control • Section 80, Product Control

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Table 2-2

CROSS-INDEX TABLE SHOWING RELATIONSHIP OF KEY QUALITY-RELATED DOCUMENT SYSTEMS AND MANUALS WITH EACH OF THE CRITERIA OF 10CFR50, APPENDIX B (Continued)

Document System or Manual and Applicable Section

X. Inspection (Continued)	
• WMD — QASAR	• Section 320-40, Product and Process Quality Planning • Section 320-50, Purchased Materials • Section 320-100, Inspection and Test
XI. Test Control	
• BWR — EOP	• Section 35, Product Development • Section 65, Safety and Licensing
• C&ID — ASME C/M	• Section 4, Process Control
• C&ID — QAP	• Section 2.11, Test Control
• NSD — OP&PM	• Section 40, Quality Assurance and Safety • Section 45, BWR Field Services
• QAEE&I — QAM	• QC Standing Instructions
• SFSO — QAP	• Section 11.0, Test Control
• WMD — ASME C/M	• Section 11.0, Test Control
• WMD — P&P	• Section 70, Quality Control
• WMD — QASAR	• Section 320-100, Inspection and Test
XII. Control of Measuring and Test Equipment	
• BWR — EOP	• Section 35, Product Development
• C&ID — ASME C/M	• Section 7, Calibration of Measuring & Test Equipment
• C&ID — QAP	• Section 2.12, Control of Measuring & Test Equipment
• QAEE&I — QAM	• QA Requirements • QC Standing Instructions
• SFSO — QAP	• Section 12.0, Control of Measuring & Test Equipment
• WMD — ASME C/M	• Section 12.0, Control of Measuring & Test Equipment
• WMD — P&P	• Section 30, Management • Section 70, Quality Control
• WMD — QASAR	• Section 320-40, Product and Process Quality Planning • Section 320-60, Quality Information Equipment • Section 320-70, Chemet Laboratory
XIII. Handling, Storage, and Shipping	
• BWR — EOP	• Section 40, Engineering Technology and Design • Section 42, Technology and Design Control

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Table 2-2

CROSS-INDEX TABLE SHOWING RELATIONSHIP OF KEY QUALITY-RELATED DOCUMENT SYSTEMS AND MANUALS WITH EACH OF THE CRITERIA OF 10CFR50, APPENDIX B (Continued)

Document System or Manual and Applicable Section

XIII. Handling, Storage, and Shipping (Continued)	
• C&ID — ASME C/M	• Section 4 Process Control
• C&ID — MPM	• Section MP5, Quality Assurance
• C&ID — QAP	• Section 2.13, Handling, Storage, and Shipping
• NSD — OP&PM	• Section 60, Material and Technical Services
• QAEE&I — QAM	• QA Requirements • QC Standing Instructions
• SFSO — QAP	• Section 13.0, Handling, Storage, and Shipping
• WMD — ASME C/M	• Section 13.0, Handling, Storage, Shipping, and Preservation
• WMD — P&P	• Section 60, Procurement Control • Section 80, Product Control • Section 90, Traffic
• WMD — QASAR	• Section 320-40, Product and Process Quality Planning • Section 320-90, Product/Process Control • Section 320-110, Nonconforming Material • Section 320-130, Quality Records and Certification
XIV. Inspection, Test, and Operating Status	
• BWR — EOP	• Section 35, Product Development
• C&ID — ASME C/M	• Section 4, Process Control
• C&ID — QAP	• Section 2.14, Inspection, Test & Operating Status
• QAEE&I — QAM	• QA Requirements
• SFSO — QAP	• Section 14.0, Inspection, Test, and Operating Status
• WMD — ASME C/M	Section 14.0, Examination or Test Status Section 30, Management
• WMD — P&P	• Section 70, Quality Control • Section 80, Product Control
• WMD — QASAR	• Section 320-70, Chemet Laboratory • Section 320-90, Product/Process Control • Section 320-100, Inspection and Test • Section 320-110, Nonconforming Material • Section 320-130, Quality Records and Certification

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Table 2-2

CROSS-INDEX TABLE SHOWING RELATIONSHIP OF KEY QUALITY-RELATED DOCUMENT SYSTEMS AND MANUALS WITH EACH OF THE CRITERIA OF 10CFR50, APPENDIX B (Continued)

Document System or Manual and Applicable Section

XV. Nonconforming Material, Parts, or Components	
• BWR — EOP	• Section 42, Technology and Design Control • Section 45, Procurement • Section 50, Manufacturing • Section 55, Change Control
• C&ID — ASME C/M	• Section 11, Nonconformities and Corrective Action
• C&ID — QAP	• Section 2.15, Nonconforming Materials, Parts, or Components
• EI — P&P	• Section 6.0, General Site Administrative Procedures
• NSD — OP&PM	• Section 40, Quality Assurance and Safety
• QAEE&I — QAM	• QA Requirements • QC Standing Instructions
• SFSO — QAP	• Section 15.0, Nonconforming Materials, Parts, and Components
• WMD — ASME C/M	• Section 15.0, Nonconforming Material or Items
• WMD — P&P	• Section 30, Management • Section 60, Procurement Control • Section 70, Quality Control • Section 80, Product Quality
• WMD — QASAR	• Section 320-110, Nonconforming Material
XVI. Corrective Action	
• BWR — EOP	• Section 42, Technology and Design Control • Section 45, Procurement • Section 50, Manufacturing • Section 55, Change Control • Section 65, Safety and Licensing
• C&ID — ASME C/M	• Section 11.0, Nonconformities & Corrective Action
• C&ID — MPM	• Section MP5, Quality Assurance
• C&ID — QAP	• Section 2.16, Corrective Action
• NPSD — P&P	• Section 80, Product Quality
• NSD — OP&PM	• Section 40, Quality Assurance and Safety • Section 45, BWR Field Services
• QAEE&I — QAM	• QA Requirements • QC Standing Instructions

