AP600 Advanced Light Water Reactor Design

Quality Assurance Program Plan

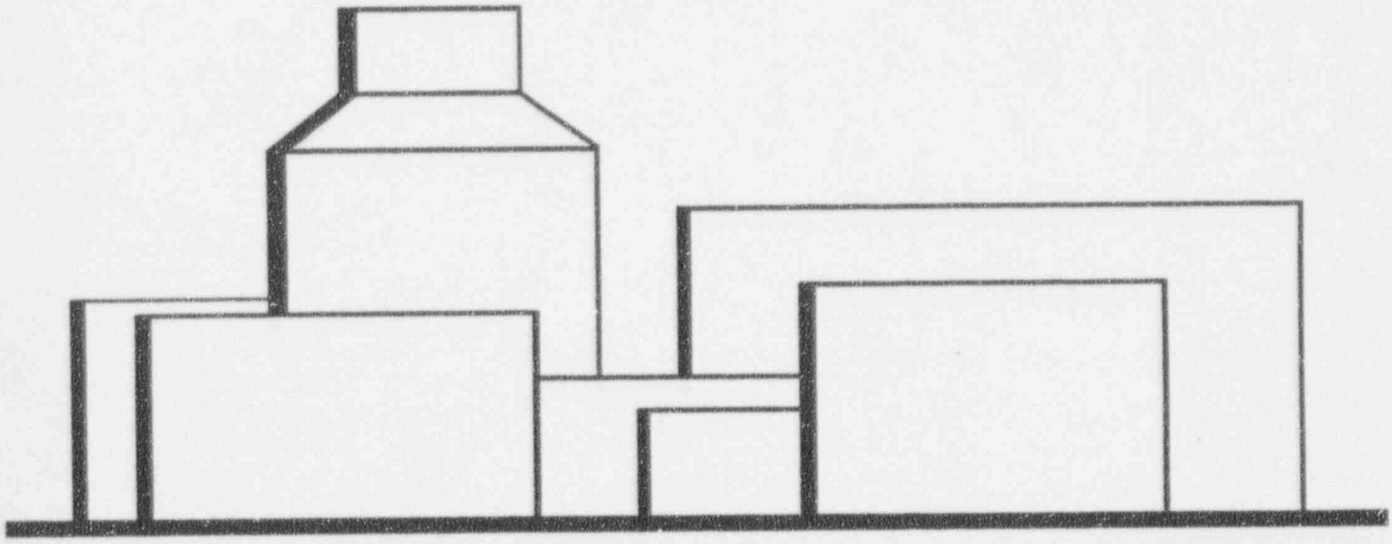
prepared for

Advanced Reactor Corporation

Palo Alto, CA

ARC-93-3-SC-001

December 15, 1993



Westinghouse Electric Corporation

AP600 DOCUMENT COVER SHEET

Form 58202F(9/93) [WP xxxx] 0058.FRM

AP600 CENTRAL FILE USE ONLY: _____ RFS #: _____ RFS ITEM #: _____

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ALTERNATE DOCUMENT NUMBER: WCAP-12600, Rev. 2
DESIGN AGENT ORGANIZATION: Westinghouse
PROJECT:
WORK BREAKDOWN #: GW-GA
TITLE: AP600 Quality Assurance Program Plan

ATTACHMENTS

WCAP-8370, Revision 12A

CALCULATION/ANALYSIS REFERENCE: None

ELECTRONIC FILENAME: APPLICATION:

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None

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ORIGINATOR	SIGNATURE/DATE
D. N. Alsing	12/8/93

AP600 RESPONSIBLE MANAGER	SIGNATURE*	APPROVAL DATE
ATBA General Manager H. J. Bruschi	H J Bruschi	Dec 8, 1993

*Approval of the responsible manager signifies that document is complete, all required reviews are complete, electronic file is attached and document is released for use.

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AP600 RECORD OF CHANGES

Form 58204 (1-91)

AP600 DOCUMENT NO. GW-GAM-001 REVISION 2

ALTERNATE DOC. NO. WCAP-12600, Revision 2

DESIGN AGENT ORGANIZATION Westinghouse

TITLE AP600 Quality Assurance Program Plan

CHANGE NUMBER	PARAGRAPH NUMBER	CHANGE DESCRIPTION AND REASON	ENGINEER APPROVAL/DATE
1	Foreword	Revised to address ARC Comments on Revision 1.	
2	Part A, Section 1	Revised per Current ATBA Organization.	
3	Part A, Section 2	Revised to Address ARC Comments on Revision 1.	
4	Part B, Section 2	Revised to address ARC Comments on Revision 1.	
5	Part B, Section 11	Revised to clarify AP600 QA Program Provisions for Test Control.	
6	Part B, Section 18	Revised to Address ARC Comments on Revision 1.	

K. A. Kloes 12-7-93
K. A. Kloes

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QUALITY ASSURANCE PROGRAM PLAN
TABLE OF CONTENTS

STATEMENT OF POLICY & AUTHORITY

It is the policy of the Advanced Technology Business Area to provide systems, products and services that meet or exceed the quality assurance requirements of the Department of Energy and the Nuclear Regulatory Commission.

The Advanced Technology Business Area General Manager is responsible for the AP600 quality assurance program. He ensures its development, implementation and verification, and retains review and approval authority in matters pertaining to the implementation of the requirements of the quality assurance program.

The Quality Assurance Manager is empowered to act on behalf of the General Manager to ensure the implementation of this Quality Assurance Program Plan and has direct access to the General Manager to ensure that appropriate action is taken to resolve all quality related issues. The Quality Assurance Manager is sufficiently free from direct pressure of cost and schedule, and has authority and access to work areas, to identify quality problems; initiate, recommend, or provide solutions to quality problems through designated channels; verify implementation of solutions; and assure that further processing, delivery, installation, or use of items or services is controlled until proper disposition of a nonconformance, deficiency, or unsatisfactory condition has occurred, including the authority to stop unsatisfactory work if necessary.

Each performer and manager is fully responsible for implementing these quality assurance requirements to achieve the quality and safety of the simplified passive advanced light water reactor Design Certification and First-of-a-Kind Engineering activities. Each manager is responsible for providing the necessary instruction and training to assure that work is performed in accordance with these requirements.

Changes to this document and to this statement of policy and authority will be approved by the Advanced Technology Business Area General Manager.

FOREWORD

The Vice President and General Manager of the Westinghouse Energy Systems Business Unit has committed the resources and support of the Westinghouse Electric Corporation to the Simplified Passive Advanced Light Water Reactor Plant (AP600) Program. As a supplier of items and services to the nuclear industry, Westinghouse has established a single Quality Assurance Plan (QAP) that complies with the applicable government regulatory and industry requirements. The QAP is identified as topical report WCAP-8370, currently Revision 12A. WCAP-8370 applies to all Westinghouse activities affecting the quality of such items and services, including the AP600. Since the scope of these activities includes operating plants and plants under construction, WCAP-8370 commits to meeting 10CFR50 Appendix B, ASME NQA-1 and NQA-2, and United States Nuclear Regulatory Commission (NRC) Regulatory Guide 1.28 Revision 3. WCAP-8370 Revision 12A has been accepted by the NRC.

The AP600 Quality Assurance Program Plan (QAPP), WCAP-12600, affirms the commitments established in WCAP-8370 for the AP600 program. It does not replace WCAP-8370, although it does establish commitments for the AP600 program that are in addition to those in WCAP-8370. WCAP-12600 further describes how some specific features of the program relate to selected criteria of the NRC Standard Review Plan, NUREG-0800, Chapter 17.3 "Quality Assurance Program Description."

WCAP-12600 was initially developed for the Design Certification program, and it continues as an integral program for First-Of-A-Kind Engineering (FOAKE). It therefore applies to work performed on both programs.

The commitments in WCAP-12600 to regulatory requirements and industry standards are tied to those established in WCAP-8370, and meet or exceed the requirements of the Design Certification and FOAKE contracts. Commitments are revised when necessary to meet new NRC or customer requirements, or when deemed necessary by Westinghouse management to improve the quality of the items and services provided.

WCAPs 8370 and 12600 also provide a foundation for implementing corporate Total Quality goals. The commitments established in response to NQA-1 requirements also support Westinghouse Total Quality initiatives. For example, the provisions for training support the human resource excellence initiative; management assessments support the management leadership initiative; self- assessments support the product/process improvement initiative; and the utilization of the Utility Requirements Document as input to the design process supports the customer satisfaction initiative.

Total Quality initiatives are also implemented by means that are outside the scope of WCAPs 8370 and 12600, such as the Energy Systems Business Unit Business Improvement Plan. This plan establishes quality improvement and performance measurement objectives integral with the financial and other non-financial business unit objectives. The Business Improvement Plan includes companion plans at lower organization levels within the Business Unit.

WCAP-8370 governs all Westinghouse nuclear work and provides for certain interfaces with the NRC. For example, WCAP-8370 is submitted for NRC acceptance, and the NRC must be notified of changes in accordance with 10CFR50.55 (f)(3). Commitment to specified Regulatory Guides for the QA program is addressed in the Standard Safety Analysis Report (SSAR). Since WCAP-12600 continues to apply to activities associated with the Design Certification phase, the QA program provides for a management position with responsibilities for interfacing with the NRC.

Changes to the commitments contained in this Quality Assurance Program Plan will be submitted to the Advanced Reactor Corporation (ARC) and to the Department of Energy (DOE) for review and acceptance.

PART A - MANAGEMENT

SECTION 1 - ORGANIZATION

See WCAP-8370 Part A, Section 1. Details of the specific organizational structure for AP600 activities are provided below.

1.0 General

The Advanced Technology Business Area of the Energy Systems Business Unit (ESBU) is responsible for Design Certification and First-of-a-Kind Engineering for the Simplified Passive Advanced Light Water Reactor Plant (AP600) and for control of the technical interface between Westinghouse engineering groups and suppliers providing engineering services. Westinghouse management is responsible for activities affecting quality as required throughout this Quality Assurance Program Plan.

1.1 Responsibility

The authority and responsibility of each group within the Advanced Technology Business Area is established by the General Manager. Responsibility for the establishment of the Quality Assurance Program Plan and for assuring its effective implementation is assigned by the General Manager to the Quality Assurance Manager.

The organizational structure, functional responsibilities, levels of authority, and lines of communication for activities affecting quality are defined in Figure 1, Page 5 and throughout this Quality Assurance Program Plan.

Responsibility for achieving quality is assigned to each individual or organization performing the work. The verification of quality achievement is assigned to individuals or groups not directly responsible for performing the work.

1.1 Responsibility (Continued)

Each manager with responsibilities in the quality assurance program may delegate work to others but shall retain responsibility for the work. Each manager is responsible for control of engineering cost and schedule for assigned activities; ensuring that the design effort is performed in accordance with approved design criteria and guidelines and applicable government, industry and environmental standards; and developing standards and procedures as needed.

1.1.1 Advanced Technology Operations

The Advanced Technology Operations Manager is responsible for the administration, implementation, and maintenance of the Westinghouse AP600 management control system; program cost and schedule reporting; customer interaction on contractual matters; configuration management administration and administration of all subcontracts and technical agreements with international participants.

In addition, the Advanced Technology Operations Manager is responsible for the AP600 systems engineering management activities which include serving as the Configuration Control Board Chairman; Reliability, Availability, and Maintainability (RAM) Program implementation; evaluation of plant cost objectives; URD Conformance Assessment and maintenance of the URD database; coordination of utility participation in reviews of the plant design and maintenance; and coordination of Competitive Technology evaluations for optimization of the AP600 design.

1.1.2 AP600 Design Certification Project

The AP600 Design Certification Project Manager is responsible for all aspects of managing and directing the successful implementation of the AP600 Design Certification program. These activities include Design Certification test programs and related analyses; safety, regulatory, and probabilistic analyses; interfacing with NRC on licensing matters; coordinating responses to NRC Requests for Additional Information (RAIs); and maintenance and revision of the Standard Safety Analysis Report (SSAR)

1.1.2 AP600 Design Certification (Continued)

and the Probabilistic Risk Assessment Report (PRA).

1.1.3 AP600 FOAKE Project

The AP600 FOAKE Project Manager is responsible for managing and directing all aspects of implementing the FOAKE contract with ARC and DOE, consistent with the design developed in the Design Certification phase. These activities include the design and analysis of safety and non-safety systems, structures, and components throughout the plant; establishing functional requirements; review and approval of design and manufacturing drawings and specifications; man-machine interface design, control systems, and control room design; modularization; plant arrangement; constructibility, construction methods, and construction schedule; plant cost estimate; and plant information management system. The AP600 FOAKE Manager is also responsible for managing, directing, and integrating the technical design and development activities performed by supporting engineering groups, both internal and external to Westinghouse.

1.1.4 Quality Assurance

The Quality Assurance Manager is responsible for developing the Quality Assurance Program Plan; documenting, approving, and verifying implementation of a quality assurance program that meets the requirements of this Quality Assurance Program Plan; assuring the development of implementing procedures; verifying that activities affecting quality have been correctly performed; and reporting to management the degree of compliance. In addition, the Quality Assurance Manager has no responsibilities unrelated to quality assurance that would prevent full attention to quality assurance functions.

Quality Assurance activities include review of design specifications for which Advanced Technology Business Area is the design agent (and drawings when used as such design specifications) and procurement documents; performance of supplier evaluations and audits; maintenance of the quality assurance program, review and development of procedures; performance of

internal audits and, at the discretion of the Quality Assurance Manager, participation in work schedule and status meetings.

The minimum qualification requirements for the Quality Assurance Manager are as stated in WCAP-8370.

1.1.5 Procurement Services

Through a matrix organization, the ESBU Procurement Services Department provides procurement services and acts as the interface between the Advanced Technology Business Area and suppliers of procured items and services. Procurement Services also provides cost information on components from suppliers to support the plant cost estimate. Procurement activities for items and services are accomplished in accordance with established procedures and the requirements of this Quality Assurance Program Plan.

WESTINGHOUSE
AP600 ORGANIZATION

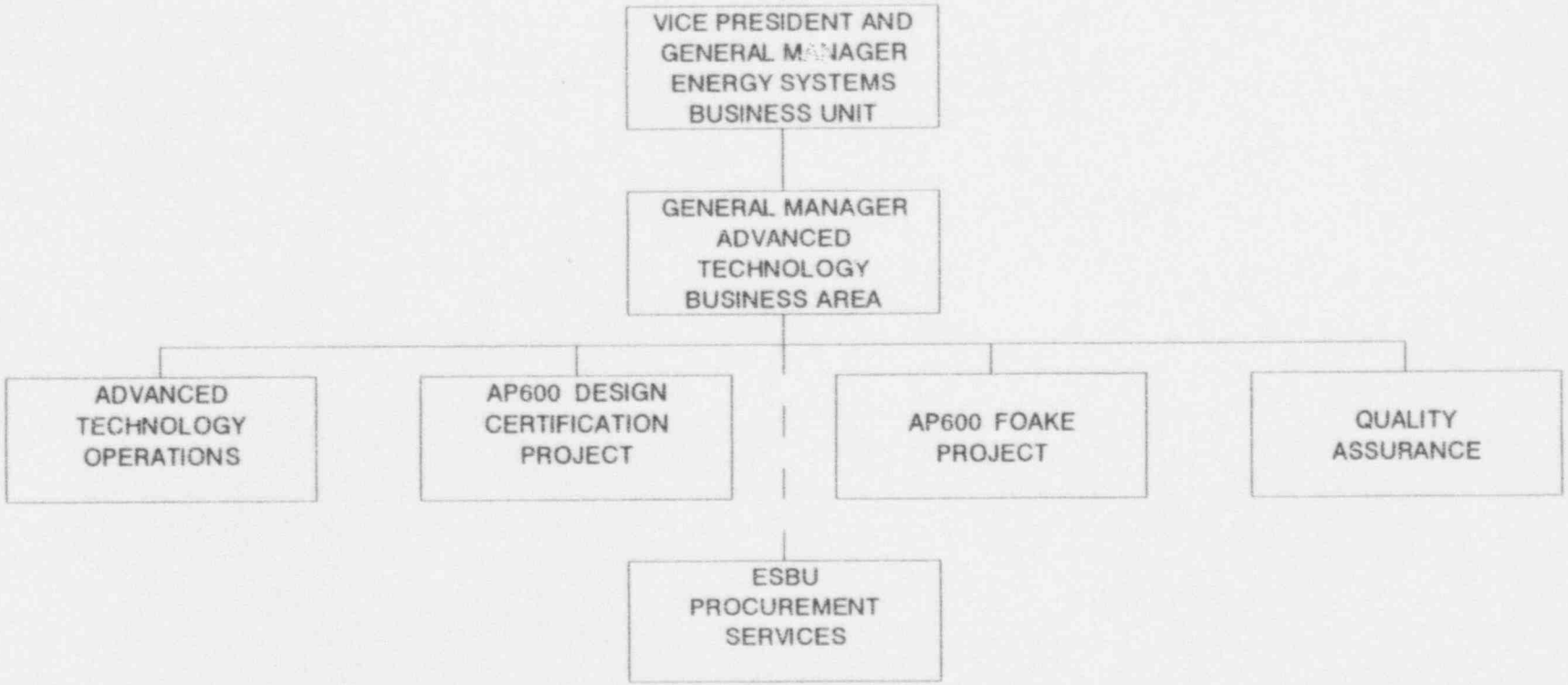

FIGURE 1

SECTION 2 - QUALITY ASSURANCE PROGRAM

See WCAP-8370 Part A, Section 2. Application of WCAP-8370 to AP600 activities includes the following:

- The graded application of quality requirements is based on a documented safety classification system that designates the safety class of equipment, components, and structures. Quality requirements appropriate to each safety class are applied.

