Arizona Public Service Company
P.O. BOX 21666 • PHOENIX, ARIZONA 85036

June 10, 1983
ANPP-24040 - WFQ/KEJ

U. S. Nuclear Regulatory Commission
Region V
Creekside Oaks Office Park
1450 Maria Lane - Suite 210
Walnut Creek, California 94596-5368

Attention: Mr. D. M. Sternberg, Chief
Reactor Projects Branch 1

Subject: Palo Verde Nuclear Generating Station
(PVNGS) Docket Nos. STN-50/528/529/530
File: 83-056-026; G.1.01.10

Dear Mr. Sternberg:

Pursuant to the requirements of 10CFR50.55 (f), published in the Federal Register, dated January 10, 1983) please find attached the current description of the APS Quality Assurance Program for the Engineering, Design, Procurement and Construction of PVNGS. This submittal identifies changes that have been made to the quality assurance program description that were previously accepted by the NRC as part of the review of our Preliminary Safety Analysis Report (PSAR).

The current description of our quality assurance program used for construction (attached) has been transfered from the PSAR and placed in the Final Safety Analysis Report (FSAR). NRC will be notified of any further changes to this QA program description as required by 10CFR50.55 (f).

The change bars in the attachment are used in the following manner:

P	:	denotes manterial transferred from the PSAR to the FSAR with no change
12	:	denotes information which has been updated and will be incorporated into Amendment 12 of the FSAR

The QA program described in section 17.1 of this submittal is applicable to each unit during the design and construction phases. The QA program for the operational phase will be implemented for each unit as described in FSAR section 17.2.2.4.

Pursuant to the requirement of 10CFR50.55 (a) (Federal Register dated January 10, 1983) the current description of the QA program for the operational phase of PVNGS is described in FSAR section 17.2.

Add: W. Haass
1/1

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If you have any questions concerning this matter, please contact me.

Very truly yours,

E. E. Van Brunt, Jr. AEOR

E. E. Van Brunt, Jr.
APS Vice President,
Nuclear Projects
ANPP Project Director

EEVBJr/KEJ/sp
Attachment

cc: E. Licitra (w/a)
A. C. Gehr "

June 10, 1983
ANPP-24040 - WFQ/KEJ

STATE OF ARIZONA)
) ss.
COUNTY OF MARICOPA)

I, A. Carter Rogers, represent that I am Nuclear Engineering Manager of Arizona Public Service Company, that the foregoing document has been signed by me for Edwin E. Van Brunt, Jr., Vice President Nuclear Projects, on behalf of Arizona Public Service Company with full authority so to do, that I have read such document and know its contents, and that to the best of my knowledge and behalf, the statements made therein are true.

A. Carter Rogers
A. Carter Rogers

Sworn to before me this 10th day of June, 1983

Nora E. Mendar
Notary Public

My Commission expires:

My Commission Expires April 6, 1987

17. QUALITY ASSURANCE

17.1 QUALITY ASSURANCE DURING DESIGN AND CONSTRUCTION

This section describes the quality assurance (QA) program which has been established by the applicant, Arizona Public Service Company (APS), to provide assurance that the engineering, design, procurement and construction of the Palo Verde Nuclear Generating Station (PVNGS) conforms with applicable regulatory requirements and with the design bases specified in the license application. The QA Program for the operational phase activities of PVNGS is described in section 17.2. The QA program described in section 17.1 is applicable to each unit during the design and construction phases. The QA program for the operational phase will be implemented for each unit in turn as described in section 17.2.2.4.

The APS QA Program for the Engineering Design, Procurement and Construction of PVNGS is described in section 17.1A of this chapter. APS shall be responsible for the implementation of this QA program. Certain work, however, has been and will be delegated to other organizations for the engineering design, procurement and construction of the PVNGS. The major participating organizations are the Bechtel Power Corporation, Los Angeles Power Division, (Bechtel) and Combustion Engineering, Inc. (CE). The QA programs for Bechtel and CE are described in sections 17.1B and 17.1C of this chapter, respectively.

The APS QA Program as well as the QA programs of Bechtel, CE and other suppliers comply with the requirements of NRC Regulation 10 CFR Part 50, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants" (10 CFR 50, Appendix B).

Changes to the quality assurance program description included or referenced in sections 17.1A, 17.1B, and 17.1C of the chapter shall be submitted to the NRC in accordance with

10 CFR 50.55(f). Changes that do not reduce the commitments in the program are submitted within 90 days after implementation. Changes that do reduce the commitments shall be submitted to the appropriate NRC Regional Office, to the Resident Inspector, and to the Document Control Desk, U.S. NRC for approval prior to implementation. 12

17.1A - APS QUALITY ASSURANCE DURING DESIGN AND CONSTRUCTION

The APS QA program is documented by written policies and directives contained in the APS QA Manual for the Design, Procurement and Construction of PVNGS.

This QA Program complies with the requirements of NRC Regulation 10 CFR Part 50, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants". In addition, the QA program is structured in accordance with the NRC Regulatory Guides listed in section 17.1A.2.6.

Definitions used are in accordance with ANSI N45.2.10, "Quality Assurance Terms and Definitions" as endorsed by Regulatory Guide 1.74. Exceptions and additional terms and definitions applicable to matters relating to PVNGS are included in the APS QA Manual.

17.1A.1 ORGANIZATION

17.1A.1.1 General

APS, as the applicant, is solely responsible for the establishment and execution of the QA Program. Bechtel, acting as the agent for APS, has been delegated the responsibility for establishing and executing major portions of the QA program as described in this chapter. Combustion Engineering (CE) is responsible for nuclear steam supply system as defined in section 17 and maintains QA responsibility for this work. APS, however, recognizes and acknowledges the ultimate responsibility for the APS QA program and provides QA surveillance and audits activities to assure that the requirements of the APS QA program are satisfied. An interface organization chart is given in figure 17.1A-1.

P 17.1A.1.2 Responsibility and Authority

12 Figures 13.1-1, 13.1-2, and 13.1-4 show the organizational structure and relationships to corporate management of individuals and groups within APS with project management responsibility and responsibility for management of the APS QA Program during design and construction. The authority and specific responsibilities of individuals within APS who perform QA functions are established and delineated in writing in the APS QA Manual. These authorities and responsibilities are described in the following sections.

12 17.1A.1.2.1 Chairman and Chief Executive Officer

As shown in figure 17.1A-1, the Chairman and Chief Executive Officer of APS has the overall responsibility for the engineering, design, procurement, construction and operation of PVNGS. Execution of these responsibilities except for operation is delegated to the Nuclear Project Management Vice President through the Executive Vice President, Arizona Nuclear Power Project (ANPP). The responsibilities for establishing the policies and practices set forth in the APS QA Manual and assuring conformance with the requirements of the APS QA Program are delegated to the Corporate Quality Assurance Manager through the Executive Vice President, ANPP. The Chairman and Chief Executive Officer shall retain the responsibility, however, for assuring the independence of the Corporate QA Manager from schedules and costs and for providing the Corporate QA Manager the authority to direct and control the APS QA Program, to assure conformance to the quality requirements of that program.

12 17.1A.1.2.2 Executive Vice President, Arizona Nuclear Power Project (ANPP)

The Executive Vice President, ANPP, reports directly to the Chairman and Chief Executive Officer and has the responsibility

for establishing and maintaining the Quality Assurance Program for the PVNGS. Day-to-day responsibilities for design and construction have been delegated to the Nuclear Project Management Vice President. The responsibilities for developing the policies and practices set forth in the APS QA Manual and assuring conformance with the requirements of the APS QA Program are delegated to the Corporate Quality Assurance Manager. The Executive Vice President, ANPP, reserves the authority to conduct, or order, the auditing of any activity at any time to determine the effectiveness of the policies and requirements set forth in the APS QA Manual and to determine compliance with the provisions of the APS QA Manual. The Executive Vice President, ANPP, is responsible for instituting a formal review of the QA Program at least annually.

17.1A.1.2.3 Nuclear Project Management Vice President and ANPP Project Director

The Nuclear Project Management Vice President through the Executive Vice President, ANPP has been designated by the Chairman and Chief Executive Officer of APS as the responsible corporate officer, for implementation of QA Program requirements during the performance of activities relating to the engineering, design, procurement and construction of PVNGS. The Nuclear Project Management Vice President's responsibilities for implementing the QA Program are delegated to the Nuclear Engineering Manager, Nuclear Records Management Manager and the Nuclear Construction Manager. The Nuclear Project Management Vice President is the focal point for all formal communications pertaining to PVNGS.

17.1A.1.2.4 Corporate Quality Assurance Manager

The Corporate QA Manager is responsible for managing the APS QA Program. The Corporate QA Manager reports directly to the Executive Vice President, ANPP. He is responsible for the

implementation of the Quality Assurance Program and for advising the Executive Vice President, ANPP, and the Chairman and Chief Executive Officer of the program's effectiveness. The Corporate QA Manager has been given the authority by the Chairman and Chief Executive Officer to have stopped by established procedures unsatisfactory work or further processing of unsatisfactory material which is not in conformance with specified quality requirements and/or the provisions of the APS QA Program.

The Corporate QA Manager is responsible for assuring the adequacy of the APS QA Program and the QA programs of those contractors assigned the obligation of establishing and implementing portions of the APS QA Program. This responsibility will be exercised through periodic surveillance and audits of the QA programs of those organizations performing the work.

The Corporate QA Manager has the authority and organizational freedom to identify quality problems. He may initiate, recommend, or provide solutions to the Nuclear Engineering Manager, Nuclear Records Management Manager and Nuclear Construction Manager. He verifies implementation of solutions.

Specific duties and responsibilities of Corporate the QA Manager include che following:

A. Develop and implement the APS QA Program.

B. Prepare and control the APS QA Manual including revisions and its distribution.

C. Formulate QA policies for use by APS.

D. Review QA programs of Bechtel and CE for compliance with regulatory requirements and use his delegated authority to ensure that deficiencies in their QA programs are corrected. Changes made to CE's QA Program for editorial or administrative purposes only do not require review.

E. Perform audits and surveillances of Bechtel's and CE's QA programs, advise management of the status of program implementation and take corrective action as deemed necessary.

F. Review specifications, drawings and procedures for conformance to APS quality requirements, applicable industry standards and regulatory requirements. P

G. Manage the QA staff in the performance of their activities and responsibilities.

H. Have audited the permanent QA records.

I. Establish liaison with the Nuclear Engineering Manager, Nuclear Records Management Manager and Nuclear Construction Manager and maintain a current status of quality related and other activities as they pertain to the PVNGS. 12 P

J. Maintain communication with the QA organizations of Bechtel and CE with respect to QA activities.

K. Review correspondence from the NRC Office of Inspection and Enforcement and direct the preparation of inspection report responses. 12

L. Inform APS management of QA activities through distribution of audit reports and other quality related information.

M. Report potential significant quality related matters both verbally and in writing to the Nuclear Project Management Vice President. P

N. Assist in preparation of significant deficiency reports to the NRC in accordance with the provisions of 10CFR50.55(e) and 10CFR Part 21.

O. Assist the Nuclear Engineering Manager, Nuclear Records Management Manager and Nuclear Construction Manager in 12

P - preparation of quality related procedures controlling the activities of ANPP personnel.

17.1A.1.2.5 APS Corporate Quality Assurance Department

12 The Corporate Quality Assurance Department is under the supervision and direction of the Corporate QA Manager for the execution of the QA program. Their specific responsibilities include the following:

A. Maintain surveillance of QA requirements, practices and experiences throughout the nuclear power industry.

P B. Develop procedures, which employ recent data and developments from the nuclear power industry, which are used to assure quality in engineering, design, procurement and construction of the PVNGS.

C. Audit Bechtel's and CE's QA programs to provide assurance that they are maintained current with new standards, criteria and codes.

12 D. Review the project "Q" list of components (see table 3.2-1), equipment, structures and systems to ascertain that the list is kept current.

P E. Review drawings, procurement documents and procedures to provide assurance that QA requirements are being incorporated.

F. Audit the design, manufacturing, testing, and construction activities of Bechtel and CE and their subcontractors to provide assurance that quality practices are being maintained.

12 P G. Utilize the assistance of Nuclear Engineering technical personnel in review and audit activities.

H. Review changes to Bechtel's prequalified bidders list and provide concurrence as deemed appropriate.

The Corporate Quality Assurance Department is organized into departments as shown in the organization chart in figure 17.1A-4. 2-1 2-2

Responsibilities of Quality Systems and Programs and PVNGS Construction QA/QC include quality assurance functions relating to engineering, design, procurement and construction of PVNGS. Therefore, these two QA departments are described below. 12

17.1A.1.2.5.1 Quality Systems and Programs. The Quality Systems and Programs Department, through the Quality Systems and Programs Manager, has the responsibility to assist the Corporate Quality Assurance Manager, in the implementation of the Quality Assurance Program for home-office activities and in monitoring P the implementation of the APS Quality Program by APS Nuclear Construction Department, Nuclear Engineering Department, Nuclear Records Management Department-Quality-Assurance and the PVNGS Construction QA/QC Department as well as the design, engineering 12 and procurement activities of Bechtel and Combustion Engineering. To accomplish this assignment, the Quality Systems and Programs Department reviews design documents to insure the APS quality requirements have been incorporated and plans and conducts P audits and surveillance of the organizations listed above to insure the requirements of the APS Quality Program have been fulfilled. The Quality Systems and Programs Manager reports directly to the Corporate Quality Assurance Manager. 12

17.1A.1.2.5.2 PVNGS Construction QA/QC. The PVNGS Construction QA/QC Department through the PVNGS Construction QA/QC Manager has the responsibility to assist the Corporate Quality Assurance Manager in the implementation of the Quality Assurance Program for site construction activities and in monitoring the P implementation of Bechtel's Quality Program for construction activities. To accomplish this assignment, the PVNGS Construction QA/QC Department reviews site engineering and inspection 12

documents to insure the APS quality requirements have been incorporated and plans and conducts audits of Bechtel's construction activities, including Quality Assurance and Control activities, to insure that construction activities are accomplished in accordance with these quality requirements and provisions of their Quality Assurance Program. The PVNGS Construction QA/QC Manager reports directly to the Corporate Quality Assurance Manager.

17.1A.1.2.6 Nuclear Engineering (NE) Manager

The Nuclear Engineering Manager, through the Nuclear Projects Management Vice President has been delegated responsibility for engineering, design and procurement of the PVNGS. The Nuclear Engineering Manager has the assistance of technical units as shown in figure 13.1-4 in fulfilling his responsibilities. The Nuclear Engineering Manager has overall control of work performed on the project including:

A. The right to review and comment on all documents including drawings, specifications, analyses, computations and procurement documents prepared by contractors in performance of all work

B. The acceptance or rejection of all plans which govern the conduct of work, the assignment of responsibilities among, the coordination of activities of Bechtel, CE, the Nuclear Engineering staff, suppliers, subcontractors and consultants employed by Bechtel or APS

C. The right to inspect either directly or through his designated representative all work performed by contractors. The Nuclear Engineering Manager shall have the responsibility and the authority to reject any material or workmanship which does not meet the requirements specified in agreements with contractors

D. - The authority to accept all work performed by Bechtel subject to the concurrence of the Corporate QA Manager indicating that the provisions of the APS QA Program have been satisfied. | P | 12 | P

The Nuclear Engineering Manager shall be responsible for the preparation and control of the Nuclear Projects Department Project Procedures Manual which shall delineate the responsibilities of the technical groups in the Nuclear Engineering Department organization and the administrative procedures and controls over the work performed by Nuclear Engineering Department personnel during the engineering design and procurement of the PVNGS. | 12 | P | 12 | P | 12 | P

For a complete description of the Nuclear Engineering Department including personnel qualifications, refer to section 13.1.1. | 12

17.1A.1.2.7 Nuclear Construction Manager

The Site Construction Manager through the Nuclear Projects Management Vice President has the delegated responsibility for the construction of PVNGS. He has the assistance of several technical groups, in fulfilling his responsibilities. The Nuclear Construction Manager directs the APS field construction engineering personnel at the power plant site to insure that the project contractors and subcontractors comply with all applicable construction codes, standards, procedures and specifications. | P | 12 | P | 12 | P

The Nuclear Construction Manager has overall control of work performed by contractors at the site including: | 12

A. The right to evaluate the specification and purchase order of field-purchased equipment and services

B. The acceptance or rejection of all construction plans which govern the conduct of work, the assignment of responsibilities among and the coordination of activities of BPC, CE, contractors and consultants employed by BPC or APS. | P

C. - The right to inspect either directly or through his designated representative all work performed by contractors. The Nuclear Construction Manager shall have the responsibility and authority to reject any material or workmanship which does not meet the requirements specified in agreements with contractors.