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Table 2-2

CROSS-INDEX TABLE SHOWING RELATIONSHIP OF KEY QUALITY-RELATED DOCUMENT SYSTEMS AND MANUALS WITH EACH OF THE CRITERIA OF 10CFR50, APPENDIX B (Continued)

Document System or Manual and Applicable Section

XVI. Corrective Action (Continued)

• SFSO — QAP	• Section 16.0, Corrective Action
• WMD — ASME C/M	• Section 16.0, Corrective Action
• WMD — P&P	• Section 30, Management • Section 60, Procurement Control • Section 70, Quality Control • Section 80, Product Control
• WMD — QASAR	• Section 320-150, Internal Audits

XVII. Quality Assurance Records

• BWR — EOP	• Section 42, Technology and Design Control • Section 60, Document Control
• C&ID — ASME C/M	• Section 9.0, Documentation and Certification
• C&ID — QAP	• Section 2.17, Quality Assurance Records
• EI — P&P	• Section 6.0, General Site Administrative Procedures
• NPSD — P&P	• Section 40, Project Funding and Work Control
• NSD — OP&PM	• Section 40, Quality Assurance and Safety
• QAEE&I — QAM	• QA Requirements • QC Standing Instructions
• SFSO — P/P	• Section 70, Quality Assurance
• SFSO — QAP	• Section 17.0, Quality Assurance Records
• WMD — ASME C/M	• Section 17.0, Quality Assurance Records
• WMD — P&P	• Section 30, Management • Section 70, Quality Control
• WMD — QASAR	• Section 320-130, Quality Records and Certification

XVIII. Audits

• BWR — EOP	• Section 75, Product Quality
• C&ID — ASME C/M	• Section 12, Audits
• C&ID — QAP	• Section 2.18, Audits
• EI — P&P	• Section 6.0, General Site Administrative Procedures

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Table 2-2

CROSS-INDEX TABLE SHOWING RELATIONSHIP OF KEY QUALITY-RELATED DOCUMENT SYSTEMS AND MANUALS WITH EACH OF THE CRITERIA OF 10CFR50, APPENDIX B (Continued)

Document System or Manual and Applicable Section

XVIII. Audits (Continued)

• NPSD — P&P	• Section 80, Product Quality
• NSD — OP&PM	• Section 40, Quality Assurance and Safety
• QAEE&I — QAM	• QC Standing Instructions
• SFSO — QAP	• Section 18.0, Audits
• WMD — ASME C/M	• Section 18.0, Audits
• WMD — P&P	• Section 30, Management • Section 60, Procurement Control
• WMD — QASAR	• Section 320-150, Internal Audits

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3 DESIGN CONTROL

3.1 GENERAL

The design of structures, systems, and components is controlled within the various design organizations to assure safe and reliable performance of products and services to be supplied. The design control processes are documented in practices and procedures which establish the responsibilites and interfaces of each organizational unit that has an assigned design responsibility. The practices and procedures include measures to assure that: | 1 | 1

- design requirements are defined and design activities are carried out in a planned, controlled, and orderly manner;
- appropriate quality requirements and standards are specified in design documents;
- suitable materials, components, and processes are specified in design documentation; | 1
- appropriate design verification methods are selected and implemented by individuals or groups not having direct responsibility for the original design; and
- design changes are controlled to the same level as was applied to the original design, including review and approval by the same organization that performed the original review and approval unless another responsible organization is designated by NEBG management.

Each GE BWR offered for sale is of a current product line which has been engineered as a "Standard Plant" design for each of several ratings. The "Standard Plant" designs, and changes thereto, are reviewed for conformance to GE product safety standards and to the applicable NRC regulations independent of sales commitments, and are updated as necessary to assure compliance with changes to these standards and regulations. Modifications to the "Standard Plant" for a particular sale are made only pursuant to the contract with the Owner, provided safety and warranty conditions are not adversely affected. Since each nuclear system sale (called "project" after sale is made) is based on a "Standard Plant," it is not necessary to repeat the review of the "Standard Plant" design documentation for each project, but only to review the modifications, if any, for each project. | 1 | 1

The NEBG engineering organizations define and document acceptable and approved materials, parts, equipment, and processes. The definition is documented in controlled design manuals and standards specifications. Standard off-the-shelf commercial items are included. The standards specifications are reviewed, approved, and issued in accordance with the engineering review system. In addition, all equipment designers have available to them direct consultation services of materials engineers during the design action and design review phases. Application selection of materials is based upon this review system, and review for suitability occurs during the engineering review for design verification action. Where engineering experience identifies a need for testing confirmation, suitable controlled qualification tests are performed. | 1

Each discrete design for the GE BWR is subject to the NEBG design control system. The NEBG design control measures are applied to: analyses for performance parameters; reactor physics; stress; thermal; hydraulic; radiation; accidents; compatibility of materials; accessibility for in-service inspection, maintenance, and repair; and specification of criteria for inspection and test. | 1

The contractual design basis and data unique to a specific project is defined to the engineering organizations by the project or program manager. The information is documented in the appropriate project/program release document, e.g., the Project Work Authorization (PWA), which authorizes and initiates the engineering and licensing work for the project. | 1

3.2 DESIGN INTERFACE CONTROL

To provide assurance of structure, system, and component interface compatibility, NEBG design documents are distributed for information, review, and coordination by affected design organizations. The responsible engineer is required

to have his design documents reviewed for interface compatibility by individuals having responsibility for the interfacing documentation in order to assure that there is no conflict in the design objectives and that the product resulting from the interfacing designs will function as planned. Design documents are also furnished to the Owner and/or his agents to provide for interface compatibility review and coordination by Owner/agent design organizations.

