QUALITY ASSURANCE PLAN
WESTINGHOUSE NUCLEAR ENERGY SYSTEMS DIVISIONS

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February, 1975

APPROVED: *E. J. Kreh*

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MASTER

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UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

DEC 31 1974

Mr. R. Salvatori, Manager
Nuclear Safety Department
Westinghouse Electric Corporation
P. O. Box 355
Pittsburg, Pennsylvania 15320

Dear Mr. Salvatori:

We have reviewed and evaluated the Westinghouse Topical Report WCAP 8370 (Rev. 7), "Westinghouse Nuclear Energy Systems Divisions Quality Assurance Plan." We find that it describes an acceptable Quality Assurance Program for the design, procurement, and construction activities which are within the Westinghouse scope of work for Nuclear Steam Supply Systems (exclusive of nuclear fuel).

For the Westinghouse Quality Assurance Program, applicants need only reference this Topical Report in Section 17 of license applications. We do not intend to repeat our review of this Topical Report when it is referenced in an application.

Should regulatory criteria or regulations change such that our conclusions about this Topical Report are invalidated, we will notify you. You will be given the opportunity to revise and resubmit it should you so desire.

Please include a copy of this letter and our evaluation in each of the reports and resubmit 90 copies to the AEC.

Sincerely,

A handwritten signature in dark ink, appearing to read "R. H. Vollmer", is written over a horizontal line.

Richard H. Vollmer, Chief
Quality Assurance Branch
Directorate of Licensing

Enclosure:
AEC Topical Report Evaluation
of WCAP 8370 (Rev. 7)

R. SALVATORI

DEC 31 1974

TOPICAL REPORT EVALUATION

Report Number: WCAP 8370 (Rev. 7), Nonproprietary
Report Title: Westinghouse Nuclear Energy Systems
Divisions Quality Assurance Plan
Report Date: November 1974
Originating Organization: Westinghouse Electric Corporation
Reviewed By: Quality Assurance Branch

SUMMARY OF TOPICAL REPORT

Topical Report WCAP 8370 (Rev. 7) describes the Quality Assurance (QA) Program which the Nuclear Energy Systems Divisions of Westinghouse Electric Corporation (Westinghouse) applies to those design, procurement, and construction activities involving safety related structures, systems, and components within the Westinghouse scope of work. WCAP 8370 (Rev. 7) commits Westinghouse Nuclear Energy Systems (NES) to comply with the requirements of Appendix B to 10 CFR 50 and to follow the QA guidance provided by the AEC in:

1. "Guidance on Quality Assurance Requirements During Design and Procurement Phase of Nuclear Power Plants," WASH 1283, Rev. 1 May 24, 1974, and
2. "Guidance on Quality Assurance Requirements During the Construction Phase of Nuclear Power Plants," WASH 1309, May 10, 1974.

Westinghouse has also agreed to follow, when applicable by contract, the guidance provided by the AEC in "Guidance on Quality Assurance Requirements During the Operations Phase of Nuclear Power Plants," WASH 1284, October 26, 1973.

Westinghouse has provided for our evaluation a detailed organizational description of those individuals and groups involved in carrying out activities required by the QA Program and a delineation of duties, responsibilities, and authority of those organizational elements of NES involved in the QA Program. WCAP 8370 (Rev. 7) contains a description of the measures used to carry out the NES QA Program activities and describes how applicable requirements of Appendix B will be satisfied by the administration and implementation of these measures.

SUMMARY OF REGULATORY EVALUATION

We have evaluated the QA Program and the organizations responsible for QA functions as described in WCAP 8370 (Rev. 7). We find that QA policy and direction originate at an acceptably high management level and are effectively communicated to other parts of the organization. Those

DEC 31 1974

- 2 -

performing QA functions have responsibility and authority commensurate with their duties in implementing the QA Program. We also find that measures have been established, to be implemented by written procedures and instructions, which address each of the criteria of Appendix B and demonstrate conformance with each criterion.

Based on our review and evaluation of WCAP 8370 (Rev. 7), we conclude that:

1. The organizations and persons performing QA functions within NES have the required independence and authority to effectively carry out the QA Program without reservation or undue influence from those directly responsible for costs and schedules, and
2. The NES QA Program contains adequate requirements, procedures, and controls to demonstrate that quality related activities will be conducted in accordance with the requirements of Appendix B to 10 CFR 50.

REGULATORY POSITION

It is the staff's position that the Westinghouse Topical Report WCAP 8370 (Rev. 7), "Westinghouse Nuclear Energy Systems Divisions Quality Assurance Plan," is acceptable for use in the design, procurement, and construction of nuclear power plants. The Topical Report can be referenced by report number in Section 17 of future Safety Analysis Reports.

ABSTRACT

This report describes the Quality Assurance Program used by Westinghouse Nuclear Energy Systems (NES) Divisions. The purpose of the program is to assure that the design, materials, and workmanship on Nuclear Steam Supply System (NSSS) equipment meet applicable safety requirements, fulfill the requirements of the contracts with the applicants, and satisfy the applicable codes, standards, and regulatory requirements.

This plan satisfies the AEC Quality Assurance Criteria, 10CFR50 Appendix B, to the extent that these criteria apply to safety related NSSS equipment. Also, it follows the guidance of the standards and regulatory guides contained within the AEC's "Gray" book, WASH 1283, Rev. 1, May 24, 1974, and the "Green" book, WASH 1309, May 10, 1974, and the "Orange" Book, WASH-1284, October 26, 1973.

This document replaces the contents of Chapter 17 for Safety Analysis Reports, except for any special or unique requirements.

I. INTRODUCTION

This topical report describes the Quality Assurance Program of the Westinghouse Nuclear Energy Systems Divisions. In its present form, the report represents a combination of several years development by Westinghouse and review by the Atomic Energy Commission. The original issue of the program description was in RESAR-3 submitted in June, 1972. This issue addressed the requirements of the SAR Format and Content Guide issued February, 1972. Changes to the program description were made as a result of license reviews on the Catawba and Vogtle projects, the revised SAR Format and Content Guide (October, 1972), the original issue of the "Gray", "Green" and "Orange" Books, issued ANSI Quality Assurance standards, and the generic questions associated with the LaSalle project Quality Assurance review. Most recently, the Atomic Energy Commission issued Revision 1 to the "Gray" Book, WASH-1283, dated May 24, 1974. This document allows Quality Assurance Program descriptions in the form of topical reports. This report contains the documentation necessary to be responsive to that option.

To maintain this topical report current with changing regulatory requirements and the dynamic nature of the Quality Assurance Program, amendments will be submitted twice a year (during the first and third quarters). The original issue shows Amendment 6 because this was the current version of Chapter 17 in RESAR-3. For consistency, future amendments will be identified with revision numbers, starting with seven (7).

This program description applies to Quality Assurance Programs in effect at this time. Thus, activities accomplished in the current time period will be performed in accordance with the systems and procedures described herein. Future amendments to this report will be issued to document the program modifications and improvements applicable to all Westinghouse projects for the activities performed in the subsequent period. Thus, Westinghouse will incorporate any new requirements into the ongoing program in a timely manner, but will not automatically backfit the requirements into previously accomplished activities. It should be

recognized that certain new requirements may take a considerable period of time to implement fully.

If there are unusual time periods required for implementation, Westinghouse will identify these in the amendment which addresses the new requirement.

TABLE OF CONTENTS

<u>Section</u>	<u>Title</u>	<u>Page</u>
17.0	<u>WESTINGHOUSE NUCLEAR ENERGY SYSTEMS</u>	
	<u>DIVISIONS QUALITY ASSURANCE PLAN</u>	
17.1	QUALITY ASSURANCE DURING DESIGN AND CONSTRUCTION	17.1-1
17.1.1	Organization	17.1-1
17.1.1.1	PWR Systems Division	17.1-2
17.1.1.2	Nuclear Fuel Division	17.1-7
17.1.1.3	Electro Mechanical Division	17.1-8
17.1.1.4	Tampa Division	17.1-10
17.1.1.5	Pensacola Division	17.1-13
17.1.1.6	Specialty Metals Division	17.1-14
17.1.1.7	Nuclear Service Division	17.1-15
17.1.1.8	Functional Responsibilities	17.1-17
17.1.2	Quality Assurance Program	17.1-18
17.1.3	Design Control	17.1-20
17.1.3.1	PWR Systems Division	17.1-20
17.1.3.2	Electro-Mechanical Division	17.1-25
17.1.3.3	Tampa Division	17.1-26
17.1.3.4	Pensacola Division	17.1-27
17.1.3.5	Specialty Metals Divisions	17.1-28
17.1.3.6	Interface Control	17.1-28
17.1.4	Procurement Document Control	17.1-31
17.1.4.1	PWR Systems Division	17.1-31
17.1.4.2	Electro-Mechanical Division	17.1-34
17.1.4.3	Tampa Division	17.1-34
17.1.4.4	Pensacola Division	17.1-34
17.1.4.5	Specialty Metals Division	17.1-35
17.1.5	Instructions, Procedures and Drawings	17.1-35
17.1.6	Document Control	17.1-36
17.1.6.1	PWR Systems Division	17.1-37
17.1.6.2	Electro-Mechanical Division	17.1-39

TABLE OF CONTENTS (Continued)

	<u>Section</u>	<u>Title</u>	<u>Page</u>
1			
2			
3			
4			
5	17.1.6.3	Tampa Division	17.1-40
6	17.1.6.4	Pensacola Division	17.1-42
7	17.1.6.5	Specialty Metals Division	17.1-43
8	17.1.7	Control of Purchased Material, Equipment	
9		and Services	17.1-43
10	17.1.7.1	PWR Systems Division	17.1-45
11	17.1.7.2	Electro-Mechanical Division	17.1-48
12	17.1.7.3	Tampa Division	17.1-49
13	17.1.7.4	Pensacola Division	17.1-50
14	17.1.7.5	Specialty Metals Division	17.1-51
15	17.1.8	Identification and Control of Material, Parts	
16		and Components	17.1-52
17	17.1.8.1	PWR Systems Division	17.1-52
18	17.1.8.2	Electro-Mechanical Division	17.1-53
19	17.1.8.3	Tampa Division	17.1-54
20	17.1.8.4	Pensacola Division	17.1-54
21	17.1.8.5	Specialty Metals Division	17.1-55
22	17.1.9	Control of Special Processes	17.1-55
23	17.1.9.1	PWR Systems Division	17.1-58
24	17.1.9.2	Electro-Mechanical Division	17.1-58
25	17.1.9.3	Tampa Division	17.1-59
26	17.1.9.4	Pensacola Division	17.1-60
27	17.1.9.5	Specialty Metals Division	17.1-60
28	17.1.10	Inspection	17.1-61
29	17.1.10.1	PWR Systems Division	17.1-61
30	17.1.10.2	Electro-Mechanical Division	17.1-62
31	17.1.10.3	Tampa Division	17.1-64
32	17.1.10.4	Pensacola Division	17.1-65
33	17.1.10.5	Specialty Metals Division	17.1-67
34	17.1.11	Test Control	17.1-67
35	17.1.11.1	PWR Systems Division	17.1-68
36			
37			
38			
39			

TABLE OF CONTENTS (Continued)

	<u>Section</u>	<u>Title</u>	<u>Page</u>
5	17.1.11.2	Electro-Mechanical Division	17.1-69
6	17.1.11.3	Tampa Division	17.1-70
7	17.1.11.4	Pensacole Division	17.1-71
8	17.1.11.5	Specialty Metals Division	17.1-71
9	17.1.12	Control of Measuring and Test Equipment	17.1-72
10	17.1.12.1	PWR Systems Division	17.1-72
11	17.1.12.2	Electro-Mechanical Division	17.1-73
12	17.1.12.3	Tampa Division	17.1-74
13	17.1.12.4	Pensacola Division	17.1-74
14	17.1.12.5	Specialty Metals Division	17.1-75
15	17.1.13	Handling, Storage and Shipping	17.1-76
16	17.1.13.1	PWR Systems Division	17.1-76
17	17.1.13.2	Electro-Mechanical Division	17.1-77
18	17.1.13.3	Tampa Division	17.1-77
19	17.1.13.4	Pensacola Division	17.1-78
20	17.1.13.5	Specialty Metals Division	17.1-78
21	17.1.14	Inspection, Test and Operating Status	17.1-79
22	17.1.14.1	PWR Systems Division	17.1-79
23	17.1.14.2	Electro-Mechanical Division	17.1-79
24	17.1.14.3	Tampa Division	17.1-80
25	17.1.14.4	Pensacola Division	17.1-80
26	17.1.14.5	Specialty Metal Division	17.1-81
27	17.1.15	Nonconforming Material, Parts or Components	17.1-81
28	17.1.15.1	PWR Systems Division	17.1-83
29	17.1.15.1.1	Deficiencies at Suppliers' Plants	17.1-83
30	17.1.15.1.2	Deficiencies at the Construction Site	17.1-84
31	17.1.15.2	Electro-Mechanical Division	17.1-84
32	17.1.15.3	Tampa Division	17.1-85
33	17.1.15.4	Pensacola Division	17.1-86
34	17.1.15.5	Specialty Metals Division	17.1-87

TABLE OF CONTENTS (Continued)

<u>Section</u>	<u>Title</u>	<u>Page</u>
17.1.16	Corrective Action	17.1-87
17.1.16.1	PWR Systems Division	17.1-88
17.1.16.2	Electro-Mechanical Division	17.1-88
17.1.16.3	Tampa Division	17.1-89
17.1.16.4	Pensacola Division	17.1-89
17.1.16.5	Specialty Metals Division	17.1-90
17.1.17	Quality Assurance Records	17.1-90
17.1.17.1	PWR Systems Division	17.1-91
17.1.17.2	Electro-Mechanical Division	17.1-92
17.1.17.3	Tampa Division	17.1-93
17.1.17.4	Pensacola Division	17.1-93
17.1.17.5	Specialty Metals Division	17.1-94
17.1.18	Audits	17.1-94
17.1.18.1	Westinghouse Corporate Audits	17.1-96
17.1.18.2	NES Quality Assurance Committee Audits	17.1-98
17.1.18.3	PWR Systems Division	17.1-99
17.1.18.3.1	Supplier's Plants	17.1-99
17.1.18.3.2	Internal	17.1-99
17.1.18.4	Electro-Mechanical Division	17.1-100
17.1.18.5	Tampa Division	17.1-100
17.1.18.6	Pensacola Division	17.1-101
17.1.18.7	Specialty Metals Division	17.1-101
17.1.18.8	Nuclear Services Division	17.1-102
17.1.19	References	17.1-103

LIST OF TABLES

<u>Table</u>	<u>Title</u>	<u>Page</u>
17-1	NSSS Functional Relationship Flow Schedule	
17-2	* Functional Responsibilities for Fuel and NSSS Equipment	6
17-3	Written Procedures within NES for Implementing Quality Assurance	
17-4	Records Retention	
17-5	Typical Data Packages (Retained by PWR-SD) for Representative Components	
17-6	Logic Flow Diagram	

* Please note Table 17-2 is contained in Chapter 17 of the
Applicant's Safety Analysis Reports.

LIST OF FIGURES

<u>Figure</u>	<u>Title</u>
17-1	Nuclear Energy Systems Organization
17-2	NSSS Functional Relationship Chart
17-3	PWR-SD Quality Assurance Program Organization
17-4	Electro-Mechanical Division Quality Assurance Program Organization
17-5	Tampa Division Quality Assurance Program Organization
17-6	Pensacola Division Quality Assurance Program Organization
17-7	Specialty Metals Division Quality Assurance Program Organization
17-8	Nuclear Service Division Quality Assurance Program Organization

17.0 WESTINGHOUSE NUCLEAR ENERGY SYSTEMS DIVISIONS
QUALITY ASSURANCE PLAN

This report presents a description of the Westinghouse Nuclear Energy Systems (NES) Divisions Quality Assurance Program. Its purpose is to describe the Quality Assurance Program used by Westinghouse NES to assure that the design, materials and workmanship on Nuclear Steam Supply System (NSSS) equipment meet applicable safety requirements.

This Westinghouse NES Divisions Quality Assurance Program is a requirement for those NSSS components, systems and structures having a vital role in the prevention or mitigation of the consequences of postulated accidents that could cause undue risk to the health and safety of the public. This program complies with the AEC Quality Assurance Criteria, 10CFR50 Appendix B, and follows the guidance of the AEC Gray book, WASH-1283, Revision 1, May 24, 1974, the Green book WASH-1309, Revision 0, May 10, 1974, the Orange book WASH-1284, Revision 0, October 26, 1973 and included and referenced regulatory guides and standards to the extent that these apply to the design, procurement, fabrication, manufacturing, turnover, and, as Westinghouse is involved by contract, installation, preoperational testing, and operation of safety related NSSS equipment.

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2
3 This report is structured to provide, first a statement of quality
4 assurance philosophy followed by an overview of the Quality Assurance
5 Plan. Sections 17.1.1 through 17.1.18 address each of the AEC
6 Quality Assurance Criteria, 10CFR50 Appendix B. For each criterion
7 the measures employed are described in sufficient detail to allow the
8 reader to understand the Quality Assurance Plan.
9

10 NES Quality Assurance Philosophy

11

12 Westinghouse Nuclear Energy Systems is an organizational group of
13 operating divisions whose purpose is to provide nuclear power plant
14 services and equipment. Figure 17-1 depicts the organization. The
15 Pressurized Water Reactor Systems Division (PWR-SD) is the lead
16 division with respect to design and procurement. The other Water
17 Reactor divisions, including the Nuclear Fuel Division (NFD),
18 Pensacola Division (PD) and the Nuclear Service Division (NSD),
19 together with the Nuclear Equipment Divisions (NED), comprised
20 of the Electro-Mechanical Division (EMD), Tampa Division (TD),
21 and Specialty Metals Division (SMD), provide nuclear power plant
22 equipment and services.
23

24 The NES philosophy on quality assurance is to provide reliable, high
25 quality products. This policy is set forth in a statement by the
26 Executive Vice President.
27

28 "Each NES Division is responsible to establish, document and
29 implement a Quality Assurance Program which assures that safety-
30 related equipment, materials and services furnished as part of,
31 or in support of a Nuclear Power Plant meet the requirements of
32 10CFR50, Appendix B. In addition, the applicable requirements
33 of 10CFR50, Appendix B are to be passed to all sub-tier suppliers
34 of safety-related equipment or services, as an integral part of
35 each division's Quality Assurance Program."
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2
3 NES Quality Assurance Plan Summary
4

5 The NES Quality Assurance Program is designed and implemented
6 to provide safe and reliable nuclear power plant equipment. The
7 quality organization in each of the NES divisions provides the
8 mechanism through which the Quality Assurance Program is administered
9 and monitored. The operation of the program is documented in
10 written procedures and instructions.
11

12 The activities of NES are complex in that there are many disciplines
13 involved. Table 17-1 and Figure 17-2 describe the flow of information
14 and effort required to design and fabricate fuel and Nuclear
15 Steam Supply System equipment. As shown, the process begins
16 with the identification of technical requirements and ends with
17 a description of the monitoring accomplished to assure process
18 adequacy. The flow schedule simplifies many complex activities
19 for the purpose of showing the overall design and fabrication
20 process. During any of the processes, each Westinghouse participating
21 group has access to higher management for arbitration of unresolved
22 issues which may arise.
23

24 Item 7 of Table 17-1 is an example of the flow schedule's treatment
25 of equipment specifications. Equipment specifications are the
26 basic method by which NES specifies technical requirements for
27 Nuclear Steam Supply System equipment. Before an equipment specification
28 can be prepared, functional engineering information is required
29 from many sources. Preliminary specifications are reviewed by
30 many groups. After issue the specifications are further reviewed
31 by the applicant and suppliers. For visibility, the generation
32 of equipment specifications is shown as one entry on the flow
33 schedule. Figure 17-2 depicts a functional rather than formal
34 organizational structure. Like the flow schedule, the functional
35
36

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2
3 chart shows the communication network in brief form. On the
4 chart both horizontal and vertical lines show communication flow
5 paths.

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7 The Quality Assurance Plan provides for the control of design informa-
8 tion. Contractual requirements from the applicant and the contents
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Revision 7

November, 1974

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3 of safety analysis reports are inputs to the design process and
4 are reviewed at several points as the design progresses. Analyses,
5 for example, of seismic calculations are accomplished in accordance
6 with specified standards. Drawings and equipment specifications
7 are independently reviewed prior to issue by knowledgeable groups
8 within Westinghouse. Essential drawings and equipment specifications
9 are reviewed by the applicant and his architect engineer. Suppliers'
10 detail designs and procedures are reviewed by cognizant NES personnel
11 to assure compliance with equipment specification and drawing
12 requirements. Design changes which occur during design, fabrica-
13 tion or installation are controlled in a manner similar to the
14 initial design.

15
16 In addition to the above, independent design verification activities,
17 formal in-depth design reviews and environmental performance
18 testing are performed on a selected basis to confirm that equipment
19 will perform satisfactorily. Design control activities are documented.
20 Interfaces between participating design organizations are defined.
21 These interfaces include the supplier-NES interface, the interface
22 among NES divisions and the interfaces among groups within the
23 divisions. The NES philosophy is that an experienced design
24 engineer is the focal point through which all other participating
25 groups work. This concept provides for single point responsibility
26 and accountability. At the same time each participating group
27 has access to higher management for arbitration of unresolved
28 issues.

29
30 The NES Quality Assurance Plan provides for the control of
31 purchased material, systems and services. Prospective suppliers
32 are evaluated for quality system capability. Purchase orders
33 are reviewed for technical and quality-related requirements.
34 As applicable, source surveillance and receipt inspection are
35 performed. Supplier documentation essential to demonstrating product
36
37

1
2
3 quality is reviewed and retained by NES. Audits and feedback of
4 discrepancy data are used by NES quality engineers to measure
5 supplier performance.

6
7 All the NES divisions have systems which control the review,
8 approval, distribution and revision of instructions, procedures,
9 specifications and drawings. Because of the varying needs of
10 the divisions, these systems differ in detail. The objective
11 of each of the document control systems is to provide a means
12 for controlling the use of documents so that NSSS equipment is
13 designed and fabricated in accordance with the stated requirements.

14
15 NES manufacturing divisions operate under controlled systems.
16 These systems require the performance of important operations
17 in accordance with instructions and procedures. These instructions
18 and procedures are substantiated by actual demonstration prior
19 to use. The means for accomplishing the operation and the criteria
20 for accepting the operation are included in instructions. Examples
21 of operations covered include welding, heat treating, nondestructive
22 examination, performance testing, welder qualification, receipt
23 inspection, final inspection, gage control, material handling
24 and material identification. The manufacturing control systems
25 provide for control of the overall manufacturing process. The
26 control system indicates inspection and test status.

27
28 The NES Quality Assurance Plan controls nonconforming material
29 by procedures which provide for documented results. All nonconforming
30 material is segregated or, if segregation is physically impractical,
31 clearly identified so that its inadvertent use is prevented.
32 Data from nonconformances are collected and summarized for use
33 in design changes, where appropriate, to prevent recurrence of
34 nonconformances.

1
2
3 The NES Divisions maintain sufficient records to clearly establish
4 the quality of the product. A microfilmed copy of the fabrication
5 and inspection records for NSSS equipment is provided to the applicant
6 for permanent retention prior to plant acceptance. To document equip-
7 ment acceptability prior to site installation, a copy of the purchase
8 order, the applicable design specification and the quality release
9 are provided to the applicant.
10

11 A comprehensive audit program is part of the NES Quality Assurance
12 Plan. This audit program provides NES management with information
13 pertaining to the effectiveness of the overall quality program.
14 Planned and scheduled audits are conducted with results reported to
15 appropriate management levels and corrective action taken as necessary.
16

17 The applicant's need to assure himself of the adequacy of the NES
18 Quality Assurance Program is recognized by NES management. The NES
19 Quality Assurance Program provides an extensive amount of design in-
20 formation for applicant review and use. On a typical nuclear power
21 plant, 1000 equipment specifications and drawings as well as various
22 design installation, testing and quality assurance manuals are trans-
23 mitted to the applicant for review. Audits by the applicant are per-
24 formed on NES activities covering design, manufacturing and documenta-
25 tion. The applicant also participates with NES quality assurance
26 personnel in selectively performing supplier surveillance. Quality-
27 related procedures and instructions as well as the results of tests
28 and inspections are available to the applicant for his review to
29 verify the operational adequacy of the overall quality program.
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1
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3 Policy
4

5 It is the Westinghouse Corporate Quality Policy "to supply products
6 that satisfy the quality requirements of its customers. When
7 the quality requirements are included in drawings, specifications,
8 and contracts, it is policy to comply and deliver to the customer
9 a product that conforms to these requirements. When the quality
10 requirements are not formally specified, reasonable requirements
11 should be inferred."
12

13 "It is Westinghouse policy to supply products with a quality
14 equal to, or better than the quality, of competitive products...."
15

16 "Each division should establish and publish a quality policy
17 consistent with the corporate policy describing the specific
18 policy applicable to its products and markets." (Extracted from
19 Corporate Quality Program Manual dated 1973.)
20

21 Since NES consists of several divisions that work jointly to provide
22 Nuclear Steam Supply Systems to the utility industry, it is necessary
23 for these divisions to define and implement a common policy pertaining
24 to Quality Assurance. Mr. J. C. Rengel, Executive Vice President
25 of NES divisions, has established the common policy and directed
26 each of the NES Divisions to comply. The following is quoted
27 from Mr. Rengel's letter of October 29, 1973 to all NES Division
28 General Managers, re-affirming the Policy established in 1969.
29

30 "The commitment of Westinghouse Nuclear Energy Systems to
31 effective and uniform implementation of Appendix B to 10CFR50,
32 'Quality Assurance Criteria for Nuclear Power Plants' is
33 reaffirmed."
34
35
36

1
2
3 "Each NES Division is responsible to establish, document
4 and implement a Quality Assurance Program which assures
5 that safety-related equipment, materials and services furnished
6 as part of, or in support of a Nuclear Power Plant meet
7 the requirements of that Appendix. In addition, the applicable
8 requirements of 10CFR50, Appendix B are to be passed to
9 all subtier suppliers of safety-related equipment or services,
10 as an integral part of each division's Quality Assurance
11 Program."

12
13 "Toward this end, annual Quality Assurance system audits
14 will be conducted of each NES division by audit teams composed
15 of members of the NES QA Committee. This Committee is composed
16 of the Quality Assurance and/or Product Assurance managers
17 of each of the NES Divisions and is chaired by the PWRSD
18 Product Assurance Manager."