- The training of personnel who perform or manage activities affecting quality includes indoctrination to the requirements of this Quality Assurance Program Plan, related quality program standards and implementing procedures, and special skills required for the performance of activities. This training is documented and identifies the name of the trainer, personnel in attendance, the subject and scope or content of the training, the location where the training was received, and the duration of the training. Management annually evaluates and documents the maintenance of proficiency of personnel in activities affecting quality.

- Management regularly assesses the adequacy and effectiveness of the quality assurance program and its implementation for compliance with the requirements of this Quality Assurance Program Plan. Management assesses their functional areas by evaluating such documents as internal and external audit reports, self-assessment reports, nonconformance reports, procedures and instructions. Additionally, consideration is given to updating the program as the result of changes brought about by reorganizations, new technologies and quality concepts, to ensure its continuing suitability and effectiveness. These assessments are documented, and actions are identified and followed to close-out.

SECTION 3 - REGULATORY COMMITMENTS

Regulatory commitments are as specified in AP600 Standard Safety Analysis Report GW-GL-021. The commitments in WCAP-8370 are consistent with those in the Standard Safety Analysis Report.

PART B - PERFORMANCE / VERIFICATION

SECTION 1 - RESPONSIBILITIES

See WCAP-8370 Part B, Section 1.

SECTION 2 - INSTRUCTIONS, PROCEDURES, AND DRAWINGS

See WCAP-8370 Part B, Section 2. Application of WCAP-8370 to AP600 activities includes the following:

- The principal document establishing the procedures for activities that affect quality is WCAP-9565, "Nuclear and Advanced Technology Division Quality Assurance Program." Additional procedures specific to the AP600 program are contained in WCAP-12601, "AP600 Operating Procedures Manual." WCAP-12601 contains a matrix that shows the relationship between WCAP-12601 procedures, the applicable procedures of WCAP-9565, and the QA program criteria of NQA-1.

- Project-specific procedures are prepared by the organizations that have primary responsibility for the activities. Procedures identify the responsible functions and specific actions necessary to implement these activities. Procedures are reviewed by Quality Assurance.

SECTION 3 - DOCUMENT CONTROL

See WCAP-8370 Part B, Section 3. Application of WCAP-8370 to AP600 activities includes the following:

- Documents that portray the AP600 design or its basis are uniquely identified in accordance with a documented numbering system that is applied to all internal and external participating design organizations.

- An Information Management System (IMS) is implemented among interfacing internal and external design organizations, which provides an effective means (using a plant-wide numbering system) to acquire, store, and retrieve the documents and data necessary to design the plant.

SECTION 4 - DESIGN CONTROL

See WCAP-8370 Part B, Section 4. Application of WCAP-8370 to AP600 activities includes the following:

- Changes to a design that has been previously released in a document for project use and placed under configuration control are subject to review and approval by a Configuration Control Board. The organization, responsibilities, and activities of the Configuration Control Board are in accordance with written procedure.

SECTION 5 - COMPUTER SOFTWARE

See WCAP-8370 Part B, Section 5.

SECTION 6 - PROCUREMENT DOCUMENT CONTROL

See WCAP-8370 Part B, Section 6. Application of WCAP-8370 to AP600 activities includes the following:

- Technical and quality requirements are communicated to organizations that supply testing and engineering services through Purchase Orders and technical cooperation agreements. Technical cooperation agreements require the same degree of review and approval as Purchase Orders.

- Procurement documents specify technical requirements (for procured items) by reference to design documents that are prepared, reviewed, approved, issued, and revised in accordance with NQA-1 Supplement 3S-1. When changes to technical requirements are made directly in procurement documents, the appropriate design documents are revised and incorporated into the contract before the item is released.

SECTION 7 - CONTROL OF PURCHASED ITEMS AND SERVICES

See WCAP-8370 Part B, Section 7. Application of WCAP-8370 to AP600 activities includes the following:

- The initial qualification and subsequent performance evaluation of suppliers to which technical cooperation agreements apply is performed in the same manner as for suppliers of purchased items and services.

- Supplier selection is not based on history alone unless at least one of the following conditions applies:

    1. The supplier has been audited within 3 years for procurement of similar products or services,

    2. An evaluation of the supplier's technical and quality capability is made, or

3. The items are both relatively simple and standard in design, manufacturing, and testing and are adaptable to standard or automated inspections or tests of the end product to verify critical characteristics after delivery.

- The performance of each supplier is evaluated on an annual basis, commensurate with the complexity and importance to safety of the items or services provided. The evaluation is documented and includes evidence, based on direct observation of work performed by the supplier, that the supplier's quality assurance program is continuing to operate successfully.

SECTION 8 - IDENTIFICATION AND CONTROL OF ITEMS

See WCAP-8370 Part B, Section 8. Application of WCAP-8370 to AP600 activities includes the following:

- The AP600 program uses a comprehensive, plant-wide numbering system to provide standard identification for all systems, components, facilities, and documentation.

SECTION 9 - CONTROL OF PROCESSES

See WCAP-8370 Part B, Section 9.

SECTION 10 - CONTROL OF MEASURING AND TEST EQUIPMENT

See WCAP-8370 Part B, Section 10.

SECTION 11 - TEST CONTROL

See WCAP-8370 Part B, Section 11. Application of WCAP-8370 to AP600 activities includes the following:

- AP600 testing activities are categorized as safety related, non-safety related, or basic research tests; quality requirements appropriate to each category are applied.

- A Test Specification and Test Procedure(s) are developed for each test program. Test Specifications define the test objective(s) and prescribe requirements for the test facility, test articles, instrumentation and data acquisition system, test conditions and parameters, quality assurance, reports, and records. Test Procedures detail the activities and provisions for assuring that calibrated instruments, appropriate equipment, and trained personnel are used; that the condition of test equipment and the item(s) to be tested are verified; that suitable environmental conditions are maintained; that adequate instrumentation and provisions for data acquisition are used; and that the necessary monitoring is performed.

SECTION 12 - HANDLING, STORAGE, AND SHIPPING

See WCAP-8370 Part B, Section 12.

SECTION 13 - INSPECTION

See WCAP-8370 Part B, Section 13.

SECTION 14 - INSPECTION, TEST, AND OPERATING STATUS

See WCAP-8370 Part B, Section 14.

SECTION 15 - CONTROL OF NONCONFORMING ITEMS

See WCAP-8370 Part B, Section 15.

SECTION 16 - CORRECTIVE ACTION

See WCAP-8370 Part B, Section 16. Application of WCAP-8370 to AP600 activities includes the following:

- The root causes of significant conditions adverse to quality are determined and documented, and the impact of such conditions on completed or related items and activities is evaluated.

SECTION 17 - QUALITY ASSURANCE RECORDS

See WCAP-8370 Part B, Section 17. Application of WCAP-8370 to AP600 activities includes the following:

- Advanced Technology Business Area retains responsibility for maintaining AP600 design documents by requiring submittal of all lifetime design documents from suppliers unless otherwise agreed by contract.

SECTION 18 - AUDITS

See WCAP-8370 Part B, Section 18. Application of WCAP-8370 to AP600 activities includes the following:

- Audits are scheduled and prioritized based on the activity's importance to safety. Audits, however, include non-safety activities important to quality. Emphasis is placed on the successful performance of activities, and provision is made for the direct observation of activities in process.

PART C - SELF-ASSESSMENT

SECTION 1 - SELF-ASSESSMENT

See WCAP-8370 Part C, Section 1. Application of WCAP-8370 to AP600 activities includes the following:

- A self-assessment program is implemented to confirm that activities affecting quality are performed in compliance with the quality assurance program and to identify opportunities for quality improvement. Following established instructions, periodic self-assessments are performed in each department on a part of the program for which that department is responsible. The self-assessments typically focus on instructions and procedures which control activities affecting quality, with the intent of assessing both the adequacy of those instructions and procedures and the effectiveness of their implementation. The results of the self-assessment are reported to management for action.

WCAP-8370,
REV.12A

WESTINGHOUSE CLASS 3

WESTINGHOUSE ELECTRIC CORPORATION

ENERGY SYSTEMS BUSINESS UNIT
POWER GENERATION BUSINESS UNIT

QUALITY ASSURANCE PLAN
APRIL 1992

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Vice President & General Manager
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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

APR 23 1992

Docket No. 99900900

Mr. N. J. Liparulo, Manager
Nuclear Safety and Regulatory Activities
NATD, Energy Systems
Westinghouse Electric Corporation
Post Office Box 355
Pittsburgh, Pennsylvania 15230

Dear Mr. Liparulo:

Your letter of March 24, 1992, forwarded a proposed revision of WCAP 8370, "Quality Assurance Plan." WCAP 8370 is the quality assurance (QA) topical report applicable to the Energy Systems Business Unit and the Power Generation Business Unit of the Westinghouse Electric Corporation.

We have reviewed the proposed revision of WCAP 8370 against the acceptance criteria provided as guidance in Section 17.3, "Quality Assurance Program Description," of NUREG-0800, the NRC's Standard Review Plan. We find the proposed revision describes a QA program that when properly implemented will meet the noted guidance and, therefore, the requirements of Appendix B of 10 CFR Part 50. The proposed revision can be referenced by applicants for a combined construction permit-operating license for a nuclear power plant in accordance with 10 CFR Part 52, without further NRC review. The proposed revision is also acceptable for other Westinghouse nuclear activities such as those involved with advanced reactors, nuclear fuel, and maintenance and modifications of existing nuclear power plants.

Please identify the revision of WCAP 8370 as Revision 12A, incorporate a copy of this letter into it, and forward one copy to the NRC in accordance with 10 CFR 50.4. Any questions on the above should be directed to Jack Spraul of my staff on (301) 504-1023.

Gary G. Zech, Chief
Performance and Quality Evaluation Branch
Division of Licensee Performance
and Quality Evaluation

FOREWORD

AND

QUALITY POLICY STATEMENT

This topical report establishes the Quality Assurance Program requirements for the Westinghouse Electric Corporation applicable to activities affecting the quality of Westinghouse (W) supplied nuclear power plant items and services. It is the policy of Westinghouse Electric Corporation to comply with the requirements of 10 CFR Part 50, Appendix B as prescribed in Regulatory Guide 1.28, Rev. 3, when supplying items and services to Nuclear Power Plants. The Westinghouse Corporate Policy Statement and Program Requirements defined in this report shall be followed by ESBU and PGBU-Pensacola Plant for items and services supplied to nuclear power plants.

> "It is the policy of Westinghouse Electric Corporation to be a reliable supplier of quality equipment, parts and services for nuclear power plants. Orders for such equipment, parts and services, that are requested to be qualified for safety-related applications by Westinghouse, are to be given the attention that is required for applicable regulatory requirements."(1)

This topical report, hereafter called the Quality Assurance Plan (Plan), is implemented by the Energy Systems Business Unit (ESBU) and the Pensacola Plant within the Power Generation Business Unit (PGBU). All orders for items used in nuclear power plant facilities are processed through the ESBU order entry process and, in the case of services, are processed through a Westinghouse Division or organization approved by the ESBU. Items and services supplied are controlled by the ESBU through the procurement control systems described in this Quality Assurance Plan.

These procurement control systems define provisions necessary to apply appropriate technical and quality requirements to all tiers of procurement.

Changes that may reduce the commitments contained herein will be submitted to the NRC for approval prior to implementation; other changes will be submitted for approval within 90 days of the change. NRC notification is in accordance with the requirements contained in 10CFR50.55(f)(3).

(1) Excerpted from the Westinghouse Corporate Policy - Equipment, Parts and Services for Nuclear Power Plants. (Rev. 1, 12/89)

CONTENTS

PART C - SELF-ASSESSMENT

LIST OF FIGURES

APPENDICES

INTRODUCTION

This Quality Assurance Plan complies with the criteria of ASME NQA-1-1989 Edition, with Addenda through NQA-1b-1991 and ASME NQA-2-1989 edition, with Addenda NQA-2a-1990, Part 2.7, (See Appendix B, Page B-1) subject to the positions described in Appendix A and C, and is implemented by the Energy Systems Business Unit (ESBU) and the Pensacola Plant of the Power Generation Business Unit (PGBU) for the design, procurement, fabrication, inspection and/or testing of nuclear power plant items and services.

The authority and responsibility within ESBU and PGBU is established by the ESBU Vice President and General Manager and the PGBU Vice President and General Manager. Responsibility for the establishment and revision of this Plan is assigned by the Vice President and General Manager of ESBU. Assuring the effective implementation of the commitments of this Plan is assigned by both the Vice President and General Manager of ESBU and PGBU. Statements of activity, scope, and function are issued for each Division implementing this Plan. Required documentation of specific organizational detail, including the authority, responsibilities and interfaces is established and maintained in the ESBU Quality Assurance Program. Also contained in the ESBU Quality Assurance Program are policies which describe activities that are implemented consistently by each Division in procedures.

Each Division participates in an interdivisional audit program to verify that each participant is implementing its quality assurance program, which complies with this Plan, for items and services provided to nuclear power plants and/or items and/or services provided to each other. Procurement services supplied by ESBU Procurement Services and project management services provided by the Project Departments to the divisions in accordance with that divisions' quality assurance program are included in the scope of these audits. When support services are provided by one division to another, management of the division providing the items or services is responsible for the work performed.

This Plan is arranged in three parts that describe the three components of quality assurance: management; performance/verification; and, self-assessment. These three components of quality assurance place emphasis on the individual performing the work to achieve the level of quality described in this Plan.

Personnel within ESBU and the Pensacola Plant are responsible for implementing these quality assurance requirements to achieve the highest quality and reliability of the items and services provided to nuclear power plants. Each manager is responsible for providing the necessary personnel indoctrination and training to assure that work is performed in accordance with these requirements.

Terms used in this Plan follow the definitions provided in ASME NQA-1 (for position, See Appendix A, Page A-4), ASME NQA-2 and supplemented by the following terms and definitions applicable to this Plan.

ESBU:	The Five (5) Divisions and ESBU Procurement Services form the Energy Systems Business Unit.
The Pensacola Plant:	A functional unit within the Power Generation Business Unit (PGBU).
Division:	One of the functional units within ESBU and PGBU, i.e., Nuclear and Advanced Technology Division (NATD), Nuclear Services Division (NSD), Process Control Division (PCD), Electro Mechanical Division (EMD), and Commercial Nuclear Fuel Division (CNFD), and Pensacola Plant.
Department:	A collection of groups having related functions.
Group:	A collection of personnel performing the same function.
Organization:	A common term for a division, department or group within ESBU or outside of ESBU.

Consumable Material:	Expendable items that must be renewed or replaced and which have an effect on permanent plant equipment.
Empirical Data:	Data obtained from direct observation or experience such as experimental data and plant performance data.
Quality Assurance:	The organization(s) to which the Division General Manager has assigned responsibilities for specific quality verification activities. Titles for these organizations may vary, and may include Quality Assurance, Quality Control, Product Assurance or similar names.
Supplier:	Any individual, organization or division who furnishes items or services in accordance with a procurement document.
ESBU Quality Assurance Program:	The Quality Assurance Program that contains policies and procedures that are common to one or more ESBU Divisions and procurment services.
Safety Class	The classification, Safety Class -1, -2, or -3 and Class 4, for items and related services as defined in the ESBU Quality Assurance Program.