3.3 SYSTEM DESIGN

Design specifications and data sheets containing design basis and other data for a specific contract are developed by the design engineer based on the applicable project/program release document and issued to the responsible design organizations in the early months following the receipt of an order. The design controlling documents provide the basis for detailed systems, structure, and component design and typically include the system and structure design specifications, piping and instrumentation diagrams, process diagrams, functional control diagrams, and instrument engineering diagrams.

The design specifications, data sheets, and design controlling documents incorporate the design and safety requirements for each plant. These designs are subject to independent design verification within engineering, as described in Subsection 3.10. These designs also are reviewed by the project engineer for each project before they can be applied to that project (see Item 2 of Table 3-1). The project engineer and project manager assigned to the particular project are responsible for overall project coordination, but are not directly responsible for the preparation of the engineering design or the documentation issued for the project. The various engineering organizations of the NEBG are responsible for the design and design control activities for the GE BWR. Engineering personnel are authorized to define and prepare performance parameters and to document the design of systems and equipment. They obtain necessary internal engineering interface consultation and services as required. They provide final design approval in accordance with documented engineering practices and procedures. Responsibility for internal design document control is vested in the engineering support organizations of the NEBG. Responsibility for interface control with the Owner is assigned to the responsible project or program manager.

In addition to the design specifications, data sheets, and design control documents, engineering organizations issue general standard design specifications which establish standard requirements for designing components which satisfy the system and structures requirements. These standard design specifications identify applicable codes, standards, regulations, and other requirements to be utilized to assure compliance with safety criteria, quality levels, and other specific requirements which have been imposed to obtain acceptable quality, safety, and reliability. These design specifications are subject to design verification review prior to issue. The original issue and any subsequent changes to the document for the project are subjected to review for project application by the project engineer.

A design freeze review is made of the engineering work after the design documents have been issued and the Owner has had an opportunity to review them for adherence to the contractual requirements and to provide interface design data from the balance of plant design (see Item 4 of Table 3-1). The system design freeze review is made by a review team coordinated by the review team leaders, and covers the data sheets, the design controlling documents, and the general standard design specifications described above. The team includes (1) the project licensing engineer who participates in the review of the documents against requirements of the PSAR and any applicable amendments, (2) the responsible design engineers who participate in the review to provide necessary design information and who initiate and follow through on any required changes, and (3) the project engineer who participates in the review of the documents against the contract requirements.

Following implementation of any changes required as a result of the design freeze review, the design is considered frozen and further changes to the design documentation will be made only for the following reasons: (1) requests by the Owner for changes from the original plant as sold, (2) changes to meet requirements of applicable codes, standards, and regulatory agencies, (3) feedback from recent plant startup testing or operating plant experience, or (4) other information identifying changes required to make a system or equipment function properly and safely. Results of design freeze reviews are documented and filed in a controlled manner for future reference in accordance with applicable codes, standards, and regulations. For identification of those positions or organizations responsible for the various types of reviews held in NEBG, refer to Table 3-1.

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3.4 STANDARD REACTOR ISLAND DESIGN

The design documentation for Owner-purchased components within the Reactor Island scope consists of one or more of the following documents: equipment procurement specifications which specify general requirements including codes, materials, processes, workmanship, and acceptance criteria; purchased part drawings which show the outline and interface requirements and specific data sheets or project sheets which define the project unique requirements of the equipment. The responsible design engineer prepares the specifications, drawings, or data sheets and is responsible for assuring that they conform to the requirements of the project PWA, the data sheets, structured system design control documents, the general design specifications, and applicable codes, standards and regulations, and that these documents are all compatible. Initial issues of purchase specifications are reviewed by QAEE&I prior to issuance to the subcontractor-designer. The purchase specification identifies the engineering documents, such as drawings, procedures, calculations and test data which must be submitted by subcontractor-designer for review and documented approval by applicable STRIDE project management and transmitted to the Owner as required by contract. The actual design work is accomplished by a qualified subcontractor who has an acceptable QA program in conformance with applicable criteria of 10CFR50, Appendix B, and other NEBG specified requirements. | 1 | 1 | 1

Design documentation is subject to design verification review by the subcontractor-designer, after which it is submitted to the STRIDE project organization for review and acceptance. Practices are in place for review, resolution, and reissue of design documents requiring change following NEBG review and comment. Any subsequent changes to the approved supplier documents are also formally reviewed and require documented approval in the same manner as the original design documentation. | 1