19
20 "This audit program complements the Corporate Headquarter
21 Manufacturing Controls audits since it will take advantage
22 of the special nuclear capabilities of the participating
23 divisions and it will also take into account problems peculiar
24 to the nuclear industry. The Corporate Headquarters audit,
25 held on the average of once each three years, will substitute
26 for the annual NES audit in the year it is held. In addition
27 to carrying out audits, the Committee will continue to serve
28 as a forum to communicate quality and reliability programs
29 and to establish improved and consistent policies on Quality
30 Assurance. The lead responsibility is placed with PWR Systems
31 Division for the functioning of the Committee, for providing
32 assistance on related matters to all Nuclear Energy Systems
33 Divisions and in interpreting, developing and promulgating
34 consistent methods for incorporation and application of Appendix
35 B requirements."

1
2
3 "Annual NES audits will not take the place of the more frequent
4 audits required to meet our responsibilities to utility
5 customers. Process audits by PWRSD of EMD, Tampa and Pensacola,
6 and by Tampa and NFD of Speciality Metals, will form an
7 integral part of our overall program to provide independent
8 evaluation of the design, manufacturing, inspection and
9 test controls applied to the products involved."
10

11 This report provides an overview of how this basic policy is
12 implemented in the various NES divisions.
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17.1 QUALITY ASSURANCE DURING DESIGN AND CONSTRUCTION

17.1.1 ORGANIZATION

NES is comprised of a number of operating divisions under an executive vice president, as shown in Figure 17-1. The authority and responsibility of each activity shown on this chart and subsequent charts is established by the division managers and set forth in a written statement of group responsibility, including quality assurance related functions. The division managers have ultimate responsibility for the quality assurance program, and the establishment of an organizational structure capable of development, implementation and monitoring of the total quality assurance program. The solid lines on the divisional organization charts (Figures 17-3 through 17-8) delineate both technical direction and administrative control. Administrative control includes responsibility for personnel indoctrination and training, wage and salary administration, and the decision for hiring or discharge of personnel.

Written position descriptions are prepared for each management and professional position and are approved by two levels of management. These descriptions specify the educational and experience qualifications of the position, and define the task responsibilities for the position.

The quality assurance aspects of NES activities are overseen and coordinated by the NES Quality Assurance Committee. The Committee has been established by the NES Executive Vice President as an extension of the policy to apply an effective quality assurance program, as expressed in the preceding pages.

Members of the Committee are appointed by the NES Executive Vice President and include the quality assurance managers from the NES divisions. The Committee has authority to identify problems,

17.1-1

Revision 7

November, 1974

1
2
3 recommended solutions, verify implementation of authorized actions
4 and verify effective implementation of actions and policies through
5 the Committee auditing function.
6

7 The Committee performs annual audits of each NES division to
8 provide information to NES management for assessing if requirements
9 relating to quality assurance are being met effectively.
10

11 The Committee also acts as an advisory body to the Executive Vice
12 President for making recommendations regarding improvement and
13 verification of the division's quality assurance systems. Decisions
14 on policy are made by the Executive Vice President, and the Committee
15 serves as one of the means for putting the determined policy
16 into effect. In addition, the Committee provides a channel for
17 communications between quality assurance personnel of the NES
18 divisions, serving to integrate the quality assurance actions,
19 to alert all divisions to quality problems and solutions, and
20 to promote effective teamwork.
21

22 The lead responsibility for the functioning of the Committee is
23 placed with PWR Systems Division. The PWRSD Product Assurance
24 Manager serves as Chairman for the Committee, and PWR Systems
25 Division takes the lead in definition and documentation of the
26 NES Division's quality assurance program.
27

28 Quality Management within each NES Division does not have prime
29 responsibility for schedule or cost, but does have the authority
30 to stop work pending resolutions of quality matters and the freedom
31 to:
32

- 33 1. Identify quality problems.
34
35
36

37 17.1-1a
38

39 Revision 7

November, 1974

2. Initiate, recommend, or provide solutions through designated channels.
3. Verify implementation of solutions.
4. Control further processing, delivery or installation of a nonconforming item, deficiency or unsatisfactory condition until proper dispositioning has occurred.

Overall contract responsibility for supplying the Nuclear Steam Supply System (NSSS) is assigned to a project manager within PWR Systems Division (PWR-SD). He provides the focal point for communications among the NES divisions, the applicant and the architect engineer. The Quality Management of PWR-SD maintains communications on quality-related matters with utility and major utility contractor quality assurance organizations, and provides advice of such discussions to project managers.

The following is a summary of design, manufacturing and quality assurance responsibilities of the NES divisions involved in furnishing NSSS equipment and services. Each division maintains and uses a Quality Assurance Manual which details the local application of that function.

17.1.1.1 PWR Systems Division

PWR Systems Division, as shown on Figure 17-3, is the lead NES Division with regard to the project management, design and procurement of NSSS equipment.

The Project Department of PWR Systems Division, through a designated Project Manager, has the primary responsibility within NES for supplying the NSSS equipment and services to the applicant.

1
2
3 The Purchases and Traffic Department provides the PWRSD procurement
4 interface with suppliers and with other NES Divisions. This department
5 is also responsible for administering the transportation of
6 equipment from supplier's facilities to the construction site.
7 Material and equipment is protected appropriately against the
8 hazards of mechanical damage and weather during the shipping.
9 This includes such provisions as; painting with a suitable rust
10 inhibitor, taking into account ease of removal of all protective
11 substances during the chemical cleaning and preoperational periods,
12 polyethylene or suitable wrapping, heavy boxes or crates, bolted
13 wooden flange protectors, suitable barriers or blocks, resilient
14 supports, inert gas purge, and other protective provisions.
15

16 Additionally, Westinghouse furnishes accelerometer instrumentation
17 with shipments of certain critical equipment. All equipment
18 furnished by Westinghouse is shipped, insofar as possible, completely
19 assembled. Technical assistance for unloading, handling and
20 storage is furnished to the applicant through the Field Operations
21 and Technical Operations Departments of the Nuclear Service
22 Division.
23

24 The Engineering Department of PWR-SD consists of several sections.
25 These sections are responsible for performing the various technical
26 functions associated with overall design of the NSSS.
27

28 The Nuclear Safety Department is responsible for providing for
29 the Nuclear Steam Supply System the safety system performance
30 requirements, safety system criteria, safety analysis methods,
31 and safety evaluations to provide the required analytical and
32 statistical evaluation of postulated accident controls. Further,
33 the department is charged with providing the licensing activity
34 to support the applicant in obtaining the construction permit
35 and operating license for the Nuclear Steam Supply System.
36
37

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3 Within PWRSD, responsibility for Quality Assurance activities is
4 assigned to the Product Assurance department. This includes having
5 lead responsibility for providing the controls for, and demonstrating
6 compliance with, the 18 Criteria of 10CFR50 Appendix B. The manager
7 of Product Assurance reports directly to the division general manager
8 and is in parallel with the other major departments within the division,
9 as shown in Figure 17-3. Thus, matters pertaining to product and
10 system quality can be related directly from the Product Assurance
11 Manager to the division general Manager, independent of other functional
12 activities. The qualification requirements for the Product Assurance
13 Manager are:

- 14
15 1. a bachelor's degree in a technical field;
- 16
17 2. at least ten years experience in engineering or manufacturing;
- 18
19 3. at least five years experience in management of technical or
20 manufacturing organizations;
- 21
22 4. working knowledge of applicable quality-related codes,
23 standards, regulatory and statutory requirements; and
24
- 25 5. demonstrated ability to prescribe, apply and assess compliance
26 with applicable requirements.
27

28 Training relevant to quality assurance activities and pertinent to the
29 position is described in Section 17.1.2.
30

31 The Product Assurance Manager directs, controls and evaluates the PWR-SD
32 Quality Assurance Program. This is accomplished through the development,
33 coordination and publication of divisional policies and procedures,
34 conduct of instruction and training programs on quality matters, and
35

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3 investigation and assessment of the program effectiveness through
4 the internal auditing program. Personnel from the Product Assurance
5 Department work with representatives from the other functional
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3 departments (Engineering, Purchasing, Nuclear Safety, Projects) to
4 assure that activities affecting quality are properly defined, imple-
5 mented and controlled.

6
7 Discussion and resolution of quality matters with the applicant and/or
8 his agent is coordinated with the cognizant project manager. Product
9 Assurance personnel provide information in response to customer
10 inquiries and audits of PWR-SD Quality Assurance activities.

11
12 The Product Assurance Department, as described by the department
13 charter, has been assigned responsibility and authority to identify
14 quality problems in quality-related functions of design, procurement,
15 manufacturing and testing; take prompt positive action to limit
16 incipient problems; initiate, recommend or provide solutions to the
17 problems to responsible management; verify implementation of the
18 necessary corrective action; and control the processing of further
19 work until proper disposition of unsatisfactory conditions is made.

20
21 The Product Assurance Department is divided into two groups, Product
22 Assurance Systems and Quality Assurance. The efforts of each group
23 are directed by individual managers.

24
25 The Product Assurance Systems group has seven major functional respon-
26 sibilities. These are: 1) The investigation and analyses of the
27 Division's procedures for compliance with the criteria of 10CFR50,
28 Appendix B as well as other industry and corporate quality standards,
29 2) preparation, promulgation and maintenance of division-level policies
30 and procedures, 3) administration of centralized files and quality
31 records, which includes compilation, auditing, storage and retrieval
32 of NSSS equipment quality assurance records, 4) internal auditing
33 for compliance to established procedures, 5) coordination of design
34 reviews, 6) quality engineering and 7) reliability engineering.
35 Responsibilities are assigned to organizational groups as defined below.

1
2
3 Quality and Reliability Engineering is responsible for PWR-SD Product
4 Assurance input to mechanical equipment specifications, drawings, and
5 related procurement documents and evaluation of supplier quality
6 assurance programs. Quality and Reliability Engineering is also
7 responsible for reliability analysis of all NSSS equipment and the
8 development of supporting reliability information.
9

10 Systems Compliance is responsible for NES design review coordination,
11 PWR-SD design review planning, reporting, and follow of open items.
12 Systems Compliance is also responsible for PWR-SD internal audits,
13 for coordination of customer audits and for the preparation and
14 maintainance of policies and procedures for PWR-SD.
15

16 Records Management establishes filing and retrieval systems,
17 prepares and maintains records flow schedules, prepares quality
18 assurance forms, provides for supplier data collection and auditing,
19 and develops methods for data package handling, including microfilming
20 techniques.
21

22 Files Operations maintains and operates central files to handle and
23 store the engineering and quality assurance records within PWRSD.
24 This group is also responsible for operation of the semi-active
25 records center and coordination of storage and retrieval activities
26 with the Corporate Records Center (long-term retention).
27

28 The Quality Assurance department consists of three sections: Quality
29 Assurance Surveillance Zone 1 and Zone 2, and Quality Assurance
30 Electrical.
31

32 The Quality Assurance Surveillance groups monitor the activities of
33 PWR-SD suppliers, verify conformance to procurement quality requirements,
34 audit the supplier's quality systems, and release equipment for shipment.
35 Surveillance personnel are trained and qualified to review supplier
36
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3 tests and inspections, and are qualified to SNT-TC-1A requirements
4 in the review, or performance, of nondestructive examinations. 6
5

6 Both resident and itinerant QA representatives are employed. To
7 provide the most effective coverage of suppliers, zone managers are 6
8 assigned responsibility for performing surveillance in specified
9 geographic areas encompassing both domestic and international suppliers.
10 Zone 1 encompasses Pennsylvania, and the states east and south of the
11 Mississippi and Ohio Rivers. Zone 2 includes the New England states,
12 New York, and the mid-west and western states. Responsibility for
13 overseas supplier evaluation and surveillance is normally delegated 6
14 to other Westinghouse NES organizations, such as WNE(Europe),
15 however, such delegation is coordinated by PWR-SD Product Assurance.
16

17 The Quality Assurance Electrical section performs the combined
18 functions of the Quality Engineering and Surveillance sections
19 as it applies to electrical/electronic equipment. Since the
20 nature and volume of electrical equipment is considerably different
21 from the other NSSS equipment, the quality engineering and surveillance 6
22 functions have been merged into this one section. However,
23 the methods and procedures used by this section are the same
24 as used for other NSSS equipment.
25

26 17.1.1.2 Nuclear Fuel Division 27

28 The Nuclear Fuel Division (NFD) has responsibility for the design
29 and manufacture of nuclear fuel assemblies and associated reactor
30 core components such as control rods, burnable poison assemblies,
31 source assemblies and plugging devices. This division is also 6
32 responsible for specifying and procuring appropriate shipping
33 containers. The organization of this division and a description
34 of the Nuclear Fuel Division Quality Assurance Program is contained
35 in Reference [1].
36
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3 17.1.1.3 Electro-Mechanical Division
4

5 Electro-Mechanical Division designs, manufactures and tests
6 control rod drive mechanisms, reactor coolant pumps, loop stop,
7 gate and check valves. Figure 17-4 shows the organization for
8 the Electro-Mechanical Division.
9

10 This division is a qualified manufacturer per requirements of
11 ASME Boiler and Pressure Vessel Code for Nuclear Power Plant Components
12 Section III and holds Certificates of Authorization for the use
13 of the "N" and "NPT" symbol stamps.
14

15 The Engineering section develops the detailed design drawings
16 and specifications including those for procurement from contractual
17 equipment specifications provided by PWR-Systems Division. Formal
18 design reviews precede the finalization and issuance of all new
19 product designs.
20

21 The Design and Analysis groups perform detailed design and design
22 analyses, such as stress and seismic analyses.
23

24 The Planning and Materials section maintains advanced schedules, and
25 plans to advance procurement of materials. Purchasing maintains liaison
26 with materials and parts suppliers, and performs the procurement function.
27

28 Manufacturing is responsible for the generation and control of manufactur-
29 ing information, and for production control; the Manufacturing Groups
30 are responsible for fabrication of product.
31

32 The Quality Assurance Organization has prime responsibility for
33 assuring compliance to all contractual requirements. In addition,
34 each department is responsible for applicable controls as outlined
35 in the Quality Program Manual.
36
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3 The overall responsibility for the implementation of the Quality
4 Assurance Program is vested in the Quality Assurance Manager who
5 also has the authority to enforce full compliance with all quality
6 requirements relative to safety, reliability, operation and maintenance.
7 This authority extends into the area of "stop work". The quality
8 assurance manager reports to the division general manager. Qualification
9 requirements for this position are:

- 10
11 1. a B. S. degree in engineering or equivalent;
12
13 2. eight years experience in a technical field with a minimum
14 of 5 years in a supervisory capacity; and
15
16 3. must possess skills in directing the establishment, administration,
17 and control of divisional quality assurance programs which
18 meet both regulatory and industrial requirements.
19

20 Training relevant to quality assurance activities and pertinent
21 to the position is described in Section 17.1.2.
22

23 Quality Assurance Engineering is responsible for planning controls
24 to assure product quality. This includes: review of all contractual/
25 governing specifications, engineering design drawings and specifi-
26 cations, purchasing information and detailed manufacturing instructions.
27 This organization is responsible for the design and implementation
28 of Inspection Point Programs including non-destructive examination
29 incorporated into manufacturing work instructions, qualification
30 of non-destructive examination personnel, and audits. Quality
31 Control Records of Quality Assurance Engineering compiles documentation
32 maintained as objective evidence of inspections performed, and
33 Material Review section of Quality Assurance Engineering performs
34 analyses of data, review of manufacturing discrepancies, and initiates
35 preventive actions to eliminate problem areas.
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3 The Inspection Section of Quality Assurance is responsible for performing
4 inspections and examinations listed in manufacturing work instructions | 6
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3 as prescribed by Quality Assurance Engineering procedures and
4 instructions, recording results, and determining product accepta-
5 bility to specified criteria.

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7 Supplier Field Assurance Engineering is responsible for surveys
8 and qualification of suppliers, design and control of quality
9 programs for purchased material, in-process inspections and tests,
10 audits, final inspection and release of supplied product.

6

11
12 Design/test engineers of the Works Engineering and Test Operation
13 section are responsible for test specifications, hydrostatic and
14 performance tests, evaluation of test results and issuance of
15 the test release.

6

16
17 Quality Assurance Engineering is responsible for the final release
18 and certification of all product prior to shipment.

19
20 17.1.1.4 Tampa Division

21
22 Tampa Division designs and manufactures steam generators and pressurizers.
23 Figure 17-5 shows the organization for the Tampa Division.

24
25 Tampa Engineering and Design and Analysis Groups perform the detail
26 design from equipment specifications provided by PWR Systems
27 Division.

6

28
29 The manufacturing groups are responsible for the fabrication
30 and testing.

31
32 The Purchases and Traffic and Purchases Procurement groups control
33 procurement of materials and supplies and the movement and delivery
34 of equipment.

6

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3 The Reliability Manager directs the activities of the Reliability
4 Engineering, Quality Assurance, and Metallurgy Departments. The
5 qualification requirements for the position of Reliability Manager
6 are:

- 7
8 1) a bachelor's degree in a technical field;
9
10 2) at least ten years experience in engineering or manufacturing;
11
12 3) at least five years experience in management of technical
13 or manufacturing organizations;
14
15 4) working knowledge of applicable quality-related codes,
16 standards, regulatory and statutory requirements; and
17
18 5) demonstrated ability to prescribe apply and assess compliance
19 with applicable requirements.
20

21 Training relevant to quality assurance activities and pertinent
22 to the position is described in Section 17.1.2.
23

24 The Metallurgical Department is responsible for the quality
25 related functions of material source approval, welding process
26 qualification, welder qualification, and resolution of shop metallurgical
27 problems.
28

29 Overall responsibility for the implementation of the Quality Assurance
30 Program is vested in the Quality Assurance Manager, who has the
31 authority and responsibility to stop any operation to assure compliance
32 with the ASME Code, customer requirements and the Westinghouse
33 requirements.
34
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Quality Assurance activities include review of design drawings, welding specifications, and manufacturing instructions. Quality Assurance performs source inspection on pressure boundary material, plates,

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3 forgings, castings and tubes, and has responsibility for inspection
4 of incoming items not inspected at source. | 6
5

6 Responsibility for planning controls to assure product quality
7 resides with Quality Assurance engineering. Quality Assurance
8 planning includes preparation of Inspection Point Programs
9 to assure compliance with drawings, specifications and ASME
10 Code requirements; the Inspection Point Program provides process
11 and product verification and is also utilized as a permanent
12 record of the inspection operations. The details of the inspection
13 program follow the manufacturing sequence of the operational
14 line-up, the format delineates the applicable forms, charts,
15 reports and documentation required.
16

17 The Inspection Point Program is implemented by technicians in the
18 Quality Control section of the Quality Assurance Department. | 6
19

20 The Quality Assurance Department is also responsible for planning
21 and implementation of non-destructive examination and for qualification
22 of non-destructive examination personnel, and for monitoring performance
23 of tests. They are responsible for final release of nuclear
24 products. | 6
25

26 The responsibility for conducting internal audits resides with
27 the Manager of Reliability Engineering. The audit program
28 provides management with a continuing overview of the compliance
29 with the quality program. In addition Reliability Engineering
30 coordinates the Tampa efforts to resolve field discrepancies
31 and initiate corrective action. Reliability engineers participate
32 in the design review function and provide additional engineering
33 support in the area of failure modes and effects analyses.
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3 17.1.1.5 Pensacola Division
4

5 Pensacola Division is responsible for the design and manufacture
6 of reactor internals and associated equipment. The organization
7 is shown in Figure 17-6.
8

9 The Pensacola Quality Assurance organization provides measures to
10 control the design, manufacture, purchase, inspection, test,
11 packaging, shipment and site installation of reactor internals.
12 Quality Assurance functions for control of purchased materials
13 include source surveillance and audits of suppliers which are
14 performed by Quality Assurance Engineering. This section is also
15 responsible for reviewing drawings and design specifications
16 and for coordinating the internal audit program for the Pensacola
17 Division, by a Quality Assurance Engineering Audit Coordinator.
18

19 The Inspection section of Quality Assurance performs inspections and
20 examinations defined by Quality Assurance Engineering instructions
21 and procedures, records results, and determines product acceptability
22 to prescribed acceptance criteria and standards. Records section of
23 Inspection performs release of product.
24

25 The Site Quality Assurance Services section of Quality Assurance
26 provides support for installation of reactor internals at construction
27 sites.
28

29 The Quality Assurance Manager reports directly to the Pensacola
30 Division Manager. Thus, the Quality Assurance Department functions
31 independently to identify quality problems, and to initiate,
32 recommend and provide appropriate solutions. Quality Assurance
33 is vested with the authority and responsibility to stop production
34 until acceptable solutions have been provided. The qualification
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requirements for the position of quality assurance manager are:

1. a B.S. Degree or equivalent in experience with knowledge of metal working, process control and nondestructive examination disciplines;
2. minimum of five years supervisory experience, and a minimum of five years experience in the quality assurance/quality control field; and
3. working knowledge of quality assurance techniques, applicable quality-related regulations and codes, such as ASME code.

Training relevant to quality assurance activities and pertinent to the position is described in Section 17.1.2

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3 17.1.1.6 Specialty Metals Division
4

5 Specialty Metals Division manufactures tubing used by Tampa
6 Division and Nuclear Fuel Division in accordance with specifi-
7 cations provided by Tampa and NFD. Figure 17-7 shows the SMD
8 organization. The Manager of Quality Control and Inspection has
9 the authority to stop work on product which, if continued, would
10 not meet customer specifications. Position requirements for Manager
11 of Quality Control and Inspection are:
12

- 13 1. B. S. degree in Metallurgical or Chemical Engineering;
- 14
- 15 2. specialized technical skills in tube mill technology;
- 16
- 17 3. minimum of 3 years supervisory experience;
- 18
- 19 4. minimum of 4 years quality control, process, or industrial
20 engineering experience;
- 21
- 22 5. minimum of 3 years tube mill quality control or production
23 experience; and
- 24
- 25 6. ability to design and administer a quality system which
26 satisfies the requirements of Appendix B to 10 CFR 50.
27

28 Training relevant to quality assurance activities and pertinent
29 to the position is described in Section 17.1.2.
30

31 Quality Control and Inspection has direct control of the division
32 gage calibration system, non-destructive examination, internal
33 auditing, and quality engineering functions. Review of raw material
34 acceptability is also a function of this group, performed by audit,
35 receiving inspection and analysis of incoming material reports,
36
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3 including review of a sample of chemistry re-analyses made by Quality
4 Services. These combined actions are effective in obtaining
5 specification quality raw materials, and source surveillance is not
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3 applied. Quality Control and Inspection has the responsibility
4 for the training and qualification of inspectors, for in-
5 process inspection, and for final inspection. Quality Services
6 has responsibility for product verification and certification. 6
7 Instrument service is performed by the Maintenance Department
8 according to a schedule specified by Quality Control
9 and Inspection.

10
11 17.1.1.7 Nuclear Service Division

12
13 The responsibility of NES at the plant site involves construction
14 consultation to the applicant. This is the responsibility
15 of the Nuclear Service Division. Figure 17-8 shows the 6
16 NSD organization.

17
18 Westinghouse NSD representatives assigned to the construction site
19 provide consultation for the work performed by the construction 6
20 contractor and subcontractors on NSSS equipment. The necessary
21 procedures and actions are coordinated with the construction
22 contractor. Special processes such as welding, cleaning,
23 and nondestructive examination are observed by qualified 6
24 Westinghouse personnel to assure the work is performed in
25 accordance with NES requirements.

26
27 Qualified personnel provide technical advice on various disciplines
28 of construction such as welding, mechanical and electrical
29 systems, instrumentation and control equipment, preoperations
30 and start-up testing. Guidance documents are provided to the
31 applicant describing Westinghouse recommended programs for
32 site activities affecting the NSSS equipment, preoperations 6
33 and start-up testing.

1
2
3 The NSD construction site manager is responsible for overseeing
4 that the Westinghouse nuclear steam supply equipment is in
5 good condition when received and that it is stored, handled
6 and installed properly according to applicable specifications,
7 procedures, and manufacturers' instructions.
8

16

9 A written procedure describes the system for identifying, reporting
10 and obtaining disposition of nonconforming material or equipment
11 discovered at the site. NSD personnel fill out a Field Deficiency
12 Report (FDR) to provide the cognizant PWR-SD engineering group
13 with the information necessary for making proper and timely
14 disposition of each problem. After the cognizant personnel
15 make a disposition, it is noted on the FDR and returned to
16 the field for action. A file for each FDR is maintained in
17 the field containing documents necessary to complete the disposition
18 or necessary modification or repair; included are telexes,
19 memoranda, telecon messages, letters, procedures, instructions,
20 shipping notices, and quality releases for new materials or
21 components. PWR-SD engineering maintains files to record all
22 field deficiencies and to provide for long-term corrective
23 action.
24

6

6

25 The Nuclear Service Division provides optional services to
26 the applicant such as Nuclear Training Services, Renewal Parts
27 and Components Services, Post Operational Services, etc.
28

16

29 Design responsibility for optional equipment (such as containment
30 fan coolers and hydrogen recombiners) is within the Nuclear
31 Services Division.
32

16

33 The Product Assurance Department of NSD is responsible for
34 conducting independent audits of Westinghouse activities at the
35
36
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3 construction site. Additional quality assurance functions for
4 NSD are provided as necessary by the quality organization with
5 PWRSD. The Product Assurance manager reports directly to the
6 division general manager.