PART A
MANAGEMENT

SECTION 1
ORGANIZATION

1.0 ORGANIZATIONAL STRUCTURE

The Energy Systems Business Unit is a functionally organized group of divisions, including ESBU Procurement Services, responsible for the design, procurement, fabrication, inspection and/or testing of certain nuclear power plant items and services, coordination of the supply of items and services, and for control of technical interfaces among the licensee or applicant, his primary agents and ESBU. Activities, responsibilities, authority, acceptance of work and interfaces are established and documented for items and services provided by ESBU divisions. These items and services are provided in accordance with quality assurance programs which comply with the requirements of this Plan. ESBU management is responsible for quality assurance program activities as committed to throughout this Plan.

The Pensacola Plant is a functional unit within the Power Generation Business Unit with the responsibility for the design, procurement, fabrication, inspection and/or testing of certain nuclear power plant items. Activities, responsibilities, authority, acceptance of work and interfaces are established and documented for items and services provided through the ESBU order entry process. These items and services are provided in accordance with a quality assurance program which complies with the requirements of this Plan. Pensacola Plant Management is responsible for the quality assurance program activities contained in this Plan, through the commitment of the PGBU Vice President and General Manager.

Figures 3 and 4 (Pages 62 and 63) provide the general organizational structure of ESBU and PGBU. ESBU will inform the NRC Vendor Inspection Branch of organizational changes on the division level, including the organizational levels of the quality assurance organization with respect to the engineering/construction/manufacturing organizations. The quality assurance structure changes will also be included down to the supervisor or first level management.

1.1 RESPONSIBILITIES AND AUTHORITY

Each Division General Manager is responsible for establishing and implementing a quality assurance program that meets or exceeds the requirements of this Plan. Responsibility for documenting the quality assurance program is assigned to a quality assurance (or similar title) manager(s). This quality assurance manager is sufficiently free from direct pressure for cost/schedule and has the authority to stop unsatisfactory work, control further design activities, processing, testing, delivery or installation of nonconforming items and services. The quality assurance manager has access to higher management levels to assure the ability to: identify quality problems; initiate, recommend or provide solutions through designated channels; and verify implementation of solutions. This quality assurance management position has the following characteristics:

a. Has direct access to the highest level manager in the division on all quality related issues;

b. Has effective communication channels with other senior management positions;

c. Has responsibilities for approval of quality assurance manual(s); and

1.1 RESPONSIBILITIES AND AUTHORITY (Continued)

d. Has no other responsibilities unrelated to quality assurance that would prevent attention to quality assurance matters.

Disputes involving quality arising from differences of opinion between quality assurance and other department personnel are elevated to a level of management necessary to assure resolution.

Responsibility for achievement of quality is assigned to each individual or organization performing the work. The verification of quality achievement is assigned to individuals or groups not directly responsible for performing the work.

Functional departments within ESBU and the Pensacola Plant are responsible for performing activities that assure the quality of items and services supplied. Each manager with responsibilities in the quality assurance program may delegate work to others, but shall retain responsibility for the work and the responsibility for the effectiveness of the quality assurance program. Authority to accomplish the delegated work is also provided.

1.1.1 SELF-ASSESSMENT POSITION: SEE PART C, SECTION 1 - SELF-ASSESSMENT

1.2 FUNCTIONAL DEPARTMENT RESPONSIBILITIES

Engineering is responsible for performing the various technical functions associated with the design and specification of items and for technical follow of the design cycle at suppliers' facilities. Engineering groups are also responsible for providing safety analyses, including safety evaluations of system and equipment design and safety performance criteria. Control of design interfaces between the various engineering departments is described in Part B, Section 4 of this Plan.

Project Groups are responsible for receipt of customer orders, transmittal of the customer requirements to the implementing division, and serving as the prime interface between ESBU, Pensacola Plant and the applicant or Licensee. Processing of customer orders is controlled by documented procedures which describe the requirements for the order entry system.

Manufacturing is responsible for the manufacture, fabrication, construction, testing and/or servicing of items. This responsibility includes material control, generation and control of manufacturing information, product planning and control, manufacturing functions, process qualification and control, in-process verification and qualification of personnel.

Quality Assurance is responsible for verifying that the quality assurance program is established, properly implemented and effective. Results of this verification are reported to management, including the General Manager. Quality assurance activities include, as applicable, reviews of drawings, specifications and procedures; source surveillance and audits of suppliers; inspections and examinations and recording of results; preparation of documentation associated with the release of items; schedule and performance of internal audits; development and maintenance of specific quality assurance program documents; qualification of inspection personnel and auditors; and, at the discretion of quality assurance, participation in work schedule and status meetings.

The minimum qualification requirements for the quality assurance manager are:

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

b. At least six (6) years experience in quality assurance (with related technical or manufacturing experience);

c. Management experience through assignments to responsible positions commensurate with this position;

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

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

ESBU Procurement Services provides total procurement services for NATD and NSD and acts as the interface for the two divisions and their suppliers. Procurement Services also provides services to PCD on a limited basis. Although PCD is structured with its own procurement department, services of ESBU Procurement Services are requested depending on capability and work load. Procurement Services provides services to CNFD for those locations that do not have their own procurement department. Procurement Services does not provide services to either EMD or the Pensacola Plant, which have within their respective divisions a Purchasing Department providing procurement activities.

Procurement activities, performed either by the division's procurement departments or ESBU Procurement Services are controlled and accomplished in accordance with established procedures and the requirements of this Plan.

1.3 INTERFACE CONTROL

Internal and external organizational interface responsibilities and changes thereto are defined and documented in procedures. ESBU and Pensacola Plant interface responsibilities and authority are established and documented in the ESBU Quality Assurance Program.

SECTION 2
QUALITY ASSURANCE PROGRAM

2.0 COMMITMENTS

This Quality Assurance Plan is applied to activities affecting the quality of items and services identified in Section 3.2.1 of the applicable Safety Analysis Report (SAR) document, as well as other items and services requested by the applicant/licensee. The applicability of this Quality Assurance Plan, is as determined by contract at, or prior to, the outset of work and application is based on the safety class of the item or service as well as on the complexity of the scope of work. The safety class of items is documented and approved by responsible management.

Appendix A and Appendix C of this Quality Assurance Plan describes commitments to the regulatory guides, ASME NQA-1 and ASME NQA-2. The exceptions, clarifications and alternates described in Appendix A and C may not all apply to all of the divisions. Divisions, including Procurement Services, comply with the guidance of the regulatory guides, ASME NQA-1, and ASME NQA-2 as written or with the exceptions, clarifications, and alternatives listed in Appendix A and Appendix C. Also, all organizations covered by this plan comply with the requirements of 10CFR50.55a, (with the specific editions of the Codes and Standards identified in individual SARs) and Criterion 1 of Appendix A to 10CFR Part 50. As applicable, American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, and American National Standard ASME NQA-1 requirements are supplemented with the guidance of the Regulatory Guides per Appendix A. (See Part A, Section 3 of this Plan for the listing of applicable regulatory guides).

Each division's quality assurance program contains provisions for the evaluation of reported conditions which may require NRC notification in accordance with the requirements of 10CFR Part 21 and 10CFR 50.55(e).

Each division that provides items and services to nuclear power plants has programs and procedures that describe compliance with the commitments of this Quality Assurance Plan, and for special equipment, environmental conditions and processes as necessary. These programs and procedures are documented and controlled as described in Part B, Section 3 of this Plan. These programs and procedures are reviewed and approved by the appropriate quality assurance department before an activity within the scope of this Plan is undertaken by a division or by others and are made mandatory by the responsible division General Manager. Figure 5 (Page 64) provides a listing of QA Manuals.

Procedures that implement division's Quality Assurance programs are approved by the manager responsible for the activities performed.

2.1 GRADED APPROACH

Control over activities affecting the quality of items and services is to the extent consistent with the complexity of the scope of work and safety related function of the item or service.

To ensure consistency in identifying those items, classification processes are documented in procedures. The processes rely on the use of the term safety class (See Figure 1 for clarification - Page 14). All applicable requirements contained in this Plan are applied to Safety Class 1, 2 and 3 items. For Class 4 items, selected requirements contained in this Plan apply (See Figure 2 for logic used to determine appropriate quality requirements - Page 15). Other similar identifiers may be used for safety class identity, such as, A, B, C and etc.; however, the requirements contained in this Plan are unchanged. These quality requirements are specified in design documents, procurement documents, procedures, etc.

This Plan may be applied to items or activities other than those designated Safety Class -1, -2, -3 and Class 4 as specified by management.

2.2 TRAINING, INDOCTRINATION AND QUALIFICATION

Training and indoctrination requirements contained in this section apply to personnel performing or managing activities affecting quality. Each manager is responsible for training personnel, as necessary, to the applicable programs and procedures prior to their performing or managing work in accordance with NQA-1 Basic Requirements and Supplement 2S-4 (for position, See Appendix A, Page A-4) and assuring necessary resources are available to accomplish their assigned tasks. This includes indoctrination to the requirements of this Quality Assurance Plan, applicable quality assurance programs and procedures, special skills training required for the performance of activities, job responsibility and authority, and assurance that personnel achieve and maintain suitable proficiency. Training and/or indoctrination is documented.

Personnel performing inspection, testing, examination and audit activities are qualified in accordance with ASME NQA-1, Basic Requirements and Supplements 2S-1 through 2S-3 and Appendix 2A-1 (for position, see Appendix A, Regulatory Guide 1.28 exception to 2A-1, Section C.1, Pages A-1 and A-2). Personnel qualification programs include documentation of capability using either formal written tests or a physical demonstration of skill, and include the maintenance of proficiency based on retraining or continuing satisfactory performance. Qualification requirements include specific provisions for education and/or experience. Documentation, in the form of certificates of qualification or other similar records, includes the activities the individual is qualified to perform and the basis used for certification.

The quality assurance manager assures that personnel performing surveillance and audits are qualified and certified. Personnel qualification includes the documentation of capability and the maintenance of proficiency based on continuing satisfactory performance or retraining. Documentation, in the form of certificates of qualification, includes the activities the individual is qualified to perform and the basis used for certification.

2.3 MANAGEMENT ASSESSMENT

Division Management regularly reviews the status and adequacy of their Division's quality assurance program for compliance with the commitments of this Quality Assurance Plan, and provides the results to each Division General Manager. This review includes familiarity with program status (through reports, meetings and/or audits, internal and external audit trend data), and performance of an annual assessment of the program. An annual assessment includes identification of corrective action when necessary and provisions for tracking the status of the action(s) specified.

FIGURE 1
CLASSIFICATION OF ITEMS/SERVICES

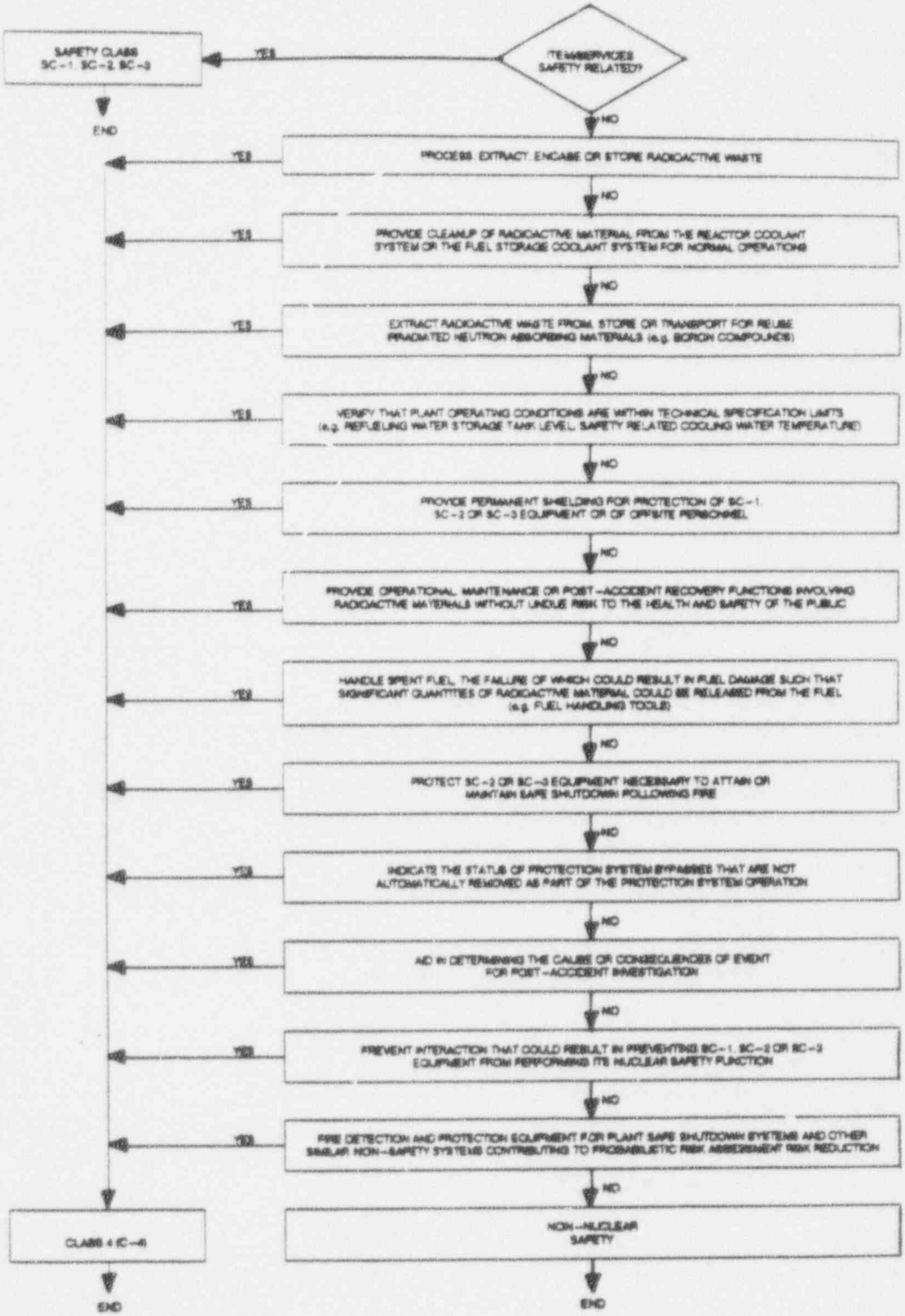
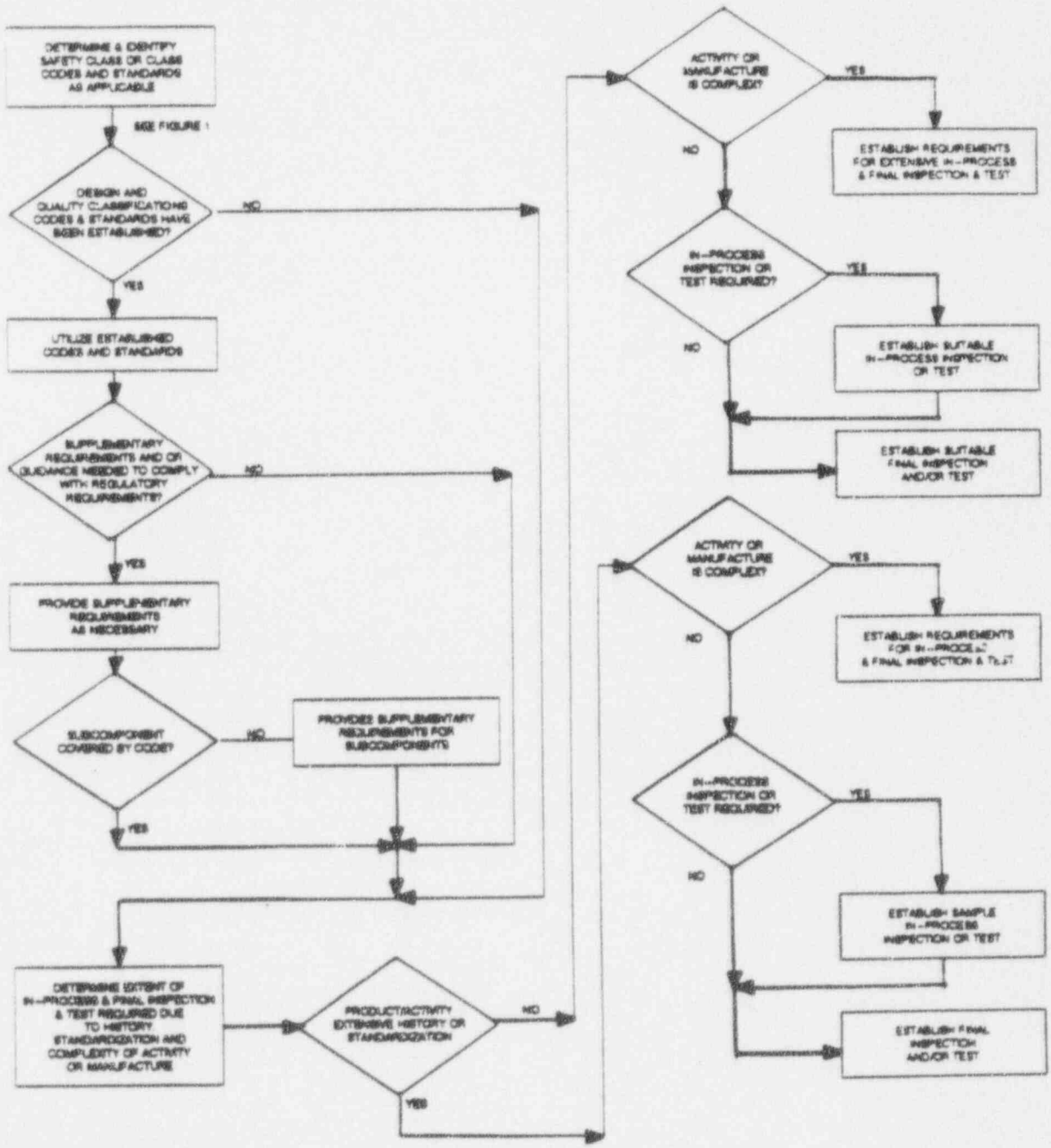


FIGURE 2

LOGIC CHART FOR DETERMINING
APPROPRIATE QUALITY REQUIREMENTS



SECTION 3
REGULATORY COMMITMENTS

3.0 GENERAL

Divisions comply with the regulatory positions included in the Regulatory Guidance listed in 3.1 of this section. Specific exceptions to, and interpretations of, this guidance are contained in Appendix A and C of this Plan. Individual projects may identify additional exceptions which will be included in the individual SAR. When work scope does not involve an SAR, exceptions and interpretations contained in Appendix A and C apply.