3.5 DESIGN OF PROCURED ENGINEERED EQUIPMENT

The design documentation of NEBG-purchased components (other than instrumentation and controls and materials used in the fabrication of NEBG-manufactured components) consists of one or more of the following documents: equipment procurement specifications which specify general requirements, including materials, processes, workmanship, and acceptance criteria; purchased part drawings which show the outline and interface requirements; and specific data sheets or project sheets which define the project unique requirements of the equipment. The responsible engineer prepares the specifications, drawings and data sheets and is responsible for assuring that they conform to the requirements of the project PWA, the nuclear system data sheets, system design control documents, interface control drawings, the general design specifications, and applicable codes, standards and regulations. The designs are subjected to design verification review and, in addition, are reviewed by the project manager to assure that the design documents meet any unique project requirements. Initial issues of purchase specifications for engineered equipment are reviewed by Procurement and QAEE&I prior to supplier bidding. Changes to the documents after the purchase order is placed, are controlled as described in Subsection 3.12, "Design Change Control." | 1 | 1

The purchase specification identifies the documents, such as drawings, procedures, calculations, and test data which must by submitted by the supplier for review and approval by Engineering and/or QAEE&I (see Item 5 of Table 3-1). | 1

Product design and quality requirements are transmitted from Engineering to Procurement through controlled issuance of Material Requests (MR's) which identify the product and specify applicable drawings, specifications, and QA requirements. Initial issuance and revisions to the MR's are controlled by written procedures.

3.6 DESIGN OF REACTOR EQUIPMENT COMPONENTS

Design documentation for reactor equipment manufactured by WMD consists of specific detailed product drawings augmented by design and process specifications necessary to fabricate, inspect, and test the finished product. The responsible engineer assures that the design documents conform to the project PWA, the nuclear system data sheets, the system design control documents, the general design specifications, and the applicable codes, standards, and regulations before release to Manufacturing. The design documents are subjected to a design verification review and a review by cognizant materials engineers. Reviews are also conducted by Nuclear Power Systems Engineering Department (NPSED) with WMD Manufacturing Engineering and Quality Assurance to assure compatibility with manufacturing and quality control technology and capability. Changes initiated after this point are controlled as described in Subsection 3.12, "Design Change Control." | 1 | 1 | 1

Product requirements are transmitted to WMD through issuance of controlled Engineering Instructions (EI's) from NPSED, or in the case of spare and renewal parts orders, by Requisition Instruction Sheets (RIS's) from the Nuclear Services Department. The EI or RIS specifies the applicable drawings and specifications.

3.7 DESIGN OF CONTROLS AND INSTRUMENTATION

The system design controlling documentation for controls and instrumentation consists of design specifications, instrument engineering diagrams, functional control drawings, and general controls and instrumentation specifications which incorporate the general functional, environmental, material, and test requirements. The responsible engineer obtains
1 | interface review of the documents he has initiated and assures that they meet the requirements of the project PWA, applicable nuclear system data sheets, system design control documents, interface control drawings, and general design specifications, as well as the applicable codes, standards, and regulations. Reviewers include the project engineer and other engineers responsible for systems or equipment with which there exists a design interface. In addition, a design verification review is performed to assure correctness and completeness of design, including specification of the appropriate quality requirements.

1 | The detail design of controls and instrumentation by NC&ID Engineering and subcontractor-designers encompasses the generation of system elementary diagrams and connection diagrams, panel and rack arrangement drawings, purchased part drawings, instrument data sheets, manufacturing drawings, and instruction manuals. The instrument data sheets define the characteristics of the measurable parameters, the instrument environment ranges, accuracies, set points, and locations of instruments required by the system design. These detail design documents are subjected to design verification review. The detail design makes use of standard products and purchased components which have been procured in accordance with approved functional specifications, and qualified for performance and design adequacy in accordance with documented procedures by a separate testing group. Design requirements, qualification test reports, calculations, and other design data are reviewed for design adequacy in accordance with documented procedures. Product requirements are transmitted from
1 | NC&ID Engineering to the NC&ID Materials organization through issuance of controlled EI's or RIS's which specify applicable drawings, specifications, and project unique requirements. Changes to the controls and instrumentation documents after release to manufacture are controlled as described in Subsection 3.12 "Design Change Control."

3.8 DESIGN OF FUEL

Nuclear system performance requirements and design bases for nuclear fuel are specified by the Nuclear Fuel & Services Engineering Department (NF&SED). Detailed fuel drawings and specifications are prepared and are subjected to a
1 | design verification review by Reactor & Containment Design. These documents are reviewed with WMD Manufacturing and QA personnel to assure compatibility with manufacturing and quality control technology and capability prior to release for manufacture. Changes to drawings or specifications are made through the use of Engineering Change Notices (ECN's) that
1 | are reviewed for consistency within cognizant NF&SED and WMD organizations, and are approved by the engineering organization that approved the original design. Design changes affecting system design or the design of non-fuel components are reviewed for system interface compatibility with other affected organizations in the NEBG.

Product requirements are transmitted from NF&SED to WMD through issuance of controlled EI's which specify applicable drawings and specifications. The Nuclear Fuel Projects Department also specifies other project unique requirements to WMD through the issuance of controlled Fuel Project Instructions (FPI's).

Design review, design release, and design change control systems are formally documented and implemented for all designs of fuel components and assemblies.

3.9 DESIGN OF HIGH DENSITY FUEL STORAGE EQUIPMENT

The system design controlling documentation for high density fuel storage equipment consists of design specifications and drawings supplemented by process specifications necessary to fabricate, inspect, test, and install the equipment. The responsible engineer assures that the design conforms to the design basis, as well as to all corporate and regulatory requirements. The design documents are subjected to a design verification review by cognizant personnel, as well as a review by SFSC-QA.