7
8 The qualifications for the NSD Product Assurance Manager are:

- 9
10 1. a B. S. in Engineering;
11
12 2. at least 10 years experience in engineering, quality assurance,
13 or manufacturing;
14
15 3. at least 5 years in management;
16
17 4. three years experience with applicable quality-related codes,
18 standards and regulatory requirements; and
19
20 5. demonstrated ability to assess and enforce compliance with
21 applicable requirements.
22

23 Training relevant to quality assurance activities and pertinent
24 to the position is described in Section 17.1.2.

25
26 17.1.1.8 Functional Responsibilities

27
28 The functional responsibilities of designing and fabricating
29 fuel and NSSS equipment and the integrated quality assurance
30 responsibilities for both safety and non-safety equipment are
31 shown in Table 17-2 (which is contained in the Applicant's Safety
32 Analysis Report). The identification of safety-related equipment
33 is covered in Chapter 3 of SAR in Table 3.2-1. The responsibilities
34 are divided into four categories: design criteria, detail design,
35 manufacture, and auditing. For each category the organization
36

37 17.1-17

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39 Revision 7

November, 1974

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2
3 responsible for performing the particular function is identified.
4 Responsibility for design criteria means that the organization
5 provides fuel or NSSS equipment design parameters. Responsibility
6 for detail design means that the organization incorporates design
7 bases, codes and regulations, and performs the fuel or NSSS equipment
8 design function. The quality assurance auditing overview is performed by
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17.1-17a

Revision 7

November, 1974

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3 audits, surveillance, and process and test witnessing of suppliers
4 of fuel and NSSS equipment. When manufacturing of NSSS equipment
5 is done by a Westinghouse NES division, the overview consists
6 primarily of audits planned and performed by PWR-SD. Overview
7 of all NES divisions is provided through audits performed through
8 the NES Quality Assurance Committee and through audits performed
9 by Westinghouse headquarters.
10

11 17.1.2 QUALITY ASSURANCE PROGRAM 12

13 The NES policy is to provide nuclear power equipment and services
14 that will provide an electric utility with a safe and reliable
15 plant throughout its design life. The NES Executive Vice President
16 establishes and communicates NES policies pertaining to quality
17 assurance matters to each of the NES divisions for implementation.
18 Each division manager further applies the NES policy as necessary
19 for local application. The quality assurance management in each
20 NES division is responsible for defining the quality assurance
21 program content and maintaining the program consistent with the
22 NES and division policies. The quality assurance program for
23 each NES division is authorized, reviewed and approved by the
24 division general manager, and is defined in a quality assurance
25 manual. The manual is prepared by the cognizant quality assurance
26 personnel and approved by the responsible QA management of the
27 respective division.
28

29 The NES Quality Assurance Committee is responsible for review
30 and proper integration of the quality assurance programs of each
31 NES division. Through the activities of the NES QA Committee
32 and the various auditing processes, including the Corporate Headquarters
33 audits, described in Section 17.1.18, regular and independent
34 management assessment of the scope, implementation and effectiveness
35 of the individual quality assurance programs, are evaluated in
36

37 17.1-18
38

39 Revision 7

November, 1974

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3 accordance with the requirements of 10CFR50 Appendix B. In addition
4 to these actions, the NES QA Committee assesses the integration
5 of the QA programs among the interfacing divisions. 7

6
7 This plan is a description of the NES Quality Assurance Program
8 and is supported by written policies and procedures governing
9 quality-related functions and activities from initiation of design
10 through fabrication and shipment. Identification of the principal
11 quality assurance documents is contained throughout this plan..

12
13 Both safety and non-safety related structures, systems and components
14 controlled by the quality assurance program and the respective
15 organizations applying quality assurance related functions on these
16 items during design engineering, fabrication, testing and inspection
17 are shown in Table 17-2 of the applicable SAR document. Identifica-
18 tion of safety-related equipment is contained in Table 3.2-1 in the
19 applicable SAR document.

20
21 Table 17-3 gives a typical and representative listing of the written
22 procedures within NES for implementing the Quality Assurance Plan.
23 Listed are the various manuals and the subjects covered, giving a
24 short description of their purpose, and relating each topic to the
25 applicable criterion of 10CFR50 Appendix B. 7

26
27 To assure that those management and supporting personnel performing
28 quality related activities are knowledgeable of quality procedures
29 and program requirements and proficient in implementing them, a
30 training program exists consisting of:

- 31
32 1. Annual Corporate training and development program. The Corpora-
33 tion provides broad training programs for personal development
34 of managerial and professional personnel. Local NES Division
35
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37 17.1-19

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39 Revision 7

November, 1974

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3 management determines each year where such personnel development
4 is needed and selects attendees for the Corporate course. These
5 courses provide between 8 to 40 hours of instruction; examples
6 of courses attended by management and professional personnel are:
7 "Problem Solving and Decision Making," "Management by Objectives,"
8 "Configuration Management," "Design of Experiments," "Statistical
9 Practice in the Control of Quality," "New Manufacturing Concepts,"
10 "Elements of Quality Control Engineering" and "Material Handling
11 and Storage."
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17.1-19a

Revision 7

November, 1974

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3 2. Periodic seminars for quality assurance personnel regarding NSSS
4 equipment. These seminars include discussion on the application of
5 quality related policies, manuals and procedures. These seminars
6 involve those technical professional personnel who perform activities
7 affecting quality. The range of topics includes: detailed review
8 of equipment design, fabrication and testing; auditing techniques;
9 supplier surveillance techniques; application of design control
10 methods; and reviews of newly-issued specifications and standards.
11 These seminars are supplemented by personnel participation in the
12 activities and training provided by professional societies such as
13 ASNT, ASME, and ASQC. Seminars typically provide one to three hours
14 of instruction. Where surveillance activity is extensive, special
15 seminars extending 4 to 12 hours are provided for surveillance per-
16 sonnel indoctrination and training. 6

17
18 3. Discussions on specific quality topics regarding NSSS equipment.
19 These are chaired by a QA manager for the purpose of discussing
20 a quality problem or as a preventive measure to preclude occur-
21 rence of a problem. These discussions include management and
22 technical professional personnel. The range of topics, as ex-
23 amples, includes: methods of supplier evaluation; identification
24 of materials & equipment; application of controls for new regula-
25 tions and requirements; techniques for use in assessing equipment
26 preparation for release and shipment. These discussions typically
27 provide two to four hours of moderated discussion coupled with in-
28 struction.

29
30 4. Classroom courses for nondestructive examination training. Personnel
31 who perform the examinations or who monitor the performance of ex-
32 aminations are qualified, as applicable. These courses are typically
33 3 to 5 days duration, including instruction, practice and examination
34

35 In addition to the foregoing programs, each NES division applies a train-
36 ing program to provide instruction to personnel responsible for performing
37
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2
3 quality related activities on the purpose, scope and implementation of
4 quality related manuals, instructions and procedures. Each NES Division
5 also provides training in the principles and techniques of quality-related
6 activities and determines that personnel performing, or monitoring,
7 quality-related activities are qualified, relative to pertinent responsi-
8 bilities associated with each function or activity. These training
9 periods typically are one to three hours duration per each quality related
10 activity, encompassing formal instruction and/or on-the-job demonstration.
11

12 The Quality Assurance Program requires that contractors and suppliers of
13 NSSS equipment have quality systems consistent with the requirements
14 of the Quality Assurance Criteria, and includes provisions for review and
15 approval of contractors and suppliers quality assurance programs.
16

17 Westinghouse is investigating the feasibility of applying the personnel
18 qualification requirements of ANSI N45.2.6-1973 as specified in
19 Regulatory Guide 1.58 to suppliers. The specific education/experience
20 requirements do not appear to be achievable for all suppliers. Westinghouse
21 is studying the situation and will either accept the requirements or
22 propose an alternative to the specific education/experience requirements
23 by January, 1975.
24

25 17.1.3 DESIGN CONTROL

26
27 Each of the NES Divisions involved in NSSS design provides measures to
28 assure effective design control. Westinghouse policies and procedures
29 for design control follow the guidance of ANSI N45.2.11 (Draft 3,
30 Revision 1, July 1973), Quality Assurance Requirements for the Design
31 of Nuclear Power Plants, for safety-related equipment. The design control
32 methods Westinghouse uses, as applied to each tier of supply, are summarized
33 in Tables 17-1, 17-3, and described throughout this section. These methods
34 include such activities as: specifying quality standards, selection and
35 review of design methods, design change control, design interface actions,
36 and implementation of design procedures.
37

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2
3 17.1.3.1 PWR Systems Division
4

5 The project manager is responsible for identifying to engineering, purchas-
6 ing, licensing and quality assurance groups the technical requirements of
7 a nuclear power plant. This identification process is formal and docu-
8 mented. The distribution of this
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3 technical information is the start of the design activity on
4 a nuclear power plant. Changes to distributed information
5 are also issued by the project manager.
6

7 Nuclear Safety prepares safety analysis reports. Prior to
8 the submittal of NSSS portions of safety analysis reports to
9 the applicant, licensing engineers obtain engineering, Nuclear Safety
10 and quality assurance review and concurrence of technical content.
11 The review process is formal and documented.
12

13 Based upon the identified technical parameters, Systems Engineering
14 groups design the nuclear power plant to meet functional, safety
15 and regulatory requirements. Mechanical and electrical design
16 engineers participate in the functional design process by identifying
17 equipment limitations and resolving functional requirements
18 with equipment capabilities. Where computer programs are used
19 in design analysis, these programs are verified and their usage
20 is controlled. The output of the Systems Engineering groups
21 is written functional parameter documents.
22

23 Control and Electrical Systems engineers and Mechanical Equipment
24 engineers are responsible for designing or specifying NSSS equipment.
25 Nuclear Safety Department engineers specify safety parameters and
26 provide them to engineering groups for incorporation
27 into components and systems specifications. Equipment speci-
28 tions are prepared by the electrical and mechanical design
29 engineers. The term "Equipment Specification" as used in this
30 plan includes drawings when they are used instead of equipment
31 specifications. Detailed quality control requirements are
32 specified in the equipment specification, or its references.
33 Examples of these are nondestructive examinations, acceptance
34 standards, functional tests, and recording of the measured
35 values of key characteristics. In the few cases when equipment
36 specifications or design drawings are not used, the specific
37 quality control requirements, tests and acceptance standards
38

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2
3 are identified in the purchase order. The design of equip-
4 ment also provides for access to components for inservice inspection
5 and maintenance as required to assure continued integrity throughout
6 the life of the plant.
7

8 Preliminary equipment specifications are reviewed within Westinghouse
9 by systems engineers, materials and process engineers, licensing
10 engineers, Quality Assurance, Projects, and others as required.
11 These independent reviews verify that equipment specifications
12 correctly incorporate design bases and meet systems requirements, 6
13 conform to established engineering standards, are adequate
14 from a metallurgical and welding point of view, meet code requirements,
15 satisfy safety requirements including those specified in safety
16 analysis reports and contain necessary quality requirements. 6
17 Written engineering instructions prescribe preparation, review
18 and approval of equipment specifications.
19

20 The design verification method is selected for proper accomplishment,
21 and may involve such methods as design review, alternate calculations,
22 or qualification testing. Where a test program is used to
23 verify the design adequacy, a qualification test of a prototype
24 unit under the most adverse design conditions will be used.
25 The design verification is performed by individuals other than
26 those who performed the original design, by individuals within
27 the PWR-SD Engineering Department. Design alterations initiated 6
28 as a result of design review, discovery of design deficiency or
29 design error, are formally documented as design changes.
30

31 Written procedures control design changes, including field
32 changes. These procedures require that review and approval
33 actions be taken by the same groups who reviewed and approved
34 the basic designs, according to written engineering instructions.
35 Upon approval, engineering initiates the required action to
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3 change the drawings and specifications to accurately reflect
4 the design change. When approved for release, copies of the
5 revised documents are provided to the applicant as well as
6 other organizations needing the documents for subsequent work.
7 As discussed in Section 17.1.6, this distribution system is
8 controlled.

9
10 Aspects of the equipment design that have an effect on that
11 part of the plant design performed by the applicant or architect
12 engineer are forwarded to them for their review. Applicant
13 or architect engineer drawings which have an effect on the
14 NES scope of supply are likewise sent to NES engineers for
15 their review.

16
17 The implementation of the design control system is audited
18 by Product Assurance Systems.

19
20 Where contractors or suppliers are responsible to design to meet
21 Westinghouse specified requirements, the purchase order contains
22 requirements for a documented design control system.

7

23
24 In addition to the verification of technical requirements discussed
25 above, formal design reviews are conducted by Product Assurance
26 Systems on critical systems, subsystems and components, considering
27 improved fabrication, installation and maintainance aspects
28 to improve their reliability in use. The design reviews are
29 comprehensive, systematic studies by personnel representing
30 a variety of disciplines who are not directly associated with
31 the development of the product. Specialists from other Westinghouse
32 divisions and outside consultants are used in the reviews as
33 necessary. Information developed by the reviews is recorded
34 for evaluation and action by the cognizant design engineer.
35 The design review proceduree requires the resolution of open
36

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3 items within specified periods. Product Assurance Systems personnel
4 verify completed action. | 6
5

6 The Design Review program is projected over a substantial period
7 of time because of the comprehensive nature of each review.
8 Both the scheduling of the review and the selection of specific
9 equipment for review are based upon many considerations including
10 whether the equipment is of a new design, its importance to
11 public health and safety, its importance to plant availability
12 and performance, and previous experience with the equipment.
13 In this priority scheme, some equipment of proven design may
14 not receive a formal Design Review. The suitability of application
15 of standard "off the shelf" commercial items is included in
16 the design review program. | 6
17

18 Design documents, design reviews, related records and changes
19 thereto are collected, stored, and maintained in a systematic
20 and controlled manner. | 6
21

22 17.1.3.2 Electro-Mechanical Division 23

24 Upon receipt of an equipment specification from the PWR Systems
25 Division the lead design engineer is responsible for correct
26 translation of equipment requirements for reactor coolant pumps,
27 control rod drive mechanisms and loop stop valves into specifications,
28 drawings, procedures, and instructions.
29

30 Engineering Department instructions specify that all designs
31 be reviewed by a Design Review Committee chaired by an individual
32 who is not a direct supervisor of the lead design engineer
33 or directly involved with the original design group. Technical
34 reviews by engineering personnel verify design adequacy for
35 compliance with performance requirements. Divisional design
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3 17.1.3.3 Tampa Division
4

5 Tampa Division is responsible for the design of steam generators
6 and pressurizers. The design effort is based upon an equipment
7 specification from PWR Systems Division. The Engineering group
8 is responsible for heat transfer, material selection, hydraulic
9 analysis and the operation. The Design and Analysis group is
10 responsible for vibration and shock analysis, experimental stress
11 analysis, general stress analysis, and materials behavior. Design
12 verification activities are performed by individuals within the
13 Tampa Engineering Department other than those who performed the
14 original design.

15
16 Prior to releasing drawings for manufacture or purchase, Quality
17 Assurance reviews drawing for conformance to ASME Code. Included
18 in the review is assurance that all necessary dimensions and
19 tolerances are shown to establish requirements for special
20 tools; that material specified is in accordance with ASME Code
21 requirements; welding specifications are compatible with material;
22 the correct nondestructive examinations are specified; any
23 special characteristics are clearly identified on the drawing.
24 The quality assurance engineer signifies review and approval
25 by signing the drawing when above points have been satisfied.
26 Design changes made as a result of reviews, on other experience
27 in manufacturing, installation or use, are documented and included
28 as drawing revisions. All drawing revisions are reviewed and
29 approved in a manner similar to the original drawings. Planned
30 and documented design reviews are conducted by Engineering
31 to assure that the product being designed and manufactured
32 meets all contractual and code requirements. These reviews
33 provide assurance that nuclear effects, mechanical, thermal,
34 hydraulic, safety and similar type studies are complete, that
35 research and development programs and tests, if necessary, provide
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adequate substantiation of the design. Compatibility of materials and design interfaces is assured and standard materials, components and processes are used where possible. Adequate accessibility for "In-Service-Inspection," maintenance or repair is designed into the product as well as specifying acceptance criteria for inspections and tests. Each design review is documented for permanent file and includes coverage of significant problems, decisions, the action taken or proposed, and follow-up to assure completion.

17.1.3.4 Pensacola Division

Pensacola Division is responsible for the design of structural components for internals of the Westinghouse pressurized water reactor. Prior to release of drawings and specification at the division, Quality Assurance Engineering reviews each drawing and specification to assure compliance with contract and ASME code requirements. This review includes the following considerations, as a minimum:

1. The material defined is code approved.
2. Proper and adequate non-destructive examinations are specified to assure compliance with the code and applicable specifications.
3. Any special processes specified are adequately defined, compatible with the material and in accordance with applicable code requirements.
4. Dimensioning is clearly defined and adequate for manufacture and subsequent piece part inspection.

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2
3 To assure that each drawing and specification receives the
4 above review, the cognizant quality engineer indicates approval
5 for drawing release by signing each drawing. Design changes
6 made as a result of reviews or other experience in manufacturing,
7 installation or use are documented and included as drawing revisions.
8 Revisions to the drawing are also reviewed and signed by the
9 quality engineer to assure continued compliance with the above
10 stipulated considerations.

11
12 This division maintains a computer controlled print-out for
13 identification and control of all drawings applicable to each
14 product line. As revisions become applicable, the print-out
15 is updated and distributed to appropriate work areas.

16
17 Operation of the Pensacola Division Design Engineering Department
18 is in accordance with detailed internal procedures which provide
19 for independent review of designs by individuals other than those
20 who performed the original design. Compliance of Design Engineering
21 with operating procedures is verified by internal audit.

22
23 17.1.3.5 Specialty Metals Divisions

24
25 Product is provided to Tampa Division and Electro-Mechanical Division
26 in accordance to detailed specification requirements. No product
27 design is performed by Specialty Metals Division.

28
29 17.1.3.6 Interface Control

30
31 Written instructions define the interfaces between participating design
32 organizations. Within PWR Systems Division, shop order Logic Flow
33 Diagrams document the relationships among the many design, procurement,
34
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3 **control** and administrative activities required to conduct the
4 business of the line organizations. Additionally, the flow
5 diagrams serve to document and show by roadmap how PWRSD complies
6 with 10CFR50 Appendix B. The level of detail depicted on the
7 flow diagram is intended to: optimally portray management
8 controls, provide an easy means of education, and to facilitate
9 the audit-ability of these controls.

6

10
11 PWR-SD, as the Lead Division within Nuclear Energy Systems,
12 establishes the design criteria and parameters for systems
13 structures and equipment. This information is transmitted
14 in the form of equipment specifications or drawings to the
15 manufacturer. In some cases the manufacturer is responsible
16 for providing a detail design or process procedure based upon
17 the PWR-SD criteria and parameters. These are submitted by
18 the vendor to PWR-SD where they are reviewed and approved prior
19 to manufacture. Review and approval requirements are clearly
20 stated in purchase orders or in the case of other NES divisions,
21 in written interface instructions.

16

6

22
23 Table 17-6, which is an extract from a typical shop order Logic
24 Flow Diagram, depicts the above process for review and approval
25 of vendor submittals, noting the specific interfaces, applicable
26 documents for detailed instructions, and appropriate criteria
27 of 10CFR50 Appendix B. It is the responsibility of the cognizant
28 manager for each shop order to maintain the currency of his
29 particular Logic Flow Diagram.

6

30
31 In addition to the interface between PWR-SD and manufacturers,
32 there is an interface with the applicant and his design agents.
33 All PWR-SD equipment specifications, flow diagrams, and procurement
34 drawings that are outline or assembly drawings used in lieu
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3 of equipment specifications, are transmitted to the applicant
4 or his design agents for review. Each project manager has
5 a written procedure defining the process for transmittal and
6 resolution of comments.
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3 17.1.4 PROCUREMENT DOCUMENT CONTROL
4

5 Nuclear Energy Systems procurements are from approved sources of supply;
6 procurement documents are originated, reviewed, and issued as
7 defined herein and further detailed in Section 17.1.6. In general,
8 the procurement of components, systems, structures, material,
9 and replacement parts within NES falls into three distinct areas:
10

- 11 1. Components procured by PWR from other NES Divisions.
12
13 2. Components, systems and structures procured by PWR from suppliers
14 and non-NES divisions.
15
16 3. Materials procured by Pensacola, Tampa, EMD, and SMD.
17

18 Relationship of the various NES Divisions is discussed in detail in Section
19 17.1.1.
20

21 17.1.4.1 PWR Systems Division
22

23 As described in Section 17.1.3, equipment specifications and
24 drawings receive a detailed review prior to issue. Purchase orders
25 reference equipment specifications and drawings as the technical
26 basis of procurement. A Product Assurance procedure requires quality
27 engineers to review purchase requisitions, purchase orders and subsequent
28 change notices. The review process assures that the purchase
29 order defines the equipment being procured and clearly specifies
30 technical and quality requirements, techniques for controlling these
31 requirements, including acceptance criteria, and that the purchase
32 order meets procedural requirements. When discrepancies are noted,
33 a written request for correction is initiated and resolved. Documented
34 evidence of the review and approval actions is maintained.
35
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3 Quality requirements, including documentation preparation,
4 retention and submittal requirements, that apply specifically 6
5 to a component are contained in the equipment specification.
6 Quality system requirements of a general nature are contained
7 in two standard documents. Each procurement order to a supplier,
8 specifically assigns the applicable quality systems requirements, 6
9 identifying the precedent document. Both documents require
10 that the supplier's Quality Assurance Program must be reviewed
11 and approved by PWR-SD prior to initiation of fabrication
12 of ordered components.

13
14 The first document is entitled, "Administrative Specification
15 for the Procurement of Nuclear Steam Supply System Components".
16 This document is applied in all component purchase orders. The
17 Administrative Specification requires the supplier not only
18 to manufacture equipment that conforms to purchase order requirements,
19 but to assure himself and Westinghouse by means of appropriate
20 inspections and tests that the equipment conforms to these requirements.
21 The quality control section of this specification contains or
22 references specific requirements in areas such as:

- 23
24 1. Organization
25 2. Purchasing Control
26 3. Receiving Inspection
27 4. Material Control
28 5. Control of Drawing and Procedures
29 6. Calibration of Measuring and Test Equipment
30 7. Personnel Qualifications
31 8. Deviations from Specifications
32 9. Special Process and Test Procedures
33 10. Handling and Storage Procedures
34 11. Inspection and Manufacturing Control
35 12. Quality Records
36 13. Quality Release
37 14. Quality Systems Audits
38
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2
3 The second document that specifies quality requirements is QCS-1,
4 "Quality Control Systems Requirements". This document requires
5 the supplier to establish and maintain a comprehensive quality control
6 system. It includes requirements for control of design, manufacturing,
7 inspection, test, shipment, and for retention, control and maintenance
8 of records.
9

10 The QCS-1 document contains the applicable requirements of 10CFR50,
11 Appendix B, which are imposed upon PWR-SD suppliers and sub-tier
12 vendors; it also satisfies the quality assurance requirements of
13 NA-4000 of the ASME Code, Section III.
14

15 QCS-1 is incorporated into PWR-SD equipment specifications and purchase
16 orders for safety-related components and equipment, including replace-
17 ment parts. As required, hold points are specified in the equipment
18 specification or elsewhere in the purchase order. These are points
19 of witness or inspection by Westinghouse beyond which work may
20 not proceed without approval by PWR-SD.
21

22 Procurement documents, primarily within the equipment specifications,
23 or otherwise within the purchase order body, identify the documentation
24 required for review and transmittal, such as drawings, specifications,
25 procedures, inspection plans, inspection and test records, personnel
26 and procedure qualifications, and material test reports.
27

28 The standard terms and conditions appended to each purchase order
29 contain the right of access to the supplier's facility and related
30 records for source inspection and audit.
31

32 NSSS equipment ordered by PWR Systems Division from other NES divisions
33 is specified by equipment specifications or drawings. Quality Assurance
34 Program requirements are satisfied by requiring NES divisions to perform
35 their work in accordance with 10 CFR 50 Appendix B.
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This imposes total quality assurance program requirements including that of review of incoming procurement orders by qualified personnel. As described in Section 17.1.18.3.1, the application of the quality assurance program by Westinghouse NES Division supplying NSSS equipment is audited by PWRSD.

A Product Assurance procedure requires quality engineers to review renewal equipment purchase documents to insure that appropriate quality requirements and acceptance criteria are applied. This review also determines that the initiating procurement documents have been prepared or reviewed by engineering personnel who are familiar with the design, so that renewal equipment similarity and compatibility to the original design is considered.

6

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AMENDMENT

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3 17.1.4.2 Electro-Mechanical Division
4

5 Upon receipt of an order from PWRSD, written procedures require that | 7
6 the overall quality requirements of the contract are reviewed by
7 cognizant engineering personnel and action is initiated to assure
8 that contractual quality requirements will be referenced in documents
9 for procurement of material, equipment and services and will be
10 met during procurement, manufacturing and shipment. Procurement
11 documents delineate the Quality Assurance Program requirements
12 consistent with application of the material, component, or service
13 being provided.
14

15 Quality engineers review purchase orders to assure that the supplier
16 is furnished all applicable requirements affecting quality.
17

18 17.1.4.3 Tampa Division
19

20 Quality Assurance has developed an inspection code which is used
21 in the determination of the supplier inspection requirement level
22 for all purchased materials. The inspection code, Code 1 thru 5,
23 is used on all purchase orders with Code 4 being applied to items
24 such as light bulbs, stationery, etc. All purchase orders for
25 materials or parts having Code 1, Code 2, Code 3 or Code 5 re-
26 quirements are reviewed by Quality Assurance to determine that
27 proper and essential quality requirements are specified.
28

29 17.1.4.4 Pensacola Division
30

31 Prior to placement of a material purchase order, the purchase requis-
32 ition is approved by the Quality Assurance Department. The purchase
33 requisition review assures that applicable drawings and specifications
34 are listed together with correct revision references, and required
35 destructive and non-destructive tests are specified.
36
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38

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3 An addendum form to the purchase order requisition titled, "Purchase
4 Order Supplementary Technical Requirement" (POSTR), is used to specify
5 quality requirements for each requisition.
6

7 17.1.4.5 Specialty Metals Division
8

9 The Purchasing Department is responsible for initiating raw material
10 purchase requisitions in accordance with Tampa and NFD requirements. | 6
11 Purchase requisitions are reviewed by the Quality Control and Inspect- | 6
12 ion, Quality Services, and Manufacturing Engineering departments
13 prior to issue. Applicable quality system requirements are specified,
14 as well as references to technical specifications.
15

16 17.1.5 INSTRUCTIONS, PROCEDURES AND DRAWINGS
17

18 Within NES, written procedures and instructions are in use to implement
19 the Quality Assurance Program, and provide assurance that all activities
20 affecting quality in the context of 10CFR50, Appendix B, are documented
21 (Reference Table 17-3). They are in formats appropriate to their
22 applications, such as:
23

- 24 1. Management Responsibility Statements (Appointment Letters)
25 2. Position Descriptions of Management and Professional Personnel
26 3. Engineering Instructions
27 4. Quality Assurance and Reliability Procedures
28 5. Projects Procedures
29 6. Purchasing Procedures
30 7. Construction Site Procedures
31

32 Each of the above contains detailed procedures and instructions
33 relating to the functioning of the quality program. Approval and
34 distribution of the procedures is controlled by the manager responsible.
35
36
37

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3 For example, engineering procedures within PWR are approved by
4 the Engineering manager and distribution is controlled by his
5 staff. Other groups affected by one department's procedures
6 review the procedures prior to their approval.

7
8 Table 17-3 relates the various NES manuals and written proced-
9 ures, to the applicable AEC criteria.