3.1 REGULATORY GUIDANCE

3.1.1 Regulatory Guide 1.8, Revision 2, "Personnel Selection and Training."

3.1.2 Regulatory Guide 1.26, Revision 3, "Quality Group Classification, and Standards for Water-, Steam-, and Radioactive- Waste-Containing Components of Nuclear Power Plants.

3.1.3 Regulatory Guide 1.28, Revision 3, "Quality Assurance Program Requirements (Design and Construction)," using NQA-1 and NQA-2.

3.1.4 Regulatory Guide 1.29, Revision 3, "Seismic Design Classification."

3.1.5 Regulatory Guide 1.33, Revision 2, "Quality Assurance Program Requirements (Operations)," with appropriate substitution of ASME NQA-1 and ASME NQA-2 for ANSI N-45.2 and its daughter standards.

3.1.6 Regulatory Guide 1.152, Revision -, "Criteria for Programmable Digital Computer Systems Software in Safety-Related Systems of Nuclear Power Plants."

3.1.7 Generic Letter 89-02 endorsement of EPRI NP-5652, "Guideline for the Utilization of Commercial-Grade Items in Nuclear Safety-Related Applications (NCIG-07)."

3.1.8 Fire protection QA controls are to be in accordance with Regulatory Positions 2 and 4 of Branch Technical Position CMEB 9.5-1 as given in SRP Section 9.5.1.

3.1.9 Radioactive waste QA controls are to be in accordance with Regulatory Position 6 of Regulatory Guide 1.143, Revision 1, "Design Guidance for Radioactive Waste Management Systems, Structures, and Components Installed in Light Water-Cooled Nuclear Power Plants."

3.1.10 QA controls are required by a commitment to Regulatory Guide 1.36, Revision -, "Nonmetallic Thermal Insulation for Austenitic Stainless Steel."

3.1.11 Regulatory Guide 1.54, Revision -, "Quality Assurance Requirements for Protective Coatings Applied to Water-Cooled Nuclear Power Plants."

3.1.12 Regulatory Guide 2.5, Revision -, "Quality Assurance Program Requirements for Research Reactors."

3.1.13 Regulatory Guide 3.3, Revision 1, "Quality Assurance Program Requirements for Fuel Reprocessing Plants and for Plutonium Processing and Fuel Fabrication Plants."

3.1.14 Regulatory Guide 3.21, Revision -, "Quality Assurance Requirements for Protective Coatings Applied to Fuel Reprocessing and to Plutonium Processing and Fuel Fabrication Plants."

3.1.15 Regulatory Guide 4.15, Revision 1, "Quality Assurance for Radio logical Monitoring Programs (Normal Operations), Effluent Streams and the Environment."

3.1.16 Regulatory guide 7.10, Revision 1, "Establishing Quality Assurance Programs for Packaging Used in the Transport of Radioactive Material."

3.1.17 Class 1, 2, and 3 items covered by Section III of the ASME Boiler and Pressure Vessel Code, the Code quality assurance requirements (NCA-4000) are supplemented by items 3.1.1 through 3.1.7. of this section.

PART B

PERFORMANCE/VERIFICATION

SECTION 1 - RESPONSIBILITIES

Individuals performing activities described in this Plan are responsible for achieving acceptable quality. These activities are accomplished by competent personnel using written instructions or procedures, or other appropriate guidance, which identify acceptance criteria, and which are of a detail commensurate with the complexity of the activity and its importance to safety.

Individuals performing verification activities are responsible for the verification of acceptable work using established acceptance criteria procedures, instructions, and other applicable guidance.

Individuals performing verification are independent from those responsible for performing the activities being verified.

SECTION 2
INSTRUCTIONS, PROCEDURES AND DRAWINGS

Activities affecting the quality of items and services are accomplished in accordance with documented instructions, procedures or drawings that include appropriate quantitative and qualitative means of verifying quality. Actions required and responsibilities for preparation, review, control, implementation and approval by the manager responsible for these documents are established in procedures or instructions. These procedures and instructions are reviewed by quality assurance.

Revisions to quality assurance programs that change the system used to accomplish an activity are identified and the reason for the change documented.

Drawings are prepared and revised based on documented design information and requirements specified by engineering. The completed drawings and revisions are reviewed and signed by engineering and processed for retention and retrieval.

SECTION 3
DOCUMENT CONTROL

3.0 GENERAL

A program for the development, identification of scope, review, approval, issuance and use of documents and changes thereto is established to assure technical adequacy and inclusion of appropriate quality requirements prior to implementation. This program includes responsibilities, as appropriate, for independent reviews by qualified individuals for quality provisions. Procedures provide methods to assure that the proper document revisions are used; that document changes are controlled to prevent inadvertent use of obsolete or superseded documents; that individuals or groups responsible for reviewing, approving, and issuing documents and revisions thereto are identified; and that review and approval of changes are performed by the organizations which originally reviewed/approved the document, or by a designated alternate organization(s).

3.1 DOCUMENT PREPARATION, REVIEW, APPROVAL AND ISSUANCE

Document control requirements include the identification of documents that are controlled and distribution thereof, and the review of documents for adequacy, completeness (for position see Appendix A, ASME NQA-1, Supplement 6S-1, Page A-6) and correctness prior to approval and issuance. Distribution of new or revised documents are made available in a timely manner to assure effective implementation.

3.2 DOCUMENT CHANGES

Changes to documents are evaluated, approved and controlled. Inconsequential editorial changes and corrections do not require that the revised document receive the same review and approval as the original document. To avoid a possible omission of a required review, the types of changes that do not require such a review and approval and the persons who can authorize such a decision are clearly identified. All other

changes are reviewed and approved by the same organization that performed the original review and approval or by an authorized alternate organization. Changes to procedures, instructions, drawings and other documents are approved and documented prior to implementation, and are made available at the location where the activity will be performed prior to commencing the work.

3.3 CONTROLLED DOCUMENTS

Documents describing activities affecting quality or specify quality requirements are controlled in accordance with this Quality Assurance Plan and implementing procedures. Controlled documents include but are not limited to instructions, procedures, design calculations, specifications, drawings, computer software documentation, design review reports, procurement documents, nonconformance reports, the standard safety analysis report, and this Quality Assurance Plan. Document control procedures include provisions for the maintenance and use of master lists, receipt acknowledgement systems, log and verification systems or tables of contents to identify the current versions of documents.

3.4 DRAWING CONTROL

Drawings prepared by the Divisions and supplier drawings requested for submittal are reviewed and approved by Engineering and controlled in accordance with established procedures. Drawings are processed for issue, retention and retrieval in accordance with these established procedures.

SECTION 4
DESIGN CONTROL

4.0 GENERAL

Procedures and instructions define the design process associated with design interfaces, control of the design, identification of design inputs, preparation of design documents, design verification, and design changes. Translation of applicable regulatory requirements and design bases into design, procurement, and procedural documents is also established, implemented and controlled.

4.1 DESIGN INPUT

Design input, such as design bases, functional requirements, performance requirements, regulatory requirements, and codes and standards are documented, reviewed, and approved by the responsible design groups. Design inputs are correctly translated and specified in sufficient detail to permit a consistent basis for making design decisions, accomplishing design verification, and evaluating design changes. Changes from approved design inputs, including the reason for the changes, are documented, approved, and controlled.

4.2 DESIGN PROCESS

Design documents are prepared by the engineering organizations and include design input and criteria, functional requirements, drawings, system and design specifications, design analyses, structure descriptions and engineering studies, as appropriate. Engineering managers are responsible for work performed and the approval of that work. Methods and responsibility for verifying calculations, specifications, and required documentation are included in procedures or instructions where appropriate. Quality requirements are specified by engineering and are reviewed and approved by quality assurance.

4.2 DESIGN PROCESS (Continued)

Approved design output documents contain the identification of any assemblies and/or components that are part of the item being designed. Further, if the assembly and/or component is a commercial grade item that is modified, inspected and/or tested to requirements more restrictive than the supplier's published product description, the assembly or component is identified as different from the commercial grade item and traceable to the documented difference. Approved design output documents are of sufficient detail to permit design verification.

Changes from approved quality standards, including the reason for the changes, are approved by the same organizations which reviewed and approved the original design. Design methods and processes that are essential to the function of the structure, system or component are selected and reviewed for suitability of application by the responsible engineering manager.

4.3 DESIGN ANALYSES

Design analyses are performed in accordance with procedures and/or instructions. Prepared design analysis documents are legible, reproducible and sufficiently detailed as to purpose, method, assumptions, design input, and references such that the analysis can be reviewed and the adequacy of the results verified by a person technically qualified in the subject without recourse to the preparer.

Computer programs used for design analysis need not be individually verified prior to each application provided: 1) the encoded mathematical model has been shown to produce valid solutions to known problems; and 2) the encoded model has been verified for the specified range of inputs and outputs. Changes to computer programs are controlled, documented and approved by authorized personnel. Changes to previously verified computer programs are verified, including evaluation of the effects of these changes on 1) and 2), above.

4.3 DESIGN ANALYSES (Continued)

Documentation of design analyses includes, either directly or by reference, the definition of the objective of the analysis; definition of design inputs and their sources; results of literature searches or other applicable background data; identification of assumptions and indication of those that require verification as the design proceeds; identification of computer calculations, including computer type, computer program name, revision, inputs, outputs, evidence of, or reference to, computer program verification, and the bases or reference to supporting application of the computer program to the specific physical problem; and review and approval.

4.4 DESIGN VERIFICATION

In accordance with established procedures, engineering managers are responsible for assuring that appropriate design verification methods used are established and implemented. These procedures ensure appropriate verification methods are used for each design, the acceptance criteria are identified, the verification is satisfactorily accomplished, and the results are properly documented. Verification is accomplished using methods such as the following, as described in procedures: design reviews, alternate calculations, or qualification tests. Design verification is performed by competent individual(s) or group(s) other than those who performed the original design. Verification may not be performed by the originator's supervisor, except when the supervisor is the only qualified person available, or provided the supervisor did not specify a singular design approach or rule out certain design considerations, and did not establish the design inputs used in the design. In these cases, the justification is documented and approved in advance by the supervisor's management. Nevertheless, a supervisor never verifies his own work or inputs. The frequency and effectiveness of the supervisor's use as a design verifier are verified during quality assurance audits to guard against abuse. Results of design verification are documented with the identification of the verifier clearly indicated (for position, see Appendix A, Page A-5).

4.4 DESIGN VERIFICATION (Continued)

Design inputs, processes, outputs, and changes are verified prior to release of design documents to others for use in design activities, procurement, manufacture, or construction except where unverified portions of the design are identified, documented and controlled. Procedures require that design verification is completed before relying on the item to perform its function and before its installation becomes irreversible requiring extensive demolition or rework. Engineering managers determine the extent of design verification required as a function of the importance to safety, the complexity of the design, the degree of standardization, the state of the art, and the similarity with previously proven designs.

Design changes are evaluated to determine their effect on the overall design and on any design analysis upon which the design is based. Changes to final designs, including field changes and dispositions of nonconforming items to "use-as-is" or "repairs" are subject to design control measures commensurate with those applied to the original design. These changes are approved by the organization that performed the original design or a qualified designate.

4.4.1 DESIGN REVIEWS

Independent reviews are performed by an individual (or individuals) or multi-disciplined design review teams. These reviews are performed by competent personnel and, where applicable, the following are addressed: design input selection, described and reasonable design output compared to design input, design input and verification requirements from interfacing organizations, appropriate design method used, design inputs correctly incorporated into the design, and adequately described, reasonable, and identified assumptions.

4.4.2 ALTERNATE CALCULATIONS

The requirements for verification by alternate calculations are described in procedures which include the review of appropriateness of assumptions, input data, and computer program or other calculation method used.

4.4.3 QUALIFICATION TESTS

Qualification tests demonstrate the adequacy of performance under conditions that simulate the most severe design conditions in accordance with written test procedures and test specifications. Test specifications are reviewed and approved by the responsible engineering group. Results of the qualification tests are approved by the engineering group responsible for the design. For tests performed on models or mockups, scaling laws are established and verified (for position, see Appendix A, Page A-5). Test results obtained for model or mockup test work are subject to error analysis, where applicable, prior to use in final design work. Information regarding verification that is incomplete, including incomplete qualification tests, is available to the applicant prior to installation of equipment.

4.5 DESIGN SPECIFICATIONS

Design specifications are used to specify technical and quality requirements either by their inclusion in the specification or by reference. These specifications are reviewed to verify accuracy and completeness. They are also reviewed by quality assurance to assure that proper quality requirements are addressed, including inspection, test, and documentation requirements. The term "Design Specification" includes drawings when they are used in lieu of design specifications.

4.6 DESIGN CHANGE CONTROL

Written procedures describe the control of design changes, including those for identified design deficiencies. Changes to approved design documents including field changes are subject to the same review and approval process as the original document. Where changes to previously verified design are made, design verification is performed.

4.7 INTERFACE CONTROL

Design interfaces are identified, documented and controlled. Interface controls include the assignment of responsibility and the use of procedures among participating design organizations, including the applicant or his agent, for the review, approval, release, distribution and revision of documents including revision of design inputs and outputs (for position, see Appendix A, Page A-6). Transmittal of design information is documented and controlled, and the status of the information is identified.

4.8 DOCUMENTATION AND RECORDS

Design documentation which provides evidence that the design and design verification were performed in accordance with procedural requirements is collected, stored and maintained. Design records also include calculations, analyses, computer programs, and sources of design input that support the final output.

SECTION 5
COMPUTER SOFTWARE

5.0 GENERAL

5.0 COMPUTER SOFTWARE

Computer software used in the design or analysis of components, structures, and systems and operation of components and systems is controlled by software procedures and instructions which comply with this plan and ASME NQA-2a-1990, Part 2.7.

5.1 COMPUTER SOFTWARE DEVELOPMENT

Development of computer codes is performed in accordance with a documented program which establishes the policies and procedures necessary to produce quality software. Any suitable software life cycle model may be adopted provided it encompasses the activities associated with requirements analysis, design documentation, code implementation and testing, installation, and operation and maintenance.