The SFSO has established a system of Spent Fuel Instructions which detail the design and verification processes and describe interfaces and responsibilities for accomplishment of the design work. 1

3.10 DESIGN VERIFICATION

Design verification is a process for an independent review of designs against design requirements to confirm that the designer's methods and conclusions are consistent with requirements, and that the resulting design is adequate for its intended purpose. All BWR product designs and each application thereof are verified. Design verification is performed and documented by persons other than those responsible for the design using the method specified by the design organization. The methods of design verification include one or more of the following: design review, qualification testing, alternate or simplified calculations, or checking. When qualification testing is used as the sole means of verifying design adequacy, a prototype or initial production unit is tested under the most adverse operational conditions expected to be experienced by the product (see Item 1 of Table 3-1). 1

For a given application, no additional verification is required for spare or renewal parts which are the same as those originally supplied. If spare or renewal parts for an application are of a modified or different design from the original design, the differences between the new part and the original part are verified for the new application. If spare or renewal parts are used in a new application (a different system, different power plant, etc.) the designs are verified for the differences between the old and the new application. 1

3.11 TEAM DESIGN REVIEW

A team design review is a formal, independent evaluation of designs by persons other than those directly responsible and accountable for the design. These activities are ongoing reviews of designs, selected by engineering management, to evaluate the adequacy of product designs including concepts, the design process, methods, analytical models, criteria, materials, applications, or development programs. When appropriate, design reviews are used to verify that product designs meet functional, contractual, safety, regulatory, industry codes and standards, and NEBG requirements. The design review team selection depends on the product design and the type of review. The team's technical competence will fall into three broad categories: (1) those with broad design experience on similar products, (2) those with specialized technical expertise such as in heat transfer, materials, structural analysis, etc., and (3) those with a functional expertise such as manufacturing engineering, product service, legal, etc. (see Item 3 of Table 3-1). 1

3.12 DESIGN CHANGE CONTROL 1

Following issuance of engineering documents, a design change control procedure is implemented with controls commensurate with those applied to the original design. Measures for documenting and dispositioning errors and deficiencies in the design and for determining and implementing corrective actions are described in this section as well as in Subsection 3.13, "Field Change Control." The end result, after all changes have been incorporated, is reflected in accurate drawings, specifications and other documents which fully describe the final design for equipment supplied. The control procedure requires that every change must be documented, design verified, approved by the responsible engineer, and reviewed by the appropriate interfacing components. The responsible engineer is charged with the responsibility for defining all other design documents affected by the change, and for resolving and coordinating changes with other engineers whose documents are affected. The Engineering Change Notice (ECN) is used for documenting the change and its approval. 1

ECN's are identified, issued, and controlled in accordance with documented procedures. Copies of ECN's are distributed to design interface personnel, including the responsible engineer who approved the change, the project manager, and to engineering, manufacturing, procurement, and QA personnel in other organizations, as appropriate. Design changes affecting interface conditions between Owner-supplied and NEBG-supplied equipment are identified and reviewed by the project manager with the Owner or his designated representative. Such documented changes are transmitted by the project manager to the Owner or his designated representative for implementation of design and field changes, as appropriate, in his interfacing scope of supply. 1

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3.13 FIELD CHANGE CONTROL

After delivery of equipment and during the installation and startup phases at the plant site, field changes that become necessary fall into two general classes: first, those generated by design changes, and second, those initiated in the field as a result of unique field conditions. In order to accomplish a field change on NEBG-furnished components, the responsible engineer processes a design change in accordance with Subsection 3.12, "Design Change Control" and issues a Field Disposition Instruction (FDI) which identifies the components affected, the changes to be made, the parts to be replaced, the source of replacement parts, the disposition of parts replaced, the procedures to be followed in making the change, and the quality requirements to be met. The responsible engineer is also responsible for providing instructions for the manufacture or procurement of the replacement parts, as applicable, and for assuring that instructions are issued for other projects requiring such changes. The design documentation supporting the FDI is subjected to a design verification review and is reviewed by the project engineer. The field change is then authorized by the project manager prior to distribution of the FDI.

When it becomes necessary to ship products to the site before manufacturing is complete (ship short) either by NEBG or its suppliers, an FDI is issued which identifies the work to be completed in the field. Such FDI's identify the necessary engineering and quality requirements.

Changes initiated by field organizations generally are the result of deviations from the planned construction or preoperational conditions. In order to initiate action to accomplish a field change on NEBG-furnished components, the field organization generates a Field Deviation Disposition Request (FDDR) which identifies the deviation and the proposed changes to correct or compensate for the deviation. The engineering and project management organizations review the FDDR for compliance with the established design criteria and for safety, performance, and functional design requirements. If the proposed method is found to be satisfactory, the FDDR is then reviewed and released for field implementation. If the proposed method for correction does not comply with the established criteria and requirements, the responsible engineer disapproves the FDDR, and an alternate solution is presented by modification of the FDDR or by issuing an approved FDI. If an FDDR results in a design change, documents are changed by use of the ECN. When an FDDR indicates an inherent problem which affects more than one project, the responsible engineer issues appropriate ECN's to effect changes to the design documents for all plants affected. The FDI's, FDDR's, and ECN's are formally identified, prepared, and controlled in accordance with documented procedures.

The NEBG installation engineers and technical specialists provide technical direction of Owner-implemented field changes during the installation, preoperational and startup testing phases. Also, verification of field change implementation during the installation phase is accomplished by NEBG surveillance of NEBG-supplied systems and components. NEBG-implemented changes at the site are performed and controlled under the direction of the NEBG.