10
11 Technical and contractual information necessary to assure effective
12 implementation of these policies and procedures is developed,
13 documented and controlled through a standard Westinghouse system
14 which consists in part of, the establishment of:

- 15
16 1. System Design Parameters
17 2. Equipment Specifications
18 3. Process Specifications
19 4. Purchasing Department Specifications
20 (including specifications for materials)
21 5. Drawings, and Bills of Material
22 6. Purchase Orders
23 7. Quality Assurance Procedures
24

25 The Quality Assurance Program provides that all activities
26 affecting quality will be accomplished in accordance with documented
27 instructions, procedures and drawings and that appropriate
28 quantitative and qualitative means of verifying quality are
29 satisfactorily accomplished and included as appropriate.
30

31 17.1.6 DOCUMENT CONTROL

32

33 Each of the NES divisions provides measures to assure document
34 availability at onset of work and effective document control.
35 Below is a description of the document control procedures which
36

1
2
3 provide methods for establishing control of instructions, drawings
4 and procedures related to quality and safety. In addition,
5 these procedures provide a means to assure that obsolete documents
6 are not used; that controls are exercised for document changes;
7 and that review and approval of changes is performed by organizations
8 who originated the document.
9

10 17.1.6.1 PWR Systems Division

11
12 Within PWR-SD there are a variety of documents used in the
13 design and procurement of the PWR plant equipment. In the
14 paragraphs below the controls in use to assure content adequacy
15 and the correct distribution are discussed.
16

17 The various sources of PWR-SD procedures relating to Quality
18 Assurance are summarized on Table 17-3. Each of the manuals
19 has written instructions describing the review, approval,
20 distribution and revision of procedures. Typically the prepar-
21 ation of new or revised procedures is controlled by the department
22 responsible for the manual. Prior to issue, proposed procedures
23 are routed to affected groups. Written comments are received and
24 resolved. Approval is the responsibility of the department
25 manager who assures the completeness and resolution of the
26 review. Manuals are serialized and assigned to specific individuals.
27 Distribution of new and revised procedures is made to each
28 person assigned a manual. Manual holders are responsible for
29 updating their manuals. Implementation of most procedures
30 is at date of issue and is clearly defined by the distribution
31 letter. In exceptional instances when implementation varies
32 from the issue date, specific instructions are provided in the
33 body of the procedure. Since design information is provided
34 by equipment specifications and drawings, both types of documents
35 are controlled by specific instructions. For both new and revised
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37

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3 equipment specifications these transmittal forms designate which groups
4 review each document, and approval requirements are clearly established.
5 The manager of the originating group is the person responsible to assure,
6 before approving the document, that all steps required by instructions
7 have been completed satisfactorily. This includes the proper review,
8 and the resolution of written comments, as well as the technical adequacy
9 of the document. Both drawings and equipment specifications are distributed
10 to central control groups from which formal and demand distributions
11 are made.
12

13 Approved drawings are microfilmed and distributed to satellite files.
14 Obsolete drawings are exchanged for revised drawings. Obsolete issues
15 are returned to the central file and destroyed. Past revisions are avail-
16 able only from the central file. All full and half-size copies of drawings
17 are informational. Since more than one revision to a drawing is applicable
18 to different plants, a computerized drawing control system defines appli-
19 cability. When a new or revised drawing is sent to central files it
20 is accompanied by an applicability form which is the input to the computer
21 system. Drawing lists are issued to all satellite files and project
22 offices monthly with partial change lists issued more frequently. The
23 written drawing control system requires division personnel to determine
24 applicability of a drawing by referral to the drawing lists.
25

26 Similar lists of current revisions of equipment specifications and process
27 specifications are also used. Procurement documents are sequentially
28 serialized and identified with the purchase order number; lists are not
29 issued, but status of documents on orders is available for review as
30 required.
31

32 Process specifications, that is, specifications that detail fabrication,
33 inspection and testing requirements are handled in a similar manner as
34 equipment specifications except that their development, approval and distri-
35 bution is coordinated by the Mechanics and Materials group.
36

1
2
3 Procurement documents are controlled by the Purchasing department.
4 The purchasing manual contains written instructions which detail
5 how purchase orders, purchase order change notices and procurement
6 advisory releases are originated, reviewed, approved and distributed.
7 The instructions specify that sequential unique numbers be
8 applied to all procurement documents. A computerized system
9 identifies the latest serial number used on each document
10 within the purchase order. Procurement documents require that
11 suppliers apply systems to assure use of proper specifications
12 and procedures, to avoid use of obsolete or superseded documents,
13 and to provide documents at the onset of the work for which
14 they are needed.
15

16 Written instructions define the requirements for transmittal
17 of documents to the applicant. Prior to distribution the applic-
18 ability of each document is assured by the approval of the
19 cognizant engineer and project manager. Quality Releases are
20 forwarded to the site by equipment manufacturers. The quality
21 release system is described in Section 17.1.7. Computerized
22 reports are issued twice a month to identify the quality releases
23 applicable to site delivered PWR plant equipment.
24

25 17.1.6.2 Electro-Mechanical Division

26

27 Manuals, as summarized in Table 17-3 are developed and maintained
28 in a manner as described for PWR-SD manuals in Section 17.1.6.1.
29 The Quality Manual is the responsibility of the Quality Assurance
30 manager. Where action and responsibilities of the departments
31 are affected, the managers of these departments shall also
32 approve related sections. The manual is reviewed on a scheduled
33 basis and revised as necessary. As revisions are approved,
34 Quality Assurance supplies copies of changed sections to the
35 manual holders.
36

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3 Procedures covering component processing, inspection and testing are
4 prepared, reviewed and approved for incorporation into manufacturing
5 routings as part of engineering planning. These procedures are either
6 incorporated directly into the manufacturing routing or are referenced
7 in separate inspection and test instructions. All documents, including
8 changes and revisions, are reviewed for adequacy and approved for release
9 by authorized personnel, as described in Section 17.1.3.2 and 17.1.4.2.

10
11 Electronic data processing is utilized in preparing and maintaining drawing
12 and specification lists showing the applicable revision. These lists
13 are strategically located in the factory and office area. The drawing
14 and specification distribution control system assures that current informa-
15 tion is available to the user and that manufacturing information is
16 upgraded.

17
18 17.1.6.3 Tampa Division
19

20 Control is maintained over the issuance of all design, welding, non-
21 destructive testing and manufacturing documents affecting quality. Each
22 drawing is reviewed and signed by Engineering, Metallurgy, Quality Assurance
23 and Manufacturing prior to release to the drawing control center. Copies
24 of the drawing are prepared from aperture cards for transmittal to the
25 Production Planning of the Manufacturing Department, who in turn prepare
26 a feeder package that includes the necessary drawing and distributes
27 the complete package to the applicable manufacturing group. Each de-
28 partment is responsible for maintaining only up-to-date drawings. The
29 drawing control center issues a master engineering drawing list. This
30 drawing list contains all drawing numbers in the active category includ-
31 ing the latest revision. Distribution
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3 of the list, which is issued as a secondary control for double-checking
4 of drawing revisions, is made twice a month to appropriate
5 department managers, including Quality Assurance.

6

6
7 Procedures that include welding, nondestructive examinations and
8 manufacturing are maintained and controlled through the Metallurgical
9 group. Serialized Tampa Specifications Manuals are issued to
10 appropriate individuals in each department. New and revised
11 specifications are distributed to manual holders who are responsible
12 to insert the new specification and destroy the outdated specification.
13 Each specification is identified by a specific number. This
14 number is shown on the drawing, dictating the procedure to
15 be used for each specific operation, i.e. welding, nondestructive
16 examination, cleaning, etc.

17
18 Tampa Quality Control Instructions (T.Q.C.I.) are issued to
19 all Quality Assurance personnel by Quality Assurance Engineers
20 or Supervisors. The purpose of these instructions is to detail
21 specific functions and responsibilities of Quality Assurance
22 personnel, i.e. N-1 form and data plate processing procedure,
23 productive Work Station Budget Charges, Inspection Stamp Issue,
24 etc. These instructions are numbered and updated as necessary.

25
26 Tampa specifications are reviewed, approved and signed similar
27 to that of the drawings, with one notable exception, the Division
28 Safety Engineer also reviews and approves each Tampa Process
29 Specification and Manufacturing Procedure. Additional discussions
30 of document controls are contained in Sections 17.1.3.3, 17.1.4.3,
31 17.1.9.3 and 17.1.10.3.

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2
3 17.1.6.4 Pensacola Division
4

5 Within Pensacola Division, operational and administrative procedures
6 are developed and implemented as described within PWR's Section
7 17.1.6.1.
8

9 The Quality Assurance Manual is the responsibility of the Quality
10 Assurance Department. This manual is approved by division Management.
11 Revisions are issued to holders of "Controlled Copies" as listed
12 on records maintained by Quality Assurance.
13

14 All drawings and product process specifications are controlled
15 by Engineering. Contract applicability is controlled through |6
16 an Engineering Design Release. The design release generates
17 input to the Business Systems Master Drawing and Specification
18 List (computer listing). This computer master drawing/specification
19 list is the contractual core internals configuration control
20 document.
21

22 All material procurements, manufacturing, Quality Assurance plans
23 and Inspection plans are all completed and coordinated with the
24 Master Drawing/Specification List.
25

26 All changes are keyed to the Master Drawing/Specification List
27 through design releases which trigger and control all implementa-
28 tions of Manufacturing planning, Quality Assurance and inspection |6
29 planning.
30

31 Additional discussions of document controls are contained in
32 Sections 17.1.3.4, 17.1.4.4, 17.1.9.4 and 17.1.10.4.
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3 17.1.6.5 Specialty Metals Division
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5 The content and issuance of manufacturing, engineering, and quality
6 information to the manufacturing, inspection, and test areas of
7 the shop is controlled. An authorized change notice system controls
8 process and/or inspection changes. Discussions of document controls
9 are contained in Sections 17.1.3.5, 17.1.4.5, 17.1.9.5 and 17.1.10.5.
10 Manuals are controlled as discussed in Section 17.1.6.1 for PWR-
11 SD.
12

13 17.1.7 CONTROL OF PURCHASED MATERIAL, EQUIPMENT AND SERVICES
14

15 Each of the NES Divisions maintains its own system for control of
16 purchased items. In general, the items purchased by the manufacturing
17 divisions are in the raw materials category and the controls therefore
18 are of a different nature than those used by PWR-SD. However, the
19 principles of evaluation, selection, auditing, and documentation
20 of quality are applied by all the NES Divisions.
21

22 Westinghouse policies and procedures for procurement control follow
23 the guidance of ANSI N45.2.13 (Draft 2, Revision 4, April 1974),
24 Supplementary Quality Assurance Requirements for Control of Procure-
25 ment of Equipment, Materials and Services for Nuclear Power Plants,
26 for safety-related equipment. The procurement control methods Westing-
27 house uses, as applied to each tier of supply, are described throughout
28 this section. These methods include such activities as: supplier
29 evaluation and selection, insertion of appropriate quality assurance
30 requirements into purchase orders, and source surveillance.
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3 NES furnishes for each component at the construction site a
4 copy of the purchase order, including changes, the design specification,
5 and a quality release. These documents certify component quality
6 and satisfy regulatory requirements pertaining to site documentation.

7
8 The quality release is a NES certification document which contains:

- 9
10 1. The purchase order number and specific identification of
11 the procured material.
12
13 2. Certification that the equipment meets all requirements
14 of the purchase order, drawings and specifications. Identification
15 of those procurement requirements which have not been met,
16 with notation of approved deviation notices. In addition,
17 contingent conditions, that is, conditions that are to
18 be corrected by the supplier, are identified and correction
19 is documented by a certification by the supplier. The
20 supplier's certification describes the action taken, is
21 signed by a responsible member of the supplier's organization
22 and is attached to the quality release. Requirements which
23 have been deferred, that is, to be accomplished at the | 7
24 site, are clearly stated.
25
26 3. The authorizing signature on a quality release is that of
27 a NES Quality Assurance representative, or in specifically
28 authorized situations, a member of the supplier's quality
29 organization.
30

31 Each NES division has a documented procedure which describes
32 the requirements for completing, authorizing, issuing, distributing
33 and revising quality releases. Periodically, PWR-SD audits
34 site releases from all NES divisions. These audits are performed
35 in accordance with a written checklist. Audit reports are distributed
36 to cognizant management for correction of deficiencies.
37
38

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3 17.1.7.1 PWR Systems Division
4

5 Prior to considering a new supplier for placement of a purchase
6 order, a supplier survey is conducted in accordance with a written
7 checklist by a team consisting of personnel from Purchasing, Engineering,
8 and Product Assurance. Other personnel such as material and process
9 engineers and manufacturing engineers participate as required.
10 The results are documented in a report issued to cognizant management
11 personnel. The survey and evaluation considerations include all
12 elements of the AEC's Quality Assurance Criteria to the extent
13 these criteria are applicable to the equipment being procured.
14 Actions to correct deficiencies in the supplier's organization
15 or systems are resolved with the supplier's management prior to
16 placing a purchase order. If an existing supplier does not maintain
17 the required quality level on PWR-SD orders, a similar team will
18 review the supplier's problems and make recommendations to his
19 management to correct the situation. When problems arise, Westinghouse
20 specialists aid the supplier in specific areas such as welding,
21 manufacturing and nondestructive examination to resolve the problem.
22 In this manner, Westinghouse assures the continued high level of
23 supplier performance necessary to obtain the quality level required
24 by the contract.
25

26 Requirements to be fulfilled by the supplier are detailed in the
27 procurement document which includes an appropriate Quality Control
28 Systems Requirement, such as QCS-1. This document details aspects
29 of supplier inspection reports, provisions for inspection equipment
30 calibration prior to use, and provision for comprehensive inspection
31 after component repair.
32

33 PWR-SD surveillance of suppliers during fabrication, inspection,
34 testing and shipment of components is planned in advance and performed
35 in accordance with written quality plans. These plans are prepared
36
37

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2
3 by Quality Assurance engineers and are based on the technical require-
4 ments of the purchase order. The plans are reviewed and approved
5 by Quality Assurance Management.

6
7 The purpose of a quality plan is to provide planned guidance to
8 the Quality Assurance field representative by (1) identifying those
9 characteristics which are most important to quality and reliability,
10 (2) providing specific instructions for the witnessing, documentation,
11 and acceptance of the equipment, and, (3) providing a summary of
12 quality releases issued for the specific purchase order. The
13 plan identifies those supplier documents requiring approval and
14 the points during manufacturing and test that Quality Assurance
15 intends to witness. Special emphasis is placed on the aspects
16 of manufacture and inspection that most directly affect performance
17 of the equipment. Lead units of a new design get particular attention
18 in the supplier's shop by both Product Assurance and Engineering
19 representatives. | 6

20
21 When planning the surveillance activities, Quality Assurance develops
22 a visit schedule. Visits are more frequent during the initial
23 stages of manufacture, particularly to a new supplier, with frequency
24 diminishing as the supplier demonstrates his capability. The purpose
25 of PWR-SD surveillance of suppliers is to provide Westinghouse
26 management first-hand objective assurance of compliance with specified
27 requirements. The principle followed is that the supplier is
28 responsible for inspecting and testing his product. The PWR-
29 SD field representative assures that the supplier has done this,
30 through review of supplier quality assurance activities, including
31 audits of records and witnessing of key events. | 6

32
33 The frequency and scope of surveillance varies with degree of
34 importance of equipment, supplier performance, complexity of the
35
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3 component, and other factors. This determination is made by Quality
4 Assurance in conjunction with engineering. Quality Assurance residents
5 are established as necessary.

6
7 Surveillance is accomplished in accordance with the Quality Plans
8 described above. During the surveillance visits, the field representative
9 sees that written instructions and procedures exist and are kept
10 current, that corrective action is implemented, and that other
11 necessary controls are effective. He performs systems auditing
12 functions in addition to reviewing product, processes and records
13 according to the quality plan. The Quality Assurance representative
14 informs, in writing, the supplier directly of problems he discovers
15 and obtains commitments to correct them. He brings these problems
16 to the attention of the supplier's management as required to obtain
17 resolution. PWR-SD management is made aware of the surveillance
18 activities, including supplier performance and problem areas,
19 by means of the trip report issued by the Quality Assurance representative
20 for each visit to a vendor.

21
22 Periodically, as the need is determined, re-audit of certain suppliers
23 is performed by Product Assurance; the re-audit is directed at
24 the supplier's total quality assurance system or to specific aspects
25 where the supplier's performance indicates need for follow-up
26 review to secure improvement.

27
28 When the Quality Assurance representative is satisfied that the
29 equipment can be released for shipment, he prepares a quality release
30 form, and distributes copies to the supplier and cognizant personnel
31 within PWR-SD. The equipment can then be released through normal
32 engineering-purchasing channels for shipment. The supplier forwards
33 the quality release with the equipment to the plant site.

1
2
3 PWR-SD has no direct responsibility for receipt inspection of equipment
4 at the site. The applicant or his designated representative establishes
5 the site receiving activities. PWR-SD provides recommendations
6 to the applicant for handling and storage of equipment and the
7 documentation as described in Section 17.1.7 to assure quality.
8

9 In some instances the supplier is authorized by PWR-SD to prepare
10 a supplier quality release. This authorization is given only to
11 those suppliers who have, over a period of time, demonstrated an
12 effective quality system. PWR-SD Product Assurance personnel
13 periodically audit the supplier's system to assure continued performance.
14

15 17.1.7.2 Electro-Mechanical Division 16

17 Prior to the award of purchase orders, Quality Assurance performs
18 a survey to evaluate and approve procurement sources for purchased
19 material or services covered by the Quality Program.
20

21 Based upon the type of component to be manufactured, the vendor
22 may be required to submit process outlines and procedures (covering
23 non-destructive examination, manufacturing and/or inspection)
24 to EMD for either information or approval prior to manufacture.
25 Such submittals when specified, are reviewed by cognizant engineering
26 personnel to assure adequate material control and conformance to
27 drawing, specification and purchase order requirements. In addition,
28 EMD maintains a comprehensive supplier surveillance program. Suppliers
29 are visited on a scheduled basis and audit reports formulated,
30 evaluated and maintained on file for future reference. On complex
31 purchased items, a Quality Assurance Engineering field representative
32 may visit the supplier's facility to witness non-destructive or
33 destructive examination or to perform verification of dimensional
34 inspection. As required by applicable purchase orders, Quality
35 Assurance Engineering releases material for shipment. The
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3 Quality Assurance Engineering field representative, after acceptance, 16
4 documents the results of source inspections and releases by means
5 of the Quality Control Release. This release along with other
6 specified supplier documentation accompanies shipments of material
7 to EMD receiving Inspection.
8

9 Upon the receipt of supplier furnished material, certified reports
10 and related documents are reviewed and components inspected by
11 receiving inspection for compliance to the purchase order and related
12 ordering data in accordance with instructions prepared and issued
13 by Quality Assurance Engineering. After acceptance, the received 16
14 material is forwarded to controlled stores or released directly
15 to manufacturing. Non-conforming material is identified and held
16 in quarantine until proper disposition is made.
17

18 17.1.7.3 Tampa Division
19

20 Established controls assure that all purchased materials conform
21 to purchase order requirements, including material and drawing
22 specifications. It is Tampa Division's policy to formally release
23 to the Manufacturing Department all materials and parts that are
24 to be used in NSSS equipment.
25

26 A Tampa Division team consisting of two or more selected personnel
27 audits a new supplier's operation to determine acceptability as
28 a supplier. For pressure boundary or safety related components,
29 this supplier survey is conducted prior to procurement. The auditors
30 are selected from the Quality Assurance, Metallurgy, Purchasing, or 16
31 Manufacturing Departments. The Quality Assurance Department conducts
32 surveillance inspections and audits as necessary to assure acceptable
33 quality products.
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3 Source inspection is performed on pressure boundary material, 16
4 plates, forgings, castings and tubes. Prior to shipment the Tampa
5 quality representative will inspect, complete a source inspection
6 form and identify the material with the assigned test number and
7 purchase order number.
8

9 A copy of the purchase order's applicable specifications, drawings
10 and prior source inspection data is furnished to the receiving
11 inspection section. Inspection of incoming material, not subject
12 to source quality assurance, but requiring in-house inspection,
13 is accomplished by Quality Assurance.
14

15 17.1.7.4 Pensacola Division
16

17 The approved supplier's list is central to the control of procurement
18 at Pensacola Division. Orders are placed only with listed firms
19 who have specific capabilities required.
20

21 New suppliers are evaluated at their facility (utilizing formal
22 audit checklists) prior to placement on the approved supplier list.
23 Continued surveillance of suppliers already listed is maintained
24 through monitoring of Receiving Inspection rejection rates, source
25 surveillance by Quality Assurance Engineering and re-appraisal
26 of supplier. Suppliers who fail to perform adequately are removed
27 from the approved list.
28

29 Upon receipt of supplier furnished material the following Quality
30 Assurance actions are initiated:
31

- 32 1. Verification that all certified test reports, letters of compliance,
33 dimensional data, welding records, heat-treat charts, etc.
34 required by the purchase order have been supplied by the
35 vendor and are complete and correct.
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2. Inspection of the product or material to determine acceptability according to instructions issued by the cognizant quality engineer.
3. If the product is accepted and released by Quality Assurance, the material, component, or assembly is forwarded to a controlled storage area to await future use, or is released directly to Manufacturing.
4. If the product is rejected, the defective product is held in a controlled area until proper evaluation and disposition is made.

Supplier submittals for repeat orders are controlled through a computer facilitated approved supplier listing. The system provides a current status of which supplier procedure, such as welding, NDE, identification, etc., is acceptable for use on specific parts.

All actions relevant to procurement are controlled by detailed written procedures and subject to audit at regular intervals.

17.1.7.5 Specialty Metals Division

Subcontractors are limited to those which have demonstrated their capabilities. They are formally evaluated and selected on the basis of the capability of their quality system and quality of raw material. Incoming lots from vendors are checked chemically and by sampling techniques to verify supplier test reports and certifications. Quality Control and Inspection maintains records of the quality performance of each supplier. These records are maintained to rate suppliers as to their performance and to aid in developing and improving the suppliers' quality program.

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3 Annually, Quality Control and Inspection personnel make surveillance
4 visits to raw material suppliers to assure continuous quality of
5 purchased material and to assure that objective evidence of quality
6 is maintained. Information obtained through these visits provides
7 data for determining the continuous acceptability of a supplier.
8

9 17.1.8 IDENTIFICATION AND CONTROL OF MATERIAL, PARTS AND COMPONENTS
10

11 Within each of the NES Divisions procedures exist establishing measures
12 which assure that identification and traceability of items is maintained
13 during the production of components and through delivery to the nuclear
14 power plant site.
15

16 17.1.8.1 PWR Systems Division
17

18 Systematic use of Standard Plant Item Numbers (SPIN) nomenclature in
19 design descriptions and procurement actions provides consistency and
20 order in component identification, and compatibility with associated
21 documentation.
22

23 Requirements for identification of NSSS safety-related equipment are
24 contained within the equipment specifications.
25

26 QCS-1 and the Administrative Specification contain requirements that
27 a supplier have measures to maintain identification and control of
28 material, parts and components. These include consideration of proper
29 location of identification markings on the part, choice of a location
30 to avoid effects on part function or quality, measures for verification
31 of identity prior to release, and records traceability from part identifi-
32 cation. The procedures used to establish these measures and the application
33 of the procedures are reviewed for adequacy during supplier selection
34 and monitored for compliance during the surveillance activities.
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3 17.1.8.2 Electro-Mechanical Division
4

5 To assure that unacceptable items are not used, identification
6 is placed on material at the supplier's plant or at EMD dependent
7 upon part end use and processing. This identification remains with
8 the material throughout subsequent manufacturing operations as a
9 control number enabling traceability to the supplier's heat, slab
10 or lot, and test data.
11

12 Serialization requirements are determined during the initial planning
13 stages and fall into the following general categories:
14

- 15 1. Specification, contract, material and equipment requirements.
 - 16 2. Critical components.
 - 17 3. Non-destructive examination control.
 - 18 4. Manufacturing control.
- 19

20 The minimum level of identification is shown on the detail, sub-
21 assembly or assembly drawing, including marking location and method,
22 and takes into consideration that the location and method do not
23 affect function or quality. This identification is also reflected
24 in the manufacturing routing. Sequential serial numbers are issued
25 by the Production Department and assurance against repetition is
26 maintained through serialization log books. Serial numbers are
27 pre-assigned to certain purchased items and included as part of
28 the purchase order requirements.
29

30 Heat identity is maintained through all operations when required
31 by contract, material, equipment or code specifications. This
32 identity is maintained by transfer of the heat number from operation
33 to operation and/or by appropriate documentation through the use
34 of sequential serial numbering and serial number log books.
35

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3 17.1.8.3 Tampa Division
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5 A test number system is used as positive and permanent identification
6 of materials and items purchased. The number identifies the supplier's
7 heat, slab or lot number and the physical and the chemical property
8 records. In instances of multipiece orders, sub numbers are utilized
9 in the event a common melt was used for all items. One major
10 exception is the tube bundle material. In this application, the
11 heat number is used and recorded for each specified tube location
12 in the bundle from definite orientation reference points.
13

14 The test numbers consist of a letter and a five digit number that
15 is assigned and affixed or stamped on each piece of material,
16 component, assembly, or set of materials and parts which are for
17 use in the manufactured product. The test number is also recorded
18 as a permanent record in the inspection point program.
19

20 Nonconforming material and parts are properly identified until
21 the action prescribed by Error Appraisal Notice has been accomplished.
22 Materials that require additional tests are tagged and held until
23 tests have been accomplished and results evaluated.
24

25 17.1.8.4 Pensacola Division
26

27 A seven digit heat code/serial number is the basic mechanism utilized
28 at Pensacola Division for traceability to mill heat, inspection,
29 NDE, and discrepancy documentation on core support structural items.
30 This unique alpha-numeric designation is applied at Receiving Inspection 6
31 and continued throughout manufacture. Thus, at any processing
32 point, the complete history of a specific core support structure
33 can be traced.
34
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3 A three digit serial number, utilized for internal structure items,
4 provides traceability to internal documentation when considered
5 in conjunction with the complete part number involved.

6
7 In each sub-assembly or assembly routing one component part is
8 designated the "identifying" part for the assembly and its identification 6
9 number becomes the assembly identification number. Inspection
10 inputs component part identification numbers (along with drawing
11 and item numbers) for each assembly into a computer system which
12 furnishes a complete parts breakdown for each final reactor assembly.

13
14 17.1.8.5 Specialty Metals Division

15
16 Permanent identification and marking methods are used for control
17 of materials throughout the manufacturing area. An identifying
18 number is applied or attached to the material as it enters the
19 plant by the receiving inspector. This number is modified as the
20 material is processed; however, the basic number is used for identi-
21 fication in both processing and storing of the material. When
22 a shipment is received, the receiving checker identifies the material
23 and notifies the receiving inspector. After inspection the receiving
24 report is stamped according to the determined disposition (accept,
25 reject, repair). Traceability to heat number is maintained.