17.1A.1.2.8 Nuclear Records Management Manager

The Nuclear Records Management Manager through the Nuclear Projects Management Vice President has the delegated responsibility for the receipt, indexing, storage, control and retrieval of APS records for PVNGS. The Nuclear Records Management Manager directs the technical and administrative activities within the Nuclear Projects Records Management Department which is comprised of five units as follows: NPRM Administration, RMS Computer System, PVNGS Drawing and Document Control, Drawing and Document Control (offsite) and Micrographics (onsite and offsite).

The Nuclear Projects Records Management Department provides onsite and offsite support for design, engineering, construction, startup and operation in the areas of documentation, drawing control and associated reference informational material by the means of hardcopy, micromedia and/or computer assisted retrieval.

17.1A.1.2.9 Bechtel Power Corporation

Bechtel is responsible to perform engineering, design, construction, cost engineering, procurement, QA, assistance in startup and preoperational testing, and project management coordination work requisite to the construction of three separate and complete nuclear power electric generating units. The organizational structure for QA which will direct Bechtel is described in Section 17.1B.

17.1A.1.2.10 Combustion Engineering, Inc. 12

CE is responsible to APS for the engineering, design, and procurement of the Nuclear Steam Supply System (NSSS). The organizational structure for quality assurance within CE and the responsibilities of individuals and groups within that organization are described in section 17.1C. P

17.1A.1.3 Project Quality Assurance Interface Control

APS has overall responsibility for interface control as it applies to the engineering, design, procurement, construction and testing of the PVNGS. This responsibility rests primarily with the Nuclear Project Management Vice President and the APS Corporate QA Manager. Additional responsibilities for controlling project interfaces rest with Bechtel and CE. 12 The responsibilities and methods used by these organizations for maintaining effective lines of communication between their QA organizations and the organizations of contractors performing work under their control are described in sections 17.1B and 17.1C respectively. P 12 A primary responsibility of the APS Corporate QA Manager is the verification of compliance with these interface measures as well as their effectiveness for controlling project interfaces.

Lines of communication between APS and its contractors shall be primarily through Bechtel. P In this regard, the primary communication line between Bechtel and APS shall be between the Bechtel Project Manager and the Nuclear Project Management Vice President. The APS Corporate QA Manager shall have direct access to the QA organizations within Bechtel and contractors. 12 In general, however, this access will be through the Bechtel Project QA Manager. P 12

P 17.1A.1.4 Personnel Qualifications

12 The Corporate QA Manager is responsible for managing and directing the APS QA Program. The Corporate QA Manager shall satisfy the following minimum qualification requirements:

A. Graduate of a four-year accredited engineering or science college or university.

B. Minimum of five (5) years experience in quality assurance, including testing or inspection (or both) of equivalent manufacturing, construction and installation activities. At least two years of this experience should be associated with nuclear facilities; or if not, the individual shall have training sufficient to acquaint him thoroughly with the safety aspects of a nuclear facility.

P

C. In lieu of a degree, a high school graduate plus ten (10) years of experience in general quality assurance or engineering of equivalent manufacturing, construction and installation activities. Five (5) years of this experience is required in QA, including testing or inspection (or both) of equivalent manufacturing, construction and installation activities. At least two (2) years of this experience should be associated with nuclear facilities; or if not, the individual shall have training sufficient to acquaint him thoroughly with the safety aspects of a nuclear facility.

12 The Corporate QA Manager shall have broad experience and formal training in the performance of QA and Quality control activities, including inspection and testing. He must be capable of planning

P and providing supervision to QA personnel who will be engaged in inspecting, testing, reviewing, evaluating and auditing the adequacy of activities to accomplish QA objectives.

The Corporate QA Manager shall be responsible for having reviewed the qualifications of Bechtel, CE, and their subcontractor personnel, and for the review of indoctrination and training programs established by those contractors for personnel who perform activities affecting quality. | 12 | P

17.1A.2 QUALITY ASSURANCE PROGRAM

17.1A.2.1 General

APS is responsible under ANPP for the Participation Agreement to manage the construction, operation, and maintenance of PVNGS in accordance with the rules and regulations of the NRC, the construction permits, operating licenses and SNM licenses issued for the PVNGS units by NRC, and the applications for such permits and licenses, and in such a manner as to provide for the protection of the health and safety of the public. The importance of QA in contributing to this safety as well as contributing to station reliability is also recognized. | 12 | P

In accordance with this philosophy, the APS QA Program has been developed and establishes the policies and practices for quality assurance for the engineering, design, procurement, and construction of PVNGS. Disagreements or differences of opinion in quality assurance matters which originate with or are brought to the attention of the Corporate Quality Assurance Manager are expected to be resolved jointly by him and the Nuclear Engineer Manager, Nuclear Construction Manager or Nuclear Records Management Manager, as appropriate. Where such resolution is not achieved within a reasonable period of time, unresolved differences shall be referred to the Vice President of Nuclear Projects Management or Executive Vice President, ANPP, as appropriate. | 12

It is the policy of APS to utilize qualified and trained personnel in all responsible project positions and job assignments. | P

Personnel shall receive formal indoctrination in QA, including | 12

basic principles; 10 CFR Part 50, Appendix B; and the contents of the APS QA Manual.

17.1A.2.2 Program Description

The APS QA Program consists of three elements which are described below. The first element is a documented system of administrative controls over activities affecting quality. The second element is quality verification and the third element is QA.

P 17.1A.2.2.1 Administrative Controls

The QA program requires preparation of appropriate documents, including procedures, drawings and specifications, which prescribe the measures which have been established to control all activities affecting quality. Compliance with this requirement is the responsibility of each and every organization or group with responsibility for the engineering, design, procurement and construction of the PVNGS. The measures which are established to control work must be detailed to the extent necessary to insure that adequate controls have been incorporated. This 12| establishes a documented system of controls which will guarantee confidence in the acceptability or quality of the work activities governed by those documents.

17.1A.2.2.2 Quality Verification

Quality is achieved through the use of skilled personnel, P adequate planning, use of suitable tools and procedures, proper definition of job requirements and appropriate supervision and technical direction. Quality is verified through surveillance, inspection, testing, checking and review of work activities and documentation. Quality verification is the basic responsibility of the organization or group performing the activity. Quality verification is performed, however, by individuals other than those who did the work.

17.1A.2.2.3 Quality Assurance

The quality assurance function consists of review, surveillance and audit. Auditing is assigned to the Corporate Quality Assurance Department, which is independent of the organizations responsible for the work. The Corporate QA Department is responsible for formulating or reviewing general quality policies; review of QA and control activities; monitoring and auditing program activities to assure compliance with established controls and requirements; and for measuring the overall effectiveness of those controls.

17.1A.2.3 Responsibilities

The organization and responsibilities of the principal parties involved in the engineering design, procurement and construction of the PVNGS are described in Section 17.1A.1, "Organization." The responsibilities of these organizations with respect to the elements of the QA program are described below.

17.1A.2.3.1 Arizona Public Service Company

Arizona Public Service Company (APS) has overall responsibility for the QA Program. Responsibility for establishing and implementing a system of administrative controls over quality affecting activities rests with the Nuclear Engineering Manager, Nuclear Records Management Manager, Nuclear Construction Manager and the Corporate QA Manager. These controls are described in the Nuclear Projects Department Project Procedures Manual, Nuclear Construction Department Project Procedures Manual, Nuclear Projects Records Management Procedures Manual and the APS QA Manual. The Nuclear Projects Department Project Procedures Manual contains the administrative procedures which control the activities of the Nuclear Engineering Department personnel.

12 P The Nuclear Construction Department Project Procedures Manual contains the administrative procedures which control the activities of the Nuclear Construction personnel.

The Nuclear Projects Records Management Procedures Manual contains the administrative procedures which control the activities of the Nuclear Records Management personnel.

12 The Corporate QA Department is primarily responsible for QA audit activities which are described in section 17.1A.18. The audit responsibility of the Corporate QA Department includes audits of contractors and the compliance of Nuclear Engineering, Nuclear Construction and Nuclear Records Management personnel with the provisions of the administrative procedures which control their activities.

17.1A.2.3.2 Bechtel Power Corporation

P Bechtel is responsible for complying with the requirements of the APS QA Program. The procedures, instructions, manuals and other documents which delineate activities carried out by

12 Bechtel engineering, procurement, construction, scheduling, and QA are described in section 17.1B. Bechtel is responsible to

P APS for the engineering, design, procurement, and construction

12 of PVNGS. Consistent with this delegated responsibility, Bechtel is responsible for both quality verification, and QA activities with respect to suppliers of equipment, material and services including CE.

17.1A.2.3.3 Suppliers

P APS requires that suppliers of equipment, materials and services which could affect the quality of safety related structures, systems and components establish and implement QA programs. These programs shall include provisions which are consistent with the APS QA Program. APS responsibilities with respect to these programs will be exercised through surveillance and audit

by the APS Corporate QA Department either in conjunction with or independent of Bechtel QA. Bechtel is responsible for performing quality verification for Bechtel activities and QA for Bechtel and supplier activities. 12 P

17.1A.2.4 Program Documentation

QA Program policies and practices are contained in the APS QA Manual. The APS QA Manual consists of QADs, listed in table 17.1A.2-1, which are approved by the Corporate QA Manager. Requirements for preparation, review, approval, revision and issuance and distribution of QADs are delineated in the APS QA Manual. Table 17.1A.2-1 includes a cross reference of the requirements of 10CFR Part 50 Appendix B to the QADs contained in the APS QA Manual. More detailed cross references to implementing procedures of APS Nuclear Projects, Bechtel, and CE are incorporated into various QADs in the APS QA Manual. Other documents which include instructions, procedures, and manuals delineating activities to be performed by APS, Bechtel and CE are identified in the APS QA Manual. 12 P 12 P 12 P

The Corporate QA Manager, Nuclear Engineering Manager and Nuclear Construction Manager have the right to review and comment on all documents, including quality assurance manuals and procedures, drawings, specifications, analyses, computations and procurement documents prepared by Bechtel. 12 P

The document control procedures for Bechtel and CE are identified in Sections 17.1B and 17.1C, respectively.

17.1A.2.5 Management Reviews

The Executive Vice President, ANPP, reviews the status and adequacy of the APS QA Program at least annually. The Executive Vice President, ANPP, requires the Corporate QA Manager to make formal recommendations with regard to the adequacy of the policies and practices contained in the APS QA Manual and the compliance with those policies and practices. The recommendations become the formal record of effectiveness of the APS QA Program. 12 P

P 12 The intent of the management review is to assess the scope, implementation and effectiveness of the QA Program to assure that the program effectively complies with APS policy and the requirements of 10 CFR 50, Appendix B. The review includes reviews or audits of quality affecting activities conducted by or for the Executive Vice President, ANPP, and/or the Chairman and Chief Executive Officer to maintain an overall awareness of the effectiveness of the APS QA Program and the implementation of APS policy directives.

12 Additionally, and on a routine basis, the Executive Vice President, ANPP, reviews appropriate QA records, including but not limited to reports of audits, reports of corrective action, reports of design verification actions, source evaluations, and personnel qualifications.

17.1A.2.6 Applicability of Codes, Standards and Regulatory Guides

P The APS QA Program has been developed, to the extent practical, in accordance with approved NRC Regulatory Guides and ANSI Standards. Bechtel is responsible to APS for maintaining control over the list of codes, standards and regulatory guides which are applicable to the engineering, design, procurement and construction of the PVNGS. This list is included in the Project Design Criteria Manual for the PVNGS which is maintained by Bechtel. All changes to this list are reviewed by the APS Corporate QA Manager and the Nuclear Engineering Manager prior 12 to implementation in procurement documents.

P 12 The Nuclear Engineering Manager has overall responsibility for determining the applicability of codes, standards and regulatory guides and for implementing the provisions of those requirements. The Corporate QA Manager is responsible for verifying that codes, P standards and regulatory guides accepted for use during the design, procurement and construction of the PVNGS are implemented. 12 The Corporate QA Manager will coordinate this effort with the Bechtel Project QA Manager as necessary to take full

12

Table 17.1A-1

APS QA References to NRC 10CFR50 Appendix B

Matrix-Relation to U.S. Nuclear Regulatory Commission 10CFR50 Appendix B, Quality Assurance Criteria for Nuclear Power Plants, and Fuel Reprocessing Plants and American National Standard ANSI N45.2 Quality Assurance Requirements for Nuclear Power Plants

PVNGS Units 1, 2 & 3

App.B Sect Nos.	Subject	ANSI Sect Nos.	Quality Assurance Manual / Quality Assurance Directives (QADs)																											
			1.0 Organization	2.0 Quality Assurance Program	2.1 Control of Quality Assurance Directives	2.2 Personnel Indoctrination, Training and Qualification Requirements	2.3 Glossary of Terms and Definitions	2.4 Management Reviews	2.5 NRC Site Inspections	2.6 Construction Site Visits	3.0 Design Control	4.0 Procurement Document Control	5.0 Instructions, Procedures and Drawings	6.0 Document Control	7.0 Control of Purchased Material, Equipment and Service	8.0 Identification and Control of Materials, Parts and Components	9.0 Control of Special Processes	10.0 Inspection	10.1 Construction Site Surveillance Reports	11.0 Test Control	12.0 Control of Measuring and Test Equipment	13.0 Handling, Storage and Shipping	14.0 Inspection, Test and Operating Status	15.0 Nonconforming Materials, Parts and Components	16.0 Corrective Action	17.0 Quality Assurance Records	18.0 Audits
I	Organization	3	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
II	Quality Assurance program	2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
III	Design control	4		X				X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IV	Procurement Document control	5		X				X				X			X												X	X	X	X
V	Instructions, procedures and drawings	6		X		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
VI	Document control	7		X	X	X		X	X		X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X
VII	Control of purchased material, equipment, and services	8		X				X				X			X	X							X		X	X	X	X	X	X
VIII	Identification and control of materials, parts, and components	9		X				X							X	X	X			X		X	X		X	X		X	X	X
IX	Control of special processes	10		X				X							X		X			X								X	X	X
X	Inspection	11		X				X			X				X	X	X	X	X	X	X	X	X	X				X	X	X
XI	Test control	12		X				X							X		X			X	X							X	X	X
XII	Control of measuring & test equipment	13		X				X									X			X	X							X	X	X
XIII	Handling, storage and shipping	14		X				X									X			X		X						X	X	X
XIV	Inspection, test & operating status	15		X				X							X		X			X	X		X				X	X	X
XV	Nonconforming materials, parts, or components	16		X				X	X		X				X	X	X		X	X	X	X	X	X	X	X	X	X	X	X
XVI	Corrective action	17		X				X	X		X				X	X	X		X	X	X	X	X	X	X	X	X	X	X	X
XVII	Quality assurance records	18		X		X		X	X		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
XVIII	Audits	19		X		X		X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

advantage of the codes and standards reviews conducted by Bechtel. P

The APS QA Program is structured in accordance with the following Regulatory Guides with the exceptions as described in section 1.8:

A. Regulatory Guide 1.28: Quality Assurance Program Requirements (Design and Construction)

B. Regulatory Guide 1.37: Quality Assurance Requirements for Cleaning of Fluid Systems and Associated Components of Water-cooled Nuclear Power Plants

C. Regulatory Guide 1.38: Quality Assurance Requirements for Packaging, Shipping, Receiving, Storage and Handling of Items for Water-cooled Nuclear Power Plants

D. Regulatory Guide 1.39: Housekeeping Requirements for Water-cooled Nuclear Power Plants 12

E. Regulatory Guide 1.30: Quality Assurance Requirements for the Installation, Inspection, and Testing of Instrumentation and Electrical Equipment

F. Regulatory Guide 1.94: Quality Assurance Requirements for Installation, Inspection, and Testing of Structural Concrete and Structural Steel During the Construction Phase of Nuclear Power Plants

G. Regulatory Guide 1.58: Qualification of Nuclear Power Plant Inspection, Examination and Testing Personnel

H. Regulatory Guide 1.116: Quality Assurance Requirements for Installation, Inspection and Testing of Mechanical Equipment and Systems P

I. Regulatory Guide 1.88: Collection, Storage and Maintenance of Nuclear Power Plants Quality Assurance Records, 12

J. Regulatory Guide 1.64: Quality Assurance Requirements for the Design of Nuclear Power Plants

K. Regulatory Guide 1.144: Auditing of Quality Assurance Programs for Nuclear Power Plants

12 L. Regulatory Guide 1.123: Quality Assurance Requirements for Control of Procurement of Items and Services for Nuclear Power Plants

M. Regulatory Guide 1.146: Qualification of Quality Assurance Program Audit Personnel for Nuclear Power Plants

17.1A.2.7 Safety Related Structures, Systems and Components Controlled by the Program

P Table 3.2-1 identifies the structures, systems and components to which the APS QA Program applies and is called the Q-List. It is a tabulation of safety related items; i.e., those items that contribute to the prevention or mitigation of the consequences of postulated accidents which could cause undue risk to the health and safety of the general public; generally, QA related functions performed on Q-List items during the engineering, design, procurement, inspection, and testing phases are in the responsibility of the organization (Bechtel 12 or ~~of~~ C-E) primarily responsible to supply the item.