3.14 DESIGN CHANGE APPLICATION

The system for assuring controlled changes in the design has been described in preceding subsections. In addition, when conditions adverse to quality or safety are identified in designs, they are documented with proposed corrective action and proposed project application of the corrective action. This is reviewed by appropriate management through a review board to finalize agreement on the necessary design change action and the projects affected. Following management decision to apply the corrective action to specific projects, the responsible engineer makes the necessary design document changes and issues MR changes, EI changes, or FDI's, where appropriate, to implement the design change. As a result, corrective action is applied to all projects where action to correct the cause of the condition is deemed appropriate (see Item 6 of Table 3-1).

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Table 3-1
DESIGN AND APPLICATION REVIEWS

Review Type	Review Scope	Responsible Organization or Individual	Text References
1. Design verification prior to issue of design documentation and changes thereto	Verification of correct translation of requirements and application.	Designated design engineer for verification.	See subsection 3.10, "Design Verification."
2. Project application review.	Incorporation of contract requirements.	Project engineer for each project.	See subsection 3.3, "System Design."
3. Team design review to determine adequacy of product design.	Evaluation of design for application of new safety, licensing, or operational requirements.	Review team selected by management.	See subsection 3.11, "Team Design Review."
4. Design freeze review	Design, contract, and licensing compatibility.	Responsible design, licensing, and project engineers.	See subsection 3.3, "System Design."
5. Review of vendor design for compliance with procurement specifications.	Vendor compliance with requirements; design adequacy.	Each design engineer responsible for the equipment design.	See subsection 3.5, "Design of Procured Engineered Equipment."
6. Review of significant design change proposals.	Authorization of design change and project application.	Managment review board.	See subsection 3.14, "Design Change Application."

4 PROCUREMENT DOCUMENT CONTROL

Measures are established and documented for the preparation, review, approval, and control of procurement documents to provide assurance that regulatory requirements, design bases, and other requirements which are necessary to assure the requisite level of quality are included or referenced in the documents for procurement of items and services, including spare and replacement parts and subcontractor design services. Design quality requirements, such as those documented in drawings and specifications are prepared, reviewed, approved, and issued by the appropriate engineering organizations, prior to order placement. Additional quality compliance requirements, such as supplier QA Program and documentation requirements, and provisions for source surveillance and audit, are prepared, reviewed, approved, and issued by QA organizations for inclusion in the procurement document packages. Reviews of procurement documents by QA personnel are made to provide assurance that quality requirements are complete and correctly stated and that they can be controlled by the supplier and verified by NEBG QA personnel. Purchase Specifications are reviewed and signed off by QA on an Engineering Review Memorandum prior to issuance.

The NEBG documents for procurement of engineered equipment are approved by the responsible engineer and released by the Nuclear Engineering Support Operation. QAEE&I develops QA requirements which are applied to each Material Request for engineered equipment or services and which become a part of the purchase contract. A copy of each purchase order for engineered equipment is sent to QAEE&I for planning purposes. 1

Quality-related changes in procurement documents are subject to the same level of control as was exercised in the preparation of the original procurement documents. The NEBG procurement organizations close out purchase orders only after ascertaining that all equipment and documentation has been received and that the pertinent records accurately reflect the procurement actions. The pertinent records are then stored and maintained in a systematic and controlled manner in designated record retention areas for the length of time specified by contract or other legal requirements. 1 1

The following information and requirements are included in procurement documents, as deemed appropriate by NEBG QA engineers:

- GE Supplier Quality Assurance Program — Identification of the requirements of the QA Program to be developed and implemented by the supplier, such as design control, document preparation and control, purchased material control, control of materials, special process controls, inspection and test control, control of measuring and test equipment, handling, storage, and shipment control, inspection and test status control, nonconforming material control, corrective action, auditing, etc.

- Basic Technical Requirements — Drawings, specifications, codes, industrial standards, and the applicable requirements of those Regulatory Guides and ANSI Standards identified in Table 2-1, with applicable revision data, test and inspection requirements, including test equipment, special instructions, and requirements such as for designing, fabricating, cleaning, packaging, handling, shipping, and normal or extended storage in the field.

- Source Surveillance and Audit — Provisions for access to the plant facilities, records, and documentation necessary for source surveillance or audit by the NEBG, the Owner, or his agent personnel when the need for such access has been determined.

- Document Requirements — Identification of supplier documents and records to be prepared, controlled, retained, maintained, submitted, or made available for NEBG review and/or approval. Such records include: drawings; specifications; procedures; procurement documents; inspection and test records; personnel and procedure qualifications; material, chemical, and physical property test results; and Product Quality Certifications.

- Lower Tier Procurement — Extension of applicable requirements of procurement documents to lower tier suppliers.

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6 DOCUMENT CONTROL

Procedures and practices are established, documented, and implemented to control the issuance and use of documents which prescribe activities affecting quality, including: design basis specifications; procurement specifications; test and inspection instructions; manufacturing, construction, and installation drawings; operating procedures; and QA plans and manuals. These measures provide assurance that documents, including changes, are reviewed for adequacy and approved for release by authorized personnel and are promptly distributed for use at the location where the prescribed activity is performed. Changes to documents are reviewed and approved by representatives of the same organization that approved the original document unless another organization is specifically designated by appropriate management. The designated reviewing individual(s) has access to pertinent background information upon which to base the review, and is determined by the NEBG management to have an adequate understanding of the requirements and intent of the original document.

Through established distribution and communication systems, those participating in an activity are furnished or apprised of current applicable instructions for performing the activity. Participating organizations have documented procedures for control of these documents, and the changes thereto, to assure use of the proper documents and to preclude the possibility of use of outdated or inappropriate documents.