26
27 17.1.9 CONTROL OF SPECIAL PROCESSES

28
29 All NES Divisions have established measures and procedures which
30 maintain control over special processes. These means include
31 the qualification of processes and personnel for welding and inspection
32 in accordance with ASME requirements, nondestructive inspection
33 per SNT-TC-1A standards, and other processes as may be necessary
34 for adequate control. Qualification records files are maintained
35 and are reviewed periodically for currency. 6

Special processes, such as welding, casting, nondestructive examination, electrochemical machining, explosive forming, cleaning and painting are prescribed by means of documented procedures. For example, paint applications are detailed in documents known as process specifications. These specifications, similar to the equipment specifications discussed in 17.1.3, are process oriented, containing requirements such as; scope of paint application, selection of paint, surface preparation and condition, method of application, curing, repair of coating, methods of removal, etc. Quality provisions provide for monitoring the process, criteria for visual examination, and checks of paint characteristics such as adhesion, flexibility and thickness.

17.1-56

Revision 7

November, 1974

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3 17.1.9.1 PWR Systems Division
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5 PWR-SD personnel are qualified in accordance with a non-destructive
6 testing certification program which conforms to SNT-TC-1A. Active
7 files are kept of qualified personnel, and are periodically reviewed
8 for currency. 6
9

10 QCS-1 and the Administrative Specification contain requirements
11 that a supplier have measures for control of special processes.
12 The procedures used to implement these measures are reviewed
13 for adequacy and for inclusion of a recorded verification of 6
14 proper performance on check lists, travelers, or equivalent
15 records. In addition, equipment specifications or purchase
16 orders identify specific processes and personnel qualifications
17 which require PWR-SD review and/or approval. Special process
18 procedures and personnel qualifications are required to be maintained 6
19 under the document control and records retention systems.
20

21 The Quality Assurance surveillance representative monitors the
22 supplier's activities to ensure that all special processes are
23 performed properly by qualified personnel using appropriately 6
24 qualified equipment and approved procedures.
25

26 17.1.9.2 Electro-Mechanical Division
27

28 Recognizing the need to control special processes, EMD has established
29 departmental responsibilities for developing, reviewing, implementing
30 and controlling special processes, including the requirements
31 for associated personnel qualifications. Special processes,
32 including welding, heat treatment, and nondestructive examination
33 procedures are reviewed by Quality Assurance Engineering to assure 16
34 compliance to applicable codes, standards, specifications and criteria.
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3 Welder procedure qualification is conducted in accordance with
4 the ASME Boiler and Pressure Vessel Code Section IX. In addition,
5 the welding process includes a program of weld electrode control.
6 Manufacturing penetrant operators (Level I) and quality control
7 nondestructive examination inspectors (Level II) are qualified
8 to SNT-TC-1A standards. Heat treatment processes are controlled
9 through EMD's calibration program. Special process procedures
10 and credentials of qualified personnel are maintained under document
11 control and records keeping systems.
12

13 17.1.9.3 Tampa Division
14

15 Definite departmental responsibilities are established to identify
16 the need for, document, and review special process procedures,
17 as well as any associated personnel qualifications. The Metallurgical
18 Department writes all welding and associated procedures including
19 pre-heat and heat treatment. The Quality Assurance Department
20 writes all nondestructive examination specifications such as radiography,
21 ultrasonics, magnetic particle and liquid penetrant. These process
22 specifications are in accordance with the applicable codes, ASME
23 Sections III and IX. Each process specifically defines the
24 personnel qualification required by the applicable code. Welding
25 qualification procedures and the required documentation are in
26 accordance with the applicable code requirement. All process
27 documents are subject to the controls and reviews noted in Section
28 17.1.6.
29

30 Lists of welders to ASME Section IX qualified and nondestructive
31 examination personnel qualified to SNT-TC-1A are issued to departmental
32 supervisors and the quality assurance technicians; welding records
33 and nondestructive examination reports indicate the individual
34 that performed the welding and the technician that performed
35 the nondestructive examination. Credentials of qualified personnel
36 are maintained under the records program described in 17.1.17.3.
37

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3 17.1.9.4 Pensacola Division
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5 The Quality Assurance Department, in conjunction with the Engineering | 7
6 Department, identifies, defines and establishes special processes and
7 process controls. Advance quality planning includes identification
8 of the need for qualification programs for special processes,
9 equipment and personnel. Prior to issuing manufacturing information
10 for the processing of the product, all such documents are forwarded
11 to Quality Assurance Engineering for review. This information
12 includes all drawings, specifications, routings and other documents
13 directly involved in processing the products.
14

15 Review of these documents by Quality Assurance Engineering consists
16 of verification that special tooling, fixturing or gaging used
17 to determine product quality is indicated at the correct operation/sequence
18 and verification that special testing together with acceptance
19 criteria is in compliance with ordering information.
20

21 Upon completion of this review and determination that the required
22 information is complete, correct and adequate, Quality Assurance
23 Engineering completes the document by adding the following: inspection
24 operations to the routing at the applicable phase in processing,
25 inspection methods and procedures, inspection forms to be completed,
26 and, sampling plans to be applied, if applicable. Special emphasis
27 is focused on control of heat-treating and welding processes. Qualif-
28 ication of personnel, conformance of process to applicable requirements,
29 and records of process data are constantly evaluated. Special
30 process procedures and qualification records of personnel are maintained
31 under document control and records retention programs.
32

33 17.1.9.5 Specialty Metals Division
34

35 Responsibilities have been established to assure that special processes,
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3 such as heat treatment, pickling, cleaning, etc. are specified and
4 defined in manufacturing specifications. Procedure responsibilities,
5 controls and qualifications, as necessary, are outlined in the
6 documents. Inspectors are used by Quality Control & Inspection for
7 for maintaining a uniform quality level, to control manufacturing
8 processes and for overall product quality assurance. Several
9 techniques of nondestructive examination are used by Quality Control
10 and Inspection which are required by customer specifications. These
11 are: ultrasonic inspection, eddy current inspection, and liquid
12 penetrant inspection. Special process specifications and credentials
13 of personnel qualifications are maintained under document control
14 and records retention programs.
15

16 17.1.10 INSPECTION 17

18 Each NES Division, in order to insure that attributes affecting
19 quality are controlled, has established measures and procedures
20 by which inspections are performed. As noted earlier, adequate
21 independence exists between inspection groups and manufacturing
22 functions to allow effective, overall controlled conditions.
23

24 Physical examinations, measurements, and tests are conducted,
25 as appropriate, to demonstrate product quality. Various job positions
26 within the quality organizations are detailed by written "Position
27 Descriptions" to assure that qualified personnel, with specialized
28 training as necessary, are utilized in the inspection and quality
29 assurance function.
30

31 17.1.10.1 PWR Systems Division 32

33 Since PWR-SD does not manufacture anything directly, emphasis
34 is placed on: providing correct and complete requirements to
35 suppliers, supplier performance, and surveillance of supplier systems
36 and product.
37

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3 The principle followed is that the supplier is responsible for inspecting
4 his product and PWR Quality Assurance personnel verify his controls
5 to assure the adequacy of inspection. As such, inspection at
6 PWR is more appropriately described as supplier surveillance.
7 Details of the PWR surveillance program are contained in the
8 description of "Control of Purchased Material, Equipment and
9 Services", Section 17.1.7.
10

11 Instructions to suppliers require that the suppliers' inspection
12 procedures provide: an identification of the quality characteristics
13 inspected; inspection planning to provide adequate control, including
14 process monitoring, over characteristics where later direct inspection
15 alone would be disadvantageous; an identification of the group res-
16 ponsible for performing the inspection operation; acceptance
17 criteria; a description of the inspection method; provision for
18 documenting the inspection; results; and disposition. Instructions,
19 specifications and drawings are to be available for inspector
20 use, and inspection equipment is to be within calibration prior
21 to performance of the inspection. Also, the supplier's inspection
22 plan is required to recognize those inspection notification points
23 specified by procurement order, for witness by Buyer (or other
24 concerned parties).
25

26 Suppliers instructions require that inspection of repairs or
27 rework made after initial inspection be performed in accordance
28 with original design and inspection requirements or approved
29 acceptable alternatives.
30

31 17.1.10.2 Electro-Mechanical Division
32

33 The quality program provides for assurance that all fabrication,
34 welding, machining and other operations are performed under controlled
35 conditions. Features include verification of documented work
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3 instructions (routings), preparation of procedures for monitoring
4 product quality (Inspection Point Program) and the physical examination
5 and testing at significant points during the manufacturing cycle,
6 including those involved where inspection at a later stage in pro- 6
7 cessing is not feasible or advantageous. Criteria for approval or
8 rejection is established by Quality Assurance Engineering in
9 accordance with engineering drawings and specifications.

10
11 In-process, final inspection, and test operations are incorporated
12 into manufacturing routings, which are approved and signed by
13 Quality Assurance Engineering in accordance with internal requirements.
14 Need for special inspection tools, fixtures and gages, inclusion
15 of all inspections, and adequacy and completeness of the routing
16 information are considered by Quality Assurance Engineering during 6
17 their review.

18
19 Before an in-process or final inspection operation is performed,
20 reference is made to appropriate document control lists to assure
21 the use of proper revisions of drawings, specifications, and
22 procedures. Measuring and testing equipment is checked before
23 use to assure proper inspection and calibration status by making
24 reference to the calibration sticker. After a manufacturing
25 sequence is inspected, the acceptance of the operation is recorded
26 by inspection on the Inspection Control Card, prior to proceeding
27 to the next operation. Each inspector verifies that all prior
28 operations are listed and signed off on the Inspection Control
29 Card. Upon performing all inspection operations as required
30 by the manufacturing routing or other approved internal instruction,
31 inspection is responsible for documenting the inspection utilizing
32 inspection forms, checklists, suitable log book, etc. Prior
33 to functional testing or to shipment of completed parts or components,
34 suitable releases are obtained, as required, from the Quality
35 Control Records center. 6
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3 Nonconforming conditions noted during inspections are documented
4 and processed in accordance with documented procedures. When
5 appropriate, sampling inspection by attributes and/or variables
6 is used. Normally, government sampling references are employed.
7 However, sampling plans may be developed from recognized texts
8 and techniques to suit EMD needs. The sampling and quality level
9 are based on the function of the component and/or characteristics.
10 Records of sampling inspection are maintained on appropriate
11 documentation and filed in the Quality Control Records center |6
12 or in the receiving inspection area per internal instructions.
13

14 17.1.10.3 Tampa Division
15

16 To provide process and product verification, detailed Inspection
17 Point Programs are generated for each manufactured unit. The
18 Inspection Point Program parallels the manufacturing operation
19 sequence that is prepared by the Industrial Engineering Section of |6
20 Manufacturing and approved by the Quality Assurance Department.
21 The Quality Assurance engineer reviews the operational line-
22 up for compliance with ASME Code Section III, drawings and applicable
23 Westinghouse specifications. The pertinent inspection points
24 are inserted by the Quality Assurance engineer, who applies inspec- |6
25 tions at the last accessible, advantageous stage in process, and
26 includes appropriate notification and hold points for witnessing
27 by purchaser and authorized code inspector, respectively.
28

29 These points specify the type of inspection, applicable nondestructive
30 examination, data to be recorded and charts or forms to be completed
31 for documentation of inspection operations. As discussed in
32 Section 17.1.3.3, the need for special inspection tools, fixtures
33 and gages is determined during Quality Assurance reviews prior |6
34 to releasing drawings for manufacture or purchase.
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3 The Inspection Point Programs are distributed to the Quality Control
4 technician of the Quality Assurance section in the applicable manu-
5 facturing areas for the specific component. The Quality Control
6 technician initials or stamps the inspection points upon completion
7 of inspection, signifying acceptance. The inspector's name and
8 SNT-TC-IA rating is shown on all non-destructive examination reports.
9 All operations within a manufacturing section are detailed and
10 accepted on the Inspection Point Program which serves as the
11 inspection checklist. Quality Control technicians verify the
12 completeness of the Inspection Point Program to assure that all
13 operations are complete within the section. Any deviation from the
14 specified routing between manufacturing groups requires documentation
15 and Quality Assurance concurrence. The program and its applicable
16 data forms, charts, and logs become a permanent quality control
17 record to provide objective evidence of the inspection operations.

18
19 The programs are audited by Quality Assurance personnel, customer
20 representatives and the authorized Code Inspector. Specific
21 mandatory notification points which require witnessing or inspection
22 by the customer representative are established and are so designated
23 in appropriate documents.

24
25 17.1.10.4 Pensacola Division

26
27 The Quality Assurance Department maintains inspection planning
28 to obtain assurance of the following points:

- 29
30 1. Inspection instructions are clear, concise, and adequately
31 definitive.
32
33 2. Inspection operations are referenced and applied at the
34 most effective and advantageous points in the process to
35 monitor product quality, including considerations to avoid
36 disadvantageous inspection.

3. Relatively complex inspection procedures are reviewed with inspection supervisors for concurrence with the information reflected.
4. Inspection methods requiring training of personnel are issued prior to production and a training program initiated on a timely basis so that personnel involved will be qualified for production inspection processing.
5. Special tooling, fixturing, and gaging equipment required for product quality evaluation are designed, built, evaluated and released for inspection for inspection use.
6. All documentation formats which will report inspection results are prepared and issued.

Required inspections and tests are displayed by the shop routing and inspection instructions referenced. Within Pensacola Division the movement of hardware from cost center to cost center is controlled by means of a routing document. This document is a brief description of the fabrication sequence including inspection operations which are distributed throughout the manufacturing cycles at those points which will verify the quality of the product. It is related to a particular engineering release to manufacturing. Each operation must be signed-off prior to proceeding to the next operation. Documentation is evaluated by Quality Assurance Records of the Inspection Department to assure that all operations, inspections and tests have been performed and are acceptable. Objective evidence of the inspection performed is documented on non-destructive examination reports and detailed dimensional inspection reports. After manufacture and inspection, the components/assembly must be released by the Inspection Department before utilization on next assembly.

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3 17.1.10.5 Specialty Metals Division
4

5 Quality Control and Inspection provides assurance that processing
6 capability requirements are being met by observation and evaluation
7 of operator's adherence to manufacturing instructions, written
8 procedures, and other control documents. In-process inspection
9 inspects the product at designated, advantageous, stages of manufacture
10 (including first piece and patrol where appropriate) to assure
11 compliance with the intermediate and final product specifications.
12

13 Procedures for inspection points are preplanned and are prepared
14 by the Quality Control Engineer in the form of Quality Control
15 Specifications. The need for special inspection tools, fixtures,
16 and gages is considered by both Quality Control and Inspection
17 and Manufacturing Engineering during the development and review
18 of these instructions. These specifications indicate the inspections
19 to be performed during the process so that it can be determined
20 that the product has met specifications. These are reviewed
21 prior to issue by Manufacturing Engineering. Results of inspections
22 are posted on the designated quality form by the inspector. As
23 final inspection operations are completed, the inspector initials
24 the follow card.
25

26 17.1.11 TEST CONTROL
27

28 Means are established at each of the NES Divisions to control
29 testing. These measures provide for the development of procedures,
30 a means of assessing adequacy of the tested items, and designation
31 of the responsibility for performing the various phases of the
32 testing activities.
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3 17.1.11.1 PWR Systems Division
4

5 QCS-1 imposes test control requirements on suppliers. It requires
6 the supplier to make provision for:
7

- 8 1. Instructions for testing method, and test equipment instrumenta-
9 tion.
10
11 2. Test prerequisites which include, but are not limited to, the
12 following:
13
14 a. Calibrated instrumentation.
15
16 b. Adequate and appropriate equipment.
17
18 c. Trained, qualified, and as appropriate, licensed and/or
19 certified personnel.
20
21 d. Preparation, condition, and completeness of the item to
22 be tested.
23
24 e. Suitable and, if required, controlled environmental
25 conditions.
26
27 f. Acceptance and rejection criteria.
28
29 g. Methods of documenting or recording test data results.
30

31 Recognition of mandatory inspection notification and hold points,
32 where applicable, for witness by Buyer or other interested parties,
33 as defined in the procurement order are incorporated either in the
34 suppliers' inspection plan or in the test procedure.
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3 Suppliers' test procedures are submitted for PWR-SD review and
4 approval. Tests are conducted by groups within the supplier
5 organization considered acceptable during supplier selection,
6 and test control systems are audited during Quality Assurance
7 surveillance. Also, records of tests are reviewed for acceptability
8 during surveillance, and this review includes consideration of
9 the qualifications of the supplier group who makes acceptance
10 disposition of test results.

11
12 17.1.11.2 Electro-Mechanical Division
13

14 In order to assure that all testing programs are conducted under
15 adequately controlled conditions, test engineers of the Works
16 Engineering and Test Control section, in conjunction with design
17 engineers of the same section, prepare test specifications, including
18 the associated acceptance criteria. The test engineers are responsible
19 for the design and procurement of all test facilities, tooling
20 and instrumentation, including the placement of applicable instrumentation
21 on a formal calibration control program.
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3 Personnel assigned to perform testing operations are trained and
4 qualified under a closely supervised program, with specific qualifica-
5 tions and responsibilities identified by position description.

6
7 Detailed test instructions are provided for in the form of drawings
8 supporting test procedures and routings into which mandatory owner,
9 contractor, and Authorized Inspector notification/witness points
10 have been incorporated by Quality Assurance Engineering as part of
11 their review function.

12
13 Initial application of new test instructions are jointly performed
14 by test engineers and the tester to insure their feasibility and
15 adequacy. Prior to initiation of the testing operation processing
16 information is reviewed to confirm that the subject item is complete
17 and in condition for testing. In addition, environmental conditions
18 are also confirmed as satisfactory for the test.

19
20 Test results are documented by the use of formal reporting forms
21 validated by the tester and test engineer, and evaluated by the
22 cognizant design engineer.

23
24 As evidence of acceptability a formal test release is issued,
25 signed and approved by the tester, test engineer and design
26 engineer and forwarded to the Quality Assurance Department.

27
28 17.1.11.3 Tampa Division

29
30 The Quality program provides for assurance that tests are performed
31 according to written procedures and under suitable controlled conditions.
32 Procedures contain instructions for the testing method and include
33 requirements for test equipment instrumentation and its calibration,
34 adequate and appropriate test equipment, trained and qualified personnel,
35 proper preparation and condition of the item to be tested, appropriate
36

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3 notification/witness points, and methods of documenting test
4 data results. Definitive acceptance criteria are established
5 by Quality Assurance, so that acceptance status can be clearly
6 shown at the completion of each test. Any nonconformance with
7 the established acceptance criteria is reviewed by Quality Assurance.
8

9 17.1.11.4 Pensacola Division

10
11 Testing performed at Pensacola Division is limited at present to
12 hydrostatic testing of a subassembly. Testing is performed by
13 qualified personnel at a predetermined point described on process
14 route sheets, using a detailed test procedure. The test procedure
15 requirements include: Use of calibrated instrumentation; adequate
16 equipment and controlled environmental conditions; inspection
17 notification/hold points for witness by purchaser and authorized
18 code inspector, respectively; and definitive acceptance criteria
19 to clearly establish acceptance status at test completion. Test
20 equipment is calibrated at regular intervals.
21

22 Test results are documented by the test technician and objective
23 evidence forwarded to the records section for retention.
24

6

25 17.1.11.5 Specialty Metals Division

26
27 One test is applied to product at SMD. For this test, which
28 is an automatic go/no-go test performed by the Manufacturing
29 Group, on-the-job training is utilized. No additional special
30 training is necessary. A documented test procedure is written
31 by Manufacturing Engineering and approved by Quality Control
32 and Inspection. The procedure includes requirements for: use
33 of calibrated instrumentation, audited as part of the regular
34 Quality Control and Inspection gage calibration program; testing
35 at a proper stage of product completion, under proper conditions;
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provision for applying the test, as required, to all products with clear go/no-go acceptance criteria, and provision for marking and isolation of any defectives. Notification points for witnessing are not applicable since a continuous process is utilized.

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3 17.1.12 CONTROL OF MEASURING AND TEST EQUIPMENT
4

5 The NES Divisions each maintain a means of controlling measuring
6 and test equipment. Each Division has developed and maintains
7 a separate basis for its own program considering such attributes
8 as; inherent stability of their equipment, purpose or use, desired
9 accuracy, and degree of usage. All measuring and test equipment
10 used for the acceptance and verification of product quality are
11 maintained under control systems, which identify the status of
12 all items of measuring and test equipment. Such specifications
13 as Mil-C-45662 and handbook Mil-HDBK-52 serve as a basis and
14 provide guidance in the determination of an effective program
15 for the control of test and measuring equipment. Typical of
16 this equipment are micrometers, plug gages, height gages, dial
17 verniers, voltmeters, temperature recorders, pressure gages,
18 hardness testers, etc. Documented procedures detail the requirements
19 for the calibration of measuring and test equipment and the
20 use of appropriately traceable measurement standards.
21

22 17.1.12.1 PWR Systems Division
23

24 The requirement for a supplier to maintain a system for calibration
25 of all examination, measuring and test equipment is contained
26 both in the Administrative Specification and QCS-1. All measuring
27 and test equipment must be uniquely identified and all calibration
28 must be traceable to national standards. An investigation will
29 be conducted and documented to determine the validity of previous
30 inspections performed when measuring and test equipment is found
31 to be out of calibration. PWR-SD verifies the acceptability
32 of the system during the supplier selection and monitors for
33 compliance during the surveillance activities.
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3 17.1.12.2 Electro-Mechanical Division
4

5 EMD under the direction of the Quality Assurance Department,
6 maintains an extensive tool and gage control program utilizing
7 electronic data processing. All tools and gages used in the
8 manufacture and inspection of completed products are inspected
9 and calibrated in accordance with established procedure. Control
10 of the use of measuring and test equipment is maintained by the
11 tool crib approach where equipment is logged out to individuals
12 or assigned to specific areas. The program requires that any
13 equipment which becomes damaged or out of calibration shall be
14 forwarded for repair or recalibration, as required. Under this
15 program, precision tools and gages are inspected and calibrated
16 at specified intervals based on their stability, purpose and
17 degree of usage. All tool and gage inspection and calibration
18 is performed in a controlled environment. Calibration stickers
19 are affixed to all equipment, excluding personal tools, which
20 have been found acceptable under the program. Personal tools
21 are identified by name with the calibration status maintained
22 by the gage inspector. Reference standards used are certified
23 and traceable to the National Bureau of Standards.
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3 17.1.12.3 Tampa Division
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5 Formalized procedures defining calibration frequency and maintenance
6 of gages and test equipment used for inspections are in effect
7 and implemented by the Quality Assurance Department. Quality control
8 tools and gages are identified by Quality control serial numbers
9 color coded to indicate calibration status, and controlled by a tool
10 crib-card index system. Established calibration schedules for each
11 type of tool or gage used for inspection purposes are used. Frequency
12 of calibration is based on engineering judgement and verified by Quality
13 Assurance review of calibration records. Damaged or inaccurate
14 measuring and test equipment is removed from the cycle until repaired,
15 recalibrated or replaced. Master measuring standards are maintained
16 and calibrated on a frequency cycle by a qualified laboratory with
17 standards traceable to the National Bureau of Standards.
18

19 Electrical test equipment such as magnetic particle equipment
20 is on a scheduled calibration cycle; the Manufacturing
21 Department is responsible for maintenance and calibration. This
22 effort is audited by Quality Assurance.
23

16

24 Pressure test gages used for hydrostatic and gas leak tests are
25 checked and calibrated on a frequency schedule; dead weight test
26 equipment is used to verify calibration. The procedures are designed
27 to assure accuracies within established standards and include disposi-
28 tion and/or corrective measures when discrepancies are noted.
29

30 17.1.12.4 Pensacola Division
31

32 All decisions on the acceptance of any product or quality characteristic
33 are made by utilizing inspection and test equipment which is under
34 calibration by Quality Assurance Department; this calibration is
35 traceable to the National Bureau of Standards. Each gage is identified
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3 with a unique identifying serial number. For each individual gage
4 there is established a gage inspection record card which is utilized
5 to record the results of periodic inspections.

6
7 Calibration frequencies are initially established by an engineered
8 estimate of the total useful life of the gage and the frequency
9 of re-calibration at one-fifth of this estimated time.

10
11 Calibration frequencies are adjusted based on an evaluation comparison
12 of the gage useage versus the wear recorded on the gage inspection
13 record card. Any gage which passes through three calibration cycles
14 without being used is placed in an inactive status until needed
15 at future time.

16
17 All gaging and testing equipment is tagged with a sticky label
18 which identifies the date calibrated, the date of next calibration
19 and an identifying stamp of the gage inspector who performed the
20 calibration. Calibration control is maintained by advancing gage
21 calibration record card in a pigeon-hole filing system where each
22 pigeon-hole represents one Work Week within the fifty-two Work Week
23 Year. Gage Record Cards which appear in the current Work Week
24 slot are calibrated within the current Work Week.

25
26 The area supervisor, whether manufacturing or inspection, has the
27 responsibility to promptly report any gage in his area known to
28 be functioning improperly. Defective equipment is red-tagged and
29 scheduled for repair or replacement.

30
31 17.1.12.5 Specialty Metals Division

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33 Measuring instruments, gages, fixtures, standards, masters, and
34 any item needed to facilitate precise measurement are under the
35 jurisdiction of the Quality Control and Inspection Department.