17.1A.2.8 Personnel Indoctrination and Training

P APS QA Program provides for the indoctrination and training of personnel performing activities affecting quality as necessary to assure that suitable proficiency is achieved and maintained. The APS QA Manual identifies the procedures that have been established by APS for indoctrination and training as well as

the personnel qualification requirements. Personnel indoctrination and training procedures assure that:

A. Personnel responsible for performing quality activities are instructed as to the purpose, scope, and implementation of the quality-related manuals, instructions, and procedures.

B. Personnel performing quality-related activities are trained and qualified in the principles and techniques of the activity being performed. 12

It is the responsibility of Corporate Managers to assure that their personnel are aware of QA requirements. This is achieved through a planned training program.

Personnel designated to participate in audits shall have or will be given training and orientation in methods for performing audits. One or more of the following methods will be employed in developing personnel: P

A. Training to provide personnel with working knowledge and understanding of both ANSI N45.2, "Quality Assurance Program Requirements for Nuclear Power Plants," and ANSI N45.2.12~~-1973~~, "Requirements for Auditing of Quality Assurance Programs for Nuclear Power Plants". 12 P 12

B. Training programs designed to provide general and specialized training in audit performance. General training will include fundamentals, objectives, characteristics, organization, performance, and results of quality auditing. Specialized training will include methods of examining, questioning, evaluating, and documenting specific audit items, methods of identifying and following up on corrective items and methods of closing out audit findings. P

C. On-the-job training, guidance, and counseling under the direct supervision of an experienced, qualified

auditor. Such training will include planning, performing, reporting and follow-up action involved in conducting audits.

D. Orientation of technical specialists by the audit team leader. Such orientation will include familiarization with audit principles and procedures.

Auditors proficiency may be maintained through one or more of the following methods:

A. Regular, active participation in the audit process.

B. Review and study of codes, standards, procedures and instructions related to quality assurance programs and program auditing.

C. Participation in training or orientation programs.

P Training requirements and procedures for Bechtel and CE project personnel whose work activities affect quality are delineated in section 17.1B and 17.1C, respectively.

17.1A.3 DESIGN CONTROL

17.1A.3.1 General

The design of structures, systems, equipment and components is controlled by the various contractor organizations to assure safe and reliable performance of products and services provided to APS. The control processes are documented by procedures and checklists which establish the responsibilities and interfaces of each contractor that has an assigned design responsibility. The procedures and checklists include means to assure that quality requirements and standards are specified in design and procurement documents; that suitable materials, parts, components, and processes are applied; and that the designs are verified for adequacy by persons other than those performing the original design. Design changes are controlled to the same level as was applied to the original design,

including review and approval by the same organization that performed the original review and approval, unless otherwise designated by Bechtel with concurrence by APS. Design documents and revisions thereto shall be distributed to responsible individuals in a timely manner and controlled to prevent inadvertent use of superseded material. Errors and deficiencies in design that adversely affect safety-related structures, systems and components are documented and appropriate corrective action is taken in accordance with sections 17.1A.15 and 17.1A.16. P 12

Bechtel has been delegated the responsibility for the engineering, design, procurement and construction of the PVNGS. They have responsibility for the QA audit of the design control measures and their implementation by the NSSS and other contractors performing design work. Bechtel's design control procedures are described in section 17.1B.

CE has responsibility for performing the design of the NSSS and/or review and approval of work performed by their subcontractors. CE's design control procedures are described in section 17.1C. P

APS has overall responsibility for the control of the design of the PVNGS. APS will review documents submitted by Bechtel, CE and their subcontractors. This review in conjunction with QA audits will provide assurance that contractors design control measures are in conformance with the requirements of the QA Manual.

17.1A.3.2 Design Control Procedures

Bechtel and CE design organizations have established and implemented design control procedures which delineate the responsibilities, authority, reporting and methods of communication of

the design organization. These procedures include provisions for the following:

A. Design Process Control

The implementation of design process control methods has been delegated to Bechtel and CE subject to review by APS NE and audit by QA. Design process control methods shall be applied to: analyses, such as thermal, hydraulic, stress and accident; core physics and design; material selection and compatibility, accessibility for both maintenance and repair and inservice inspection, and delineation of acceptance criteria for tests (construction and preoperational) and inspections.

B. Design Standards

Design documents and specifications developed for Quality Class "Q" structures, systems, equipment and components shall be prepared and reviewed by Bechtel and CE to ascertain inclusion of the following:

1. Engineering requirements
2. NRC design criteria
3. NRC QA criteria
4. NRC regulatory guide conformance or applicability
5. Applicability of industry codes and standards, i.e., ASME, IEEE, ANS, and ANSI
6. Conformance with the Safety Analysis Report
7. Interface requirements including internal interfaces.

C. Design Interface Control

Bechtel Quality Assurance reviews interface control procedures to verify that implementing procedures are being properly used with design documents prepared by Bechtel. Bechtel's design interface control is described in Section 17.1B. Bechtel maintains interface control with the subcontractors and with APS. APS Corporate Quality Assurance will perform audits to verify that interface controls are maintained between APS and Bechtel and between Bechtel and their subcontractors including CE. | P | X | 12

D. Design Verification

Bechtel and CE are responsible for developing and implementing a design verification or checking method prior to issuance of Bechtel and CE design, engineering and specification documents. This will include design review, alternate calculations where applicable and qualification testing. | P

Bechtel and CE will document significant deficiencies which may adversely affect safety related structures, equipment, systems or components in the design process and shall take appropriate corrective action and document same. When a test program is specified to verify adequacy of the design, qualification testing of a prototype unit subjected to the most adverse design conditions shall be used. Materials, parts, equipment and components which are considered "off the shelf" shall be reviewed and selected based on their suitability of application when such items are employed or related to QA Class "Q" systems, structures, equipment or components. | 12 | P | 12 | P

E. Design Change Control

Bechtel and CE have developed and implemented design change control procedures which are commensurate with those used for the original design. Final results, upon incorporation of all design changes are documented in final as-built drawings and specifications. P

F. Field Change Control

Upon receipt of material, equipment and components, and during the construction and preoperational test phase, field changes may be required.

Field changes shall be approved by the Project Engineer and shall be subject to the same design change control procedures described in section 17.1A.3.2.C. 12

Field changes shall be documented and subject to design control procedures implemented by Bechtel.

APS shall be notified of each change and may review proposed changes prior to implementation. Bechtel/CE shall submit supporting documentation for all changes. The field changes shall be reflected in the appropriate drawings and specifications.

G. Control of Significant Deficiencies P

Significant deficiencies which are safety-related shall be reported in accordance with the NRC Code of Federal Regulations - 10CFR50.55(e).

H. Design Records

The Bechtel/CE contractor are responsible for the collection, storage, distribution and maintenance of design documents, design reviews, records, and changes thereto. The system shall be maintained in a systematic and controlled manner subject to audit by APS.

17.1A.4 PROCUREMENT DOCUMENT CONTROL

Bechtel is responsible for the preparation and submittal of procurement documents in compliance with the QA requirements, to APS for review and comment. This review is coordinated by the Nuclear Engineering Manager or Nuclear Construction Manager. The awarding of contracts is by APS. Contracts will be managed by Bechtel. P 12 P

CE is responsible for procurement of NSSS components. Bechtel audits CE procurement activities for compliance with C-E QA requirements. 12

Procedures established and implemented by both Bechtel and CE, delineate the preparation and the review of procurement documents by cognizant and qualified personnel, to assure that applicable regulatory requirements, design bases and quality requirements are properly included or referenced; that these requirements can be inspected or controlled; that there are adequate acceptance/rejection criteria, and all of these QA requirements have been complied with by the procurement documents. P

The procurement documents identify the requirements for the QA Program to be implemented by vendors and contractors. The QA requirements are in accordance with the Q-List, which is discussed in table 3.2-1. The procurement documents document the supplier's or contractor's acceptance of obligation to implement the QA Program in accordance with 10 CFR 50, Appendix B. 12

Procurement documents include or reference, as applicable, basic technical requirements including regulatory requirements, component and material identifications, drawings, specifications, codes and industrial standards with applicable revision dates, tests and inspection requirements, and special process instructions and requirements for such activities as designing, fabrication, cleaning, erecting, packaging, handling, shipping, field storage and inspecting. P

Procurement documents include provisions for right of access to vendors facilities and records for source inspection and audit by Bechtel, CE, APS, and/or regulatory agencies.

Procurement documents include, as appropriate, documentation requirements, identifying the documents to be prepared, maintained, submitted, or made available for review and comment, such as: drawings, specifications, procedures, procurement documents, manufacturing and inspection plans, inspection and test records, personnel and procedure qualifications, as well as material, chemical, and physical test results. Instructions on record retention and disposition are provided.

Changes and additions to procurement documents require at least the same reviews and approvals as the original documents.

Procurement documents for spare parts or replacement parts comply with all of the foregoing requirements.

Procurement documents include provisions for extending applicable requirements of the procurement documents to the suppliers lower tier suppliers, including right of access if necessary to facilities and records by Bechtel, CE, APS, and/or regulatory agencies.

APS has overall responsibility for the control of the procurement of PVNGS items and services. This control is exercised through reviews of procurement document control measures conducted by Nuclear Engineering, Nuclear Construction and Corporate QA Departments. Audits are conducted by the APS Corporate QA Department to verify that the measures have been established and implemented.

Descriptions of Bechtel's and C-E's procurement document control measures are discussed in section 17.1B and 17.1C, respectively.

17.1A.5 INSTRUCTIONS, PROCEDURES AND DRAWINGS

The APS QA Program requires that activities affecting quality be prescribed by documented instructions, procedures or drawings of a type appropriate to the circumstances, and accomplished in accordance with such documents. These documents include appropriate quantitative and qualitative criteria for determining whether or not an activity has been satisfactorily accomplished. P

A contractor, or supplier, responsible for an activity affecting quality, is required to provide the necessary instructions, procedures, or drawings to appropriately prescribe the activity. These documents must be reviewed and approved by responsible personnel prior to accomplishing the activity.

Bechtel, and/or APS, may require the submittal of such documents for review and acceptance, prior to the undertaking of an activity. Such a requirement shall be identified in procurement documents.

The Corporate QA Department verifies that activities affecting quality have been performed in accordance with instructions, procedures, or drawings and that required documentation exists for verification. 12

The APS QA Manual contains an identification of the controlled procedures, instructions, manuals and other documents which delineate activities carried out by APS. P

These documents form the basis for control over the activities which could affect the quality of Quality Class "Q" structures, systems and components of the PVNGS during engineering, design, procurement and construction. 12

The QA Manual identifies the originating authority; the responsibility for document review for APS QA policy compliance; the responsibility for review, comment and acceptance within APS; and the responsibility for approval, for the controlled documents used by APS. APS Corporate QA will perform audits to verify that these documents are being utilized in the proper manner. P 12

Bechtel and CE documents are identified in sections 17.1B and 17.1C, respectively.

17.1A.6 DOCUMENT CONTROL

The APS QA Program requires that organizations with responsibility for documents which prescribe activities affecting quality establish and implement document control measures. The procedures which have been established by APS to implement the requirements for document control are identified in the APS QA P manual. These procedures identify the format and content requirements for documents; the responsibilities for preparation, review, approval and revision to documents; the document identification systems used by APS; the measures to control issuance and distribution, receipt, filing and storage, use and disposition. Documents include drawings; design specifications, calculations, engineering studies, vendor data, test procedures, design criteria, Q-List, PSAR/FSAR and QA programs and procedures.

The procedures which have been established by Bechtel and CE to implement the requirements for document control are described in section 17.1B and 17.1C.

12 The Corporate QA Manager is responsible for the maintenance, issuance and control of the APS QA Manual. The Corporate QA P Manager is also responsible for the issuance of instructions 12 which delineate the performance of activities by APS Corporate QA personnel.

12 The Nuclear Engineering Manager is responsible for the preparation of document control procedures for Nuclear Engineering Department, where there is responsibility for the issuance, P review, and/or acceptance of documents. Such activities include review and comment on design documents issued by Bechtel; review and comment on procurement documents prepared by Bechtel; review 12 of acceptance and qualification test procedures; and review and P comment on changes to previously accepted documents. These

document control procedures identify the individuals or groups responsible for each activity. P

The Nuclear Construction Manager is responsible for preparation of document control procedures for Nuclear Construction where there is responsibility for the issuance, review, and/or acceptance of documents. Such activities include review and comment on field design and procurement documents, qualification test procedures, and construction plans. These document control procedures identify the individuals or groups responsible for each activity. 12 P 12

Bechtel has the responsibility for engineering, design, procurement, and construction document control for the project. Bechtel is responsible for the issuance of design documents to the site prior to commencement of work; the coordination and control of interface documents with various suppliers and contractors; the control of changes to design documents; coordination of documents with APS; the review and acceptance of procedures submitted by suppliers; project QA program documents; and distribution and control of design documents released for construction. Document control procedures require that only proper and current documents are provided and are used by contractors performing an activity; that superseded documents are properly controlled; that current and updated distribution lists are established; and that supervision monitor for compliance with document control requirements. P

Suppliers and contractors are responsible for maintaining prescribed document control procedures as part of their own QA program. The document control measures which are adopted by an organization, must be designed to assure that only currently approved documents are used by those performing an activity; that there are means for determining the status of a document; that the use of outdated or inappropriate documents is precluded and that changes are included in all documents affected by the change.

The document control procedures require that an organization prescribe measures to preclude inadvertant use of outdated or superceded documents.

Bechtel is responsible to APS for a comprehensive system of planned and documented audits to verify compliance with all P aspects of the QA program for document control. These audits shall be performed by personnel not having direct responsibilities in the areas being audited.

Bechtel shall conduct internal and external audits to assure that both its document control program and the programs of other organizations including C-E are being implemented and are satisfactory.

12 The APS Corporate QA Manager is responsible for having conducted surveys and audits to verify compliance with the requirements for P the control of documentation. This includes the audit of the audit programs carried out by each organization as necessary to 12 determine their effectiveness. The Corporate QA Manager reviews Bechtel's audit schedules and results on a routine basis to verify that appropriate corrective action and timely followup action, including reaudit of deficient areas, is taken where indicated by the audit findings.

17.1A.7 CONTROL OF PURCHASED MATERIAL, EQUIPMENT AND SERVICES

The APS QA Program requires that procedures be implemented P which delineate the methods and responsibilities for assuring that material, equipment, and services, procured by Bechtel, or other suppliers and contractors, conform to the requirements of the procurement documents.

The procurement procedures of Bechtel, its suppliers and contractors, require that quotations to furnish material, equipment and services be solicited only from a prequalified bidders' list which is prepared by Bechtel. Criteria for prequalification are delineated in the procedures, and take into consideration previous experience with the bidder including the bidder's

reputation and experience with utilities and the nuclear industry, his QA capability, and other factors. APS periodically reviews the Bechtel prequalified bidders' list.

Addition of bidders to the prequalified bidders' list requires a detailed and documented evaluation by qualified personnel, which includes assessment of bidders' management capabilities, financial resources, plant facilities, technical capabilities, and QA Programs. Visits to suppliers or contractors' facilities are made, to assist in the evaluation process. P

Bechtel QA is responsible for preparing the bidders' QA program acceptance criteria. Bechtel Procurement Supplier Quality is responsible for evaluating and accepting bidders' programs and manuals. 12

Procurement documents delineate the documentation which a successful bidder is required to furnish as evidence of compliance with the procurement document requirements.