Functional requirements, design documents, and test requirements and results are verified by the responsible software group in accordance with procedures written by technically competent personnel who do not have direct responsibility for development of the code. Verification is performed at each phase to ensure that the products of a given phase fulfill the requirements of the previous phase. Software validation is performed at the end of the implementation phase to ensure that the code satisfies the identified requirements.

5.2 SOFTWARE CONTROL AND DOCUMENTATION

Documented controls are established to capture the approved configuration of computer programs, and identify all approved changes. The

development and maintenance of computer software include documentation describing software requirements, software design, verification and validation (testing), configuration control, and error reporting and resolution. Written procedures describe how records are collected, maintained, and stored. Individuals or organizations developing or supplying software are required to utilize policies and procedures that meet the applicable requirements of this Plan.

5.3 SOFTWARE TESTING

Computer programs are tested for all intended applications by the responsible design organization. The extent of testing may include, as appropriate, verification tests, hardware integration tests, and in-use tests. Verification tests are performed to demonstrate the capability of a computer program to produce valid results. In-use tests are conducted to confirm acceptable performance of programs in the operating system and are used when codes are installed on different computers, or when significant hardware or operating systems changes are made. Acceptance criteria may be based on hand calculations, documented results from other verified computer programs, empirical data or published data in technical literature. The degree of testing is dependent on the importance to safety and complexity of the program. Testing is conducted in accordance with written procedures and the results are documented and independently verified by a responsible authority. Records are stored, controlled, and protected in accordance with documented procedures.

5.4 Software Procurement

Individual or organizations developing or supplying software or providing software services are required to utilize established policies and procedures that meet the applicable requirements of this plan. Existing, procured, or otherwise acquired software that has not been developed in accordance with the requirements of this plan shall be controlled, evaluated, and tested prior to use as described in documented procedures.

SECTION 6
PROCUREMENT DOCUMENT CONTROL

6.0 PROCUREMENT DOCUMENT CONTENT

Technical, quality, regulatory, administrative, and reporting requirements applicable to the procurement of items and services are specified in procurement documents. Technical and quality requirements include criteria such as applicable codes and industry standards, test and inspection requirements, and special process instructions. The quality requirements also include supplier quality assurance program requirements, requirements for access to the supplier's facility, documentation requirements, and requirements for nonconformance control. Where necessary, technical and/or quality requirements are specified in procurement documents by reference to design specifications and/or other documents.

As necessary, procurement documents require suppliers to have a quality assurance program consistent with the applicable requirements of this Plan.

Spare or replacement parts are procured to requirements equal to or more stringent than the original requirements, and are suitable for their intended service.

6.1 PROCUREMENT DOCUMENT REVIEW

Procurement documents are reviewed by engineering, as appropriate, and quality assurance prior to contract award (for position, see Appendix A, Page A-6). This review is documented, and assures that technical and quality requirements, are correctly specified, including adequate acceptance criteria, and that procurement documents have been prepared, reviewed and approved in accordance with applicable procedures.

6.2 PROCUREMENT DOCUMENT CHANGES

Procurement document changes to technical and quality requirements are controlled and processed in the same manner as the original procurement document.

SECTION 7
CONTROL OF PURCHASED ITEMS AND SERVICES

7.0 PROCUREMENT PLANNING

Procurement of items and services is controlled by procedures which describe the responsibilities and methods to ensure conformance with specified requirements contained in procurement documents.

Procurement planning provides for the preparation of required procedures prior to initiation of the activity, procurement document preparation, selection of suppliers, bid evaluation and award (for position, see Appendix A, Page A-8), control of supplier performance, verification activities, including hold and witness points (for position, see Appendix A, Page A-7), control of nonconformances, corrective action, acceptance of items or services, and quality assurance records. The items and/or services required, applicable scope of work, and all technical and quality requirements are defined in writing. Authorization for the work is by the procurement documents.

7.1 SUPPLIER SELECTION

Prior to placing an order with a new supplier, an evaluation is conducted by quality assurance and, as appropriate, engineering and/or purchasing.

Supplier evaluation and selection measures provide for the evaluation of a potential supplier's capability to provide items and/or services in accordance with specified requirements. Suppliers are evaluated before purchase order placement and the results documented. Evaluation and selection methods include one or more of the following (for position, see Appendix A, Page A-7): a) evaluation of the supplier's history (including current capability) of providing an identical or similar product which was satisfactorily accomplished in accordance with specified requirements;

b) review of supplier's current quality records supported by documented qualitative and quantitative information which can be objectively evaluated; and c) supplier's technical and quality capability is determined by a source evaluation of his facilities, personnel, and the content and implementation of his quality assurance program.

Significant deficiencies are documented and corrected, and commitments to resolve all other unacceptable conditions are obtained from the supplier prior to contract award.

7.2 BID EVALUATION

Bid evaluations are performed by designated individuals or organizations to determine the extent of conformance to the procurement documents. This evaluation addresses the following subjects, as applicable to the types of procurement: technical requirements consideration, quality assurance requirements, suppliers' personnel capability, supplier's production capability, suppliers' past performance, alternates and exceptions. Prior to contract award or prior to start of related work activity, unacceptable quality conditions resulting from the bid evaluation are resolved or commitments are obtained to resolve the conditions.

7.3 SUPPLIER PERFORMANCE EVALUATION

Suppliers are evaluated initially for the items and services specified to determine the acceptability of their quality assurance programs for the items and services specified. Acceptability of suppliers is documented. A formal evaluation of suppliers is performed each year to determine if additional actions such as audits are required during the upcoming year. This evaluation includes a review of some or all of the following: prior quality program audits, supplier surveillance activities, nature and frequency of hardware discrepancies, results of audits from other sources (customers, ASME, NRC, etc.) if available, significant changes in the supplier's QA program, procurement document compliance, supplier required

submittals, processing required change information and document exchange, and the supplier's responsiveness and cooperation in resolving quality questions or problems. As a result of this evaluation, suppliers requiring a complete quality program reaudit are identified. The results of this evaluation are documented and approved by responsible management. Regardless of the results of the evaluation, suppliers are reaudited every three years. Evaluations are not conducted for the year a supplier is scheduled to be audited. At divisions holding the appropriate ASME certificates of authorization, suppliers are categorized as ASME Code and non-ASME code suppliers. ASME accredited suppliers are selected and evaluated in accordance with the requirements of this Plan for items and services supplied.

Based on an evaluation conducted and documented in accordance with NQA-1, Section 5.1 of Appendix 4A-1, supplier audits are not necessary for procuring items that are (1) relatively simple and standard in design, manufacturing, and testing and (2) adaptable to standard or automated inspections or tests of the end product to verify quality characteristics after delivery.

Evaluations of Divisions and ESBU Procurement Services are performed by auditing their documented quality assurance programs to the requirements contained in this Quality Assurance Plan.

7.4 CONTROL OF SUPPLIER GENERATED DOCUMENTS

Supplier submittal of documents such as specifications, procedures, certified material test reports, nondestructive examination reports, and drawings required for review or approval or information, are identified in the procurement documents. These submittals, when required, are evaluated against approved acceptance criteria for technical correctness, adequacy of inspection methods, and completeness of test data. The submittal and review of supplier documents and the methods used for their

control are detailed in written procedures. Contingent conditions that require additional action after delivery of the item to the applicant/licensee are documented. Contingent conditions are monitored and their resolution is documented and provided to the applicant/licensee before the item is placed in service or use.

7.5 ACCEPTANCE OF ITEMS AND SERVICES

7.5.1 GENERAL

Procedures are established for the acceptance of items or services supplied by the Divisions and their suppliers.

A quality release based on importance to safety and/or complexity of the item is authorized by quality assurance when items are shipped for use in nuclear power plants. The quality release is a document which includes specific information identifying the item and the applicable procurement documents, and certifies that the item meets all procurement requirements. The quality release includes identification of any approved deviations from the procurement requirements and is signed by a person(s) authorized by quality assurance. Procedures describe the actions necessary to initiate, authorize, issue, distribute and revise quality releases. These procedures include provisions for ensuring documented evidence of item acceptance is at the nuclear power plant before the item is placed in service or used.

For items that are shipped to a Division facility or transferred from one Division facility to another for further processing, receiving or source inspections are performed in accordance with established requirements commensurate with the complexity and use of the item and the status of the supplier or facility. This receiving or source inspection verifies that the item and specified documentation comply with the applicable requirements. The status is identified on, or traceable to, the item.

7.5.2 METHODS OF ACCEPTANCE

Items or related services are accepted by one of the following methods or a combination thereof.

Certificate of Conformance (C of C) - When a C of C is used for acceptance, criteria (a) through (f), as a minimum, are met: (a) the purchased item will be identified on the C of C by purchase order number. (b) the C of C identifies or references documents that identify the procurement requirements, such as codes, standards and other specifications; approved changes, waivers, or deviations are also identified on the C of C; (c) procurement requirements that are not met are identified along with an explanation of how the nonconformance was resolved; (d) the person responsible, as described in the responsible division's or supplier's quality assurance program, signs the C of C; (e) the C of C process, which includes preparation, review and approval, is described in the responsible division's or supplier's quality assurance program; and (f) verification of the supplier's C of Cs and certification process is performed during audits or surveillance, or both, at intervals commensurate with the supplier's past performance.

Source Verification - When specified in procurement documents, quality assurance surveillance of suppliers during fabrication, inspection, testing or release of items is provided. For complex items, guidance for surveillance activities is provided by established quality procurement standards or procurement quality requirements generated prior to the activity. Audits, surveillance, and/or inspections by quality assurance personnel are performed to verify suppliers' compliance with quality assurance procedures and procurement document requirements. Where no established quality standards exist, the specific technical requirements of the procurement documents are used as the basis for surveillance. The degree of surveillance varies with the degree of importance of the item, supplier performance and complexity of the item, and may result in a requirement to verify lower tier activities of the suppliers.

7.5.2 METHODS OF ACCEPTANCE (Continued)

Receiving Inspection - Receiving inspections are performed in accordance with procedures and inspection instructions. These inspections are performed to verify conformance to specified requirements. Such features as proper configuration, identification, dimensional, physical and other characteristics, freedom from shipping damage and cleanliness are also verified. The supplier's quality performance, as verified during audits and/or surveillance, is considered in determining the extent of receiving inspection to be performed. Any required documentation specified in the procurement documents to be furnished prior to receiving inspection is reviewed during surveillance and release of the item.

Post-Installation Testing - The responsible division and the applicant/licensee or his agent will mutually establish the test requirements and acceptance documentation in test specifications when post-installation tests are used.

7.5.3 ACCEPTANCE OF SERVICES ONLY

Acceptance of procured services is by any or all of the following methods: technical verification of data produced; surveillance or audit of the activity; review of objective evidence for conformance to procurement document requirements. These methods are described in procedures.

7.6 CONTROL OF SUPPLIER NONCONFORMANCES

Procedures that describe the method of disposition of items and services that do not meet procurement document requirements are established by divisions and the supplier.

7.6 CONTROL OF SUPPLIER NONCONFORMANCES (Continued)

These procedures contain provisions for the evaluation and approval of the supplier's disposition of nonconformances to procurement documents, nonconformances to division approved supplier documents (for position, see Appendix A, Page A-7), verification of the disposition and maintenance of records. Nonconformances identified in division supplied documents are controlled in the same manner.

7.7 COMMERCIAL GRADE ITEMS

Requirements for the use and control of commercial grade items are described in procedures which meet the requirements of this Plan and Generic Letter 89-02 [NRC endorsement of EPRI NP-5652, "Guideline for the Utilization of Commercial-Grade Items in Nuclear Safety Related Application (NCIG-07)"]. Engineering responsibilities for the identification of important characteristics are also contained in the procedures and include: special processes and tests, design, material and performance characteristics and acceptance criteria. When used, commercial grade items are identified in approved design output documents. Source evaluation, as applicable, is performed by divisions in accordance with 7.2 of this Section and is based on the item's complexity and importance to safety.

Commercial grade items are identified in the purchase order by the manufacturer's published product description. After receipt of the commercial-grade item the following are verified: item meets product description; freedom from shipping damage; required inspections and testing were accomplished; and required documentation is acceptable and traceable to the item.

SECTION 8
IDENTIFICATION AND CONTROL OF ITEMS

8.0 METHODS

Identification and control requirements are established in quality assurance programs and are specified in procurement documents for items including consumable materials and items with limited shelf life or limited calendar or operating life, to prevent the use of incorrect or defective items.

Items of production, such as batches, lots, components and parts, are identified from their initial receipt and fabrication through their installation and use. This identification is traceable to the design or other specifying documents. Identification markings on the item are used to the maximum extent possible. When this method of identification is impractical, physical separation, procedural control, or other appropriate controls are used. Marking of items is accomplished by using material and methods that provide a clear and legible identification. Markings are transferred to each part when an item is subdivided, and these markings are not obliterated or hidden by surface treatment. These requirements take into consideration the location and the method of identification so that the fit, function, or quality of the item being identified is not adversely affected.

8.1 TRACEABILITY

Identification and control procedures assure that identification is maintained on the item or on records traceable to the item to preclude use of incorrect or defective items, to an extent consistent with the item's importance to safety. Item identification can be traced to appropriate documentation such as design documents, procurement documents, process control documents, or inspection records. Item identification is verified and documented prior to release of the item for further use.

8.1 TRACEABILITY (Continued)

Specific requirements for identification and traceability of items when specified by codes, standards, or specifications, such as grade of material, heat, batch, test and serial number are also controlled by the quality assurance programs.

8.2 LIMITED LIFE ITEMS

Items having limited calendar or operating life are identified and controlled to preclude use of items whose shelf life or operating life has expired.

8.3 MAINTAINING IDENTIFICATION OF STORED ITEMS

The control of item identification for stored items is based on the duration and conditions of storage. This control considers provisions such as maintenance or replacement of markings when damaged or deterioration occurs due to environmental conditions.

SECTION 9
CONTROL OF PROCESSES

9.0 PROCESS CONTROL

Processes affecting quality of items or services are controlled by instructions, procedures, drawings, checklists, process control documents, or other appropriate methods. These methods control process parameters and assure that specified environmental conditions are maintained. Special processes may include welding, heat treating, nondestructive examination, electro-mechanical machining, explosive forming, cleaning, and painting.

9.1 SPECIAL PROCESSES

Special processes are those which are highly dependent on the control of the process or the skill of the operators, or both, and in which the specified quality cannot be readily determined by inspection or test of the product. Examples of special processes include, but are not limited to, welding, heat treating and nondestructive examination.

Special processes are performed in accordance with documented instructions which include or reference procedure, personnel and equipment qualification requirements. These requirements comply with applicable codes, standards, specifications, or other documents. The documented instructions also specify conditions for accomplishing the process, use of proper equipment, parameters to be controlled, calibration requirements, including acceptance criteria, and any special requirements. Qualification records are maintained and quality assurance personnel are involved in the control of qualification activities through procedure approval, surveillance or audits, as appropriate.

9.1 SPECIAL PROCESSES (Continued)

Qualification of processes and personnel for welding and inspection is in accordance with the ASME Boiler and Pressure Vessel Code or other specified requirements. Nondestructive examination is in accordance with ASNT SNT-TC-1A or other specified requirements. For suppliers, quality assurance personnel perform audits and/or surveillance at the supplier's facility to specified requirements of special process qualification and process activities.

SECTION 10
CONTROL OF MEASURING AND TEST EQUIPMENT

10.0 GENERAL

Control of measuring and test equipment, including identification of equipment controlled, is specified in procedures, instructions or procurement documents. These documents specify the requirements contained in this Plan for calibration and the maintenance and control of measuring and test equipment. Examples of the equipment defined and controlled are micrometers, gages, hardness testers, transfer standards, electronic instruments, etc., and include peripheral devices such as PCs, microprocessors and software when used as an integral part of the measuring and test equipment. PCs, microprocessors and software when used as an integral part of the measuring and test equipment are not interchanged without recalibration.

10.1 SELECTION

Measuring and test equipment is selected to assure proper type, range, accuracy and tolerance to accomplish specified requirements contained in test procedures, test instructions or procurement documents.