The NEBG engineering services organizations are assigned responsibility for the initial distribution, safeguarding of originals and future retrieval of design documents. Controlled distribution lists are maintained to assure that distribution is to responsible individuals and organizations. The NEBG organizations utilize a design record retention/retrieval system based on prints made from microfilm/microfiche. When a document is issued or revised, the engineering services organization replaces the prior revision microfilm and relocates it to an obsolete file.

The NEBG-QA-related documents such as the Project Master Parts List, Project Work Authorizations, Engineering Instructions, Shop Travelers, Work Orders, QA Plans, QA Procedures and those documents identified in Subsection 2.2 are controlled in accordance with the following provisions: 1

- Individuals or organizations responsible for preparing, reviewing, approving, and issuing documents and their revisions are identified by higher level procedures with appropriate authority for such delegation of responsibility.

- Interface documents are developed, coordinated, controlled, and require mutual agreement between the interfacing organizations.

- Assurance that proper documents are being used is ascertained by cognizant supervisors and verified by QA through inspection and audits.

- Distribution lists are established by the issuing organization and include those individuals or organizations with a need to know in order to fulfill their assigned responsibilities.

- Revised documents are distributed to those on controlled distribution of the original or prior revision of the document. Distribution of changes or additions to issued manuals and other QA documents is made to a controlled distribution list with instructions to the recipient as to the disposition of the obsolete documents.

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7 CONTROL OF PURCHASED MATERIAL, EQUIPMENT AND SERVICES

Procedures and practices are established and documented to provide assurance that purchased items and services, whether purchased directly or through subcontractors, conform to the procurement document requirements. These measures include provisions, as appropriate, for the following: source evalutation and selection; review of procurement requirements: QA or engineering review of supplier documents; appropriate objective evidence of quality furnished by the supplier; surveillance, inspection, or audit at the source; and examination or review of items or services upon delivery or completion. Documentation of such requirements is originated and maintained by the cognizant QA organizations. Spare and renewal parts that perform safety-related functions are procured to a level of quality standards and controls that are at least as stringent as those employed for the procurement of the original equipment.

Measures for evaluation, certification, or qualification, and selection of procurement sources by engineering and QA personnel include the use of historical quality performance data, source surveys (including a review of the supplier's QA Program), or source qualification programs. Specific provisions for QA review, concurrence and audit of NEBG suppliers' QA Programs are delineated in purchase orders for safety-related equipment or services. Suppliers of engineered equipment and services are required to document their QA Program in accordance with the applicable elements of ANSI N45.2 and to submit their documented QA Program to the NEBG for review. Those comments affecting component quality are resolved prior to commencement of any work which could be affected by the comments.

The NEBG suppliers are subject to audit/evaluation by NEBG QA personnel for evaluation of the sufficiency of the supplier's QA Program and for adequacy of implementation. Each supplier of safety-related equipment or services is audited or evaluated initially to determine acceptability of their QA Program. If acceptable, the supplier is placed on an approved supplier list. Following placement on the approved supplier list, the supplier is either: (1) audited annually to determine the continued acceptability of the supplier's program, or (2) evaluated annually to determine if an audit is required during the upcoming year. When an evaluation is performed, the results are documented and approved by responsible QA personnel. This evaluation considers pertinent factors, such as: the results of previous audits; history of performance of product and/or purchased service; effectiveness of implementation of the supplier's QA Program; and the importance, complexity, and quality requirements of the item or service concerned. Regardless of the results of evaluations, active suppliers are audited at least every 3 years.* 1

Source inspection or surveillance is performed by NEBG QA organizations as necessary to assure the required quality of an item or service. The QA organizations may elect not to perform source inspection or surveillance of supplier activities when the quality of the item or service is to be verified by some other method such as: review of test reports, inspection or review upon receipt, or by the performance of acceptance or installation tests. The QA representatives responsible for supplier audit and surveillance are typically assigned responsibilities as follows:

- Review purchase specifications and drawings to assure a clear understanding of quality requirements.
- Participate in preproduction reviews with supplier personnel to assure mutual understanding of quality requirements.
- Review suppliers' detailed fabrication process sheets to assure proper sequencing and adequate in-process inspection, test, and control.
- Witness and audit various qualifications, tests, inspections, and nondestructive examinations.
- Audit heat treatment, welding, cleaning, preserving, packing, and packaging activities.
- Review supplier QA records for compliance with requirements.

*May be satisfied by ASME survey.

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16 CORRECTIVE ACTION

Procedures and practices are established and documented which provide assurance that conditions adverse to quality or nonconformance such as: failures, malfunctions, deficiencies, and deviations in material and equipment are promptly identified, documented, and corrected or otherwise handled in accordance with established procedures. Corrective action followup and closeout procedures provide for assuring that corrective action commitments are implemented in a systematic and timely manner. Results of such followup and closeout activities are periodically reported to appropriate levels of management. Corrective action documentation and request forms or formal letters are used to document the corrective-action-related requests, responses and followup.

Procedures provide for significant conditions adverse to quality to be identified, their causes to be determined, and for corrective action to be taken. Pertinent information is then documented and reported to responsible management through established communication systems.

Each cognizant NEBG QA organization is responsible for the following:

- Identifying, diagnosing, and determining the cause of chronic quality problems.
- Transmitting relevant information to the individual responsible for taking corrective action.
- Verifying to assure that corrective action is taken which will preclude repetition of the problem or satisfactorily control the cause of the problem.