Suppliers are required to furnish Bechtel with information concerning their manufacturing and inspection plans in order that Bechtel may plan and implement a source surveillance plan. Bechtel QA coordinates the establishment of surveillance plans with APS to permit APS participation in supplier surveillance. The surveillance plan includes inspection of items, witnessing of processes or tests, and audits of the suppliers' QA Programs. P

Prior to release for shipment, material and equipment requiring source inspection must be inspected for conformance to procurement document requirements by CE representatives, and/or Bechtel Procurement Supplier Quality Representatives. Verification is made that quality documentation exists and is complete. Documentation of this verification will constitute acceptable evidence of compliance with all procurement requirements. A copy of this verification document is sent to the Bechtel Field Quality Control Engineer. 12 P

Items that have been source inspected are examined, upon receipt, for shipping damage, correctness of identification and proper quality documentation. Inspection status is described in section 17.1A.14. Documentary evidence showing that Q-List items or materials conform to procurement requirements shall be available at the site prior to installation of such items or use of such material, except as discussed in sections 17.1A.15 and 17.1A.17. Items found by receiving inspection to be non-conforming shall be segregated and/or controlled as described in section 17.1A.15.

Documentary evidence is insufficient to identify the specific requirements, such as codes, standards and specifications met P by the procured item. This requirement can be satisfied by having available at the site, copies of the purchase specification, purchase order and any changes, and written certification of conformance to procurement requirements. These documents shall be maintained by the Project Field Quality Control Engineer. Bechtel QA shall verify by audit the validity of the certifications of conformance.

The procedures which have been established by APS to implement the requirements for procurement control are identified in the APS QA manual. These requirements are based on Appendix B to 10 CFR Part 50. The procedures which have been established by Bechtel and CE to implement the requirements for procurement control are described in sections 17.1B and 17.1C.

12| The APS Corporate QA Manager is responsible for having audits conducted to verify compliance with all aspects of the requirements described in the referenced procedures and QA manuals. This includes the audit of the audit programs carried out by P each involved organization. The Corporate QA Manager is responsible for having reviews of Bechtel's audit schedules and results on a routine basis and for verifying that corrective action and followup action, including reaudit of deficient areas, are taken.

17.1A.8 IDENTIFICATION AND CONTROL OF MATERIALS, PARTS AND COMPONENTS

The APS QA Program requires that vendors and contractors establish and implement procedures for the identification and control of materials, parts and components (including partially fabricated subassemblies) to assure the use or installation of only accepted items.

Bechtel is responsible for assuring that onsite procedures exist and are being implemented for the identification and control of materials, parts and components.

Bechtel and C-E shall require in their procurement documents, that equipment be identified at the source, prior to shipping, in accordance with the established plant identification system. In addition, traceability of materials, parts or components to the supplier's quality documentation is specified in the procurement documents. P

Source and receiving inspection planning shall include the verification of the correct identification of items and their records and shall note these as a condition for acceptance.

Physical identification shall be used, to the maximum extent possible, for relating an item at any stage of work to an applicable drawing, specification, and/or other pertinent technical document. Where physical identification is impractical or would affect the function or quality of the item, physical separation, procedural control, or other means shall be employed.

Material storage areas at supplier's shops and at the site shall be controlled to assure identification of materials.

The APS Corporate QA Manager is responsible for having audits conducted to verify compliance with the procedures and measures for identification and control of materials, parts and components. Audits conducted by the Corporate QA Department will 12 P 12

evaluate the effectiveness of the controls which Bechtel is exercising over suppliers.

17.1A.9 CONTROL OF SPECIAL PROCESSES

Special processes are defined as those metallurgical, chemical, or other processes where assurance of the process quality is dependent largely on the inherent skill of the operator, and on the control of process parameters. It cannot be assured by direct inspection of work alone. These include, but are not limited to, welding, heat treating, chemical cleaning, and nondestructive examination (NDE).

The APS QA Program requires that contractors and suppliers identify, in their submittals, the special processes they intend to comply. Contractors and suppliers must assure that in performing these processes, qualified procedures, equipment and personnel are used under controlled conditions, and in accordance with the requirements of applicable codes and standards.

Personnel, equipment and procedures utilized in the performance, control and inspection of special processes shall be qualified prior to use, in accordance with applicable codes and standards. Special processes shall be performed under controlled conditions by qualified personnel in accordance with written process sheets, shop procedures, checklists, travellers, or equivalent. Evidence of verification shall be documented.

For special processes not covered by existing codes or standards, or where quality requirements exceed the requirements of established codes and standards, the procedures for qualifying personnel, procedures or equipment shall be defined in the procurement documents and shall be submitted for review prior to use.

Documentation of procedures and personnel qualification shall be kept current by the contractor or supplier. The documentation shall be subject to Bechtel QA Audit. Audits of special processes shall include verification that qualified personnel and procedures are used, and there there is compliance with the requirements of applicable codes and standards. P

The APS Corporate QA Manager shall have audits conducted which evaluate the effectiveness of the control over special processes exercised by Bechtel's QA organization. The specific measures for control over special processes shall be identified prior to commencement of any activities by Bechtel or other contractors or suppliers performing special processes. 12

17.1A.10 INSPECTION P

The APS QA Program requires that suppliers establish, prior to manufacture, a specific inspection program for activities affecting quality, which is designed to verify compliance with the quality requirements identified in the procurement documents.

Bechtel is responsible for establishing and implementing an inspection program which meets the requirements of 10 CFR 50, Appendix B.

Bechtel QA has responsibility for the audit of the Bechtel inspection program and its implementation by Bechtel personnel, and audit of CE and other contractors and suppliers inspection programs relative to Q-List items. 12 P

Audits may be conducted by the APS Corporate QA Department to verify that inspection plans, instructions and procedures have been established, are acceptable, and are being implemented. These audits supplement those audits conducted by Bechtel and C-E QA personnel. 12 P

Inspections shall be performed by individuals other than those who performed the activity and who are qualified. They should

be from a group independent of those having direct responsibility for manufacture. If such independent inspection personnel are not available, additional inpection shall be provided by Bechtel or other independent contractors.

The supplier shall maintain integrated manufacturing and inspection plans that clearly identify the items and activities to be P inspected. The plans must include the specific inspections required by the procurement documents or those in the referenced codes and standards.

Inspections shall include the monitoring of processes and personnel when inspection of the finished product is impractical or inconclusive; inspection and process monitoring shall be utilized for adequate control.

Inspections shall be performed in accordance with procedures, instructions and/or checklists, which shall contain the 12 following as applicable:

A. Identification of quality characteristics to be inspected.

B. Identification of those individuals or the organization responsible for performing the inspection operation.

C. Acceptance/rejection criteria. P

D. Calibration requirements.

E. A description of the methods of inspection.

F. Evidence of completion and certification of inspection operation.

G. Record of the results of the inspection operation.

H. Record of reinspection results.

The supplier inspection plans shall include the following as applicable: 12

A. Identification of materials,

B. Dimensional checks,

C. Material test reports,

D. Fitup of parts,

E. Assembly of components,

F. Process parameters,

G. Examination of work,

H. Cleanliness of parts and work area,

I. Use of correct documentation,

J. Monitoring of processes,

K. Handling, cleaning, packaging and storage procedures, and

L. Documenting of activities.

Inspections shall be satisfactorily completed and documented prior to releasing equipment for shipment, or special control established over a part or subassembly which has not completed satisfactory inspection.

Bechtel shall review the integrated manufacturing and inspection plans of suppliers and establish a set of mandatory inspection holdpoints. Required mandatory holdpoints, beyond which work may not proceed without the approval of Bechtel, shall be included in the supplier's inspection plans, or otherwise controlled to insure that work does not proceed without acceptance. P

Inspectors from the Bechtel Procurement Supplier Quality Department monitor supplier's activities as part of the Bechtel overall supplier surveillance plan. APS Corporate QA will participate in selected audits performed by Bechtel and/or 12

perform supplier surveillance or audits to monitor Bechtel/CE supplier surveillance or supplier audit activities.

C-E and other suppliers who procure equipment from subsuppliers shall be responsible for assuring that their suppliers establish and implement a satisfactory inspection program. They shall determine that there is compliance with the quality requirements specified in the procurement documents.

Contractors at the site shall be required to establish and implement inspection programs that are in accordance with contract requirements and the applicable codes and standards. These programs are subject to review and acceptance by Bechtel.

A contractor's planned inspections shall be performed by inspection personnel, independent from the individual or group performing the activity being inspected. Bechtel shall review the P contractors' inspection plans and establish notification points for their witness. Mandatory holdpoints may be established beyond which work may not proceed without Bechtel release; mandatory holdpoints shall be identified in the contractors' inspection plans.

The work of contractors who do not have inspection responsibility, shall be inspected by Bechtel. Bechtel shall prepare inspection plans based on design document requirements, the applicable codes and standards, and the work procedures adopted by the contractor. They shall provide the contractor with the inspection program to coordinate the scheduled inspection activities. Inspections shall be documented by checklists or reports.

The inspection activities of Bechtel, and all suppliers and contractors, are subject to auditing by APS QA to verify compliance with specified requirements.

17.1A.11 TEST CONTROL

The APS QA Program requires that a documented test program be implemented to assure that required testing be identified and properly performed to demonstrate that Q-Listed structures, systems and components will perform satisfactorily in service. Identification of the required testing shall be based on design considerations, and regulatory requirements. Testing will be in accordance with written test procedures which incorporate the requirements and acceptance limits contained in applicable design and procurement documents.

Proof and performance testing of components shall be performed and documented by suppliers as required in procurement documents. Suppliers may also be required to perform prototype qualification tests. The performance of supplier testing may be witnessed by Bechtel and/or APS. Notification and mandatory holdpoints, shall be incorporated in the suppliers manufacturing and test plans. P

The procedures which have been established by Bechtel and CE to implement the requirements for test control are described in sections 17.1B and 17.1C.

The Corporate QA Manager shall have audits of Bechtel and C-E conducted to verify that documents specify the applicable tests to demonstrate that structures, systems, and components perform satisfactorily in service. Audits of the Bechtel QA Program to ensure that suppliers are satisfactorily performing tests in accordance with design requirements will also be conducted. 12 P

The program for the testing of structures, systems and components, to demonstrate their satisfactory performance in service, is described in Chapter 14. *

17.1A.12 CONTROL OF MEASURING AND TEST EQUIPMENT

The APS QA Program requires that procedures be implemented for the control, calibration and periodic adjustment of tools, gauges, instruments and other measuring and test equipment used to obtain and/or verify conformance to established quality requirements.

Suppliers and contractors, as part of their QA Program, shall implement written procedures for the control and calibration of tools, measuring and testing equipment. Contractors shall maintain documentation of the calibration status and records of tools and gauges utilized. Assurance of supplier and contractor performance shall be obtained by evaluating their procedures, and during periodic in-process audits of records by both Bechtel and APS QA.

Inspection, test and work procedures shall include provisions assuring that tools, gauges, instruments and other inspection, measuring and testing equipment, and devices used in activities affecting quality, are of the proper range, type and accuracy. To assure its accuracy, inspection, measuring and test equipment shall be calibrated, adjusted and maintained, prior to first use, and at prescribed intervals thereafter, with calibration performed against equipment certified to have known valid relationships to nationally recognized standards or performed on some other documented basis. The acceptance criteria for principal contractor's calibrating procedures will include the requirement that the degree of uncertainty of the calibrating standards shall be less than the error of the equipment being calibrated. Control measures shall prevent the use, by unauthorized personnel of calibrated tools, gauges, instruments, and other measuring and test equipment. Special calibration and control measures are not required for devices when normal commercial practices provide adequate accuracy.

The calibration status, date of calibration, and recalibration date, shall be displayed prominently on each device, whenever possible, or on records traceable to the device. The records shall contain all elements necessary for control and verification of past calibration activities.

Inspection, test and work procedures shall include the requirement that, whenever inspection, test, or measuring equipment is found to be out of calibration, the acceptability of all items inspected, tested, or measured since the last documented calibration must be evaluated. P

The APS Corporate QA Manager shall be responsible for having audits conducted to verify compliance with the procedures and measures for controlling measuring and test equipment. These measures shall be identified prior to commencement of any activities by suppliers or contractors which require the use of measuring and test equipment. 12 P

17.1A.13 HANDLING, STORAGE AND SHIPPING

The APS QA Program requires that procedures be established and implemented, to control the handling, storage and shipping (including cleaning, packaging and preservation of material and equipment) to assure the maintenance of quality from source through installation or use. 12

Bechtel shall review procurement documents to assure that they either provide, or require that suppliers provide, instructions on handling, storage, shipping, cleaning and preservation for the product supplied. Instructions shall be provided for marking, labeling, packaging, shipping and storing of items. Marking shall identify the shipment, and special handling or storage requirements, including indications of the presence of special environments, or the need for special control. P

Bechtel shall establish a surveillance plan to assess and document onsite compliance with handling, storage, cleaning and preservation procedures.

C-E is responsible for verifying that requirements of procurement documents are satisfied, prior to release of an NSSS component for shipment to the site.

Bechtel shall review CE's requirements and procedures for handling, storage and shipping.

Bechtel has responsibility for handling, storing and preserving materials and equipment at the site. The responsibility may be delegated to a responsible contractor, e.g., electrical equipment and materials to the electrical contractor.

Special coverings, equipment, and protective environments (such as inert gas atmosphere), specific moisture content levels, and temperature levels, shall be provided and maintained for given materials and components as specified in manufacturers' instructions, supplemented by additional requirements as specified by Bechtel. P

Special handling tools and equipment necessary to assure safe and adequate handling of critical, sensitive, or perishable items, shall be provided and controlled. Special handling tools and equipment shall be inspected and tested by qualified personnel in accordance with written procedures, at specified times, to verify that the tools and equipment are maintained and suitable for the intended task.

Cleaning of components or systems at the site shall be performed in accordance with procedures prepared by the supplier of the equipment. The procedures shall be reviewed by Bechtel. Cleaning operations may be monitored by Bechtel. APS QA will conduct audits to verify that handling, storage and shipping procedures are being implemented. These audits may be conducted through Bechtel's QA Department. 12

17.1A.14 INSPECTION, TEST, AND OPERATING STATUS

The APS QA Program requires that written procedures be prepared and implemented which delineate the requirements, methods and responsibilities for:

A. Indicating the status of inspections and tests performed on individual items during the procurement and construction phases of the project, to preclude inadvertent bypassing of such inspections and testing. P

B. Indicating the operating status of installed structures, systems, and components during the construction testing phase, to prevent inadvertent operation of equipment or hazard to plant personnel. 12

These procedures shall be provided and implemented by suppliers or contractors who fabricate or assemble materials or equipment in their shops, by site contractors having responsibility for inspection of their work, and by Bechtel for onsite indication of inspection and test status of the items they inspect.

Prior to the start of preoperational testing, APS shall establish procedures, based on current practices, for the control of test and operating status indicators, including the authority for application and removal of tags, markings, labels and stamps. P

The inspection and test status of items shall be indicated by the use of markings such as stamps, tags, labels, routing cards, or other suitable means, and shall be noted in records traceable to the item. The procedures shall delineate the authority for application and removal of status markings.

The operating status of installed structures, systems and components shall be indicated by the operating panel readouts or equivalent. When such readouts are incomplete or inoperable, and for systems and components not having such readouts, operating status shall be indicated by such means as tagging of valves and switches.

12 During construction testing, written procedures shall be implemented for controlling abnormal electrical or mechanical arrangements such as bypassed interlocks, installed jumpers, and piping bypasses.

Identification of abnormal operating status shall always include placing such identification at control locations where the system or component can be actuated, started or controlled.

P Items whose status is nonconforming, inoperative or malfunctioning, shall be so indicated, as required by section 17.1A.15.

Bechtel is responsible for audits which assure that the foregoing requirements are complied with by all responsible organizations. APS is responsible for audits of delegated activities, and for internal audits for compliance by APS

12 groups participating in acceptance testing.

17.1A.15 NONCONFORMING MATERIALS, PARTS, OR COMPONENTS

The APS QA Program requires that procedures be prepared and implemented which describe the methods of controlling material, parts or components which do not conform to defined requirements, to prevent their inadvertent use or installation.