10.2 CALIBRATION AND CONTROL

Measuring and test equipment is calibrated using calibration standards with greater accuracy than the equipment being calibrated. Calibration standards with the same accuracy may be used if adequacy for the requirements and the basis of acceptance are documented and authorized by the responsible engineering manager. Measuring and test equipment is calibrated prior to use, after use, or at specified intervals based on the required accuracy, purpose, degree of usage, and stability characteristics. Measuring and test equipment is calibrated against

certified equipment having known valid relationships to nationally recognized standards. Calibration standards have an uncertainty (error) the required accuracy, purpose, degree of usage, and stability characteristics. Measuring and test equipment is calibrated against certified equipment having known valid relationships to nationally recognized standards. Calibration standards have an uncertainty (error) limit requirement of no more than 1/4 of the tolerance of the intended use of the equipment being calibrated. If no nationally recognized standards exist, the basis for calibration is documented.

Measuring and test equipment is uniquely identified and affixed with tags, labels or markings that indicate calibration status. Records are maintained to show the status of each item within the calibration program. Controls include documented disposition and/or corrective measures when discrepancies are noted. Damaged or inaccurate measuring and test equipment is tagged or segregated until repaired and recalibrated, or replaced. Documentation to determine the validity of previous measurements performed when measuring and test equipment is found to be out of calibration is maintained.

10.3 HANDLING, STORAGE AND RECORDS

The handling and storage of measuring and test equipment are controlled to assure that the accuracy of the equipment is maintained.

Calibration records are maintained, traceable to the measuring and test equipment, and provide calibration status. Calibration records provide the information required to determine the validity of previously recorded test results.

SECTION 11
TEST CONTROL

11.0 GENERAL

Testing is planned, executed, documented, and evaluated to specified requirements in accordance with written procedures, to demonstrate that items will perform satisfactorily in service. Characteristics to be tested and the test methods used are specified prior to test. Test requirements and applicable acceptance criteria are specified in procurement documents, test specifications, technical documents or procedures.

When acceptance criteria are not met and modifications, repairs and/or replacements are necessary, these modifications, repairs and/or replacements will be retested to the original acceptance criteria.

11.1 TEST REQUIREMENTS

Test requirements and acceptance criteria may be documented in various controlled forms, such as test procedures, test specifications, drawings, travelers, or test instructions; and, are provided or approved by the organization responsible for the design.

Test controls are established to identify criteria that specify when testing is required, the development of procedures, a means of assessing the adequacy of the test items, and designation of the responsibility for performing the various phases of the testing. Controlled tests include, as appropriate, proof tests before installation, post-modification tests, prototype qualification tests, and production tests, construction tests and pre-operational tests.

11.2 TEST PROCEDURES

Test procedures and/or associated instructions include: a) method and instruction for performing the test; b) test prerequisites, such as

11.2 TEST PROCEDURES (Continued)

calibrated instrumentation, adequate and appropriate equipment, qualified personnel, preparation, condition and completeness of the item to be tested, suitable and, if required, controlled environmental conditions; c) requirements and acceptance criteria, by incorporation or reference to design or other technical documents; d) mandatory inspection hold points, if required for witness by owner, contractor, or inspector; and, e) requirements for documenting test data results.

11.3 TEST RESULTS AND RECORDS

Test results are documented, evaluated, and their acceptability determined by a qualified, responsible individual or organization. Test results that determine final product acceptability are evaluated by a responsible authority to assure that test requirements have been satisfied.

Test records shall, as a minimum, identify the following: item tested, date of test, tester or data recorder, type of observation, results and acceptability, action taken for any deviation noted, and person(s) evaluating test results.

SECTION 12
HANDLING, STORAGE AND SHIPPING

12.0 GENERAL

A program commensurate with the safety significance of the item is implemented to control the handling, storage, shipping, cleaning, and preserving of items to prevent loss, damage, and deterioration. This program is documented in procedures or instructions.

These procedures/instructions may be in different formats, such as manufacturing procedures, shipping instructions, drawings, process control documents and cleaning process specifications.

12.1 SPECIAL REQUIREMENTS

Special handling, storage and shipping requirements are contained in various documents, such as drawings, specifications or procurement documents, and these requirements are provided to the applicant/licensee when equipment is shipped to the plant site or storage facility. Special protective equipment, such as containers, shock absorbers, accelerometers, special protective environments (e.g. gas atmospheres, specific moisture content levels, temperature levels), and special personnel training are specified, provided and verified.

Special handling equipment used is controlled, inspected, tested and verified at specified intervals to assure the equipment is maintained in accordance with documented instructions. Operators of special equipment are experienced or trained in the proper use of the equipment.

12.2 MARKING

Instructions for marking and labeling are established as necessary to identify, maintain, and preserve the item. Any special controls, such as environmental considerations, are also indicated.

SECTION 13
INSPECTION

13.0 PERSONNEL

Inspections for product acceptance are performed by personnel who are qualified to perform the assigned inspection task and not responsible for the work being inspected. Qualification is certified as described in Part A, Section 2, Para. 2.1 of this Plan.

Inspections by personnel during on-the-job training shall be performed under direct supervision of a qualified person. Ultimate verification of conformance is always by the qualified person.

13.1 PLANNING

Planning for these inspection activities is accomplished and documented using checklists, procedures, travelers, procurement documents or supplier procedures. These documents identify characteristics and activities to be inspected, the inspection method, the acceptance criteria, the organization responsible for performing the inspection, and the documentation of inspection results.

If sampling is used to verify acceptability of a group of items, the sampling procedure is documented and based on recognized standard practice.

13.2 HOLD POINTS, IN-PROCESS AND FINAL INSPECTIONS

Procedures are established and implemented for inspection of items which include source, in-process, modification and final inspection.

Hold points, if required, are identified and defined in inspection documents. Work shall not proceed beyond hold points without consent

from the organization which established the hold points. This consent is recorded prior to continuation of work. Corrected areas are reinspected when acceptance criteria is not met. Modifications, repairs, or replacement of items subsequent to final inspection require reinspection or retest, as appropriate, to verify acceptability.

Items in process are inspected commensurate with their complexity and importance to safety. Monitoring methods are used where inspection of items is impossible or otherwise impractical. Both inspection and process monitoring are used when control is inadequate without both. When both inspection and process monitoring are required, coordination and sequencing of these activities are established and documented.

Final inspections are planned and performed to verify conformance of the item to specified requirements. Completed items are inspected for completeness, marking, calibration, adjustments, protection from damage, or other characteristics as required to verify quality. Inspection also includes the review of the adequacy and completeness of the inspection results and the resolution of any nonconformances.

13.3 RECORDS

Inspections are documented, and the inspection records contain, as a minimum: item inspected, date of inspection, inspector, type of observation, results or acceptability, and reference to action taken for any nonconformances.

Inspection results are recorded either by qualified inspectors or by personnel during on-the-job training. Inspection results recorded by personnel during on-the-job training are verified by qualified inspectors and this verification is documented. Completed inspection records are reviewed to the extent necessary to determine the adequacy and completeness of the inspection records.

SECTION 14
INSPECTION, TEST AND OPERATING STATUS

14.0 IDENTIFICATION AND TRACEABILITY

Procedures have been established to assure the inspection, test and operating status of items is verified before release, fabrication, receipt, installation, test and use. Inspection, test and operating status is indicated either on the item or in documents traceable to the item.

14.1 CONTROL OF STATUS INDICATORS

The application and removal of status indicators are controlled through the use of inspection control cards, process control documents, or other documents, or by computerized control systems. Altering the sequence of tests, inspections or other operations requires the same control as the original review, and approval.

SECTION 15
CONTROL OF NONCONFORMING ITEMS

15.0 IDENTIFICATION, SEGREGATION AND DISPOSITION

Procedures are established to control the identification, documentation, evaluation, segregation, and disposition of nonconforming items which include failures, malfunctions, deficiencies, deviations and defective material and equipment. Nonconformance documentation identifies the nonconforming item, describes the nonconformance and its disposition, and documents approvals and any reinspection or testing required. Individuals, including appropriate engineering and quality assurance personnel, or organizations, who are authorized to segregate, control and approve the disposition of nonconforming items are identified. Nonconforming items are controlled to preclude their inadvertent use.

Nonconformances are "used-as-is," "rejected or scrapped," "repaired," or "reworked." Technical justification for the acceptability of a nonconforming item to be repaired or used-as-is is documented. Items used-as-is or repaired that do not conform to design requirements are subject to design control measures commensurate with those applied to the original design. Repaired or reworked items are reinspected in accordance with appropriate procedures/instructions, and with the original acceptance criteria. In accordance with this plan, quality assurance verifies implementation of the controls applied to nonconforming items during audits and surveillance.

SECTION 16
CORRECTIVE ACTION

16.0 GENERAL

Conditions adverse to quality such as failures, malfunctions, nonconformances, and out-of-control processes (including failure to follow procedures) shall be identified. These adverse conditions are also analyzed, documented, and corrected commensurate with their importance to safety. A "no-fault" attitude towards identification of problems is applicable to all personnel and is described in implementing procedures and training. Responsibility for implementation of any portion of the corrective action program may be delegated but management retains responsibility for its effectiveness.

16.1 CORRECTIVE ACTION

Personnel performing activities in accordance with this Plan identify conditions adverse to quality and suggest, recommend or provide solutions to the conditions as appropriate. Procedures describe the identification, documentation, classification, cause analysis, and correction of the conditions adverse to quality.

Conditions adverse to quality are reviewed to determine the need for additional corrective action. These conditions are also analyzed for trends in quality performance and the results of these trend analyses are provided to appropriate management levels. Provisions are contained in procedures or instructions that ensure corrective actions (including procedural software and hardware) are reviewed and not inadvertently nullified by subsequent actions. Corrective action involving rework, repair and replacement of items includes any inspections or tests that are to be performed in accordance with either the original requirements, or approved and specified alternate requirements. For significant

16.1 CORRECTIVE ACTION (Continued)

conditions adverse to quality, the causes are determined and documented and the impact of such conditions on items and services is evaluated for significant trends and reported to the appropriate level of management.

Actions taken to prevent recurrence are documented and reported to appropriate levels of management.

16.2 FOLLOW-UP

Implementation of corrective action is verified by responsible individuals or organizations. For corrective action resulting from reports (e.g., nonconformance reports, audit reports, computer software error reports, NRC inspection reports, customer audit reports, etc.) quality assurance participates in verifying that appropriate corrective action is documented and implemented.

SECTION 17
QUALITY ASSURANCE RECORDS

17.0 GENERAL

Quality Assurance Record - "A completed document that furnishes evidence of the quality of items and/or activities affecting quality." (NQA-1) (for position, see Appendix A, Page A-4)

Records that furnish evidence of quality are specified, prepared and maintained in accordance with established procedures. Requirements and responsibilities are identified and contained in these procedures and include methods for indexing, distribution, identification, classification, retrieval and retention. These requirements assure the generation and maintenance of records that reflect the quality of completed work.

Quality Assurance Records listed in Appendix 17A-1 of NQA-1 are controlled in accordance with this section. As required by contract, quality assurance records are maintained and/or forwarded to the applicant/licensee for retention.

17.1 RECORD ADMINISTRATION

Design specifications, procurement documents, test procedures or other documents specify the records to be generated. Managers responsible for the generation of quality assurance records are also responsible for ensuring that they are evaluated for completeness, accuracy, indexing, record classification (as lifetime or nonpermanent records), and record validation.

Documents are considered valid records only if stamped, initialed or signed and dated by authorized personnel or otherwise authenticated. This authentication may take the form of a statement by the responsible individual or organization. Handwritten signatures are not required if the document is clearly indicated as a statement by the reporting individual or organization. These records may be originals or copies.

17.1 RECORD ADMINISTRATION (Continued)

Correction of quality assurance records is in accordance with procedures, which include provisions for review or approval by the originating organization, and the date and identification of the person authorized to issue the correction.

Each group generating and collecting quality assurance records is responsible for indexing (for position, see Appendix A, Page A-8), identifying the status, and maintaining a retrieval system for records. Records indices, i.e., records flow schedules, include, as a minimum, record retention times and location of the records. Identification of the item or activity is provided by the record and/or the index.

17.2 CLASSIFICATION

Records are classified as lifetime or nonpermanent in accordance with the following guidelines:

Lifetime - Those records which meet one or more of the following criteria:

- Those records which would be of significant value in demonstrating capability for safe operation.
- Records which would be of significant value in maintaining, reworking, repairing, replacing or modifying an item.
- Records which would be of significant value in determining the cause of an accident or malfunction of an item.
- Records which provide required baseline data for in-service inspections.

17.2 CLASSIFICATION (Continued)

Nonpermanent - Records which show evidence that an activity was performed in accordance with applicable requirements but which do not meet any of the criteria for lifetime records. Examples of nonpermanent records are system audit reports, design control procedures, design procedures, training records and surveillance reports. Retention periods for nonpermanent records are established and documented in accordance with Regulatory Guide 1.28, Regulatory Position 2.

17.3 STORAGE, PRESERVATION AND SAFEKEEPING

Records are maintained in a manner which allows access by index to the information contained in the records. Records Flow Schedules are used to identify records maintained. The schedules identify the retention periods, the classification and disposition requirements, microfilming requirements (active records), and retention period at the permanent records storage facilities (inactive records). These requirements are specified in procedures that describe the system for identifying, accepting, maintaining, protecting and retrieving quality assurance records, and as clarified in Appendix A of this Plan, Pages A-8 through A-12.

17.4 STATUS, RETRIEVAL AND DISPOSITION

Each group generating and collecting quality assurance records is responsible for identifying the status, and maintaining a retrieval system for records. The receipt control system is structured in accordance with procedures and alternatives to NQA-1 described in Appendix A (Page A-9) of this Plan. Retrieval of records is controlled by authorized personnel. Disposition of records is described in procedures which delineate responsibilities and requirements and processing of these records in accordance with this Plan.

SECTION 18
AUDITS

18.0 GENERAL

Quality Assurance is responsible for planning and performing internal and external audits in accordance with established procedures to verify compliance with this Quality Assurance Plan. Quality Assurance is also responsible for determining and reporting to management the overall effectiveness of the implementation of the quality assurance program. Audits include follow-up action where indicated.

18.1 SCHEDULING

Audit scheduling and resource allocation are based on the status and safety importance of the activity and audits include the full scope of quality related activities being performed. Internal audits are conducted at least once a year or at least once during the life of the activity, whichever is shorter. External audits are conducted every three years or more frequently as determined by the annual supplier performance evaluations. The audit schedule is reviewed and revised when necessary to assure coverage is maintained. Supplemental audits are performed when necessary to provide verification of specific activities and processes.

18.2 PREPARATION

Audit plans are developed and documented prior to each audit. The audit plan identifies the audit scope, requirements, audit personnel, activities to be audited, group(s) to be notified, applicable documents, schedule and written procedures or checklists to be used during the performance of the audit.

18.3 AUDIT PERSONNEL

Auditors are independent of any responsibility for performance of the activity which they will audit. Auditor selection is based on knowledge and experience required for the activity being audited. Auditors are qualified in accordance with ASME NQA-1, Supplement 2S-3. Audit team members are selected prior to the audit. Lead auditors are responsible for ensuring that team members are prepared to participate in the audit prior to its initiation.

18.4 PERFORMANCE

Audits are conducted in accordance with written procedures or checklists. Activities being audited are evaluated against quality assurance program requirements, and the results of the audit are reported to management. Where corrective action is required for significant conditions adverse to quality, management is informed immediately.

18.5 REPORTING

The audit report is signed by the audit team leader and contains the following information: description of the audit scope; identification of the auditors; personnel contacted during the audit; summary of audit results, including effectiveness of the quality assurance program; and, description of each audit nonconformance and request for corrective action in sufficient detail to enable corrective action to be taken.

18.6 RESPONSE, FOLLOW-UP ACTION AND RECORDS

Managers of the audited activities are responsible for evaluation of the audit nonconformance(s), scheduling and implementing corrective action, identifying measures to prevent recurrence, and providing written response of action taken or planned. Lead Auditors evaluate corrective action plans and provide for follow-up action, including the reaudit of deficient areas where appropriate, to verify that corrective action is accomplished as scheduled. The completed audit files include audit plans, audit reports, written replies, and a record of completed corrective action.

PART C
SELF-ASSESSMENT
SECTION 1 - SELF-ASSESSMENTS

1.0 GENERAL

Self-assessment is a means to a balanced approach where the quality assurance department and other functional departments work together to accomplish the quality objectives of each Division.

The self-assessment process objective is for functional departments to independently review and evaluate overall performance to determine the level of quality that is achieved through their individual activities and compliance to procedures.