Continuous surveillance of operating BWR performance is maintained. Periodic contact by NEBG personnel with plant operations personnel provides detailed information on statistical performance of the plant, as well as narrative reports of equipment malfunctions or failures. Automatic data handling systems record and analyze the statistical information. This information is analyzed by the cognizant design components and carefully monitored for significant or generic equipment weakness. This provides feedback to the responsible design component to avoid repetition of the same problems. Prompt communication to all operators of similar equipment is provided whenever significant or avoidable problems are discovered. Implementation of appropriate design changes to assure corrective action on requisition projects is accomplished in accordance with procedures described in Subsection 3.12, "Design Change Control," and Subsection 3.13, "Field Change Control." 1 1

17 QUALITY ASSURANCE RECORDS

Procedures and practices are established and documented to provide assurance that sufficient records are prepared and accumulated as work is performed to furnish documentary evidence that the quality of items is satisfactory and that other closely related activities have been performed satisfactorily. Requirements and responsibilities for record generation, accumulation, transmittal, retention, and maintenance are documented in these procedures. The QA records are consistent with the requirements of applicable codes, standards, regulations, specifications, and contract requirements and are adequate for use in effective management of the QA Program.

The QA records include such documentation as the results of design reviews, inspections, tests, material analyses, etc. These records also include closely-related data such as qualifications of personnel, procedures, and equipment and other documentation required by applicable codes and regulations. Inspection and test records, as a minimum, identify the completion date of the inspection or test, the inspector or data recorder, the type of observation, the results, the acceptability of the item, and the action taken in connection with any nonconformance noted. The QA records are identified, collected, stored, and maintained in a systematic and controlled manner and are retrievable consistent with the applicable NEBG and regulatory requirements.

Each functional NEBG organization is responsible for collecting, filing, transmitting, and/or maintaining and controlling those quality-related records which they generate or cause to be generated in accordance with documented procedures. Nonconformance reports (IR's and DDR's) are filed and maintained by the cognizant line QA organization. Corrective action reports and audit reports prepared by P&QAO are filed and maintained by P&QAO. These reports are made available to the Owner and NRC personnel for audit and review at GE facilities upon request.

For those items for which there are no code requirements for record retention or transmittal, designated QA records, such as outline drawings, purchase specifications, material property records or inspection and test data are provided to the Owner or maintained for him in accordance with the contractual agreement with the Owner.

Records which identify the "as built" condition of safety-related items as furnished by GE shall be transmitted to, or retained for, the Owner for the life of the items. | 1

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13 AUDITS

A comprehensive system of planned and documented audits is carried out to verify product quality and compliance with the QA Program. This audit program is designed to assure compliance with all aspects of 10CFR50, Appendix B, including, as a minimum, the quality-related aspects of design, procurement, manufacture, storage, shipment, and GE-supplied services at reactor sites. These audits are conducted at scheduled intervals as documented in audit schedule planning or on a random unscheduled basis, or both, as appropriate. The NEBG instructions require that QA audits be conducted using pre-established written procedures or check lists by appropriately trained personnel not having direct responsibilities in the areas being audited. Audit results are documented by the auditors and transmitted for review and commitment of corrective action by management having responsibility in the area audited. Audit data are periodically analyzed and reports indicating performance trends and the effectiveness of the QA Program are prepared and issued to responsible management for review and assessment.

After evaluation and agreement on audit findings, the responsible managers take whatever action is necessary to correct any noncompliance revealed by the audit. The audit program provides for followup action, including any necessary reaudit of deficient areas, to assure that corrective action has been taken. Audits are performed to determine the following, as appropriate:

- The adequacy of documented QA-related policies, procedures, instructions and practices to meet their intended purpose of assuring product quality.
- Compliance with quality-related policies, procedures, instructions, and practices.
- The adequacy of work areas, activities, processes, items of equipment, documents, and records.
- Product compliance with applicable engineering drawings and specifications.
- Implementation of corrective action in accordance with applicable procedures.

The P&QAO, by delegation from the NEBG Group Executive through the NEBG OPG, has the responsibility for conducting QA audits of each of the Department-level organizations that affect product quality for the purpose of appraising the quality of the products and the effectiveness of the quality system. The Quality Assurance and Product Assurance Sections of P&QAO are required to prepare plans, prior to the first of each year, for the conduct of audits which will assure that the quality system established by such Department-level organization is audited at least annually.

Division-level organizations are required by the NEBG OPG to perform annual self-audits to determine the effectiveness of, and verify compliance with, assigned portions of the BWR QA Program. Each organization prepares plans for the conduct of internal audits prior to February 1 of each year so that during the course of each year all aspects of the BWR QA Program are included in at least one self-audit in addition to the P&QAO audits. More frequent audits or measurements may be conducted when dictated by any of the following circumstances: (1) When significant changes are made in functional areas of the QA program; (2) when a systematic, independent assessment of program effectiveness or product quality or both is considered necessary; or (3) when it is necessary to verify implementation of required corrective actions. 1

The NEBG suppliers' quality-related systems, procedures, processes, operations, in-process and finished products, and documentation are subject to audit by the cognizant NEBG QA organizations. Audits are used to assess the adequacy of quality-related systems and procedures and compliance thereto, and to evaluate the effectiveness of inspection operations and other product controls. "QA Requirements," which are included as part of the purchase specifications for engineered equipment important to safety, require NEBG suppliers to grant access to the NEBG QC Representatives for audit and review of applicable design, manufacturing, and quality control records, reports, and documents.

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