All suppliers, contractors and subcontractors who furnish,

P fabricate, erect or install materials or equipment shall implement, as part of their QA Program, acceptable procedures for the control of nonconforming items. These procedures shall include methods for identification, segregation, documentation, evaluation and disposition of items which do not conform to the requirements of the design or procurment documents, including the pertinent QA Programs.

Upon identification of a nonconformance, the supplier or contractor shall suspend the affected work until the nonconformance has been evaluated if:

A. The continuance of the work would conceal the nonconformance and make corrective action difficult or impossible.

B. The nonconformance is due to the work procedure and continuing its use would increase the extent or severity of the nonconformance.

Nonconforming items, where practical, shall be segregated from acceptable material in a controlled access location; when this is not possible, control shall be maintained by tagging, marking or other clear means of identification. Installation of nonconforming items into plant systems will be permitted only when established procedures are implemented which assure that the component or system will not be operated unsafely. As a general rule nonconforming items are not to be used or installed. However, this requirement will not preclude reasonable exceptions such as those situations where nonconforming conditions relate only to the need for minor repairs or replacement of easily accessible parts, or lack of actual documentation at the site, and where the nonconformance can be readily resolved. In such cases, the decision to proceed on installation of nonconforming items must be supported by appropriate engineering evaluations. P

Justification for use and installation of a nonconforming item will be generally limited to avoidance of unreasonable schedule delays or prevention of equipment or component placement which would otherwise seriously block access to placement areas. 12

Nonconformance reports justifying installation or use of nonconformance items will be produced prior to installation or use and will be approved in accordance with established procedures. The procedures will provide for an established system of nonconformance identification and for timely completion of prescribed corrective action. These items will be tagged "Hold" with reference on the tag to the documentation described above.

A final check of the documentation verifying the quality of a particular system and acceptance of nonconformances that have not been dispositioned will be required before construction tests can be made.

All identified nonconformances shall be documented. When the disposition consists of repair or correction by existing approved procedures, documentation on appropriate forms is acceptable. When the disposition consists of repair by procedures requiring approval, or by design change requiring waiver or other approval, the documentation shall be by appropriate written report of the nonconformance and its resolution, inspection and approval.

P Identified nonconformances shall be evaluated and a recommended disposition proposed by the supplier or contractor performing the work in question. Identified nonconformances, when so resolved by the supplier or contractor, shall be repaired or reworked in accordance with documented procedures. The affected items shall be reinspected for acceptance in accordance with applicable procedures and codes.

Dispositions involving special repair procedures or design changes shall be made and approved by the responsible design organization, or by Bechtel, and reviewed by Bechtel. The evaluation and disposition of the nonconformance shall be controlled by written procedures.

12| Before equipment is released for shipment, the inspectors (Bechtel, C-E, and others) shall determine that proper disposition has been made of the nonconformance and the necessary documentation is complete and accurate.

P Documentation for items that have been repaired or accepted as-is shall describe the change, waiver or nonconformance which has been accepted, identify the accepting party and denote the as-built condition. The documentation for all such nonconforming items shall be filed as part of the QA records. These nonconformances are reported to management as described in section 17.1A.16.

Bechtel has responsibility for the disposition of nonconformances identified by Bechtel and APS and the review of nonconformance reports of contractors including CE. Procedures developed to implement nonconformance systems require that appropriate levels of engineering, quality assurance, and project management are authorized to approve nonconformances. Resolutions of nonconformances requiring "repair" or "accept as is" must be approved by the engineering organization that specified the original criteria. The procedures established by Bechtel include requirements to keep APS QA informed as to the nature and status of identified nonconformances. APS requires that BPC and other contractors notify the APS QA Manager immediately when a condition adverse to quality is discovered and appears to be reportable. This shall include immediate notification of all Deficiency Evaluation Reports initiated by BPC. P 12

APS has the ultimate responsibility to determine if a nonconformance initiated by APS or by any contractor borders on or meets conditions stated in 10CFR Part 50.55(e) or 10CFR Part 21. APS management, including the Nuclear Engineering Manager, Nuclear Construction Manager, Corporate QA Manager and Nuclear Projects Management Vice President, shall decide what action is to be taken with regard to formally notifying the NRC and resolving the nonconformance or deficiency. P 12

APS QA shall periodically review the log of nonconforming reports maintained by Bechtel. This review shall concentrate on the types of nonconformances which are occurring on the project to detect trends, and timely disposition of nonconformances by Bechtel. P

APS QA shall conduct audits to verify that established procedures are being complied with in the disposition of nonconforming items.

17.1A.16 CORRECTIVE ACTION

The APS QA Program requires that procedures be established and implemented to assure that conditions adverse to quality and items discussed in section 17.1A.15, "Nonconforming Materials, Parts or Components," are promptly identified and corrected, and that the cause is determined and corrective action is taken to preclude repetition.

Conditions adverse to quality, such as design deficiencies, failures, malfunctions and nonconformances, shall be promptly identified and reported by cognizant Bechtel or CE personnel. The report shall be directed to the person, or organization, responsible for correction of these conditions. The reports on conditions adverse to quality may be in the form of inspection reports, audit reports, or by formal letter.

The report shall include a determination of the underlying causes of a problem. Implementation of corrective action shall be verified by reaudit or reinspection, including a determination as to whether the underlying causes of the problem have been adequately corrected to preclude repetition. In these cases, the adverse condition, its cause, and the corrective action taken shall be documented and reported to appropriate levels of management, including Bechtel and APS.

Suppliers and contractors shall be required, in procurement documents and contracts, to have, as part of their QA Program, a system for corrective action when conditions adverse to quality are identified, either at their facility or on material and equipment for which they are responsible. If the deficiencies or deviations are discovered at the site, responsible management of the affected supplier or contractor shall be promptly notified and advised of the problem. Followup by Bechtel will assure that the required corrective action is taken. Bechtel shall resolve the technical aspects of problems, or concur with solutions proposed by suppliers or contractors. Nonconformances to approved project procedures shall be reported to Bechtel QA.

17.1A.17 QUALITY ASSURANCE RECORDS

The APS QA Program requires that records be provided and maintained to furnish documentary evidence of the quality of items and of activities affecting the quality of items and systems of the PVNGS, and that written procedures be implemented delineating the methods and requirements for receiving, identifying, storing and preserving these records.

The records required for each safety-related item include the following: design records; as-built data; results of reviews, inspections, tests, work performance monitoring, and materials analyses; operating logs; and closely related data such as qualifications of personnel, procedures and equipment.

The design records shall include the following information: design basis, drawings, specifications, and design changes. The records shall include deviations and their disposition. P

Inspection records and test records shall include the following information: date of the inspection or test; identification of the item inspected or tested; identity of the inspector, data recorder, and/or evaluator; type of observation; results of the inspection or test; acceptability; and action taken in connection with any deficiencies noted.

The specific QA records which suppliers and contractors are required to provide shall be specified in procurement or contract documents, and shall comply with applicable regulatory requirements, codes, standards and specifications. Quality verification documentation is to be provided prior to or with each shipment of material to the site. If these objectives cannot be met, procedures have been developed to allow the shipment to and receipt at the site of items or equipment that may lack some of the quality verification documents called for in the procurement specification. Procedures provide a tracking system to ensure that required documentation is received. 12

Organizations which do work on the design, fabrication, erection or testing of the structures, systems or components important to safety are responsible for submitting records of those activities as required by the procurement documents, applicable codes and standards.

Bechtel is responsible for obtaining, processing, and adequately storing and protecting the QA records for the project until these records are turned over to APS on completion of each unit of the station.

P Suppliers or contractors who exercise the option to retain QA records beyond the construction phase shall meet APS's requirements on retention, including storage, preservation and safekeeping. These records shall be made available on demand for use by APS, or its agent.

APS is responsible for the permanent storage, protection and maintenance of the records during the life of the unit, including periodic verification of the availability of such records stored for APS by other organizations.

A record storage facility will be located so as to provide convenient access to information necessary for operations, maintenance, inservice inspection, problem solving, or engineering of station modifications. The record storage facility shall meet the requirements of Regulatory Guide 1.88 as 12 described in section 1.8.

P Station orders and procedures are prepared by the Station Operations staff, as part of the Operational QA Program. This is 12 discussed in section 17.2.

P Bechtel shall carry out a comprehensive system of planned and documented audits to verify compliance with all aspects of the QA program for records management. These audits shall be performed by personnel not having direct responsibilities in the areas being audited. Bechtel shall conduct internal and external audits to assure that both its records managemement

program and the programs of other organizations including C-E are being implemented and are satisfactory. P

The APS Corporate QA Manager shall be responsible for having audits conducted to verify compliance with the requirements for the management and control of the QA records. This shall include the audit of the audit programs carried out by each responsible organization to determine their effectiveness. The Corporate QA Manager shall review Bechtel's audit schedules and results on a routine basis and verify that corrective action and follow-up action, including reaudit of deficient areas, have been taken where indicated by the audit findings. 12 P 12

17.1A.18 AUDITS

The APS QA Program requires that a comprehensive system of planned and documented audits be established and implemented to verify compliance with all aspects of the QA Program, and to assess its effectiveness. P

All organizations which are required to have and implement a QA Program are required to conduct audits of their program and the programs of their subcontractors.

Bechtel has the responsibility for audits of vendors and contractors during the design, procurement and construction phases of the project, as well as for internal audits of its own activities as described in section 17.1B.18. 12

APS shall monitor the implementation of the audit program by Bechtel by informal observation and by documented periodic audits. As part of the auditing of Bechtel, APS shall participate in a sampling of the audits conducted by Bechtel. In addition, APS will audit its own project activities, including the QA function itself. P

The Corporate QA Manager is responsible for keeping APS management informed on QA matters and for necessary action to correct deficiencies when action by management is needed. He discharges 12 P

P 12 his responsibilities by conducting independent periodic audits of the APS QA Program, and by reporting his findings to: management, the Nuclear Projects Management Vice President, the Executive Vice President, ANPP and others who have corporate responsibility for the areas audited.

P Audits shall be performed in accordance with written procedures, or checklists, by trained personnel having no direct responsibilities in the area audited. Audits may be conducted by QA Engineers and/or other qualified personnel, such as technical specialists from other departments, designated by the Corporate QA Manager. 12

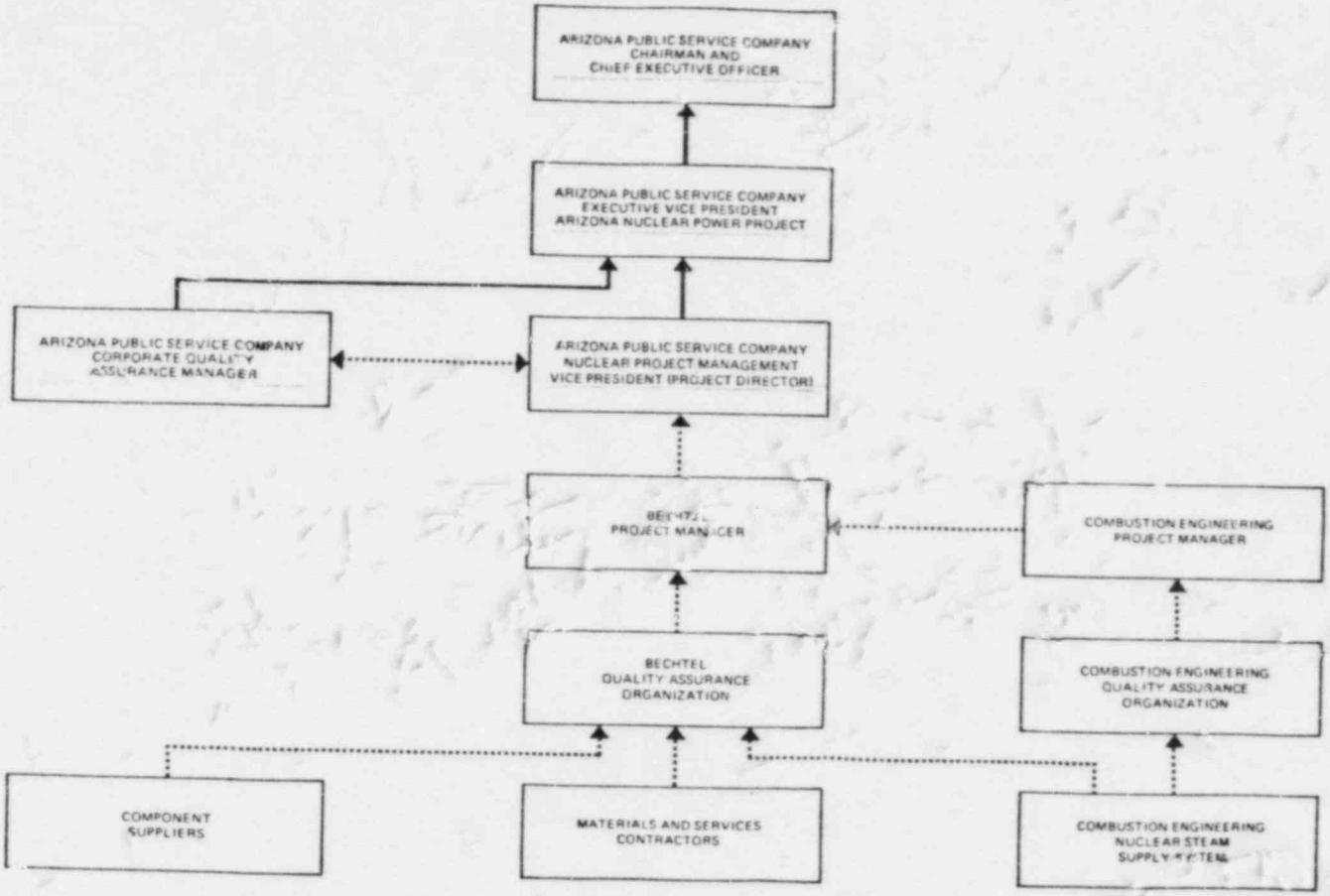
P The purpose of audits is the evaluation of work areas, activities, processes, items and documentation, to provide an objective evaluation of compliance with established requirements, methods or procedures; to assess progress in assigned tasks; to determine adequacy of QA Program performance; and to verify implementation of recommended corrective action. Audit results shall be documented and reviewed with management responsible for the area audited, who shall take necessary action to correct reported deficiencies. 12 P

Audits shall be conducted at either planned, periodic intervals, or on a random unscheduled basis. The Corporate QA Manager shall maintain a schedule for the audits. Audits will selectively cover each of the various elements of APS and Bechtel QA Programs, at the beginning of the project activity involving those elements, and at regular intervals thereafter. The scheduled frequency of audits may be changed by the Corporate QA Manager as circumstances dictate; e.g., changes in level of activity, importance of activity, previous findings, changes in organization or procedures, or occurrence of problems. 12 P

Audits may be used to determine the acceptability of suppliers' or contractors' QA Programs prior to awarding of a purchase order or contract; follow-up audits shall be used to assure

that suppliers and contractors properly implement their QA Programs.

Suppliers and contractors shall be required, in procurement and contract documents, to perform internal auditing of their own QA Program. Compliance with these requirements shall be verified by APS and/or Bechtel audits. P



Palo Verde Nuclear Generating Station
FSAR

INTERFACE ORGANIZATION CHART

Figure 17.1A-1

17.1B BECHTEL QUALITY ASSURANCE DURING DESIGN AND CONSTRUCTION

The Bechtel Power Corporation, Los Angeles Power Division, Quality Assurance (QA) Program for the Palo Verde Nuclear Generating Station (PVNGS) complies with the applicable provisions of section 1.8 and the following:

A. 10CFR50, Appendix B, Quality Assurance Criteria for Nuclear Power Plants and Fuel Processing Plants

B. 10CFR50, Licensing of Production and Utilization Facilities

C. Section 17 of the NRC Regulatory Guide 1.70, Revision 3, "Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants"

D. Quality assurance requirements of Section III, ASME Boiler and Pressure Vessel Code for items covered by the Code

   Bechtel is the holder of an ASME Certification of Authorization--"N" Stamp

E. American National Standards (ANSI) given in the listing below, except for the noted exceptions or alternatives as described in section 1.8.