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3 Quality Control and Inspection is responsible for the control | 6
4 of gaging equipment used by both quality control and manufacturing
5 personnel. Quality Control and Inspection checks and maintains | 6
6 all gages and fixtures assigned to the quality control groups for
7 use in accepting products. The gage calibration lab is under the
8 supervision of Quality Control and Inspection and has written procedures | 6
9 requiring that status of calibration be maintained on all gages
10 and the periodic recall, inspection, and calibration of gages.
11 When calibration is complete, proper notation is made on each gage
12 or instrument in addition to recording calibration results on the
13 Tool Inspection Master Card. Calibration frequencies established |
14 by Quality Control and Inspection based on experience are verified | 6
15 periodically by a review of the Tool Inspection Master Card.
16

17 17.1.13 HANDLING, STORAGE AND SHIPPING
18

19 Measures to establish control over handling, storage and shipping
20 are in documented procedures in use at each of the NES Divisions.
21

22 17.1.13.1 PWR Systems Division
23

24 Since PWRSD does not manufacture equipment, emphasis is placed
25 on controlling the supplier's handling, storage and shipping activities.
26 The Administrative Specification and QCS-1 specify that a supplier's
27 Quality Program require the use of handling procedures and handling
28 equipment inspection procedures to prevent damage to a product.
29 The vendor must have adequate written work and inspection instructions
30 for storage, preservation, packaging and shipping to protect the
31 products from damage, loss, deterioration or substitution. As required
32 by the Equipment Specification, these procedures may be subject
33 to approval by PWR-SD.
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3 A supplier's procedures and systems for handling, storage and shipping
4 are evaluated during source selection and monitored for compliance
5 during PWR-SD Quality Assurance Surveillance.
6

7 17.1.13.2 Electro-Mechanical Division
8

9 EMD has established procedures defining a system of inspection
10 and usage control for all lifting fixtures and devices used in
11 the factory in accordance with existing specifications and applicable
12 Industrial Safety Standards. In addition, a review committee has
13 the responsibility to review lifting and handling fixtures and
14 equipment, and to arrange for marking of their identification and
15 limits, and to determine necessary corrective action when non-
16 compliance to a required standard is found.
17

18 In-process movement and storage of material, components, sub-assemblies
19 and assemblies is defined by manufacturing procedures that provide
20 the instructions necessary to maintain identity and protect finished
21 attributes and surfaces from damage.
22

23 Packaging and shipping requirements required by contract are reviewed
24 and appropriate manufacturing routing prepared. Specific packaging
25 instructions are referenced within the manufacturing routing including
26 pertinent inspections to assure that preservation, packaging and
27 packing is accomplished to protect the products and/or supplies
28 from damage, loss, deterioration, degradation or substitution.
29

30 17.1.13.3 Tampa Division
31

32 Established procedures and training are provided for materials handling
33 personnel. A procedure book on safe practices in rigging and crane
34 operation, including sketches and handling methods for all major
35 production lifts, is supplied to the riggers and crane operators.
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3 The guidelines set forth in the procedure book are established
4 by the Tampa Division Lifting Committee and includes requirements
5 for inspection of chain slings, wire rope slings, shackles, eye
6 bolts, plate clamps and hoisting ropes. In addition to visual
7 examination, all hooks are periodically nondestructively examined.
8

9 Protective covers are used on nozzles after final machining to
10 protect weld preparations, preserve cleanliness and minimize damage.
11

12 Engineering generates shipping drawings that detail arrangement | 6
13 for barge or car shipments, cradles to be used, size and number
14 of tie down straps and rods. In conjunction with the drawing,
15 a formal engineering procedure is issued that specifies appropriate
16 requirements such as strap and tie down locations, welding to be
17 performed, special reinforcement liquid envelope protection application | 6
18 instructions, etc.
19

20 17.1.13.4 Pensacola Division
21

22 Handling, storing and shipping methods are defined by written procedures.
23 Quality Assurance Engineering reviews all procedures, make recommenda- | 6
24 tions for improvements, and audits the procedures for compliance. Special
25 frames, jig, and containers are used for in-process handling and
26 storage to protect the dimensional and finish attributes of component
27 parts.
28

29 17.1.13.5 Specialty Metals Division
30

31 Facilities are available and procedures are written for crating,
32 packaging, preserving and identifying products for overseas and
33 domestic shipments in accordance with various commercial and federal
34 specifications.
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3 The material is handled and stored according to procedures which
4 describe the manner of storage, protection of finishes, and control
5 of limited life supplies. Quality Control and Inspection conducts 16
6 periodic audits of storage areas to assure conformance to applicable
7 storage procedures and requirements.
8

9 17.1.14 INSPECTION, TEST AND OPERATING STATUS
10

11 Each of the NES Divisions has established procedures to indicate
12 the inspection, test and operating status of materials, parts and
13 components. A major purpose of these procedures is to preclude
14 inadvertent bypassing of Inspections and tests.
15

16 17.1.14.1 PWR Systems Division
17

18 QCS-1 and the Administrative Specification contain requirements
19 that a supplier have measures to indicate the inspection, test,
20 and operating status of an item, and that nonconforming items are
21 clearly identified to prevent inadvertent use. The supplier is
22 required to control usage of inspection and welding stamps or other
23 status indicators, including declared authority for application 6
24 and removal of tags, marking labels, and stamps. The procedures
25 used to establish these measures and the application of the procedures
26 are reviewed for adequacy during supplier selection and monitored
27 for compliance during the surveillance activities.
28

29 17.1.14.2 Electro-Mechanical Division
30

31 The positive identification of inspection status for each product
32 is accomplished by the Inspection Control Card (ICC) which travels
33 with the product from one manufacturing section to the next. The
34 quality control inspection stamps on the ICC indicate acceptance
35 of the product at specific checkpoints integral to the manufacturing 16
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3 routing with assigned operation numbers. The inspection stamp
4 system maintains control of each stamp symbol and the individual
5 to whom it is issued. | 6

6
7 17.1.14.3 Tampa Division
8

9 Procedures are used to maintain identity of all material and manufactured
10 components, beginning with receipt inspection through final shipment
11 of the product. Material is identified by use of Tampa test number
12 as described in Section 17.1.8. Test numbers are not changed when
13 material is transferred to another order. These numbers are recorded
14 in the applicable inspection point program. The required test
15 reports can be identified by the master test number log.
16

17 The inspection point program readily identifies the completed manu-
18 facturing operations as well as the completed inspection and/or
19 nondestructive tests. Also, Production Planning of the Manufacturing | 6
20 Department keeps an up to date status report on each component
21 for all orders.
22

23 Nonconforming material is identified by use of tags as described
24 in the Error Appraisal Notice procedure (see Section 17.1.15).
25 The inspection documents identify the technician that performed
26 the inspection or test; the individual qualifications are in accordance
27 with SNT-TC-1A as required by the ASME Code, Section III.
28

29 17.1.14.4 Pensacola Division
30

31 All manufactured material is identified by a route sheet throughout
32 the manufacturing operation. The route sheet is stamped at all
33 inspection, NDE and manufacturing steps. If an item is discrepant,
34 the number of the rejection document is entered on the route sheet.
35 Therefore, the status of each item is always available. Control
36 of stamp issuance and use is maintained by Quality Assurance Records
37 of the Inspection Department. | 6
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39 17.1-80

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3 17.1.14.5 Specialty Metal Division
4

5 A record system is followed to identify the stage of manufacture | 6
6 of a product at SMD. Manufacturing instructions indicate inspection
7 and test points in the sequence of operations. An identifying
8 number is applied to the material as it enters the plant. This | 6
9 number is modified as the material is processed; however, the
10 basic number is used for identification. Process Follow Cards
11 identify the status of the manufacturing operations as well as
12 inspection and test status.

13 | 6
14 Non-conforming materials are identified and held for disposition.
15 Actions taken are documented and become part of the records and
16 data system. | 6
17

18 17.1.15 NONCONFORMING MATERIAL, PARTS OR COMPONENTS
19

20 Each NES division has documented procedures to control nonconforming
21 material, parts and components which prevent their inadvertent
22 use and provide for their identification, segregation and disposition.
23 Normally each NES division makes disposition of those nonconforming
24 material reports which vary from specifications and standards established
25 within the division. Where in-process nonconforming items are
26 submitted for inspection, rejected, and repaired to attain full
27 compliance with design specification requirements, notation of
28 the repair and re-inspection is contained within the inspection
29 records. Nonconformances of technical requirements of procurement | 6
30 documents are controlled by PWR-SD. If a deviation from procurement
31 requirements affects an interface with other nuclear power plant
32 equipment (e.g., dimensional deviation of mounting points, location
33 of nozzles, etc.) the cognizant engineer is responsible for notifying
34 the applicant of the discrepancy prior to the time of shipment of
35 the equipment. Documentation uniquely identifies the nonconforming
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item to assure documentation-to-equipment traceability, describes the nonconformance, the disposition of the nonconformance, and includes signature approval of the disposition. Approved nonconformance reports are identified on the final quality release, and are transmitted to the applicant as part of the data package.

6

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3 Additionally Westinghouse assesses deficiencies and determines
4 which are significant. The applicant is notified of each significant
5 deficiency, as defined in 10CFR50, 55(e), found in the process
6 of design, manufacture, fabrication, installation, construction,
7 testing, and inspection:
8

6

- 9 1. Which, if it were to have remained uncorrected, could have
10 affected adversely, the safety of operations of the nuclear
11 power plant at any time throughout the expected lifetime of
12 the plant, and
13
14 2. Which represents either,
15
16 a) a significant breakdown in any portion of the Quality
17 Assurance program. Deficiencies found during the normal
18 operation of the Quality Program, such as inspection,
19 test, audits, design reviews, etc., are not considered
20 as indication of a breakdown.
21
22 b) a significant deficiency in final designs approved and
23 released for construction.
24
25 c) a significant deficiency in the construction of or significant
26 damage to a structure, system, or component requiring
27 correction action involving extensive effort, or
28
29 d) a significant deviation from performance specifications
30 requiring corrective action involving extensive effort.
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3 17.1.15.1 PWR Systems Division
4

5 17.1.15.1.1 Deficiencies at Suppliers' Plants
6

7 The Administrative Specification and QCS-1, described above, contain
8 specific contractual requirements for controlling nonconforming
9 material or workmanship.
10

11 Suppliers are required to provide a system for the identification,
12 documentation and evaluation of discrepancies, for reviewing for
13 trends, and for alerting the supplier's cognizant management to
14 the need for corrective action. A Westinghouse deviation form
15 is initiated at the supplier's and completed per instructions on
16 the back of the form. Upon receipt at PWR the deviation is processed
17 in accordance with documented instructions to assure proper review
18 and disposition by both Engineering and Product Assurance with | 6
19 concurrence of Mechanics and Materials and/or System Engineering
20 as appropriate. Possible dispositions are, Accept, Repair, Scrap,
21 and HOLD & Resubmit. When repair is indicated, acceptance of the
22 repaired item upon completion of the repair is noted by a Quality
23 Assurance Signature on the deviation form. The acceptability of
24 repaired or reworked parts, components or equipment is verified | 6
25 by reinspecting as originally performed, or by a method which is
26 at least equal to the original inspection method.
27

28 Deviation Notices which describe nonconformances to technical
29 procurement requirements, including those which are dispositioned
30 for use unchanged, and Deviation Notices dispositioned for repair | 6
31 are referenced on and attached to, the Quality Release, and forwarded
32 with the equipment shipment. A permanent file of the deviation
33 records is maintained by PWRSD.
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Deviation Notices from PWRSD suppliers and other NES Manufacturing Divisions which supply NSSS equipment are collated, summarized, and analyzed on a regular basis to aid in the detection of quality trends and areas where corrective action is required.

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JULY, 1974

AMENDMENT 6

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3 17.1.15.1.2 Deficiencies at the Construction Site
4

5 A written procedure provides for documented reporting by Westinghouse
6 personnel of deficiencies on NSSS equipment found during plant construc-
7 tion. These reports are submitted by Westinghouse site engineering
8 personnel to the cognizant engineering department. Like reports from
9 suppliers' plants, these reports are reviewed for necessary action,
10 formally approved by the cognizant engineer and permanently filed.
11 Summary Reports are developed by PWRSD Product Assurance to alert
12 appropriate management levels of trends in deficiencies found and the
13 actions taken. Verification of the deficiency correction is delegated
14 to NSD and is performed by Westinghouse Site personnel. These actions
15 are audited by NSD Product Assurance.

6

16
17 17.1.15.2 Electro-Mechanical Division
18

19 Non-conforming material is identified and held in quarantine until
20 disposition is received. All deviations are reviewed and disposition
21 made by engineering personnel. The Non-conforming Material Control and
22 Evaluation Program provides for review and evaluation of cause and cor-
23 rective action to prevent recurrence.

24
25 Data concerning non-conforming material is categorized to type of
26 deviation and component. Appropriate reports are formulated under
27 the program for evaluation and management action toward reduction in
28 costly defectives and towards quality improvement.

29
30 EMD utilizes a multi-copy Material Review Report (MRR) with non-repeti-
31 tive sequential numbers. In addition, EMD utilizes electronic data
32 processing to summarize Material Review Report by order, part, serial
33 or lot number. This summary provides convenient quality history trace-
34 back.

16

35
36 The MRR system provides:
37

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2
3 1. Identification of non-conforming materials and its status.
4

5 2. Segregation of non-conforming materials from production material
6 by physical means where possible or otherwise by positive
7 identification. | 6
8

9 3. Formal disposition of the non-conforming materials from Engineer-
10 ing and Quality Assurance Engineering. | 6
11

12 4. Verification of rework or repair to correct the non-conforming
13 material by inspection personnel in the form of a stamp or
14 authorized signature on appropriate documentation.
15

16 5. Further, the system provides for correction of the causes
17 of non-conforming materials to prevent recurrence during all
18 phases of procurement and fabrication.
19

20 17.1.15.3 Tampa Division
21

22 Materials, parts or components which do not meet design drawings
23 or specifications, process specification or quality standards are
24 considered defective material. All deviations are documented
25 by the Error Appraisal Notice (EAN) system. An EAN is issued
26 upon discovery of nonconforming or defective work produced by
27 any department and a caution tag is attached to the material signifying
28 a discrepant condition. Upon issuance of an EAN by the Quality
29 Assurance Technician, the Quality Assurance Engineer verifies
30 the technician's findings. The Quality Assurance or Manufacturing
31 Engineer recommends corrective repair when applicable. Where
32 appropriate repair procedures are incorporated within approved welding
33 or manufacturing procedures, these are specified and the EAN is
34 completed by Quality Assurance. EAN's are transmitted to Metallurgical
35 Engineering for all discrepancies that involve welding and related
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3 functions such as heat treatment, pre-heat, etc.; and/or Engineering
4 for all other conditions. Engineering or Metallurgical Engineering 16
5 either agrees with the recommended repair, or issues further instructions.
6 The answered EAN is returned to Quality Assurance who then initiates
7 an attachment that details the manufacturing operations and inspections
8 required to conform to the specified Engineering instructions.
9 The EAN with attachment is distributed to Manufacturing, Manufacturing
10 Groups, Quality Assurance and other departments that are involved. 6
11 Upon completion of the repair the EAN attachment is signed off
12 by the Quality Assurance technician and is added to the inspection
13 records for that particular component or part and the caution
14 tag is removed from the piece by the Quality Assurance technician.
15 The system provides identification of discrepant material, a formal
16 notification to individuals involved and the formal signature
17 signifying repair and acceptance of the material. In the event that
18 material or parts are not repairable and are to be scrapped, the
19 piece is removed from the manufacturing area to prevent inadvertent
20 use of the piece.
21

22 17.1.15.4 Pensacola Division
23

24 Pensacola Division maintains systematic control of the identification,
25 segregation, and disposition of all nonconforming materials, components,
26 subassemblies, and equipment. A specific form is assigned for
27 each type of rejection that could occur in the processing of all
28 material and subsequently fabricated product. These forms provide
29 for the specific delineation of existing conditions resulting in
30 a "reject" disposition.
31

32 The issuance, processing, and dispositioning of this documentation
33 is under control of the Quality Assurance Department. When the
34 determination is made that a discrepancy exists, the material
35 or product involved is immediately tagged and segregated, if feasible,
36 until disposition is made on the governing document.
37

Disposition of nonconforming material is defined by formal procedures. All dispositions must be approved by the pertinent quality engineer before any rework, repair, scrap, or vendor return action is taken. All dispositions are formally documented, and files kept for future reference and management evaluation.

The Inspection Department is responsible for performing the routed inspection operations and tests, signing off the rework/repair routing and preparing required non-destructive examination reports and detailed dimensional reports.

17.1.15.5 Specialty Metals Division

A formal procedure is used in identifying and controlling all defective material detected at receiving, in any stage of processing or at final inspection. It is the responsibility of the Quality Control and Inspection Department to identify any production material that varies from contract, drawings, specifications, procedures, process, or quality standards. Quality Control and Inspection then informs the proper personnel, determines or obtains disposition, approves and signs off the corrections or modifications, maintains records of the occurrence, and assures that fundamental corrective action is taken.

Deviations from product or process contractual requirements are reported to NFD or Tampa in accordance with their instructions for their disposition.

17.1.16 CORRECTIVE ACTION

Each NES Division has a corrective action program which has a means for determining the need for corrective action, documenting the need and the action taken, follow-up on the action for effectiveness, and reporting the need and action taken to appropriate levels of

management. Distribution of summary reports includes the division
general manager, the quality assurance manager, and the manager
of the departments audited.

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3 17.1.16.1 PWR Systems Division
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5 QCS-1 requires that the supplier's quality system provide for the
6 identification and evaluation of significant or recurring discrepancies
7 and for alerting the supplier's cognizant management of the need
8 for corrective action. The supplier must review corrective action
9 for effectiveness and the need for further action. The suppliers
10 corrective action program is reviewed for adequacy during supplier
11 selection and monitored for compliance during the surveillance
12 activities.
13

14 Product Assurance receives and reviews nonconformance documents. The
15 deficiency data received from suppliers (Deviation Notices) and from
16 construction sites (Field Deficiency Reports) is analyzed to determine
17 patterns of occurrence by supplier, by NSSS component, or by process. 6
18 With this as a guide, Product Assurance and cognizant engineers determine
19 corrective actions that are needed to prevent recurrence. This
20 action is in addition to assuring that the supplier or site personnel
21 take corrective action of the individual deficiencies reported.
22 Follow-up of corrective actions is made to verify effective correction
23 of root causes of discrepancies. Through periodic reports management
24 is informed of the need for action, and the action taken. Several
25 of the reports are: Trip reports, Field Deficiency Report Summaries 6
26 and Audit reports.
27

28 17.1.16.2 Electro-Mechanical Division
29

30 EMD's Quality Program provides, through a computer system, for
31 the early detection of non-conforming material, summarization of
32 recurring or significant quality problems, analysis of trends,
33 and diagnosis of causes. Appropriate levels of management are
34 notified of significant failures, malfunctions, and non-conformances.
35 The corrective action program covers vendor quality performance,
36 in-plant operations and field installation problems.
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3 17.1.16.3 Tampa Division
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5 The Quality Assurance Engineer is responsible for reviewing all
6 Error Appraisal Notices and other data relating to the quality
7 of products and operations under his cognizance. As a result of
8 this review, the Engineer is responsible for initiating positive
9 corrective action when a quality problem of significant magnitude
10 is indicated on the basis of safety, cost or possibility of shipping
11 undetected discrepancies and recurring discrepancies indicate a need
12 for correction of design, process or method.
13

14 Systems have been established to identify and document trends in
15 specific operations such as tube welding, inspection and test
16 and also all major pressure welds. Reports are issued to cognizant
17 management personnel for action when deemed necessary.
18

19 17.1.16.4 Pensacola Division
20

21 The cause of deficiencies and action taken by the responsible group
22 to prevent the recurrence of discrepancies are documented. Recurring
23 deficiencies are tabulated by a computer program and analyzed
24 by cognizant quality and manufacturing engineers. Positive corrective
25 action is taken to prevent recurrence.
26

27 A quality costs program permits computer tabulation of specific
28 quality costs, so that problem areas may be readily identified,
29 investigated and corrected.
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3 17.1.16.5 Specialty Metals Division
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5 Formal procedures require the documented reporting of all material
6 and manufacturing deficiencies. The documentation includes a complete
7 description of the deficiencies, the specification or requirement
8 involved and the disposition. These conditions require formal
9 review by appropriate levels of management. Non conformances to
10 procurement order design requirements are submitted to Tampa or
11 NFD for approval; nonconformance reports are traceable to lot or
12 heat numbers.
13

14 Recurring deficiencies are analyzed by Quality Control and
15 Inspection and cognizant engineers for corrective action taken
16 to prevent recurrence. The recommended action requires the review
17 and approval of responsible Manufacturing, Manufacturing Engineering,
18 and Quality Control and Inspection managers. In addition to corrective
19 action covering deficiencies, standard statistical evaluations
20 are performed on current manufacturing data to determine manufacturing
21 trends and to prevent the manufacture of defective material.
22

23 A Quality Costs Program is in effect which identifies problem
24 areas. Teams are established to investigate the causes and see
25 that corrective action is put in place.
26

27 17.1.17 QUALITY ASSURANCE RECORDS
28

29 The NES Quality Assurance Program includes the retention of those
30 fabrication, inspection and surveillance records essential to demon-
31 strating product quality. Records are reviewed by Westinghouse
32 Quality Assurance personnel, microfilmed and submitted to the
33 applicant prior to plant acceptance. Records relating to the
34 design and fabrication of NSSS equipment are available for review.
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3 Westinghouse policies and procedures for accumulation, use and
4 retention of quality assurance records follow the guidance of
5 ANSI N45.2.9 (Draft 15, Revision 0, April 3, 1974), Requirements
6 for Collection, Storage, and Maintenance of Quality Assurance
7 Records for Nuclear Power Plants for safety-related equipment. An
8 acceptable alternative to the protective construction features of
9 permanent storage facilities is utilized, where a duplicate set of
10 records is maintained in separate geographical locations, as at
11 the point of origin, at PWR-SD, or at Westinghouse Records Center.
12 This occurs especially where PWR-SD maintains a microfilm file
13 of duplicate records. The duplicate records afford advantages in
14 communication between work locations, and other data gathering
15 and problem solving functions, as well as excellent protection
16 against records loss, which potentially may occur where only original
17 records exist. The records control methods Westinghouse uses,
18 as applied to each tier of supply, are described in Tables 17-4, 17-5,
19 and throughout this section.

20
21 17.1.17.1 PWR Systems Division

22
23 Records affecting quality such as Engineering Department designs
24 and analyses, Purchasing procurement documents, Product Assurance
25 design reviews and audits, Nuclear Safety Department studies and
26 analyses and Quality Assurance supplier surveillance reports are
27 maintained by PWR-SD.

28
29 Internal documents QCS-1, Administrative Specification and Equipment
30 specifications provide documentation requirements to suppliers
31 defining the content of quality assurance records, and requirements
32 for maintenance, transmittal and retention. These records include
33 suppliers design records, material test reports, personnel qualifications,
34 nondestructive examination, inspection, and test records. Records
35 such as trip reports, deviation notices, and other quality-related
36 documents form a part of the records maintained by PWR-SD.

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2
3 All suppliers are required to maintain these records for specified
4 periods, after which they notify PWR-SD for disposition. Copies of
5 records covering significant inspections on critical portions of
6 the component are transmitted to PWR-SD. These inspection records
7 along with quality file for each component which will be maintained
8 for the life of the plant.
9

10 Table 17-4 is a listing of the documents and records kept as a part
11 of the NSSS program. Key elements to provide document identification
12 and retrievability are the regular use of SPIN, shop order and
13 purchase order numbers. Item 8d shows both the supplier and NES
14 having a retention responsibility. The supplier retains all data
15 relative to the component, and PWR-SD obtains copies of specific
16 significant data to maintain as a part of the history file. Table
17 17-5 lists some typical components and details the data retained
18 for each.
19

20 Records generated at the construction site are filed and maintained
21 there.
22

23 17.1.17.2 Electro-Mechanical Division 24

25 EMD maintains sufficient product related records to furnish documen-
26 tary evidence of activities affecting quality. The documentation
27 and data requirements are determined during the initial quality
28 planning stage for each contract and appropriate instructions and
29 documentation check lists are prepared for internal records audits
30 to assure that required records are generated. Records include results
31 of technical and divisional reviews, inspections, audits, material
32 analyses, data on work performance, operating logs and test results.
33 Closely related data such as qualifications of personnel, procedures,
34 and equipment are also retained.
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3 Retention is determined by the respective department which conducts
4 the review, test, qualification, etc. Records affecting quality,
5 including those maintained by other departments, are subject to
6 quality assurance audit.

7
8 17.1.17.3 Tampa Division
9

10 Documentary evidence and records of inspection and other related
11 manufacturing information are maintained. The records include
12 materials test reports, nondestructive test reports and radiographic
13 film, heat treatment logs and charts, inspection point programs
14 and all related documents including the Error Appraisal Notices.
15 The records will identify the inspector, the results and action
16 taken to correct deficiencies.
17

18 17.1.17.4 Pensacola Division
19

20 A records system is maintained by Quality Assurance to furnish
21 documentary evidence of all results affecting quality. This system
22 includes, but is not limited to, logging and filing of material
23 certifications, inspection results, discrepancy documentation,
24 test results, audit results, and other closely related data such
25 as qualification of personnel, procedures and equipment.
26

27 Pensacola Division maintains a comprehensive records system designed
28 to accumulate, evaluate and retain permanent and non-permanent
29 documents in accordance with ASME code and ANSI standards.
30

31 All documentation is forwarded to the Quality Assurance Records
32 Section of the Inspection Department upon completion of manufacturing
33 or inspection operations. The Records Section has receipt control
34 of all records received and only authorized personnel are permitted
35 access to the files.
36

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3 Quality status checklists are maintained by the Records Section
4 for all major items. Records for other items involves a relatively
5 short process time span and thus do not require status checklists.
6

7 After shipment of a shop order, all pertinent records are placed
8 on microfilm within 30 days. One copy of the micro-film remains
9 at Pensacola Division for reference purposes and one copy, along
10 with radiographic film is forwarded to the Westinghouse central
11 storage facility.
12

13 All activities related to records are defined in written procedures
14 and audited at regular intervals.
15

16 17.1.17.5 Specialty Metals Division
17

18 Objective evidence and records of the various inspection operations
19 are maintained in the Quality Control and Inspection files. 16

20 Records related to source or receiving inspection are accumulated
21 in the Quality Control and Inspection files. A permanent record 16
22 of the results of calibration and checking of gages is maintained
23 in the Quality Control and Inspection files in line with the established 16
24 Gage Control Procedure. A written records retention system is
25 in effect for appropriate special process, Quality Control and
26 Inspection and Quality Services records. 6
27

28 17.1.18 AUDITS
29

30 To verify the effectiveness of the Quality Assurance Program, NES
31 has a comprehensive system of audits. Planned and scheduled audits
32 are conducted by:
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1. The Corporate Quality Staff of the NES Division
2. The NES QA Committee of the NES Division
3. NES Divisions of other NES divisions for intra-NES purchases.
4. NES Divisions of their suppliers
5. NES of Westinghouse site activities
6. Each NES division of its own internal programs.