1.1 ORGANIZATION

Each Division General Manager and the ESBU Procurement Services Manager is responsible for identifying a management position with responsibility for assuring the implementation of the self-assessment function. This management position possesses the following characteristics: 1) sufficient authority and organizational freedom exist to implement assigned responsibilities; 2) it is sufficiently free from direct pressure for cost/schedule; 3) effective lines of communication exist with persons in other senior management positions; and, 4) there are no duties or responsibilities that preclude adequate attention to assigned self assessment responsibilities. When site activities warrant, an on-site management position that possesses the same characteristics and responsibilities will be established.

1.2 OBJECTIVES AND RESPONSIBILITIES

Personnel responsible for implementation of the self-assessment function are aware of division or organization activities so they can act in a management advisory function. Responsibilities of the personnel include assessment of overall performance; identification of potential

problems; reporting of assessment findings in a timely fashion to a level of management having the authority to cause corrective action; and verifying satisfactory completion of corrective action. Personnel performing self-assessment activities are technically and performance oriented, having the quality of the end product as their primary objective. Procedures and processes are of secondary importance to them and they have no direct responsibilities in the area they are assessing.

1.3 ASSESSMENT PROCESS

Assessments are performed to a planned and scheduled program. Planning identifies the characteristics and activities to be assessed, and the acceptance criteria. Scheduling is dynamic and based on the safety importance of the activity, and self-assessment resources are supplemented when the quality assurance program effectiveness is in doubt. Assessments are accomplished using documented instructions, procedures, checklists or other documentation of a detail commensurate with the activity's complexity and importance to safety. Implementation of the quality assurance program for work delegated to others is also assessed as described in this section.

Results of self-assessments are documented and reviewed by the assessor's management and management having responsibility in the area assessed. Corrective action is initiated when deficient areas are identified or the effectiveness of the quality assurance program is in doubt.

FIGURE 3

ESBU AND PGBU DIVISIONAL STRUCTURE

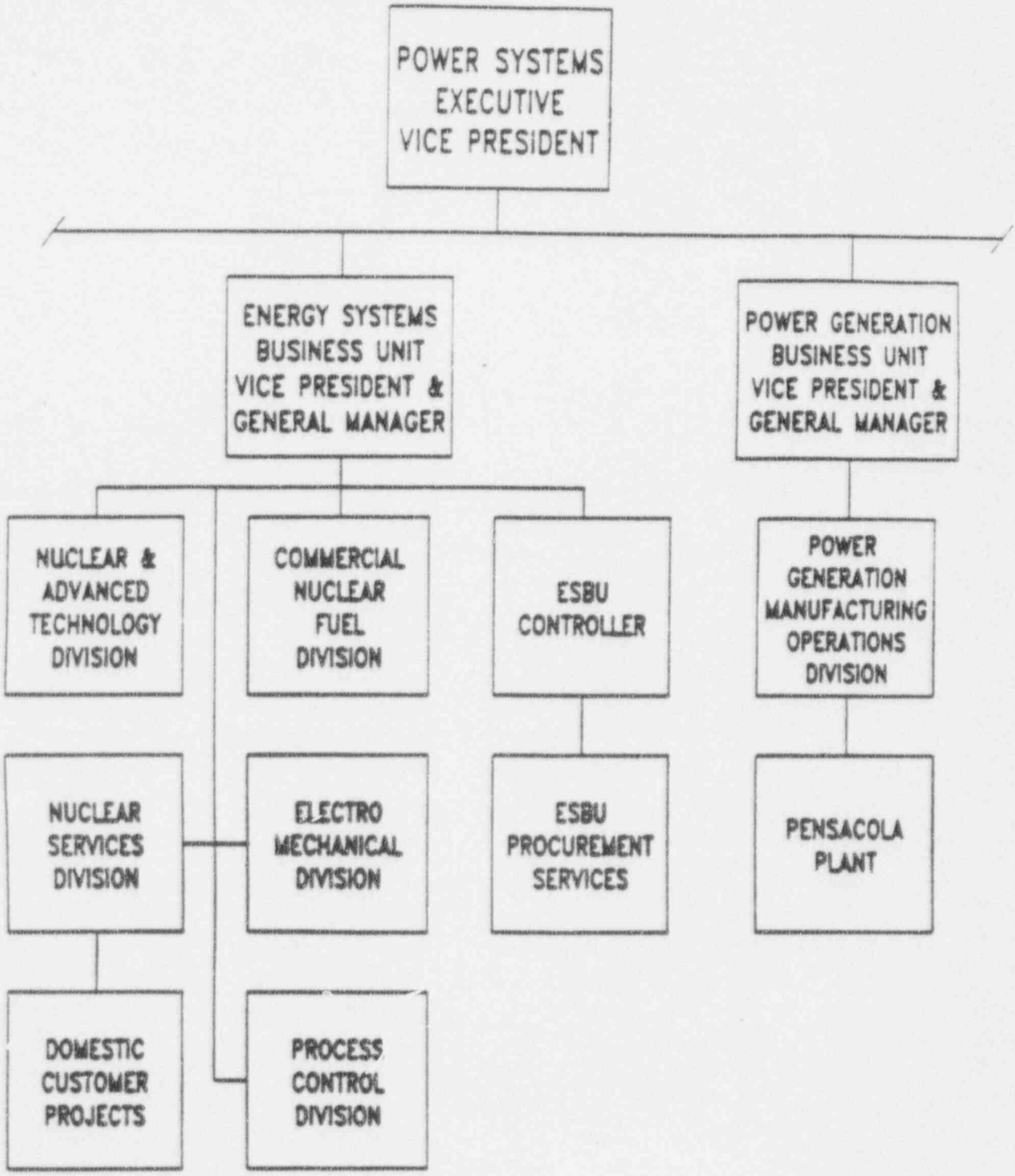
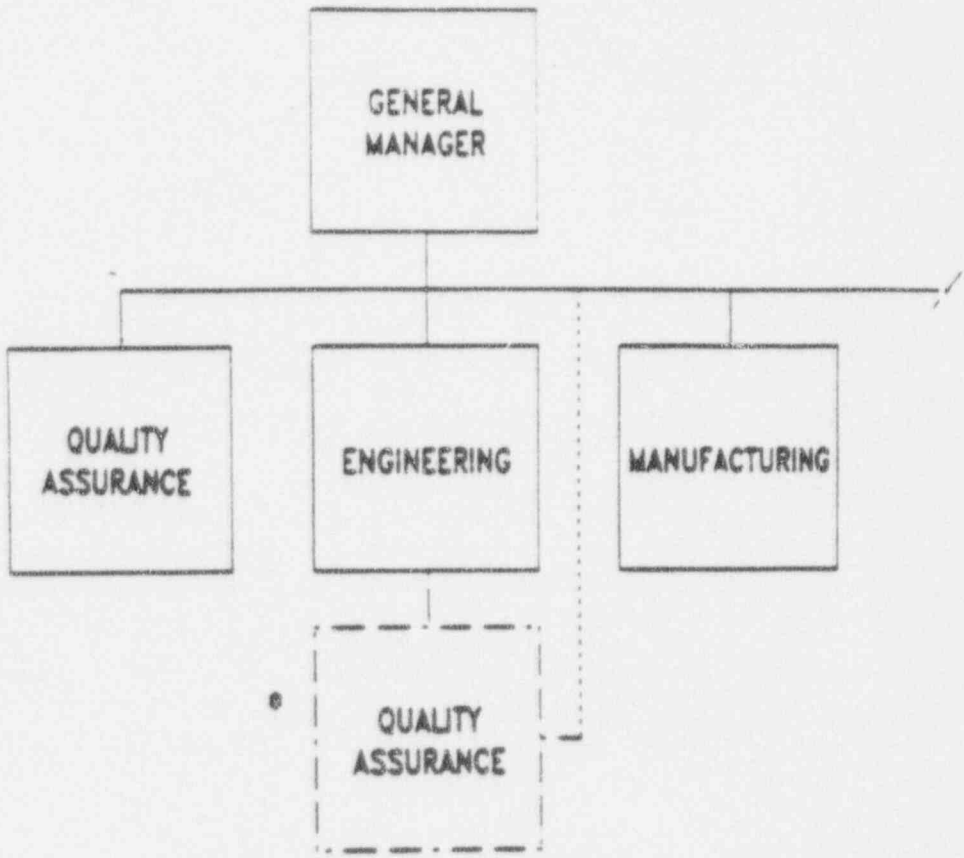


FIGURE 4

TYPICAL QA ORGANIZATION REPORTING STRUCTURES



*QUALITY ASSURANCE MAY REPORT TO A FUNCTIONAL DEPARTMENT, BUT THE QUALITY ASSURANCE MANAGER HAS DIRECT ACCESS TO THE GENERAL MANAGER.

FIGURE 5

QUALITY ASSURANCE MANUALS

Manual Title

ESBU Quality Assurance Program

Nuclear and Advanced Technology Division Quality Assurance Program

Advanced Energy Systems Quality Assurance Program

Electro Mechanical Division Commercial Nuclear Quality Assurance Program Manual

Process Control Division Quality Assurance Program Manual

Commercial Nuclear Fuel Division Product Policy-Procedure Manual

Nuclear Services Division Quality Assurance Program Plan

Pensacola Plant Nuclear QA Program Manual

APPENDIX A

POSITIONS ON REGULATORY GUIDES AND ASME NQA-1

Additional positions on Regulatory guides and ASME-NQA-1 may be given in individual SARs, except as noted below. The Westinghouse divisions will conform to the latest NRC guidance unless the SAR specifies a different revision.

Regulatory Guide 1.8, Rev. 2

Qualification and Training of Personnel for Nuclear Power Plants.

This Regulatory Guide is not applicable to scope of work.

Regulatory Guide 1.26, Rev. 3

Quality Group Classifications and Standards for Water -, Steam-, and Radioactive-Waste - Containing Components of Nuclear Power Plants.

See specific SAR document.

Regulatory Guide 1.28, Revision 3

Quality Assurance Program Requirements
(Design and Construction)

ESBU follows NRC Regulatory positions with the following clarifications.

Regulatory Guide

Regulatory Guide 1.28, Revision 3, Section C.1 "Appendix 2A-1, Nonmandatory Guidance on the Qualification of Inspection and Test Personnel" provides guidance on the qualification of inspection and test personnel.

Position - Alternative

Where high school graduation is specified in Appendix 2A-1, Paragraph 3.0, a General Education Development equivalent of a high school diploma is considered acceptable.

Where three levels of qualification are to be utilized depending on the complexity of the function involved, specific level designations for personnel involved in inspection, examination, and testing activities may not necessarily be used. A combination of position descriptions and pre-determined qualification requirements for a position define the level of capability required to perform the function. These methods are used to identify levels of capability that include the comparable requirements of the levels identified in Appendix 2A-1.

Regulatory Guide 1.28, Revision 3 (Continued)

Quality Assurance Program Requirements
(Design and Construction)

Regulatory Guide

Regulatory Guide 1.28, Revision 3, Section C.3 "Audits" scheduling/ supplementary requirements for audits.

Position - Clarification

The regulatory position provided in Section C.3, along with alternatives to NQA-1, which are compatible with Regulatory Guide 1.28, Revision 3 will be followed.

Regulatory Guide 1.29, Revision 3

Seismic Design Classification

See Specific SAR Document

Regulatory Guide 1.33, Revision 2

Quality Assurance Program Requirements (Operation)

This Regulatory guide is not applicable to scope of work.

Regulatory Guide 1.36, Revision -

Nonmetallic Thermal Insulation for Austenitic Stainless Steel

See Specific SAR Document

Regulatory Guide 1.54, Revision -

Quality Assurance Requirements for Protective Coatings Applied to Water-Cooled Nuclear Power Plants

See Specific SAR Document

Regulatory Guide 1.143, Revision 1

Design Guidance for Radioactive Waste Management Systems, Structures, and Components Installed in Light-Water-Cooled Nuclear Power Plants

See Specific SAR Document

Regulatory Guide 1.152, Revision -

Criteria for Programmable Digital Computer Systems Software in Safety-Related Systems of Nuclear Power Plants.

Divisions follow NRC Regulatory Positions

Regulatory Guide 2.5, Revision -

Quality Assurance Program Requirements for Research Reactors

This Regulatory guide is not applicable to scope of work.

Regulatory Guide 3.3, Revision 1

Quality Assurance Program Requirements for Fuel Reprocessing Plants and for Plutonium Processing and Fuel Fabrication Plants

This Regulatory Guide is not applicable to scope of work.

Regulatory Guide 3.21, Revision -

Quality Assurance Requirements for Protective Coatings Applied to Fuel Reprocessing and to Plutonium Processing and Fuel Fabrication Plants

This Regulatory Guide is not applicable to scope of work.

Regulatory Guide 4.15, Revision 1

Quality Assurance for Radiological Monitoring Programs (Normal Operation) - Effluent Steams and the Environment

This Regulatory Guide is not applicable to scope of work.

Regulatory Guide 7.10, Revision 1

Establishing Quality Assurance Programs for Packaging Used in the Transport of Radioactive Materials

Divisions follow NRC Regulatory Positions.

ASME NQA-1

DIVISIONS FOLLOWS ASME NQA-1 WITH THE FOLLOWING CLARIFICATIONS, ALTERNATIVES AND EXCEPTIONS.

NQA-1 (Supplement S-1, Section 2) Standard Paragraph

Definition of a Quality Assurance Record: "A completed document that furnishes evidence of the quality of items and/or activities affecting quality."

Position - Alternative

At manufacturing divisions, product-related records are not considered complete until the time of product shipment.

"Quality assurance records are provided long-term protection either by storage of duplicate records at geographically separate locations, or by storage of single copy records at either the Corporate Records Center, or another facility meeting the requirements of Section 4.4.1 or 4.4.2. Prior to their delivery to the long-term storage facility, records are protected by normal office procedures, including either duplicate copies or the capability to reconstruct records lost during this period."

NQA-1 (Supplement 2S-2, Section 2.1) Standard Paragraph

"The American Society of Nondestructive Testing Recommended Practice No. SNT-TC-1A, June 1980 Edition and its applicable supplements shall apply as requirements to NDE personnel covered by this Supplement."

Position - Alternative

Divisions holding an ASME Certificate of Authorization may qualify nondestructive examination personnel as requested by the ASME Code.

NQA-1 (Supplement 2S-4, Section 4) Standard Paragraph

"Training shall be provided, if needed, to: (a) achieve initial proficiency; (b) maintain proficiency; and (c) adopt to changes in technology, methods, or job responsibilities."

Position - Clarification

Manufacturing divisions have programs for training personnel performing fabricating, handling, shipping, storing and cleaning activities to achieve initial proficiency. Maintenance of proficiency is accomplished through continued assignments in that activity. Additional training is performed, as needed, when the job function/responsibility is changed.

ASME NQA-1

NQA-1 (Supplement 2S-4, Section 5) Standard Paragraph

"Records of the implementation of indoctrination and training may take the form of: (a) attendance sheets; (b) training logs; or (c) personnel training records.

Position - Clarification

At manufacturing divisions training records for personnel performing fabricating, handling, shipping, storing and cleaning activities are available for review, however, they are not maintained as nonpermanent quality assurance records.

NQA-1 (Supplement 3S-1, Section 4) Standard Paragraph

Design Verification: "The results of design verification shall be clearly documented with the identification of the verifier clearly indicated."

Position - Clarification

For Design Verification activities performed, the signature of a responsible reviewer may be used to document and substantiate the performance of the verification activity. Procedures define the responsibilities of the verifier and required verification actions. Additionally, these procedures contain requirements for independence of the verifier, qualification of the verifier, and checking of the assumptions, techniques, inputs and results of the design activity.

NQA-1 (Supplement 3S-1, Section 4.2.3) Standard Paragraph

Qualification Tests: "When tests are being performed on models or mockups, scaling laws shall be established and verified."

Position - Clarification

For scale modeling, scaling laws are identified, documented and the appropriateness of the scaling techniques is verified.

ASME NQA-1

NQA-1 (Supplement 3S-1, Section 6.0) Standard Paragraph

Interface Control: "Interface controls shall include the assignment of responsibility and the establishment of procedures among participating design organizations for the review, approval, release, distribution and revision of documents involving design interfaces."