   1. ANSI N45.2-1971-- Quality Assurance Program Requirements for Nuclear Plants (Regulatory Guide 1.28)

   2. ANSI N45.2.1-1973-- Cleaning of Fluid Systems and Associated Components During the Construction Phase of Nuclear Power Plants (Regulatory Guide 1.37)

P 12 3. ANSI N45.2.2-1972-- Packaging, Shipping, Receiving, Storage, and Handling of Items for Nuclear Power Plants (During the Construction Phase) (Regulatory Guide 1.38)

P 12 4. ANSI N45.2.3-1973-- Housekeeping During the Construction Phase of Nuclear Power Plants (Regulatory Guide 1.39)

P 12 5. ANSI N45.2.4-1972-- (IEEE-336) Installation, Inspection, and Testing Requirements for Instrumentation and Electric Equipment During the Construction of Nuclear Power Generating Stations (Regulatory Guide 1.30)

P 12 6. ANSI N45.2.5-1974-- Supplementary Quality Assurance Requirements for Installation, Inspection, and Testing of Structural Concrete and Structural Steel During the Construction Phase of Nuclear Power Plants (Regulatory Guide 1.94)

P 12 7. ANSI N45.2.6-1978-- Qualifications of Inspection, Examination and Testing Personnel for the Construction Phase of Nuclear Power Plants (Regulatory Guide 1.58)

BECHTEL QUALITY ASSURANCE DURING DESIGN AND CONSTRUCTION

8.	ANSI N45.2.8-1975--	Supplementary Quality Assurance Requirements for Installation, Inspection and Testing of Mechanical Equipment of Systems for the Construction Phase of Nuclear Power Plants (Regulatory Guide 1.116)	12 P 12
9.	ANSI N45.2.9-1974--	Requirements for Collection, Storage and Maintenance of Quality Assurance Records for Nuclear Power Plants (Regulatory Guide 1.88)	P 12
10.	ANSI N45.2.10-1973-	Quality Assurance Terms and Definitions (Regulatory Guide 1.74)	P 12
11.	ANSI N101.4-1972--	Quality Assurance for Protective Coating Applied to Nuclear Facilities (Regulatory Guide 1.54)	P 12
12.	ANSI N45.2.11-1974-	Quality Assurance Requirements for the Design of Nuclear Power Plants (Regulatory Guide 1.64)	P 12
13.	ANSI N45.2.12-1977-	Requirements for Auditing Quality Assurance Programs for Nuclear Power Plants (Regulatory Guide 1.144)	P 12
14.	ANSI N45.2.13-1976-	Requirements for Control of Procurement of Equipment, Materials and Services for Nuclear Power Plants (Regulatory Guide 1.123)	P 12

15. ANSI N45.2.23-1978- Qualification of Quality Assurance Program Audit Personnel for Nuclear Power Plants (Regulatory Guide 1.146)

The program described herein is applied by the Bechtel Power Corporation, Los Angeles Division (hereafter referred to as "Bechtel"), to those safety-related structures, systems, and components (Q-List items) identified in table 3.2-1 for which Bechtel has responsibility under contract with the Arizona Public Service Company (hereafter referred to as "APS").

The Bechtel scope of work is: To perform professional engineering, design, construction, cost engineering, procurement, QA, quality control (QC), assist in startup and preoperating testing and project management coordination work requisite to the construction of these separate and complete nuclear power electric generating units.

The term "quality assurance" is defined as all those planned or systematic actions necessary to provide adequate confidence that an item or facility will perform satisfactorily in service.

The term "quality control" is defined as all those QA actions that provide a means to control and measure the characteristics of an item, process, or facility to established requirements.

"Quality" is achieved through the use of planning and procedures, suitable tools, proper definition of job requirements, skilled personnel, and supervision and technical direction.

Quality is verified through surveillance, inspection, testing, checking, and review of work activities and documentation. It is Bechtel policy that QC and verification are the responsibility of the organization or group that performs the activity; i.e., engineering, procurement, or construction. Quality verification is performed by individuals other than those who performed the work.

BECHTEL QUALITY ASSURANCE DURING DESIGN AND CONSTRUCTION

The Bechtel QA functions consisting of review, surveillance, and auditing is assigned to the Quality Assurance Group, which is independent of the organizations responsible for the work. The QA Group is responsible for formulating and/or reviewing general quality policies; coordination of QA, control and verification activities; and for monitoring and auditing program activities to verify compliance with established requirements, and to measure program effectiveness. When the term "quality assurance" is applied to personnel titles or procedures, it refers to the personnel and practices of the QA Group. The overall Bechtel QA program--which includes the activities of the organizations performing work as well as QC and QA--is referred to as the Bechtel Quality Program. P

For the purpose of clarity, the QA terms used in this section are the definitions from ANSI N45.2.10 and Regulatory Guide 1.74, Quality Assurance Terms and Definitions, supplemented by the following additional terms and definitions: 12 P

A. BPC--Bechtel Power Corporation, which includes the Los Angeles, San Francisco, Ann Arbor and Gaithersburg Power Divisions 12

B. Bechtel--the Los Angeles Power Division of BPC

C. Administrative Direction (Administrative Supervision)--responsible for hiring, salary review, and assignment of an individual

D. Coordination--bringing together and ensuring communication between independent groups, including responsibility for identification of interface problems, reconciling a position, and arriving at agreement P

E. Formulate--responsibility for coordination of effort by affected organizations in preparation of documentation describing or defining a policy or procedure

F. Monitor--to watch over, observe, or examine a work operation (Results of the observations and examination may be recorded; however, sign-off responsibility is not included.)

G. Project Direction--directions or instructions concerned with project operations includes coordination and day-to-day direction of the project entities receiving technical direction from others, but does not include authority to overrule prescribed procedures or technical decisions of such entities

H. Project Home Office--the division or home office assigned responsibility for management of the project

I. Q-List Items--safety-related systems, components, and structures to which this program applies (refer to table 3.2-1).

J. Quality Assurance Group--the QA Group consists of the Manager of Division QA Manager, QA Manager of Projects, Project QA Manager, and the QA personnel within the power divisions (refer to section 17.1B.1.5.1).

K. Review--to examine any form of documentation for the purpose of establishing acceptability relative to requirements of the function represented by the reviewer. (Reviews may range from a thorough investigation to a spot check. Reviews are generally not hold points, but signoff on documents or records traceable to the documents is required.)

L. Surveillance--a broad term pertaining to and including both monitoring and witnessing

M. Technical Direction--instructions and directions defining technical requirements for an activity. (This may include furnishing prescribed procedures, technical requirements, design approaches, specifications, and design details.)

N. Technical Guidance--providing advice representing a preferred method or approach to a function or activity. (This may include establishing general requirements or policy, but not specific procedures or instructions.)

O. Witness--to watch over, observe, or examine a specific test or work operation, which includes sign-off responsibility for conformance to procedures or specifications P

17.1B.1 ORGANIZATION

17.1B.1.1 Bechtel Group

Figure 17.1B-1 illustrates the organization chart of the Bechtel Group. The Bechtel Group consists of Bechtel Power Corporation (BPC), Bechtel Petroleum Incorporated, Bechtel Civil and Minerals Incorporated and Bechtel Investments Incorporated. Nuclear power plant work is assigned to and performed by the BPC and its four divisions, San Francisco Power Division, Los Angeles Power Division, Ann Arbor Power Division, and Gaithersburg Power Division. 12

Design, procurement and construction of PVNGS is assigned to the Los Angeles Power Division, under contract to APS. P

17.1B.1.2 Bechtel Power Corporation

Members of the BPC management team are responsible for coordination of, and technical guidance to, activities within their disciplines for all power divisions and their respective area offices. 12 P

The BPC President approves basic quality policies for use as guidelines in the power divisions. The BPC Manager of Quality Assurance is responsible for technical guidance of the BPC QA program. He formulates or reviews overall quality policies for BPC, provides technical guidance to the power division QA managers, and evaluates the effectiveness of the total BPC 12 P

quality program. The following is a specific list of the primary responsibilities of the BPC Manager of QA:

A. Formulate or review overall quality policies for use in BPC and recommend them for approval by the BPC President

B. Review division QA policies and QA procedures prior to release for compliance with BPC policies

C. Review, obtain concurrence and approval for compliance with BPC quality policy, quality manuals from Bechtel centralized functions external to BPC

P

D. Formulate and direct audit programs to assure BPC management that the overall quality programs of the power divisions conform with policy and that the programs as implemented are effective.

E. Provide reports to the BPC President evaluating the effectiveness of division programs and any problems requiring special attention

F. Coordinate the quality program of centralized functions external to BPC, the Procurement Supplier Quality Department, and the Materials and Quality Services (M&QS) Department

12

P

G. Conduct quality program coordination meetings with responsible power division managers, Managers of QA, QC, and Engineering, and centralized Bechtel functions external to BPC

12

Each power division retains full responsibility for projects assigned to it and each division has the skill required to carry out its projects. Support services are provided to the divisions by centralized functions such as Materials and Quality Services.

P

17.1B.1.3 Materials and Quality Services (M&QS) | 12

The M&QS is a centralized function reporting to the Bechtel Research and Engineering Manager (figure 17.1B-1). The M&QS Manager is responsible for furnishing specialized chemical, metallurgical, process evaluations and procedures. They also assist in auditing of suppliers of ASME Section III materials and/or services to Bechtel divisions. M&QS quality functions for power projects are coordinated by the BPC Manager of QA. | P | 12 | P

The M&QS responsibilities include: | 12

A. Develop and qualify welding and nondestructive examination (NDE) procedures

B. Train and qualify Bechtel nondestructive examination (NDE) personnel

C. Support engineering procedures and qualifications of personnel

D. Provide technical guidance to field welding engineers

E. Review supplier and subcontractor welding, nondestructive examination, and protective coating procedures, and QC manuals for ASME components and metal structures applications | P

F. Prepare and maintain the BPC QA Manual for ASME Nuclear Components (BQAM-ASME III) and provide liaison with the ASME and authorized inspection agencies in matters associated with compliance with the ASME Code BQAM-ASME, and the control of the ASME Nuclear Symbol Stamps

G. Participate in audits of BPC field construction, which include compliance with the QA Manual for ASME, Nuclear Code Section III, components, and BPC and subcontractor field welding and nondestructive examination and protective coatings programs

H. Participate in surveys and audits of materials and component suppliers and subcontractors, as required

I. Consult with Engineering, Procurement, Construction, QA and QC on failure analysis problems involving materials, welding, protective coatings, and nondestructive examination

J. Support Engineering in the preparation of specifications for components, piping, metal structures, and protective coatings and in the selection of materials.

17.1B.1.4 Procurement

Procurement, as a service organization, does not establish technical or quality requirements contained in Procurement documents nor does it approve changes thereto; these functions are the responsibility of the Engineering Departments.

The quality functions of Procurement are supplier surveys, quality program verification, surveillance inspection, and audit of supplier activities for implementation of quality programs. These functions are the responsibility of the Manager of Procurement Supplier Quality (PSQM). The Procurement supplier quality function is independent of purchasing and expediting functions. The Procurement Supplier Quality Department program as applied to power projects is established by the Manager of Procurement Supplier Quality and is coordinated by the Division Manager of QA. The Manager of Procurement Supplier Quality is responsible for assuring that Bechtel purchased items and associated quality verification records subject to source inspection comply with requirements contained in procurement documents.

PSQM responsibilities are as follows:

A. Prepare and maintain the Procurement Supplier Quality Manual and associated procedures thereto.

B. Train and qualify Bechtel procurement supplier quality personnel

C. Survey and audit potential suppliers for conformance to 10CFR50, Appendix B and ANSI N45.2, as applicable, and perform periodic audits and quality program verification activities of selected suppliers and offsite subcontractors as required. | P | 12

D. Prepare source inspection plans | P

E. Perform progressive surveillance inspection of items and review of quality verification documentation in accordance with the Procurement Supplier Quality Manual and associated procedures and the Procurement document requirements.

F. Release items for shipment. | 12

The Field Services Manager directs the operation of source inspectors. He is independent of project-assigned personnel. He is responsible for the quality of the inspectors' performance in implementing the designated source inspection plans for PVNGS (see figure 17.1B-4). The inspection plans are designated by the project from a book of standard plans (the Procurement Inspection Department Surveillance Inspection Plans) and augmented by the Procurement Supplier Quality Manual requirements. Plans unique to PVNGS or changes to previously approved PVNGS plans must be approved by the Project QA Manager, as provided by the Project Quality Program Manual. Neither the inspector nor anyone above him in the chain of command is responsible for the cost/schedule impact of project delays or expense caused by deficiencies the inspector may discover in inspected materials. The performance of the inspector is evaluated solely by the Field Services Manager and/or his staff. | P | 12 | P | 12

17.1B.1.5 Los Angeles Power Division (LAPD) Management | P

Figure 17.1B-2 illustrates the LAPD organization chart. The Los Angeles Power Division management team, under the direction | 12

of the Vice President and General Manager, provides effective management direction, administration, and functional guidance to Division entities and individuals.

The Division management organization is uniquely suited to the nature of Division activities and functions. The Division management team includes the Vice President and General Manager, Vice President and Manager of International Operations, Vice President and Manager of Domestic Operations, Vice President and Acting Manager of Division Construction, Manager of Division Engineering, Vice President and Manager of Houston Area Office, Manager of Division Support Services, Manager of Division Personnel, Manager of Division Technical Services, Manager of Division Quality Assurance, Manager of Procurement and Manager of Public Relations. Managers have direct responsibility and authority for the functions of their organizations.

17.1B.1.5.1 Division Quality Assurance

The Manager of Division QA is responsible for planning, controlling and managing the QA program. He reports to and receives authority from the Division Vice President and General Manager. His specific responsibilities include:

- Plan the overall QA program
- Formulate QA policies
- Formulate QA procedures
- Approve quality-related Engineering Department procedures
- Direct the activities of QA
- Control the QA program application

He controls the application and effectiveness of the QA program through QA management and project audits of Engineering, Procurement Supplier Quality, Procurement, and Construction.

The Manager of Division QA is responsible for assuring that the BPC Manager of QA has approved the procedures describing the functions, training, and qualification requirements of individuals performing procurement, inspection, and construction QC activities. | 12 | P

The Manager of Division QA prepares reports of division and project quality status for distribution to the division Vice President and General Manager and BPC management. These reports include important quality events, significant items, a comprehensive analysis or problem areas and the actions taken in their regard. The BPC Manager of QA provides the Manager of Division QA with technical guidance through correspondence and periodic management quality coordination meetings. | 12 | P | 12 | P

The Project QA Manager (PQAM) for the Palo Verde project is assigned by and receives technical and administrative direction from the Manager of Division QA and the QA Manager of Projects. The PQAM is responsible for directing and managing the PVNGS Quality Program. | 12

The Procurement Supplier Quality Manual describing the functions, training, and qualifications of personnel in procurement inspection is approved by the BPC Manager of QA after review and acceptance by the Manager of Division QA. | P | 12

The Quality Control Training program for the project describing the functions, training, and qualifications of personnel in construction quality control is approved by the Chief Construction QC Engineer, after review and acceptance by the Project QC Engineer (PQCE) | P | 12

The adequacy of the Procurement Supplier Quality Manual and the Quality Control Training Program are selectively evaluated by performing an in depth review of: | P

- Basis for determining inspection level and sequence
- Adequacy of inspection methods

12 The Manager of Division QA is assisted by the QA Manager of Projects and is responsible for providing overall management P pertaining to QA technical direction to the project. Figure 12 17.1B-5 illustrates the organization of the Los Angeles QA P Division for PVNGS.

The Manager of Division QA provides technical and administra-12 tive direction to the QA Group within the division. The Manager of Division QA has the following responsibilities:

A. Formulate or review division QA policies for use in his P division where necessary to implement or supplement basic QA policy defined by the BPC and recommend these 12 for approval by the Vice President and General Manager.