7

Quality assurance audits are conducted in accordance with defined audit procedures by trained personnel who do not have direct responsibilities in the area being audited. As required by these procedures, checklists are utilized. As a minimum, a documented audit report detailing discrepant areas with needs for corrective measures is issued and reviewed with management having responsibility in the area audited. The originator of an audit report is required to follow an open item until action is taken to satisfy an audit action item. Records of actions taken to achieve resolution are maintained. Reaudits are performed to verify corrective action taken is effective. Areas subject to audit include all procedures and operations within each of the divisions which affect or have an active part in the total Quality Program as defined by 10CFR50 Appendix B. These include work areas; fabrication, testing and inspection activities; design control activities; procurement activities; processes; product items; process, tests and inspection equipment; personnel qualification; and quality assurance records. Checklists are used to assure that audits appropriately encompass these areas. The schedule and sequence of operations to be audited is planned in advance. For example, the

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3 PWR-SD audits of NES divisions furnishing equipment to PWR-SD
4 are established on a calendar year basis by mutual agreement
5 between PWR-SD and the particular division. The calendar year
6 schedule identifies the operations to be audited.
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3 To demonstrate the existence and effectiveness of the internal
4 audit program, the following items are periodically made available
5 to utility customer reviewers on a routine basis:
6

- 7 a. Audit procedures and checklists
8
9 b. Audit schedules, including area of function to be audited
10 and names of auditors scheduled for audits
11
12 c. Evidence of audit completion, including names of actual
13 auditors
14
15 d. Evidence of audit responses and resolution of responses.
16

17 Should significant deficiencies be encountered (Reference 10CFR50.55.e)
18 during an internal audit, such information would be provided to
19 the applicant as indicated in Section 17.1.15.
20

21 Westinghouse policies and procedures for auditing follow the guidance
22 of ANSI N45.2.12 (Draft 3, Revision 4, February 22, 1974), Requirements
23 for Auditing of Quality Assurance Programs for Nuclear Power Plants,
24 for safety-related equipment. The auditing programs Westinghouse applies,
25 as appropriate to each tier of supply, are described in Tables 17-1,
26 17-2, 17-3 and throughout this section. These methods include such
27 activities as audit planning, performance, reporting and follow-up
28 actions.
29

30 17.1.18.1 Westinghouse Corporate Audits
31

32 The Westinghouse Corporate Headquarters Quality Assurance Staff has a
33 formal audit program which applies to all divisions of Westinghouse,
34 including divisions furnishing equipment or services to the nuclear
35 industry.
36

37 17.1-96
38

39 Revision 7

November, 1974

The Quality Assurance Staff is appointed by the Vice President of Manufacturing, who reports directly to the Vice Chairman, Planning. The Vice Chairman, Planning, reports to the Chairman of the Board, who is the Chief Executive Officer. In addition to the auditing function, the staff maintains quality-related training services and provides planning and advisory services for the quality programs throughout Westinghouse. Quality program recommendations are broadly based, considering fundamental aspects of quality assurance upon which individual divisions can construct programs suited to their individual products and customer needs.

The purpose of the audits performed by the Corporate Quality Assurance Staff, is to provide an independent assessment of the division's quality products.

The Corporate Staff evaluates whether or not the division is producing a product which complies with the requirements of their customers and is using effective methods for assuring the manufacture of quality products.

Audits are performed of each division's quality assurance effort by a two-to-four man team, consisting of the team leader from the Headquarters Quality Assurance Staff and the remaining members from the NES Quality Assurance Committee, excluding the quality assurance manager of the division being audited. The audit normally takes five days. The Corporate Headquarters audit of each Westinghouse division is held on the average of once each three years.

The quality assurance systems and procedures that have been established by the division are reviewed to determine if these systems and procedures are sufficient to provide an effective program. Observations

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are then made to assure that the established systems and procedures are being correctly followed.

An oral presentation of the findings and conclusions of the audit is made to the Division General Manager, Quality Assurance Manager, and other personnel affected by the audit findings. The items

17.1-97a

Revision 7

November, 1974

recommended for improvement in the quality assurance program are presented as well as recommendations of approaches for accomplishing these improvements.

Following the audit, a written report containing the findings and recommendations reviewed in the oral report is prepared and sent to the responsible division personnel. In addition, a copy of the report is sent to the Executive Vice President to whom the division reports and to the corporate Vice President of Manufacturing.

17.1.18.2 NES Quality Assurance Committee Audits

The Westinghouse Nuclear Energy Systems Quality Assurance Committee has established an audit program which applies to all the NES Westinghouse divisions engaged in nuclear supply system design or manufacture of Pressurized Water Reactor equipment. The purpose of the audits is to provide in-depth evaluation of the quality assurance policies and processes of the various Westinghouse Nuclear Energy Systems divisions in order to verify that they result in products and services which meet safety and reliability requirements. Particular emphasis during the audit of the quality assurance programs is placed on compliance with the requirements of 10CFR50, Appendix B.

In addition to carrying out audits, the committee serves as a forum to communicate quality and reliability activities, and to establish improved and consistent division policies of quality assurance in light of nuclear industry requirements

Annual quality assurance system audits are conducted of each Westinghouse Nuclear Energy Systems division by an audit team composed of representatives from the Committee. However, the Quality Assurance Manager, from the division being audited is not a member of the audit team.

17.1-98

Revision 7

November, 1974

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Typical team membership is three men. Each audit normally takes three days. The Corporate Headquarters audits, described above, of Westinghouse Nuclear Energy Systems Division substitutes for the annual Westinghouse Nuclear Energy Systems audit the year it is held.

At the conclusion of each audit an oral presentation is made by the audit team to the division General Manager and Quality Assurance Manager of the division which has been audited.

17.1-98a

Revision 7

November, 1974

Following the audit, a written report containing the findings of the audit and recommendations for improvement in the quality assurance program and its implementation is sent to the responsible division personnel, to the committee members, and to the Westinghouse Nuclear Energy Systems Executive Vice President. This procedure assures high level management attention to actions needed to carry out recommendations of the audit. Analyses of audit data are made to detect quality trends over a span of several audits. The trends indicated and a review of the quality assurance program effectiveness are reported to management.

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17.1.18.3 PWR Systems Division

17.1.18.3.1 Suppliers' Plants

The Westinghouse PWR Systems Divisions audit function of suppliers is described in Section 17.1.7, Control of Purchased Material, Equipment and Services. The NES Manufacturing Divisions which supply NSSS equipment are also considered as suppliers to PWR and scheduled audits of the divisions are conducted by PWR Quality Assurance. Audits of suppliers' QA program include a review of suppliers' internal and sub-tier auditing programs.

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17.1.18.3.2 Internal

The Product Assurance Department performs audits within the PWR Systems Division. These audits cover procedures and implementation of the procedures. All PWR-SD departments are subject to audit, with emphasis on Design, Procurement, and Product Assurance. The audits are performed periodically by a team headed by Product Assurance personnel and selected from appropriate engineering groups of PWR Systems Division and from outside divisions as necessary. Audit findings are documented and sent to management for review and corrective action, where necessary.

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3 Additional audits of PWR System Division are conducted by the NES
4 Quality Assurance Committee and the Westinghouse Headquarters Quality
5 Control Staff.

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7 17.1.18.4 Electro-Mechanical Division
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9 EMD maintains comprehensive internal audit programs to assure that
10 established systems are being followed or that systems adjustments are
11 made. Audit programs also provide management with a continuing over-
12 view of quality trends, methods and functions. Formal audits are | 6
13 conducted by a team consisting of members from Engineering, Manufac-
14 turing, Quality Assurance and other functions not having direct
15 responsibility for areas being studied. Deviations noted during the
16 audit are corrected and appropriate action taken to assure against
17 recurrence. Audit reports are formulated for review and action by
18 management.

19
20 Additional audits of EMD are conducted by the NES Quality Assurance
21 Committee, the Westinghouse Headquarters Quality Control Staff and
22 by PWR Quality Assurance personnel.
23

24 17.1.18.5 Tampa Division
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26 A continuing program of surveillance audits is conducted to assure
27 conformance to standards, procedures and methods for all activities
28 affecting product quality. The program includes reinspection of
29 previously accepted work, verification of required documentation
30 and reviews of Error Appraisal Notice data and corrective action
31 methods. The audit program also provides management with continuing
32 overview of quality trends, methods and functions.

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34 The Reliability Engineering Department also has a formal Internal
35 Audit Program. The Internal Audit Program is designed as a
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3 cooperative effort by all activities who perform quality related
4 functions for the purpose of assuring compliance with requirements
5 and identifying and resolving problem areas. Audit Teams consist-
6 ing of two members from outside Quality Assurance and a Quality
7 Assurance department advisor conduct approximately six scheduled
8 audits per year. The results of each audit are discussed with the
9 manager of the area audited and documented in an audit report
10 issued by the Reliability Engineering Department to designate
11 management. As necessary, the Reliability Engineering Manager
12 assigns personnel to initiate and follow-up on required corrective
13 action. When reaudits are deemed necessary, they are performed
14 by the Quality Assurance Department to provide assurance that
15 corrective action has been effective in resolving problem areas.
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3 Additional audits are conducted by the NES Quality Assurance Committee,
4 the Westinghouse Headquarters Control Staff and by PWR Quality
5 Assurance personnel.
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7 17.1.18.6 Pensacola Division
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9 The Quality Assurance Engineering Audit Coordinator implements a program
10 of periodic internal audits. The audits evaluate compliance with all
11 quality related internal procedures and also comprise an assessment
12 of quality program effectiveness. Audit findings are reported to
13 responsible management and specific corrective action with implemen-
14 tation date is documented for each audit discrepancy. Follow-up
15 audits are conducted to assure that corrective action has been
16 completed.
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18 The audit coordinator initiates an annual schedule of audits to be
19 performed. The audit teams are made up of personnel having no
20 responsibility for performance of activities being audited.
21

22 Audits of Pensacola Division internal procedures are also conducted
23 by the NES Quality Assurance Committee, the Westinghouse Headquarters
24 Quality Control staff and PWR Quality Assurance personnel.
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26 17.1.18.7 Specialty Metals Division
27

28 Internal quality audits are performed as a quality engineering
29 function by Quality Control and Inspection. In addition, Quality
30 Control and Inspection and Quality Services perform cross-check
31 audits on each section. Audits are performed to determine the
32 adequacy of established procedures for controlling quality and to evaluate
33 the degree of compliance with the procedures.
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3 The Quality Control and Inspection Audit Team, performing as a management | 6
4 audit function, is responsible for the following:
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- 6 1. Investigating potential and actual problem areas which directly
7 or indirectly affect the quality and performance of the Division's
8 products.
9
10 2. Reporting favorable and unfavorable conditions to supervision
11 directly responsible for corrective action.
12
13 3. Reviewing and re-auditing corrective action measures taken
14 and the conditions that caused them to assure that such conditions
15 have been eliminated.
16

17 Subjects of primary concern to the team are documentation, compliance
18 with procedures follow, process conformance, product quality, and house-
19 keeping functions. Correction of discrepancies noted by the Audit Team
20 rests with the supervisor of the area affected, but solution and
21 permanent elimination of the basic problem remain the responsibility
22 of the manager to whom that supervisor reports.
23

24 Audits of raw material subcontractors are performed by Quality Control | 6
25 and Inspection, to determine adequacy of the subcontractor quality
26 assurance effort and compliance with procedures.
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28 Additional audits of SMD are made by the NES Quality Assurance Committee,
29 the Westinghouse Headquarters Quality Control Staff, and by Tampa and
30 NFD Quality Assurance personnel. PWRSD does not audit SMD.
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32 17.1.18.8 Nuclear Services Division
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34 Product Assurance conducts independent audits of Westinghouse NSD | 6
35 activities at the construction site to assure that proper procedures
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and instructions are available and in use, and that adequate controls exist and are effective. Reports of audits are sent to appropriate management of the PWR Systems Division, including Product Assurance.

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Additional audits of NSD are made by the NES Quality Assurance Committee, and the Westinghouse Headquarters Quality Control Staff.

17.1.19 REFERENCES

1. "Nuclear Fuel Division Quality Assurance Program Plan",
WCAP-7800.

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TABLE 17-1

NSSS FUNCTIONAL RELATIONSHIP FLOW CHART

ITEM	FUNCTION	ORIGINATING GROUP	PARTICIPATING GROUPS	SUBSEQUENT ACTION
1	Dissemination of contractual requirements	Project manager		Nuclear Safety, quality assurance and reliability, functional engineering groups, PWR-SD equipment design groups, field operation group, purchasing
2	Identification of regulatory requirements	Nuclear Safety	Projects, functional design groups	PWR-SD equipment design groups, functional design groups, quality assurance and reliability
3	NES Quality Assurance program	NES quality assurance groups (through the NES Quality Assurance Committee)	NES equipment design and manufacturing groups, projects, purchasing, safety and licensing	Applicant, NES Quality assurance groups
4	Quality assurance and reliability procedures	NES quality assurance and reliability groups	NES equipment design and manufacturing groups, projects, NES purchasing groups, safety and licensing	NES quality assurance and reliability groups, applicant
5	Design control procedures	NES equipment design groups, functional design, NES reliability groups	NES quality assurance manufacturing and purchasing groups, projects, safety and licensing	NES equipment design and reliability groups, applicant

AMENDMENT 6

17.1-104

JULY, 1974

TABLE 17-1 (Continued)

NSSS FUNCTIONAL RELATIONSHIP FLOW SCHEDULE

ITEM	FUNCTION	ORIGINATING GROUP	PARTICIPATING GROUPS	SUBSEQUENT ACTION
6	Specification of system and equipment functional requirements	Functional design groups	Projects, safety and licensing, applicant	PWR-SD equipment design groups, architect engineer, applicant
7	Equipment specifications or drawings	NES equipment design groups	Functional design groups, NES equipment design groups, quality assurance and reliability, projects, safety and licensing, applicant, architect engineer	Applicant, architect engineer, constructor, purchasing, NES quality assurance and manufacturing groups, field operations group, suppliers
8	NES manufacture	NES manufacturing groups	NES equipment design, quality control and quality assurance groups	Constructor, applicant, field operations group
9	Supplier selection and approval	NES quality assurance, equipment design and purchasing groups	Projects NES manufacturing groups	Supplier, purchasing
10	Supplier detail design, fabrication and inspection documents	Supplier design, manufacturing and quality control groups	NES equipment design groups, NES quality assurance and reliability groups	Supplier, NES quality assurance groups
11	Product surveillance and process audits	NES quality assurance groups	Applicant, purchasing	Projects, NES equipment design groups, supplier

AMENDMENT 6

JULY, 1974

NSSS FUNCTIONAL RELATIONSHIP FLOW SCHEDULE

ITEM	FUNCTION	ORIGINATING GROUP	PARTICIPATING GROUPS	SUBSEQUENT ACTION
12	Quality release	Supplier, NES quality assurance groups	NES equipment design and purchasing groups, projects	Applicant, constructor, field operations group
13	System layout drawings	Architect Engineer	Functional design groups, PWR-SU equipment design groups	Applicant, constructor
14	Receipt inspection and erection of NSSS equipment at nuclear power plant site	Constructor	Applicant, field operations group	NES equipment design and quality assurance groups, projects
15	Plant testing and acceptance	Applicant	Architect engineer, safety and licensing, field operations group, functional engineering groups, NES equipment design groups	Applicant
16	Audits of:			
	a. NES Quality Assurance Program	Applicant, Headquarter QC Staff, NES Quality Assurance Committee	NES quality assurance and reliability groups	All NES groups
	b. NSSS design and fabrication	Applicant, NES quality assurance groups	Architect engineer, all NES groups	All NES groups
	c. NSD site activities	NSD Quality Assurance	NSD Quality Assurance, Field Operations, Technical Operations	Field Operations

The groups identified on this table relate to the functional chart depicted on Figure 17-2.

WRITTEN PROCEDURES, INSTRUCTIONS
AND RELIABILITY QUALITY ASSURANCE

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	XVII	XVIII
PWRSD Policy & Procedures Manual	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
PWRSD Quality Assurance & Reliability Manual	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
PWRSD Engineering Policies & Procedure Manual	X	X	X	X	X	X	X		X									
PWRSD Purchasing Manual				X	X		X						X	X	X			
PWRSD Project Manual				X	X	X	X											X
Safety & Licensing Manual		X	X		X	X												
EMD Quality Assurance Manual	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
EMD Purchasing Manual							X											
EMD Engineering Dept. Instructions			X															
Pensacola Quality Program Manual	X	X	X	X	X	X	X	X	X	X	X	X	*	X	X	X	X	X
Tampa Standard Division Procedure			X	X	X	X	X	X	X	X					X			
Tampa Purchasing Manual				X	X		X						X	X	X			
Tampa Quality Assurance Manual	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
SMD Quality Assurance Manual	X	X		X	X	X	X	X	X	X	X	X	*	X	X	X	X	X

Tampa Product Control & Design Proc. X

*Handled by specific instructions on shop travelers or in individual component specifications.

TABLE 17-3 (Continued)

WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

10CFR50
Appendix B
Criteria

<u>Procedures</u>	<u>Purpose</u>	
PWRSD POLICY & PROCEDURES MANUAL	To set forth and define Division Policies and Procedures	
SUBJECT:		
ORGANIZATION CHARTS, CHARTERS, AND PERSONNEL ROSTERS	To set forth policy and procedural instructions for establishing and maintaining organization charters, organization interfaces, organization charts, departmental personnel rosters and docu- mentation of the authorities and duties of personnel and organizations for all PWRSD functions and activities that affect the quality of safety- related structures, systems, components, and services.	I

TABLE 17-3 (Continued)

WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	10CFR50 Appendix B <u>Criteria</u>
QUALITY ASSURANCE PROGRAM	To set forth policy and procedural instructions for establishing and maintaining a quality assurance program that ensures and demonstrates PWRSD compliance with applicable regulatory, industry, and Westinghouse quality assurance requirements for PWR Nuclear Power Plants.	II V
CLASSIFICATION OF SAFETY RELATED PWR PLANT COMPONENTS & SERVICES	To set forth policy requirements covering the identification and classification of all safety related structures, systems, components and services.	II VII
DESIGN VERIFICATION AND DESIGN REVIEWS	To set forth PWRSD policy, procedural instructions, and design review guidelines to be followed in verifying designs at all significant design stages of structures, systems, and components involved in the nuclear steam supply system and appropriate system auxiliaries to the NSSS.	III

TABLE 17-3 (Continued)WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	<u>10CFR50 Appendix B Criteria</u>
QUALITY REQUIREMENTS AND STANDARDS	To set forth policy instructions for specifying quality requirements and quality standards in design documents such as specifications, drawings, etc. in such a manner that manufacturers and the plant constructor can demonstrate through inspection or testing that the structures, systems, and components meet the specified requirements.	III IV
DESIGN CHANGE CONTROL	To set forth policy and procedure to control changes to PWRSD design documents in order to know and control the configuration of the facility, structure, system, or component throughout design, construction, and operation of the PWRSD plant.	III

TABLE 17-3 (Continued)WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	10CFR50 Appendix B <u>Criteria</u>
INTERFACE CONTROL	To set forth PWRSD policy instructions for identifying and controlling interfaces associated with design, procurement, safety, reliability, and other such functions.	III
PROCUREMENT DOCUMENT CONTROL	To set forth PWRSD policy instructions necessary to assure that adequate information on quality, safety, and reliability requirements are included or referenced in procurement documents for items and services.	IV

TABLE 17-3 (Continued)WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	<u>10CFR50</u> <u>Appendix B</u> <u>Criteria</u>
DOCUMENT CONTROL	To set forth PWRSD policy instructions to assure effective control (review, comment resolution, approval, issue, change, and disposition) of documents which prescribe all activities affecting quality, safety, reliability, and performance of safety related PWRSD structures, systems, and components.	VI
SUPPLIER QUALITY ASSURANCE PROGRAM SURVEYS	To set forth policy instructions for performing surveys of prospective and current suppliers' quality assurance programs, to determine their acceptability and to ensure the required quality of purchased materials, items and services, essential to the overall effectiveness of the PWRSD Quality Assurance Program.	VII

TABLE 17-3 (Continued)WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	10CFR50 Appendix B <u>Criteria</u>
MANUFACTURING CONTROL	To set forth policy instructions for controlling materials, equipment, components, and services furnished by PWRSD directly or through suppliers, to assure that only correct and accepted safety-related items and services conforming to the procurement documents are used and installed in PWR Nuclear Power Plants.	VII IX
TEST AND INSPECTION	To set forth policy instructions for establishing and executing a program for controlling tests and inspections of materials, systems, components, etc. that affect the quality, safety, and reliability of structures, systems, components, and services furnished by PWRSD directly or by suppliers, for PWR plants.	X XI XII XIV

TABLE 17-3 (Continued)WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	<u>10CFR50</u> <u>Appendix B</u> <u>Criteria</u>
HANDLING, STORAGE, SHIPPING, AND RECEIVING	To set forth policy instructions for the control of handling, storage, shipping, and receiving including cleaning, packaging, and preservation of material, structures, systems, and components for PWR plants, to prevent damage, deterioration, and loss.	XIII
CONTROL OF NON- CONFORMANCES, REPORTING DEFICIENCIES, AND CORRECTIVE ACTIONS	To set forth policy instructions for controlling nonconformances in material and equipment, reporting significant deficiencies, and exercising necessary corrective actions.	XV XVI

TABLE 17-3 (Continued)

WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	<u>10CFR50 Appendix B Criteria</u>
DOCUMENTATION AND RECORDS	To set forth policy requirements regarding control, maintenance, and disposition of records associated with the documentation of PWRSD activities relative to the assurance of quality, safety, and reliability of Westinghouse Nuclear Power Plants.	XVII
QUALITY ASSURANCE AUDITS	To set forth policy and procedural instructions for establishing and executing a comprehensive system of planned and documented audits to verify compliance with all aspects of the PWRSD Quality Assurance Program, and to assess program performance.	XVIII

TABLE 17-3 (Continued)WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	<u>Criteria</u>
QUALIFICATION OF PERSONNEL	To set forth policy instructions for establishing and maintaining the qualification of personnel associated with the quality, safety, and reliability of structures, systems, components, and services provided by PWRSD directly or by suppliers for PWR plants.	IX
SAFETY ANALYSIS REPORT CONTROL	To set forth policy instructions for ensuring that the requirements specified in design documents for a particular PWR plant technically support all the functional design and safety system performance requirements specified in the Safety Analysis Report (SAR) for the particular plant.	II III VI

10CFR50

Appendix B

TABLE 17-3 (Continued)WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	<u>10CFR50 Appendix B Criteria</u>
PWR QUALITY ASSURANCE AND RELIABILITY MANUAL	To set forth specific quality instructions for implementing the policies prescribed in the PWRSD Policy and Procedures Manuals.	
SUBJECT:		
PWR SYSTEMS DIVISION QUALITY ASSURANCE PLAN	Its purpose is to describe the procedures and actions used by Westinghouse to assure that the design, materials and workmanship employed in the fabrication and con- struction of systems, components and installations within the Westinghouse scope of responsibility in a nuclear power plant are controlled and meet all applicable re- quirements of safety, reliability, operation and maintenance.	I II

TABLE 17-3 (Continued)

WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

10CFR50
Appendix B
Criteria

<u>Procedures</u>	<u>Purpose</u>	
EQUIPMENT SPECIFICATION AND DRAWING REVIEW	The adequacy of specifications and drawings prepared for equipment is assured through independent review of these documents. The PWR Systems method of review is explained in this procedure. The term "E-spec" refers to equipment specifications or drawings when they are used in lieu of equipment specifications.	III IV
PURCHASE ORDER REVIEW	This procedure describes Quality Assurance review of purchase orders for clarity and for adequacy of quality requirements.	IV
QUALITY CONTROL PLANS	To define the procedure followed in developing Quality Control Plans.	V VII

TABLE 17-3 (Continued)WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	10CFR50 Appendix B <u>Criteria</u>
ENGINEERING DRAWING CONTROL	This procedure describes the procedure for engineering drawing review for adequacy, including correct definition of quality requirements and clear definition of acceptance standards, and provides the means for obtaining any needed corrections and documenting concurrence.	VI
CONTROL OF NONCONFORMING MATERIAL	To define an instruction for controlling, reviewing and dispositioning of non-conforming materials through the use of the Deviation Notice. This procedure describes how non-conforming materials parts and equipment are documented, reported, evaluated and dispositioned.	XV

TABLE 17-3 (Continued)

WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	10CFR50 Appendix B <u>Criteria</u>
CUSTOMER AUDITS OF PWR SYSTEMS DIVISION	This procedure deals with customer audit of the quality control program maintained by the PWR Systems Division	XVIII
SUPPLIER SURVEILLANCE AND AUDITS	This procedure describes the method used in survey- ing suppliers' facilities to provide for control of quality of equipment delivered to PWR Systems. Supplier surveillance is divided into two categories. First, audits that monitor the supplier's operating systems and process procedures; second, product verification in specific areas to exercise control over critical fabrica- tion and test points. These two surveillance categories are taken into account in the Quality Control Plan.	VII, VIII, IX, X, XI, XII, XIV

TABLE 17-3 (Continued)WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	<u>10CFR50 Appendix B Criteria</u>
QUALITY CONTROL LEVELS	PWR Systems Division applies three levels of quality control to procured materials. This procedure defines these levels and describes how they are assigned.	II, VII
SUPPLIER EVALUATION AND APPROVAL	Formal evaluations of new, prospective, or existing suppliers are necessary to determine and record their ability to meet Westinghouse Nuclear Energy Systems requirements for the manufacture of NSSS equipment. This procedure describes the means used by Quality Assurance for these evaluations.	VII

TABLE 17-3 (Continued)

WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	10CFR50 Appendix B <u>Criteria</u>
CUSTOMER PARTICIPATION IN SURVEILLANCE	In fulfillment of contractual and regulatory requirements, customers' quality assurance representatives periodically visit Westinghouse and its supplier's fabricating facilities to observe the Westinghouse Quality Assurance surveillance effort and to assure that supplier fabrication is controlled. This procedure describes how this activity is coordinated.	II VI XVII
QUALITY RELEASES	To describe the use of quality releases prior to shipment from supplier to site including assessment of completeness and adequacy of the equipment and related documentation.	VII
WESTINGHOUSE AUDITS OF PWR-SD	This procedure describes the audits conducted by Corporate Quality Assurance personnel who are organizationally independent from the operating divisions of the corporation, and audits conducted by the NES QA committee who are concerned with the integrated Quality Assurance Program of NES.	XVIII

TABLE 17-3 (Continued)WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	<u>10CFR50 Appendix B Criteria</u>
PRODUCT DOCUMENTATION FILES	To define the responsibilities and method of processing and maintaining the product Documentation Files.	XVII
LONG RANGE FILE RETENTION	The purpose of this procedure is to clearly define the retention responsibilities for equipment design and fabrication records.	XVII
TRAINING, QUALIFICATION, AND CERTIFICATION OF NONDESTRUCTIVE EXAMINATION PERSONNEL	To provide a uniform system for training, qualifying and certification of personnel who need to utilize non-destructive examination (NDT) methods and techniques and to assure personnel have optimum knowledge of the current state of the art commensurate with their specific job function.	IX

TABLE 17-3 (Continued)WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	10CFR50 Appendix B <u>Criteria</u>
CONTROL OF RENEWAL EQUIPMENT PURCHASES	To define the responsibilities and method of reviewing renewal equipment purchases, manufacture, and shipment to assure that products of the required quality are shipped to the customer.	VII
IDENTIFICATION OF EQUIPMENT AND COMPONENTS	To define the method for standard equipment identification.	VIII
TRIP REPORTS	To provide a standardized, effective system for documenting quality assurance activities at suppliers plants, plant sites, customer meetings, etc.	VII

TABLE 17-3 (Continued)WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	<u>10CFR50 Appendix B Criteria</u>
SUPPLIER CORRECTIVE ACTION NOTICE	To provide a coordinated system for obtaining and documenting corrective action for critical or chronic supplier deficiencies.	XVI
SUPPLIER QUALITY RELEASES	To provide for certain situations where the final quality review and preparation of equipment for shipment may be performed by the supplier.	VII
DESIGN REVIEW	To provide guidelines for conducting a design review.	III

TABLE 17-3 (Continued)WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	<u>10CFR50 Appendix B Criteria</u>
RELIABILITY ANALYSIS	This procedure describes the approach used in applying reliability analysis to component, sub-system or system design.	II, III
DATA FEEDBACK AND ANALYSIS SYSTEM	To define the methods and responsibilities for acquiring, classifying, filing, retrieval and analysis of empirical data on Westinghouse Nuclear Steam Supply Systems.	XVI
EQUIPMENT DEFICIENCY ANALYSIS	To identify equipment defects through a systematic review of the deficiency data file.	XVI

TABLE 17-3 (Continued)

WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

10CFR50
Appendix B
Criteria

<u>Procedures</u>	<u>Purpose</u>	
PWRSD ENGINEERING POLICIES AND PROCEDURES MANUAL	To set forth specific Engineering instructions for implementing the policies prescribed in the PWRSD Policy and Procedures Manuals.	
SUBJECT: OBJECTIVES AND POLICIES	To state overall objectives and policies of Engineer- ing, within the scope defined by Division Policy.	I II
TECHNICAL POLICIES AND PROCEDURES	To set forth policy and procedural instruction govern- ing the areas of: Position Papers, Preparation of E-Specs, Control of Design Changes, Control and Distribution of Licensing Reports, Safety Analysis Reports, Reports Supporting Licensing Applications, and Drawings.	III V VI

TABLE 17-3 (Continued)WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	10CFR50 Appendix B <u>Criteria</u>
QUALITY ASSURANCE	To define a procedure for stipulating the Quality requirements of equipment designed or specifies by PWRSD. In addition, key sections of the Quality Assurance Manual are referenced.	ALL
ADMINISTRATION	To set forth policy and procedural instructions for such areas as supplier evaluation, purchase order submittals, and documentation and storage.	IV VII IX
PWR PURCHASING MANUAL	To set forth specific purchasing instructions for implementing the policies prescribed in the PWRSD Policy and Procedures Manuals.	