Position - Clarification

The responsibilities and authority of persons involved in the design process are defined by organization charts, management appointment letters and internal procedures. These documents are available for audit but are not transmitted to external organizations. Various interface agreements are established among the design departments, suppliers, customers and architect-engineers to ensure the proper flow and control of design information among the participants, and are documented by correspondence procedures, memoranda of understanding or contract documents.

NQA-1 (Supplement 4S-1, Section 3) Standard Paragraph

Procurement Document Review: "Reviews shall be performed and documented to provide objective evidence of satisfactory accomplishment of such review prior to contract award."

Position - Alternative

At some divisions, purchase order review is not documented because the purchase requisition, which is the basis for the purchase order, is reviewed and approved by quality assurance.

At other divisions, the review of purchase requisitions is not formally documented. Emphasis is placed on review of the purchase order. Purchase order reviews are documented.

NQA-1 (Supplement 6S-1, Section 2) Standard Paragraph

"The control system shall be documented and shall provide for (a) through (c) below:...(c) review of documents for adequacy, completeness and correctness prior to approval and issuance."

Position - Alternative

Procedures identify requirements and provide guidance for completing quality assurance records. These procedures require that applicable portions of these records be completed. It should be recognized that it is not always appropriate to "completely fill out" all records, particularly for those records completed on pre-printed forms.

ASME NQA-1

NAQ-1 (Supplement 7S-1, Section 2) Standard Paragraph

Procurement Planning: "Planning shall provide for the integration of;....(e) verification (surveillance, inspection or audits) activities by Purchaser, including notification of hold and witness points;"

Position - Alternative

Divisions routinely identify notification points in procurement documents when applicable. Such points are not always identified in pre- and post-award meetings. However, the required notification/hold points are specified by changes to the procurement documents in a reasonable time prior to their being accomplished to allow the Purchaser the opportunity to witness the event.

NQA-1 (Supplement 7S-1, Section 3.1) Standard Paragraph

Source Evaluation and Selection: "Measures for evaluation and selection of procurement sources, and the results therefrom, shall be documented and shall include one or more of (a) through (c) below:"

Position - Alternative

In addition to methods (a), (b) and (c) for the evaluation and selection of procurement sources, ASME accredited certificate holders may be selected for the supply of ASME Section III code items and services as identified within the scope of their ASME certificates, based upon ASME acceptance of their Quality Assurance Program. Audits and annual evaluations are performed in accordance with the commitments and requirements of this Plan.

NQA-1 (Supplement 7S-1, Section 9) Standard Paragraph

Control of Supplier Nonconformances: Nonconformances to the procurement requirements or Purchaser approved documents, which consist of one or more of the following, shall be submitted to the Purchaser for approval of the recommended disposition: (2) requirements in supplier documents which have been approved by the Purchaser, are validated."

Position - Clarification

Suppliers are required to submit deviations from technical procurement requirements for approval. When suppliers are required to submit selected process or manufacturing procedures for approval, the term approval means a review to assure that the supplier understands the procurement requirements and is applying appropriate measures to assure compliance with these requirements. The approval

Position - Clarification (Continued)

action does not relieve the supplier of responsibility for assuring the acceptability of the product. Thus, suppliers are not required to submit nonconformance reports on deviations from these procedures, unless they constitute deviations from the Westinghouse procurement requirements.

NQA-1 (Supplement 7S-1, Section 2 Standard Paragraph

Procurement Planning: "Planning shall provide for the integration of:.... (c) bid evaluation and award;"

Position - Clarification

Contract Award - A contract award is initiated by the preparation of a procurement document. One of the several methods below may be used.

1) Quality assurance reviews and approves purchase requisitions and purchase requisition changes. Necessary corrections or additions are completed prior to signing. A purchase order or change which accurately reflects the technical and quality requirements of the purchase requisition is then prepared by the purchasing department and issued to the vendor. In some cases, the quality requirements are predetermined for the item being procured. In this situation the quality requirements referenced in the procurement documents are previously approved by quality assurance.

2) Quality assurance reviews purchase requisitions and changes prior to contract award/order placement. In addition, purchase orders and changes are reviewed concurrently with issuance. If there is a discrepancy in the purchase order, quality assurance initiates a corrective action notice requesting resolution of the item, and if appropriate, identifies the point to which order processing may proceed (without effect on quality-related activities) prior to resolution of the discrepancy. Where required, a hold is placed on manufacturing until the item in question is resolved.

3) Quality assurance reviews and approves purchase orders and changes prior to issuance.

NQA-1 (Supplement 17S-1, Section 2.4) Standard Paragraph

Index: "The records shall be indexed."

Position - Clarification

Divisions maintain more than one index for quality assurance records to provide necessary access and retrievability. The practice is utilized as an alternative to a single index for all quality assurance records.

NQA-1 (Supplement 17S-1, Section 3.2) Standard Paragraph

Receipt Control: "As a Minimum, a receipt control system shall include the following:...(b) a method for identifying records received."

Position - Alternative

Receipt control systems are maintained to fit individual needs and requirements. Each system is defined in procedures and identifies the types of records to be processed. Files are established in accordance with these procedures establishing a separate file location for each category of record. When a record is received, it is filed in its pre-assigned location. The large volume of records and the diverse nature of the activities being performed practically preclude keeping a running inventory of each record received into an in-process/working file. The presence of the document itself serves as the record of what has been received. When action is completed for a particular activity or component, the in-process information is checked to assure that all appropriate records are available.

NQA-1 (Appendix 17S-1, Section 4.4.1) Standard Paragraph

Single Facility: "Design and construction of a single record storage facility shall meet the criteria of (a) thru (i) below:"

Position - Alternative

The Westinghouse Corporate Records Center (CRC) in Boyers, PA is utilized as a permanent records storage facility for inactive records which are stored in duplicate and/or single records as accepted by the U.S. Nuclear Regulatory Commission (6/02/80 and 3/08/79 letters from Mr. W. P. Haass and 4/23/81 letter from Mr. U. Potapovs). This facility is located in an underground limestone mine that is no longer being worked and is approximately 200 feet beneath the surface. Entry is made down a gradual graded hard surface roadway to a 24-hour guarded steel gate. This records storage facility provides an alternate to the construction criteria for a permanent records storage facility (as described below) which adequately protects records from possible destruction.

NQA-1 (Appendix 17S-1, Section 4.4.1) Standard Paragraph

Enforced concrete, concrete block, masonry, or equal construction;

Position - Clarification

The walls which constitute the perimeter of this storage facility are limestone ribs, 15-20 feet thick with eight inch heavy duty concrete blocks constructed between the ribs from floor to ceiling with sealed expansion joints. There are no doors or other openings in this perimeter to permit access to non-Westinghouse sections of this storage facility.

NQA-1 (Appendix 17S-1, Section 4.4.1 Standard Paragraph

Floor and roof with drainage control; if a floor drain is provided, a check valve (or equal) shall be included;

Position - Alternative

The limestone mine, approximately 200 feet below ground level, is impervious to water and is 38 feet above the water table. Additionally, the entrance to the (CRC) is located approximately five miles away and 100 feet above the nearest stream. Floor and roof drains are not necessary.

NQA-1 (Appendix 17S-1, Section 4.4.1 Standard Paragraph

Doors, structure, frames and hardware shall be designed to comply with the requirements of a minimum two hour fire rating;

Position - Clarification

All doors, frames and hardware are constructed of non-flammable materials such as steel or brass.

NQA-1 (Appendix 17S-1, Section 4.4.1) Standard Paragraph

Sealant applied over walls as a moisture or condensation barrier;

Position - Clarification

Aluminum enamel paint is applied to the walls and ceiling as a sealant.

ASME NQA-1

NQA-1 (Appendix 17S-1, Section 4.4.1) Standard Paragraph

Surface sealant on floor providing a hard-ware surface to minimize concrete dusting;

Position - Clarification

Floors in the storage area are constructed of either asphalt or concrete over four feet of limestone. The asphalt floors are coated with a sealant. Concrete floors are coated with a hard wearing deck enamel.

NQA-1 (Appendix 17S-1, Section 4.4.1) Standard Paragraph

Foundation sealant and provisions for drainage;

Position - Clarification

The foundation consists of four-foot thick limestone base covered with concrete or asphalt acting as the foundation sealant. Because of the underground location and the fact that limestone is impervious to water, no foundation draining is necessary.

NQA-1 (Appendix 17S-1, Section 4.4.1) Standard Paragraph

Forced-air circulation with filter system;

Position - Clarification

A natural draft of air flows through the mine and passes through forced-air circulation fans when entering and existing the storage areas. This air is also filtered as it enters the storage facility. This system assures adequate air circulation through the storage areas. The ventilation openings are equipped with fire rated dampers that close in guillotine fashion upon sensing heat.

NQA-1 (Appendix 17S-1, Section 4.4.1) Standard Paragraph

Fire protection system;

Position - Clarification

A series of smoke detectors are located at strategic locations throughout the storage facility which would alert the fire crew at the first sign of a fire. This alarm system is tied into a central fire alarm board at the guard station located at the mine entrance. A volunteer fire crew with equipment is located at the storage

Position - Clarification (Continued)

facility. Additionally, fire extinguishers are located throughout the storage areas. A guard makes a tour inside the area every four hours during non-working hours. A volunteer fire department in a neighboring town is located within 1-1/2 miles of the mine entrance.

NQA-1 (Appendix 17S-1, Section 4.4.1) Standard Paragraph

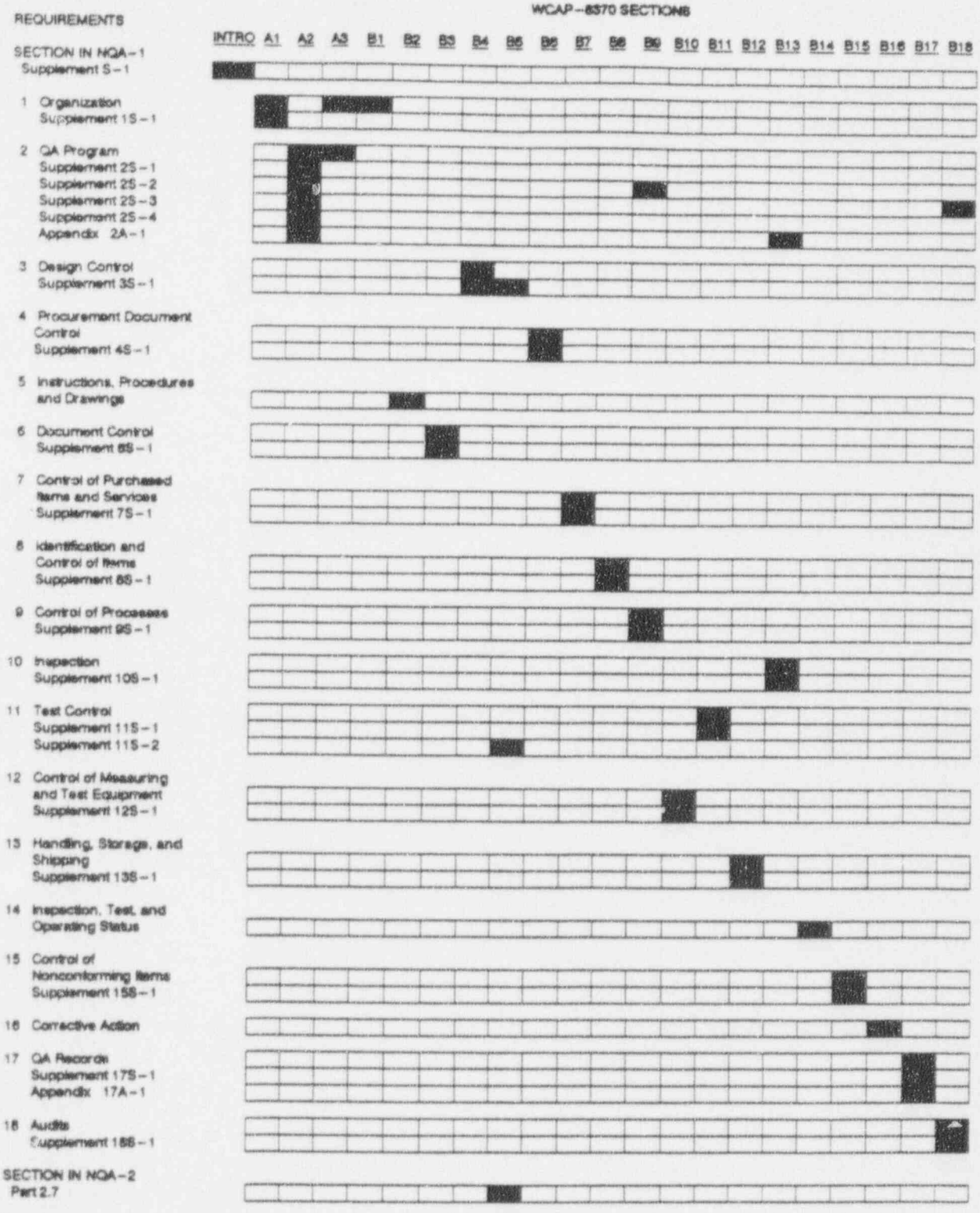
No pipes other than those providing fire protection to the storage facility are to be located within the facility. Only those penetrations used exclusively for fire protection, communication, lighting or temperature/humidity control are allowed; all such penetrations shall be sealed or dampened to comply with the minimum two-hour fire protection rating.

Position - Alternative

A single waterline is located within the storage facility to provide service water for sanitation and kitchen facilities. This line is equipped with shut-off valves both inside and outside the storage area. A drainage line is also located in the storage area to remove the discharge.

APPENDIX B

CORRELATION OF WCAP-8370 TO ASME NQA-1-1989 THROUGH ADDENDA 1b AND ASME NQA-2a-1990, PART 2.7 REQUIREMENTS



APPENDIX C
POSITIONS ON ASME NQA-2

Divisions follows ASME NQA-2 identified in Appendix C with the following clarifications, alternatives and exceptions.

NQA-2 Part 2.1 Quality Assurance Requirements for cleaning of Fluid Systems and Associated Components for Nuclear Power Plants.

Divisions follows the requirements of Part 2.1 for those portions of the construction site work within their scope.

NQA-2 Part 2.2 Quality Assurance Requirements for Packaging, Shipping, Receiving Storage, and Handling of Items for Nuclear Power Plants.

Subsection 4.2.3 Special Shipments

Position - Exception

For special shipments, W implements requirements for bracing and tie down, identification of the shipment, use of impact recording meters and escorts, and investigation of the carrier and transportation route when appropriate. However, W does not consider it desirable or feasible to implement subsection 4.2.3 in all situations. For example it may not always be desirable to identify special shipments with large letters or it may not always be possible to install impact recording meters prior to handling. In summary, W implements controls for special shipments based upon engineering judgement and experience to assure proper transportation of the special shipment.

Subsection 3.6.2 Vaporproof Barrier Material

"Vaporproof barrier material should be colored to contrast with the material on which it is used."

Position - Alternate

W utilizes vapor barriers in packaging processes that contrast with the material being packaged when such packaging materials are commercially available. A variety of colors for these packaging materials is not readily available because of the limited supply of material which meet other physical and chemical requirements.

Section 5 Receiving (Requirements for receiving contained in Section 5)

Position - Clarification

The divisions follows this section for those portions of the construction site work within their scope.

POSITIONS ON ASME NQA-2

Section 6 Storage(Requirements for storage contained in Section 6.)

The divisions follows this section for those portions of the construction site work within their scope.

Section 7 Handling (Requirements for handling contained in Section 7.)

Position - Alternate

The divisions and their suppliers use conservative industrial engineering practices for controlling the lifting and moving of completed component during packaging and shipping operations.

NQA-2, Part 2.3 Quality Assurance Requirements for Housekeeping for Nuclear Power Plants

Divisions follows the requirements of Part 2.3 for those portions of the construction site work within their scope.

NQA-2, Part 2.5 Quality Assurance Requirements for Installation, Inspection, and Testing of Structural Concrete, Structural Steel, Soils, and foundations for Nuclear Power Plants

Part 2.5 of NQA-2 is not applicable to the divisions' scope of work.

NQA-2, Part 2.7 Quality Assurance Requirements of Computer Software for Nuclear Power Plants.

Divisions follows the requirements contained in Part 2.7 (Detailed in Section B-5 of this Plan.

NQA-2, Part 2.8 Quality Assurance Requirements for Installation, Inspection, and Testing of Mechanical Equipment and systems for Nuclear Power Plants

Part 2.8 of NQA-2 is not applicable to the divisions' scope of work.