B. Approve QA procedures and instructions that define responsibilites and functions of QA personnel within the division

C. Review, prior to release, quality-related procedures P and manuals prepared by departments and projects within his division for conformance to QA policies

D. Formulate audit programs and conduct audits and reviews to assure Bechtel management and APS that the QA program of the division conform with policies and requirements of Bechtel and APS. Identify the need for corrective action and assure follow-up

E. Provide periodic reports to the Vice President and 12 General Manager and the BPC Manager of QA evaluating the effectiveness of the division's quality program and advise of any problems requiring special attention

F. Provide and maintain a qualified and suitably trained P staff of QA Engineers to carry out required project and staff functions

G. Formulate programs for maintaining the professional competence of personnel within his organization and

provide assistance in training and indoctrination programs for division management and engineering personnel whose activities affect quality

H. Participate in quality coordination meetings with responsible managers and supervisors of QA and QC from other divisions and centralized Bechtel functions external to BPC P

I. Coordinate the QA, QC, and quality engineering programs within the division

The Project QA Manager prepares reports of project QA status. 12
These reports include important QA events, significant items, a comprehensive analysis of problem areas, and the actions taken in their regard. P
Appropriate action based on the status of project QA activities is taken by the Manager of Division QA. 12

17.1B.1.5.2 Division Engineering

Figure 17.1B-6 illustrates the LAPD Engineering Organization. The Manager of Division Engineering provides technical and administrative direction to the Engineering Department. P
The Manager of Division Engineering is assisted by Managers of Engineering, Engineering Managers, Chief Engineers, and the Supervisor of Quality Engineering. 12
Engineering Managers are responsible for the management and technical direction of assigned projects, and for assuring that the projects are provided with adequate personnel and are following prescribed division procedures for conduct of engineering activities. P
Engineering Managers provide administrative direction to the Project Engineering Manager.

The Chief Engineers are responsible for the technical adequacy of engineering design performed within the division for their respective disciplines. They are responsible for assigning the engineers, designers, and draftsmen required to perform engineering functions within their respective disciplines on

projects, and for maintaining an adequate staff of specialists and other support personnel to provide technical guidance to the projects and to perform independent reviews of selected engineering design work. Chief Engineers provide administrative and technical direction to the engineers in their respective disciplines.

The Supervisor of Quality Engineering supports the Engineering Department in the preparation and conduct of Quality Program functions within the Engineering Department. He provides technical and administrative direction to the Quality Engineering staff and Quality Engineers assigned to projects. The Supervisor of Quality Engineering has the following responsibilities:

P

A. Assists the Manager of Engineering in preparation of Engineering Department procedures related to the Quality Program and reviews for compliance to program requirements

B. Provides technical and administrative direction to Quality Engineers

C. Prepares procedures for conduct of quality engineering functions

D. Provides appropriate indoctrination and training programs for Engineering Department personnel to assure implementation of Engineering Department procedures related to the quality program

E. Represents the Engineering Department in quality coordination meetings.

17.1B.1.5.3 Division Construction

12 Figure 17.1B-7 illustrates the LAPD Construction Organization. The Vice President and Manager of Division Construction provides

P technical and administrative direction to the Construction

12 Department. He is assisted by the Managers of Construction,

Construction Services Manager, Chief Construction Engineer, and Chief Construction QC and Training Engineer. Managers of Construction are responsible for providing overall construction management and technical direction to assigned projects, and for ensuring that projects are provided with adequate personnel and are following prescribed division practices and procedures for conduct of Construction activities. The Chief Construction Engineer is responsible for providing Division Standard Work Procedures to the projects. 12 P

Field Engineering provides technical guidance and surveillance of construction work, which includes inprocess examination and inspection. Formal quality verification and acceptance of inspection and testing are the responsibility of field QC.

The Chief Construction QC and Training Engineer reports to and receives administrative direction from the Manager of Division Construction, and is responsible for planning, directing, and controlling the construction QC program and QC activities. 12 P

The Project QC Engineer (PQCE) reports to and receives technical and administrative direction from the Chief Construction QC and Training Engineer. Field QC Engineers are functionally and administratively responsible to the PQCE. They are responsible for quality witness and inspection verifications of construction and test activities using approved quality control procedures and instructions. 12

Chief Construction QC Engineer has responsibilities to: P

A. Prepare and maintain the Construction Quality Control Manual

B. Approve any special field QC procedures and instruction for the project

C. Hire and assign Field QC Engineers to the projects

D. Train and certify Field QC Engineers per ANSI N45.2.6

E. Prepare and/or approve field inspection planning

P F. Provide technical and administrative direction to Field QC Engineers

G. Provide periodic reports to management on the status and effectiveness of the QC program

12 The activities of Construction QC and QA personnel are independent of construction cost and schedule influences.

The Project QA Manager (PQAM) at the construction site is responsible for directing and managing the project QA program, including the approval of construction QC procedures and instructions prior to use, and the review of QA verification P evidence of compliance to requirements of approved construction inspection instructions and procedures. He is assisted in these responsibilities by QA Engineers at the design office and construction site.

17.1B.1.5.4 Division Procurement

12 Figure 17.1B-3 identifies the organization of Division Procurement. The Manager of Division procurement reports to the Vice President and General Manager and is responsible for providing P management of the purchasing and procurement inspection functions in accordance with Bechtel group and division policies and procedures. The Division Supplier Quality Manager and the Project Procurement Manager report to the Manager of Division 12 Procurement administratively and receive project direction from the Project Manager.

17.1B.1.6 Project Organization and Functions

17.1B.1.6.1 Project Manager

P The Project Manager is responsible for project direction based on the Bechtel scope of work, APS requirements, and Bechtel policies and procedures. The Project Manager is the leader of

the Bechtel project team consisting of the Project Engineering Manager, the Project QA Manager, the Project Procurement Manager, the Project Cost and Scheduling Supervisor, the Project Startup Manager, the Project Construction Manager, and representatives from other Bechtel groups, as required. He provides the necessary direction to the project team to ensure satisfactory performance. Figure 17.1B-8 illustrates the project management organization.

The Project Manager is responsible for the application of the Project Quality Program by the designated departments and for coordinating the activities of project QA and QC to assure that the Quality Program is implemented in conformance with the quality policies and procedures approved for his project.

The Project Manager is the primary interface with APS and major client vendors. The interface at the project management level concerns matters of establishing, maintaining, and changing the Bechtel scope of work, the project schedule, project costs, and coordinating the Quality Program. Authority for interface at the project function level concerning technical and QA matters related to the performance of project functions is delegated by the Project Manager to the project team.

17.1B.1.6.2 Project Quality Assurance

The project QA program is implemented through the Project QA Manager (PQAM). The PQAM is responsible for managing and directing the Palo Verde QA Program at the construction site and the design office. The PQAM is assigned by and receives technical and administrative direction from the QA Manager/ Projects. He coordinates with and represents the Project Manager in QA matters. The PQAM supervises the project QA staff, which includes those at the jobsite and at the project home office.

BECHTEL QUALITY ASSURANCE DURING DESIGN AND CONSTRUCTION

In order to assure that the quality program is sufficiently addressed, the PQAM's duties and responsibilities for the PVNGS include:

A. Review and approval of:

- Material requisitions and specifications for purchase orders and subcontracts
- Subcontractors' QA programs and manuals
- Bid evaluations/selection of project approved suppliers
- Purchase orders and subcontracts
- Selected single-line drawings and P&IDs
- Vendor inspection planning
- Construction work plans and procedures
- Site inspection planning
- Review for reportability/validation and concurrence of nonconformance descriptions and dispositions

B. Coordinate the establishment of the project quality program

C. Overall surveillance of the project quality program and coordination of its implementation

D. Coordinate project quality-related activities of engineering, procurement, and construction and provide necessary interface during audits or inspections by off-project entities of M&QS, ANI, NRC or regulatory agencies

E. Surveillance and audit of project quality-related functions and advise management of the status of program implementation

F. Review and provide quality program compliance signoff on project documents described in the Project Quality Program Manual (PQPM), including QA descriptions in Safety Analysis Reports, subcontractor QA programs, and selected quality verification records packages prior to transfer for Prerequisite Tests, or release for APS Preoperational Testing | P | 12

G. The PQPM delegates the authority to stop work to the PQAM. Stop Work action is immediately implemented by verbal notification to the cognizant superintendent and field construction manager. Stop Work action is documented on a Stop Work Order, which delineates | P | 12

1. Reasons for stopping work | P
2. Description of the condition that precipitated the Stop Work action

Distribution of the Stop Work Order includes, as a minimum, the QA Manager, Project Construction Manager, project management and APS. The cognizant superintendent and Project Construction Manager are responsible for implementing the Stop Work Order. Quality Assurance verifies that the work has stopped. Activities may proceed after disposition to proceed and/or corrective action has been approved by the PQAM. | 12 | P | 12

H. Identify quality problems, initiate, recommend, or provide solutions and verify implementation of solution through established procedures. | P

I. Conduct Trend Analysis Program responsive to repetitive problems indicative of ineffective prior corrective action implemented as a result of audit/surveillance findings or SDDR/NCR conditions.

17.1B.1.6.3 Project Engineering

The Project Engineering Manager provides project direction to the discipline groups and is responsible for the conduct of P engineering on the project. He is responsible for ensuring that engineering work under Bechtel cognizance is carried out in accordance with the project direction received from the Project Manager and the technical direction received from the 12 Engineering Manager. Figure 17.1B-9 shows the Project Engineering Organization.

The Engineering Group Supervisors are responsible for the quality and technical adequacy of the engineering work performed under their guidance. The group supervisors receive their technical direction in these matters from the Chief Engineers for their respective disciplines.

The Engineering Group Supervisors are assigned a team of engineers, designers, and draftsmen from their respective Chief Engineers. The Project Engineering Manager, Project Engineer, Assistant Project Engineers, Project Quality Engineer, Engi- P neering Group Supervisors, Engineers, Designers, and Draftsmen comprise the Bechtel project engineering team. This team is responsible for all Bechtel engineering design work performed by the project and for checking functions performed on the project. Special design support is furnished to the project by specialty groups. The Project Engineer is responsible for coordination of such special design work performed by other than project personnel and for requiring that it be subjected to the same degree of checking and control as that conducted on the project. The Project Engineering Manager is assisted in 12 implementation of the Engineering Quality Program by the Project Quality Engineer. The project engineering team has the following P responsibilities:

A. Prepare calculations, drawings, and specifications which constitute the engineering designs

B. Ensure that drawings, specifications, procedures, and instructions conform to APS requirements and applicable Bechtel Standards, applicable industry standards, regulatory agency requirements, and the design bases as defined in Safety Analysis Reports | P | 12

C. Prepare specifications for proposed supplier and subcontractor QA programs | P

D. Establish the need for supplier inspection and review results of same

E. Review and approve design changes and approve nonconformances which include "repair" or "use as is" disposition | 12

F. Review drawings, specifications, procedures, test data, manuals, and reports submitted to engineering by suppliers and subcontractors

G. Prepare licensing documents for Safety Analysis Report | P

H. Conducts work in accordance with Engineering Department procedures authorized for the project

I. Establish the test program requirement where necessary to demonstrate that supplied or procured items will perform satisfactorily in service

17.1B.1.6.4 Project Construction | 12

A Project Construction Manager is assigned to each nuclear plant project and is responsible for the project field construction performance. He is responsible for ensuring that construction work under Bechtel cognizance is carried out in accordance with the project direction received from the Project Manager and direction received from the Vice President and Manager of Division Construction. He also is responsible for ensuring that the quality of the work is properly verified and documented. | P | 12 | P

The project construction team includes: Superintendents who are in direct charge of the craft; Field Engineers who perform field engineering and provide technical guidance including in-process control inspection of construction work; field procurement personnel who are responsible for purchase of field procured items and control of materials prior to release for construction; the Field Contracts Administrator who coordinates activities in field subcontracts; the Project QA Engineer, assigned by and administratively and technically responsible to the Project QA Manager, who is responsible for coordinating the QA program; and Field QC Engineers, assigned by and administratively and technically responsible to the Chief Construction QC Engineer. The Field QC Engineers are responsible for the field QC program, including performance of all quality verification inspection. Field QC is coordinated by the Project Field Construction Manager. Figure 17.1B-10 shows the organization of the project construction team.

Field QC is the responsibility of the Project QC Engineer whose responsibilities include:

A. Perform all jobsite quality verification inspection

B. Prepare jobsite QC documentation and maintain construction QC records

C. Perform surveillance of subcontractors' quality programs and review of subcontractor's quality verification documentation

D. Provide technical direction to testing laboratories and inspection subcontractors

E. Administer the nonconforming material control systems, and verify acceptance of rework and repairs in accordance with nonconformance dispositions.

F. Review supplier quality verification documentation package(s) for completeness and traceability to the item(s)

The Project QC Engineer (PQCE) is assigned the responsibility for effective execution of the quality control program at the construction site. The Chief Construction QC Engineer, who receives administrative direction from the Vice President and Manager of Division Construction, provides technical and administrative direction to the Project QC Engineer for work performance and verification. The Project QC Engineer coordinates work scheduling with the Project Construction Manager but does not take direction from him. At no time is the PQCE subjected to pressures of schedules and cost impact of his inspection findings.

Contractors are assigned first-level responsibility for the quality of their work. Their performance is coordinated and monitored by the Bechtel field organization. The Bechtel field QC organization performs the degree of quality verification/surveillance inspection of contractor and documentation performance appropriate for the individual contractor scope of work.

17.1B.1.6.5 Project Procurement

The Project Procurement Manager provides coordination and is responsible for the conduct of project procurement activities.

Figure 17.1B-11 shows the organization of the project procurement team.

The Project Procurement Manager and Project Supplier Quality Supervisor are responsible for:

A. Purchasing

1. Develop prequalified bid lists
2. Primary interface with prospective vendors for performing vendor qualification when required
3. Primary interface with bidders prior to award and, after award, with the vendor concerning matters resulting in purchase order and contract changes

4. Bidding activities, including preparation of the commercial evaluation of bid proposals

P

B. Procurement Supplier Quality

1. Definition of Procurement supplier quality scope of work as required by Engineering

2. Coordination of Procurement Supplier Quality Inspection Services with project requirements

12

3. Coordinate audits with Procurement Supplier Quality Technical Services in the conduct of post-award audits of the implementation of suppliers QA/QC programs.

4. Pre-award surveys of supplier's facilities and QA/QC programs

17.1B.1.6.6 Project Startup Prerequisite Testing

Quality Assurance in the prerequisite testing program is achieved by prior review and approval, at appropriate levels, of prerequisite test procedures, schedules, forms for reporting, and results of testing including nonconforming conditions.

P

Reviews are made as appropriate by project engineering (Bechtel and APS), Bechtel startup management, Combustion Engineering, Inc. (C-E), other suppliers, the Joint Test Group (JTG), and APS QA Manager. The JTG consists of a Bechtel Startup Engineering member, the C-E Site Manager, two members of the PVNGS onsite review organization, one APS Nuclear Services member, one Plant Operations department member, the PVNGS Plant Startup Engineer, and an APS QA Engineer. Copies of approved prerequisite test procedures are maintained in the jobsite document control center.

Provisions are made for changes to prerequisite test procedures after approval. Approval by the JTG is required, and further approvals may be required, as judged by the JTG, depending upon the nature of the change.

Quality control is further achieved by APS/BPC QA personnel assigned to monitor prerequisite tests as they are performed and by documentation, evaluation, and approval of results, which are maintained in the site document control center. P 12 P

QA monitoring/auditing the prerequisite test program ensures that tests have been conducted in accordance with approved procedures, using calibrated equipment. 12

All of the activities described are subject to QA surveillance and auditing.

17.1B.2 QUALITY ASSURANCE PROGRAM P

17.1B.2.1 Scope

The program described in this section is applied to those structures, systems, and components (Q-list items) whose satisfactory performance is required to prevent accidents that may cause undue risk to the health and safety of the public, or to mitigate the consequences of such accidents if they do occur. These items are defined as safety-related and are identified in table 3.2-1. 12

17.1B.2.2 Policy

The Bechtel Quality Program complies with NRC Regulations and practices prescribed by ANSI, APS requirements, and Bechtel policies. The program assigns the responsibility for quality to the organization performing the work, and includes, as a basic requirement, that individuals responsible for verifying and checking are independent of the individual or group responsible for performing the work. Additionally, independent reviews, audits, and surveillance are provided by individuals who are independent of the organizations responsible for performing work. P

Overall quality policy of the BPC, approved by the BPC President, is formulated or reviewed by the BPC Manager of QA, who is independent of individuals responsible for direction or coordination of Engineering, Procurement, and Construction activities, 12 P

and who reports to management of the BPC. Quality policies and QA procedures of the responsible divisions are formulated or reviewed by the QA managers in the divisions who receive technical guidance from the BPC Manager of QA and report directly to management of their division. Quality Assurance practices for individual projects are implemented through the Project QA Manager who receives technical and administrative direction from Manager of Division QA and the QA Manager of Projects. Project department and division quality practices are subject to audit by QA at various levels.