TABLE 17-3 (Continued)WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	<u>10CFR50 Appendix B Criteria</u>
SUBJECT		VII, XIII
SELECTIONS OF SUPPLIERS	To set forth the policy on selection of suppliers.	XV
ORDER PREPARATION AND ADMINISTRATION	To set forth the instructions for preparation and administration of an order, including requisitions, purchase orders and change notices, Procurement Advisory Releases and Acknowledges.	IV V
COORDINATION WITH OTHER ACTIVITIES	Sets forth instructions for interface relationships with other groups.	III, XV

TABLE 17-3 (Continued)WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	<u>10CFR50 Appendix B Criteria</u>
GENERAL PROCUREMENT CONSIDERATIONS	To set forth specific instructions on the evaluation of suppliers, visits, terms and conditions, proposal evaluation, and order review.	VII XIII XV
PWR PROJECTS MANUAL SUBJECT:	To set forth specific Projects Instructions for implementing the policies prescribed in the PWRSD Policy and Procedures Manuals.	
COMMUNICATIONS	To set forth procedures for Drawing Transmittal, Projects Communications, Communication with other NES divisions, review of engineering specifications, and the Specification Control System.	III V VI

TABLE 17-3 (Continued)

WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	10CFR50 Appendix B <u>Criteria</u>
ENGINEERING	To set forth procedures for the interfacing relationships dealing with; Customer Quality Assurance, Surveillance and Visitations.	XVIII
PROCUREMENT	To set forth procedures for project activities associated with procurement.	IV
SAFETY AND LICENSING MANUAL	To set forth specific instructions for the Safety and Licensing group on implementing the policies prescribed in the PWRSD Policy and Procedures Manuals.	

TABLE 17-3 (Continued)WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	<u>10CFR50 Appendix B Criteria</u>
SUBJECT: PROCESS ASSURANCE PLAN	To address criteria applicable to Safety and Licensing and give an overview of means of compliance.	II
SAFETY ANALYSIS REPORTS (SAR)	To set forth instructions for the preparation, review, issuance, and revising on SARs. In addition, the means of handling questions in detailed.	III V VI
OPEN LICENSING ISSUES (OLI)	To set forth instructions on identifying, assessing and communicating the status of Open Licensing issues to achieve problem resolution.	

TABLE 17-3 (Continued)WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	10CFR50 Appendix B <u>Criteria</u>
REGULATIONS, CODES AND INDUSTRIAL STANDARDS	Identifies responsibility for preparation of fundamental safety criteria to assist in the design process by assuring conformance with AEC Safety and Licensing Requirements.	III
WCAP PREPARATION	Establishes guidelines within Safety and Licensing for the handling of Topical Reports.	VI
EMD QUALITY ASSURANCE MANUAL	To set forth specific quality instruction for implementing the quality program.	

TABLE 17-3 (Continued)WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	10CFR50 Appendix B <u>Criteria</u>
SUBJECT: MANUAL AND ADMINISTRATION	To define the Quality Program Manual and its administration, such as scope and format of the manual itself, the provisions for issuance, distribution and maintenance, approvals, and applicability.	II
QUALITY ORGANIZATION AND ORGANIZATION CHARTS	To describe the organizational position of the Quality Assurance Department within the Electro-Mechanical Division and the manner in which the responsibilities and authority of the Quality Assurance Department are implemented by its internal organization.	I

TABLE 17-3 (Continued)WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	10CFR50 Appendix B <u>Criteria</u>
QUALITY PLANNING	To identify total contract quality requirements as early as possible after order receipt and to assure that actions are undertaken in a timely and organized manner.	III IV V
INTEGRATED MANUFACTURING AND QUALITY PLANNING INSTRUCTIONS	Describes the program to assure that the desired product quality is maintained by clear and complete instructions of a type appropriate to the circumstances.	V
QUALITY CONTROL RECORDS	To outline the system implemented to generate, compile and store those records necessary to be maintained as objective evidence of compliance.	XVII

TABLE 17-3 (Continued)WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	<u>10CFR50 Appendix B Criteria</u>
CORRECTIVE ACTION FOR NONCONFORMING MATERIAL	To establish a procedure for insuring timely corrective action for nonconforming material.	XVI
CONTROL OF DOCUMENTS AND CHANGES	A. To define the procedure for release and control of drawings and specifications and document status reporting. B. To assure that proper document revisions are used by Manufacturing and Inspections and provided to the authorized inspector. C. To provide and maintain shop order effectivity of documents. D. To establish a uniform method of processing engineering changes and supplementary information in order to evaluate and control technical aspects. E. To provide availability of previous and current revisions of documents compatible to WEMD product lines.	VI

TABLE 17-3 (Continued)WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	10CFR50 Appendix B <u>Criteria</u>
EQUIPMENT CONTROL AND CALIBRATION	To establish necessary controls for the periodic inspection and calibration of all measuring and testing equipment used for the acceptance of quality.	XII
CONTROL OF PURCHASES	Defines the procedures for controlling the quality of vendor-furnished deliverable materials.	IV VII
IN-PROCESS AND FINAL INSPECTION AND TESTING	To establish necessary controls covering in-process inspection of material, parts, and components including final inspection and testing of complete products.	X XI

TABLE 17-3 (Continued)WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	10CFR50 Appendix B <u>Criteria</u>
HANDLING, STORAGE AND DELIVERY	Provides the work and inspection instructions for handling, storage preservation, packaging, and shipping to protect the quality of products and prevent damage, loss, deterioration, degradation, or substitution of products.	XIII
CONTROL OF NONCONFORMING MATERIAL	To establish a procedure for the identification, segregation, and disposition of material that does not conform to the requirements, provide a means of analyzing the causes of nonconformance so that corrective action can be taken to prevent recurrence and to provide immediate solutions to problems generated by manufacturing processes during the course of manufacture.	XV

TABLE 17-3 (Continued)WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	10CFR50 Appendix B <u>Criteria</u>
INSPECTION STATUS INDICATOR	Defines the methods used to show the inspection status of products.	XIV
PERSONNEL CERTIFICATION FOR NONDESTRUCTIVE EXAMINATION	To establish the practice for certifying personnel to perform nondestructive examination duties at Westinghouse Electric Corporation, Electro-Mechanical Division.	IX
DESIGN CONTROL	To outline the control system implemented for review involving designing, design engineering development and design interface activities	III

17.1-149

JULY, 1974

TABLE 17-3 (Continued)WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	<u>10CFR50 Appendix B Criteria</u>
MANUFACTURING CONTROL (IDENTIFICATION OF MATERIALS, PARTS AND COMPONENTS)	To describe the methods for identification, control and traceability of materials, parts and components through all stages of processing.	VIII
AUDITS	To establish the procedure for audits to insure compliance with all aspects of the Quality Assurance Program and determine effectiveness of the Program.	XVIII
EMD PURCHASING DEPT. MANUAL	To detail responsibilities, policies and procedures of the Purchasing Department for the control of purchased materials, equipment and services.	VII

TABLE 17-3 (Continued)WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	10CFR50 Appendix B <u>Criteria</u>
EMD ENGINEERING DEPT. INSTRUCTIONS	To establish procedures for design control including such elements as reviews, verifications of adequacy, tests, approvals, release and control of changes.	III
PENSACOLA QUALITY PROGRAM MANUAL	To set forth specific instructions for implementing the Quality Program.	
SUBJECT: GENERAL	Provides a comprehensive overview of the Quality System utilized at <u>W</u> Pensacola Division, defining organization, responsibilities, and authority.	I II V

TABLE 17-3 (Continued)WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	10CFR50 Appendix B <u>Criteria</u>
CONTRACT CONTROL	Describes the system utilized for dissemination of current contractual information to all affected internal departments.	III VI
DESIGN DRAWING AND DESIGN SPECIFICATION CONTROL SYSTEM	To define the system for release and control of design drawing and specifications to provide the proper document revisions to the authorized inspector.	III V VI
CONTROL OF PURCHASE	To define the activities associated with control of purchasing including: requisition review, supplier evaluation, approval requests, quality release, material rejection and corrective action.	IV VII XV XVI

TABLE 17-3 (Continued)WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	10CFR50 Appendix B <u>Criteria</u>
MANUFACTURING AND QUALITY ASSURANCE PLANNING	Defines the routine actions of manufacturing and quality engineering in planning for the acquisition, manufacture and inspection of material, components or assemblies.	II, V, VIII, IX X, XIV
MANUFACTURE CONTROL	To define the system for control of the manufacturing process	VIII, IX, X, XIV
INSPECTION	To define the activities required to inspect, evaluate results, document, and release manufactured items for further processing or assembly.	X XVII

TABLE 17-3 (Continued)WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	<u>10CFR50 Appendix B Criteria</u>
WELDING	To define the procedure to be used to assure that all welds made on products in process of manufacture are made per qualified procedures by qualified welders using properly controlled and traceable filler metal.	IX
NON-DESTRUCTIVE EXAMINATION, QUALIFICA- TION AND CONTROL	To define the methods for qualifying, certifying and controlling non-destructive examination personnel, equipment and procedures.	IX XI
GAGE AND INSTRUMENT CONTROL	To provide "off the shelf" availability of reliable calibrated inspection instruments and gages, and to maintain records of gage location and calibration status.	XII

TABLE 17-3 (Continued)WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	<u>10CFR50 Appendix B Criteria</u>
SPECIAL PROCESS CONTROL AND HEAT-TREATING	To describe control of special processes.	IX
NON-CONFORMING MATERIAL CONTROL	To describe the non-conforming review and documentation system.	XV
CORRECTIVE ACTION	To define the Corrective Action Program	XVI
INTERNAL QUALITY AUDITS	To describe the system for audit of conformance to internal procedures and processes.	XVIII

TABLE 17-3 (Continued)WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	10CFR50 Appendix B <u>Criteria</u>
QUALITY DOCUMENTATION	To define the product documentation necessary and the method of data retrieval.	XVII
CUSTOMER WITNESS POINTS	To describe the system utilized to assure customer notification prior to occurrence of contracted "witness points".	II X
TAMPA STANDARD DIVISION PROCEDURE SUBJECT: DRAWING CONTROL	To set forth standard division procedures. For control of releasing and distributing drawings and corresponding change notices prior to and during the manufacturing cycle.	III V VI

17.1-155

JULY, 1974

TABLE 17-3 (Continued)WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	10CFR50 Appendix B <u>Criteria</u>
MATERIAL, FINISH AND PROCESS SPECIFICA- TION HANDLING	Procedure for requesting new and/or revised specifications for material, finish, process and manufacturing procedures. Procedure includes the control for issuance and distribution.	III V VI
PREPARING MANUFACTUR- ING LINE-UPS	Procedure for preparation and review of both new and revised manufacturing line-ups.	V, VI, X
PROCEDURE FOR ORDERING FEEDERS	Procedure for control and release of manufacturing operational line-ups from which Inspection Point Programs are generated.	V VI

TABLE 17-3 (Continued)

WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	10CFR50 Appendix B <u>Criteria</u>
PREPARATION OF EMERGENCY MANUFACTUR- ING INFORMATION	Procedure for preparation and control of manu- facturing information released to Manufacturing for one-time job activities.	V
WELDER QUALIFICATION PROCEDURE	Procedure for control of recording and reviewing welder qualifications for Code compliance.	V IX
ERROR APPRAISAL NOTIFICATION PROCEDURE	Procedure for control on "Non-conforming Material".	III, V, VI, VII, XV
RECEIVING AND IN- SPECTION PROCEDURE	Procedure for controlling receipt and inspection of material.	IV, V, VII, VIII, X

TABLE 17-3 (Continued)

WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	10CFR50 Appendix B <u>Criteria</u>
CONTINGENCY ERROR APPRAISAL NOTIFICATIONS	Procedure for control of open EAN's, at time of shipment on Quality Release form that must be satisfied and cleared at the field sites.	V IX
PURCHASE ORDER PROCEDURE	Procedure for preparation and issuance of instructions for material and services.	IV V
G LETTER PROCEDURE	Procedure to expedite drawing changes for a specific customer order only and for incorporating drawings into units when time does not permit waiting for drawing change and release by the standard procedure.	III, V, VI, XV

TABLE 17-3 (Continued)WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	<u>10CFR50</u> <u>Appendix B</u> <u>Criteria</u>
EMERGENCY SUB- CONTRACTING OF GOODS AND SERVICES	Procedure for controlling preparation and issuance of instructions for both material and services.	IV
PRODUCT CONTROL AND DESIGN PROCEDURE	To set for specific Engineering Instructions.	
SUBJECT: PRODUCT PROCESSING PROCEDURE	Procedure detailing section activities necessary to process the product in compliance with the equipment specification and the governing codes.	III

TABLE 17-3 (Continued)WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	10CFR50 Appendix B <u>Criteria</u>
EQUIPMENT SPECIFICATIONS	Procedure for maintaining Design Control of requirements specified in the equipment specification and to insure that all design requirements are incorporated into the product.	III
DESIGN CODES AND ADDENDA	Procedure for maintaining Design Control of all requirements in Section III A.S.M.E. Code and to assure that all design requirements are incorporated into the product design drawings and documents within six months after issue date.	III
DESIGN REVIEWS AND CHECKLISTS	Procedure for conducting design reviews.	III

6

TABLE 17-3 (Continued)WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	<u>10CFR50</u> <u>Appendix B</u> <u>Criteria</u>
STRESS REPORT COMPLIANCE WITH HARDWARE	Procedure to insure that final stress report is reviewed to by product design section in which design originated and wherein all changes and variations are recorded.	III
TAMPA QUALITY ASSURANCE MANUAL	This manual has been prepared for the Nuclear Energy Systems, Large Components Division, Tampa Division by the Quality Assurance Section and provides information on procedures, systems, and activities performed by the Quality Assurance personnel.	

TABLE 17-3 (Continued)WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	10CFR50 Appendix B <u>Criteria</u>
SUBJECT: QUALITY ASSURANCE CONTROL PROGRAM	To provide a positive system for controlling the quality of nuclear vessel products supplied by the Tampa Division of Westinghouse Electric Corporation.	II
APPLICABILITY	Establishes Applicability of the QA manual.	II
DESIGN CONTROL	To define the QA function in Design and Design Change Control.	III
QUALITY ASSURANCE AUTHORITY AND ADMINI- STRATION OF MANUAL	To set forth the authority and responsibility for administration of the manual.	I VI
ORGANIZATION AND RESPONSIBILITIES	Defines the responsibilities and functions of the Quality Assurance Department.	I

TABLE 17-3 (Continued)WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	10CFR50 Appendix B <u>Criteria</u>
QUALITY ASSURANCE PLANNING	Establishes the pre-planning requirements for specification review and Inspection Point Plan development by QA.	VI X XIV
CONTROL OF PURCHASED MATERIAL	Establishes QA requirements associated with Ordering Information, P.O. Inspection Codes, QA Review of P.O.s, Supplier Evaluations and Audits, Source Inspection and Receiving Inspection.	IV VI VII VIII
INSPECTIONS, EXAM- INATIONS, NONDESTRUCTIVE EXAMINATIONS, AND PROCESS VERIFICATION	To set forth instruction for, In-process Inspection, Patrol Inspection, Final Inspection, Shipping Inspection, Nondestructive Examination, Post Weld Heat Treat Verification, and the development of Quality Assurance Instructions.	IX X XI XIII

17.1-164

JULY, 1974

TABLE 17-3 (Continued)WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	<u>10CFR50</u> <u>Appendix B</u> <u>Criteria</u>
CONTROL OF NON- CONFORMING OPERATIONS AND/OR MATERIAL	Establishes the guidelines for writing and handling Error Appraisal Notices (EAN's) that were initiated by <u>W</u> Tampa personnel performing in-house inspections and by <u>W</u> field representatives performing either source inspections at supplier's plant or assembly and test inspections at customer's plant sites.	XV
CORRECTIVE ACTION PROGRAM	To set forth the procedure and responsibility for initiating positive corrective action.	XVI
CONTROL OF SPECIFI- CATIONS & DRAWINGS	Establishes procedures to assure that only specifications and drawings used are current and that outdated non-applicable specifications are removed and destroyed.	V

TABLE 17-3 (Continued)

WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	10CFR50 Appendix B <u>Criteria</u>
WELDING AND WELD ROD CONTROL	Defines welding controls which are established to provide assurance and objective evidence that all welding operations performed during the manufacturing cycle adhere to and conform with Engineering drawings, process specifications, customer and code requirements.	IX XII
PERSONNEL QUALIFICATION	Establishes the Tampa program for qualification of non-destructive examination and the examination of personnel.	IX
TECHNICIAN'S STAMP CONTROL	Specifies the method of assurance that all rubber stamps used by Quality Assurance personnel are recorded and identified to specific individuals.	X XIV XVII

TABLE 17-3 (Continued)WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	10CFR50 Appendix B <u>Criteria</u>
MATERIAL HANDLING	Defines the material handling program and Inspection of Lifting Equipment.	XII
TOOL AND GAGE CONTROL	Defines the calibration frequency and main- tenance for gages and equipment used by the Quality Assurance Department and establishes responsibility for compliance to the procedure.	XII
OBJECTIVE EVIDENCE OF QUALITY	Defines the records program.	VII XVII
QUALITY AUDITING	To set forth the instructions for the Quality Auditing Program.	VII XVIII

17.1-167

JULY, 1974

TABLE 17-3 (Continued)WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	<u>10CFR50</u> <u>Appendix B</u> <u>Criteria</u>
SPECIALTY METALS DIVISION QUALITY ASSURANCE MANUAL SUBJECT: ORGANIZATION	Defines the functions of the various components of the Quality Control Organization.	I
ADMINISTRATION OF PRODUCT QUALITY CONTROL	Establishes the Quality Planning and order processing procedure.	II
INSPECTION AND TEST PHILOSOPHY	Establishes responsibility for all phases of Inspection & Test.	X XI

TABLE 17-3 (Continued)WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	10CFR50 Appendix B <u>Criteria</u>
SUPPLIER AND MATERIAL QUALITY ASSURANCE	Establishes procedures for Purchase Re- quisition Control & Vendor evaluations.	IV V, VII
MATERIAL IDENTIFICATION	Describes the system used by Quality Control in identifying and controlling material throughout the entire manufacturing cycle.	VIII
PROCESS CONTROL AND IN-PROCESS INSPECTION	To set forth instructions for Process Control and in-process inspection.	X
SPECIAL PROCESSES	Establishes special process controls and non- destructive examination requirements and qualifications.	IX

TABLE 17-3 (Continued)WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	<u>10CFR50 Appendix B Criteria</u>
STATISTICAL PLANNING AND APPLICATION	Defines statistical methods and techniques utilized for sampling inspection.	X
RECORDS AND DATA SYSTEM	To set forth the records program for main- taining objective evidence of Quality.	XVII
DRAWING, SPECIFICATION, CHANGE REVIEW, AND CONTROL SYSTEM	Defines the measure for document control including changes.	V VI
CONTROL OF NON- CONFORMING MATERIAL	Describes the procedure used in identifying and controlling all defective material detected at Receiving, or in any stage of processing and assuring that corrective action is taken.	XV XVI

TABLE 17-3 (Continued)WRITTEN PROCEDURES WITHIN NES
FOR IMPLEMENTING QUALITY ASSURANCE

<u>Procedures</u>	<u>Purpose</u>	10CFR50 Appendix B <u>Criteria</u>
QUALITY AUDIT SYSTEM	Establishes responsibilities and instruction for Audits.	XVIII
USE AND CONTROL OF INSPECTION STAMPS	Sets forth instructions for the use and control of Inspection Stamps.	XIV
CONTROL LABORATORIES	Establishes responsibilities and instructions for performing tests on raw materials, inter- mediate and final product.	XI
GAUGE CONTROL	Establishes measures for control of measuring and test equipment.	XII

TABLE 17-4

RECORDS RETENTION

List of Typical Documents and Records kept by PWRSD for NSSS
safety related and additional selected major components

<u>Document Description</u>	<u>Primary Retention Responsibility</u>
1. Equipment Specifications	Engineering
2. Process Specifications	Engineering
3. Instrumentation and Control Standards	Engineering
4. Drawings	Central Files, Drafting Reproduction
5. Design Review Documentation	Quality Assurance
6. Purchase Order, Change Notices and Procurement Advisory Releases	Purchasing
7. Equipment Prototype Test Data, Design Calculations and Stress Reports	Engineering
8. Supplier Fabricated Equipment	
a. Supplier fabricating, testing and NDT procedures	Engineering (if NES approval required) Supplier (when NES approval not required)*
b. Radiographs	Supplier*

-
- * Quality Assurance has the responsibility for reviewing documentation maintained by the supplier and assuring that the supplier has adequate facilities for long-term retention. Purchasing has the responsibility for enforcing the contractual retention and retrieval requirements.

TABLE 17-4 (Continued)

RECORDS RETENTION

<u>Document Description</u>	<u>Primary Retention Responsibility</u>
c. Testing equipment calibration records and personnel qualifications	Supplier*
d. Mill test reports, final acceptance inspection records, special process records and performance test records	Supplier* and Quality Assurance
e. Quality Releases, Code Forms, Inspection Plans and nameplate rub-offs	Quality Assurance
f. QA trip reports, QC Plans, Deviation Notices and supplier survey reports	Quality Assurance
9. Technical Manual, Instruction Book and Spare Part Forms	Engineering
10. Field Deficiency Reports	Engineering**

6

* Quality Assurance has the responsibility for reviewing documentation maintained by the supplier and assuring that the supplier has adequate facilities for long-term retention. Purchasing has the responsibility for enforcing the contractual retention and retrieval requirements.

** Original records are retained by Technical Operations of Nuclear Service Division.

TYPICAL DATA PACKAGES (RETAINED BY PWR-SD)

FOR REPRESENTATIVE COMPONENTS

DATA TYPE	Steam Generator	R. C. Piping	R. C. Fittings	Letdown HX	Seal Water Injec. Filter	Accumulator	Safety Injec. Pump	Boron Injec. Tank	R. C. Loop Stop Valve	Pressure Relief Valve	Waste Evap. Feed Pump	HO Adapt. Plugs
Quality Release	X	X	X	X	X	X	X	X	X	X	X	X
Insp. Checklist	X	X	X	X	X	X	X	X	X			
Pressure Envelope Material Certifications	X	X	X	X	X	X	X	X	X	X	X	X
RT Records	X	X	X	X	X	X	X	X	X	X		
PT/MT Records	X	X	X	X	X	X	X	X	X	X	X	X
UT Records	X	X				X		X	X	X		X
Dimensional Records	X	X	X	X	X	X	X	X	X			X
Performance Test Data							X		X	X	X	
Code Form	X	X		X	X	X		X				
Heat Treat Records	X	X	X			X	X	X	X			
Trip Report Summary Sheet		X	X	X	X	X	X	X	X			

17.1-173

TABLE 17-3 (Continued)

TYPICAL DATA PACKAGES (RETAINED BY PWR-SD)

FOR REPRESENTATIVE COMPONENTS

DATA TYPE	Steam Generator	R. C. Piping	R. C. Fittings	Letdown Hx	Seal Water Injec. Filter	Accumulator	Safety Injec. Pump	Boron Injec. Tank	R. C. Loop Stop Valve	Pressurizer Relief Valve	Waste Evap. Feed Pump	HD Adapt. Plugs
Nameplate Ruboff	X			X	X	X		X				
Supplier Certificate of Compliance				X	X	X			X			
Pressure Test Certificate				X	X	X		X	X	X	X	

17.1-174

TABLE 17-6 LOGIC FLOW DIAGRAM

17.1-175

JULY, 1974

TABLE 17-6 LOGIC FLOW DIAGRAM

JULY, 1974

a) THE NES QUALITY ASSURANCE COMMITTEE IS COMPOSED OF THE QUALITY ASSURANCE AND RELIABILITY MANAGERS FROM EACH OF THE NES DIVISIONS. THE COMMITTEE'S CHAIRMAN IS THE PWR-SD PRODUCT ASSURANCE MANAGER.

Figure 17-1
Nuclear Energy Systems
Organization

Figure 17-2 NSSS Functional Relationship Chart

Figure 17-3 PWR-SD Quality Assurance Program Organization

Figure 17-4. Electro-Mechanical Division Quality Assurance Program Organization

Figure 17-5. Tampa Division Quality Assurance Program Organization

Figure 17-6 Pensacola Division Quality Assurance Program Organization

Figure 17-7 Specialty Metals Division Quality Assurance Program Organization

Figure 17-8. Nuclear Service Division Quality Assurance Program Organization