Design verification includes checking within the project by individuals other than those who perform the original design and review and verification of technical adequacy of designs by the Chief Engineers or their technical staff who are independent of the project.

Supplier and subcontractor QC requirements are specified in the procurement specifications by engineering, which requires suppliers and subcontractors to execute appropriate quality programs. Verification of supplier/subcontractor compliance is provided by source surveillance and inspection at suppliers facilities by the Procurement Supplier Quality Department, or by field quality control for onsite subcontractors. Also, surveillance and audit of these activities by QA personnel, the Procurement Supplier Quality Department staff, and/or M&QS.

Inspection of construction activities performed directly by Bechtel includes in-process controls and inspection of the work by formal QC verification inspection activities and audits by QA, supplemented by M&QS personnel as required.

When disputes arise from a difference of opinion between QA/QC personnel and other department personnel (Engineering, Procurement, QC, and Construction personnel) regarding project quality program matters the final authority rests with the PQAM, subject only to appeal to the Manager of Division QA by the Project

Manager. The PM will assure that the functional department heads are informed of this disagreement and have adequate opportunity to present their position. If the Project Manager agrees with the PQAM, the functional department heads will be informed of the decision and have adequate opportunity to present their position to the Manager of Division QA. 12 P 12

17.1B.2.3 Program Documentation

The PQPM contains or references the procedures and manuals that comprise the project quality program. This manual is controlled and maintained by the PQAM. P 12

Quality program policy, procedures, and instructions are contained in the documents listed in table 17.1B-1. Copies of Bechtel standard documents are available for review by regulatory authorities and APS. Controlled copies of those designated by footnote in the table are available upon request to cognizant regulatory bodies. Controlled copies of project manuals and procedures are made available to APS and, through them, to regulatory authorities when required. P 12

Division and department standard procedures and practices form the basis for the QA program on each nuclear project. These procedures and instructions are contained in standard manuals, modified to meet specific project requirements, and supplemented where necessary by specific inspection plans, work instructions, and check lists. P

The method for controlling the distribution of the listed documents is established in each manual. Records shall be maintained identifying the document, the document recipient, and acknowledgement of the receipt of the original issue and subsequent revisions.

These controls require that procedures and revisions are transmitted by letters giving instructions pertaining to the procedures or revisions. This letter also serves as a form to acknowledge receipt. A master file is maintained for records

Table 17.1B-1

BECHTEL QUALITY PROGRAM DOCUMENTS (Sheet 1 of 3)

Document	Originating Authority	Review for QA Policy Compliance	Authorizing Approval	Content
Bechtel Power Corporation Quality Policies(a)	BPC Manager of QA	NA	BPC General Manager	Basic BPC policies to be used by all divisions and services
Bechtel QA Manual - ASME Nuclear Components (BQAM-ASME III)(a)	M&QS	BPC Manager of QA	BPC General Manager and appropriate authorized code inspection agency	Policies and procedures for overall Bechtel program applicable to ASME work
Procurement Supplier Quality Manual(a)	Procurement Supplier Quality Manager	BPC Manager of QA	Procurement Supplier Quality Manager	Procurement inspection procedures and standard supplier inspection plans
Division Quality Program Manual	Division QA Manager	BPC Manager of QA	Division Manager (or Deputy Division Manager)	Division policy supplementing BPC quality policy

a. Available on request to appropriate regulatory bodies.

Table 17.1B-1

BECHTEL QUALITY PROGRAM DOCUMENTS (Sheet 2 of 3)

Document	Originating Authority	Review for QA Policy Compliance	Authorizing Approval	Content	P
Division QA Department Procedures Manual	Division QA Manager	Division QA Manager	Division QA Manager	Procedures for conducting division QA activities	12
Engineering Department Procedures	Designated individuals	Division QA Manager	Manager Division Engineering	Definition of responsibilities and procedures for conduct of design, design review, and document control in the engineering departments	P 12 P

Table 17.1B-1

BECHTEL QUALITY PROGRAM DOCUMENTS (Sheet 3 of 3)

Document	Originating Authority	Review for QA Policy Compliance	Authorizing Approval	Content
Project Quality Program Manual	Cognizant project team members	Project QA Manager	Project Manager, Division QA Manager	References to appropriate Bechtel standard procedures and practices, revised and supplemented if necessary to meet specific project requirements
Construction Work Plan Procedures and Quality Control Instructions Manual	Division Construction/PQCE	Project QA Manager	Project Field Engineer, QA Manager, PQCE	Responsibilities and practice for construction activities (how the work is performed inspected and accepted)
Internal Procedures Manual	Project engineering manager	Division QA Manager	Engineering Manager	Project Design/ Interface Procedures

associated with the procedures, and follow-up action is taken in 30 days if delinquent manual holders have not responded. P

The PQPM is approved by the Division QA Manager and Project Manager. The manuals and procedures described in table 17.1B-1 are the basic quality program documents for the project. These manuals are distributed to appropriate personnel who have quality-related responsibilities. 12

Table 17.1B-2 provides a list of 18 procedures directly related to the 18 criteria of 10CFR50, Appendix B. The total quality program is described in the PQPM. P

The project team (refer to section 17.1B.1.6) has the responsibility for preparing and maintaining documentation defining project design criteria and applicable codes, standards, and regulatory requirements. Further, the project team has the responsibility for preparing and maintaining organization charts and documentation defining interface responsibilites among various Bechtel groups and other major non-Bechtel project participants, such as APS and C-E. 12

17.1B.2.4 Personnel

Responsibilities, education, and experience requirements of individuals involved in quality program related activities are formally documented in job descriptions that are approved and periodically reviewed by Bechtel management. Requirements for education, experience, and proficiency levels are commensurate with the degree of importance of the job assignment (refer to table 17.1B-3). P

Bechtel QA and QC personnel participating in the quality program are provided with indoctrination and training covering the standards, policies, and procedures which apply to the specific portions of the work they are performing to assure that suitable proficiency is achieved and maintained.

Personnel performing inspection, examination, and testing activities to verify quality are qualified in accordance with

BECHTEL QUALITY ASSURANCE DURING DESIGN AND CONSTRUCTION

Table 17.1B-2

BECHTEL QUALITY ASSURANCE DURING DESIGN AND CONSTRUCTION

(Sheet 1 of 5)

Matrix -- Relation to U.S. Nuclear Regulatory Commission 10CFR 50 Appendix B, Quality Assurance Criteria for Nuclear Power Plants and American National Standard ANSI N45.2 Quality Assurance Requirements for Nuclear Power Plants

PVNGS Unit 1, 2 & 3
Job No. 10407

App. B Sec. No.		ANSI Sec. No.	Project Quality Program Manual: 1.0 Project Organization (I)	2.0 Project Quality Assurance Program Procedures (PQPM) (II)	3.0 Design Control (III)	4.0 Procurement Document Control (IV)	5.0 Instructions, Procedures and Drawings (V)	6.0 Document Control (VI)	7.0 Control of Purchased Matl. Equip. and Serv. (VII)	8.0 Identification and Cont. of Matl. Parts & Comp. (VIII)	9.0 Control of Special Processes (IX)	10.0 Inspection (X)	11.0 Test Control (XI)	12.0 Calibration and Cont. of Meas. and Test Equip. (XII)	13.0 Handling, Storage, Shipping and Preserv. (XIII)	14.0 Inspection, Test and Operating Status (XIV)	15.0 Nonconforming Matl. Parts and Comp. (XV)	16.0 Corrective Action (XVI)	17.0 Quality Assurance Records (XVII)	18.0 Audits (XVIII)	19.0 Glossary of Terms and Definition (XIX)	20.0 QA Requirements for Fire Protection Systems (XX)	Forms
I	Organization	3	X						X									X	X	X	X		
II	Quality assurance program	2	X	X	X	X	X		X								X	X	X	X	X	X	
III	Design control	4			X			X	X	X							X	X	X	X	X	X	
IV	Procurement document control	5				X			X									X	X	X	X	X	
V	Instructions, procedures, and drawings	6			X	X	X		X									X	X	X	X	X	
VI	Document control	7			X		X	X	X									X	X	X	X	X	
VII	Control of purchased material, equipment, and services	8				X	X	X	X			X			X	X	X	X	X	X	X	X	
VIII	Identification and control of materials, parts, and components	9							X	X	X	X				X	X	X	X	X	X		
IX	Control of special processes	10							X		X	X					X	X	X	X	X		
X	Inspection	11							X	X	X	X			X	X	X	X	X	X	X	X	
XI	Test control	12							X		X	X	X			X	X	X	X	X	X	X	
XII	Control of measuring & test equipment	13							X		X	X		X			X	X	X	X	X		
XIII	Handling, storage & shipping	14							X	X		X			X		X	X	X	X	X		
XIV	Inspection, test & operating status	15							X			X				X	X	X	X	X	X	X	
XV	Nonconforming material, parts, or components	16							X								X	X	X	X	X	X	
XVI	Corrective action	17							X								X	X	X	X	X	X	
XVII	Quality assurance records	18			X				X		X	X			X	X	X	X	X	X	X	X	
XVIII	Audits	19			X			X	X								X	X	X	X	X	X	

12

Table 17.1B-2

PROJECT QUALITY PROGRAM MANUAL (Sheet 2 of 5)

Procedure No. and Title	Substance
1.0 Organization	Describes the organizational structure and responsibilities for the quality program which will direct the Los Angeles Power Division of Bechtel Power Corporation resources during design procurement, and construction of PVNGS
2.0 Quality Procedure	Describes the procedures and guidelines that facilitate control of: quality program procedures; classification of systems, components, and structures; training of personnel whose activities affect quality; and reporting the effectiveness of the quality program to management.
3.0 Design Control	Describes the design process consisting of preparation, review, approval, change control, and distribution of design documents. The process provides for independent review to assure design adequacy, inspectability, testability, and compatibility with the safety analysis report. Also described are the review requirements for the PSAR and ER, and quality related functions and responsibilities of the project field engineering group

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Table 17.1B-2

PROJECT QUALITY PROGRAM MANUAL (Sheet 3 of 5)

Procedure No. and Title		Substance
4.0	Procurement Document Control	Describes the method of controlling the quality of supplier furnished material or services
5.0	Instructions, Procedures, and Drawings	Defines the governing documents that delineate the responsibilities of engineering, construction, QA, procurement supplier quality, procurement (field), and startup, and the system used as an extension of the Project Quality Program Manual when interpretation of policy/requirements necessitates more detailed procedural instructions
6.0	Configuration Control	Describes measures for maintaining control of design documents for PVNGS
7.0	Supplier Quality Assurance Program	Describes the QA requirements for sub-contractors and suppliers of materials or services to the Los Angeles Power Division of Bechtel Power Corporation
8.0	Identification and Control of Material, Parts, and Components	Defines the system of material identification and control for assuring that Quality Class 1 and 2 materials, parts, appurtenances, components, and systems are of the proper configuration, and, when required, are traceable to supporting quality documentation

Table 17.1B-2

PROJECT QUALITY PROGRAM MANUAL (Sheet 4 of 5)

Procedure No. and Title	Substance
9.0 Control of Special Processes	Describes the system for the control of special processes, equipment, and personnel
10.0 Inspection	Defines the requirements for supplier and jobsite inspection programs. These requirements apply to structures, systems, and components designated Quality Class Q
11.0 Test Control	Describes a system for control of testing for conformance with design disclosures
12.0 Calibration and Control of Measuring and Test Equipment for Construction and Startup	Describes a system of periodic calibration to assure the accuracy of instruments, gages, and measuring devices used in the construction and startup of PVNGS
13.0 Handling, Storage, Shipping and Preservation	Defines responsibilities to assure adequate handling, storage, shipping, and preservation instructions and procedures are provided for safety-related items
14.0 Inspection, Test, and Operating Status	Describes the requirements and responsibilities of suppliers to identify the inspections, tests, and operating status performed in Quality Class Q materials and equipment

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Table 17.1B-2

PROJECT QUALITY PROGRAM MANUAL (Sheet 5 of 5)

Procedure No. and Title	Substance
15.0 Nonconforming Materials, Parts and Components	Defines the procedure for identification, control, and disposition of material, equipment, or supplies that do not conform to controlling documents
16.0 Corrective Action	Describes the system that provides corrective action for deficiencies discovered during monitoring of the QA program
17.0 Quality Assurance Records	Defines the controls for design, procurement, supplies, and construction quality-related records
18.0 Audits	Defines the procedure for conducting audits of engineering, procurement, construction suppliers, and subcontractors' activities performed by or for the Los Angeles Power Division
19.0 Glossary of Terms and Definitions	Delineates definitions and terms used in this manual as applicable to PVNGS
20.0 QA Requirements for Fire Protection Systems	Defines the procedures for design, installation and testing of BPC/ Subcontractor activities consistent with regulatory guidelines and intent of NRC BTP APCSB 9.5-1 Appendix A

the established project requirements. Procurement Supplier Quality personnel are required to meet the requirements established in the Procurement Supplier Quality Manual. Quality Assurance personnel and others participating in audits are required to be trained and qualified in accordance with documented procedures. Personnel performing pressure boundary and structural welding and nondestructive examinations are required to meet applicable qualification requirements of the ASTM Code and other appropriate codes and standards.

Table 17.1B-3

QUALIFICATION AND EXPERIENCE LEVELS

Title	Required Background
Division QA Manager	Advanced degree with 5 or more years of related experience, or engineering degree with 8 or more years of related experience
QA Manager/ Projects	Advanced degree with 2 to 4 years of related experience, or undergraduate degree with 5 to 7 years of related experience, or no degree with 8 or more years of related experience
Project QA Manager	Advanced degree with 2 to 4 years of related experience, or undergraduate degree with 5 to 7 years of related experience, or no degree with 8 or more years of related experience
Project QA Engineer	Advanced degree with less than 2 years of related experience, or undergraduate degree with 2 to 4 years of related experience, or no degree and 5 to 7 years of related experience
QA Engineer	Advanced degree with less than 2 years of related experience, or undergraduate degree with 2 to 4 years of related experience, or no degree and 4 to 6 years of related experience

NOTE: Qualifications and experience levels described above are to be considered as guidelines and are not absolute when other demonstrated capabilities and managerial characteristics prevail.

Personnel assigned to projects are provided with specific indoctrination and training covering project procedures applicable to their work. This is accomplished by general discussion of specific procedures and individual training by project supervisors and staff specialists. Similar programs are employed for indoctrination of individuals assigned to staff and specialist groups.

Formal qualification requirements are applied as follows:

A. Quality Control Personnel

Field QC Engineers and home office QC staff and supervision will be qualified in accordance with the project established requirements of ANSI N45.2.6 or SNT-TC-1A, as applicable.

B. Quality Assurance Personnel

Personnel performing audits will be qualified in accordance with the appropriate requirements of ANSI N45.2.12.

C. Procurement Supplier Quality Representatives

A formal training program developed by the Procurement Supplier Quality Department is required for shop inspectors with assigned nuclear plant purchase orders. This program is defined in the Bechtel Procurement Supplier Quality Manual (PSQM) and conforms to requirements equivalent to those of ANSI N45.2.6.

17.1B.2.5 Management Review

Management reviews of the status and adequacy of the QA program are accomplished through periodic reports and presentations by QA management personnel to their respective managers, and through review of QA management audit reports. Meetings are held on a regular basis at both corporate and division management level. Meetings at the BPC level are conducted by the BPC Manager of QA, and at the division level meetings are conducted by the Manager of Division QA.

Also, the overall BPC and each division program is reviewed annually by individuals outside the QA function. These reviews are performed by or for BPC and division management and may simultaneously cover BPC management and/or special divisions. The results of these reviews are documented. P

17.1B.3 DESIGN CONTROL

The Bechtel design control program is based upon the requirements of ANSI N45.2.11. 12

Engineering Department policies, design criteria, design guides, standards, procedures, and instructions are employed for control of engineering design work to meet technical and regulatory requirements. P These controls identify responsibilities and procedures necessary to ensure that design requirements are correctly translated into the final design. The controls also provide for appropriate documentation to permit review of the process used and results obtained. 12 The controls also specify appropriate quality standards for control of changes and design interfaces. P

Design criteria are assembled by the project on a discipline basis during the initial stages of design. These criteria include the criteria contained in Safety Analysis Reports and project requirements. The design criteria are maintained current and serve as a basis for preparation of the final design. Departures from division engineering discipline standards require approval by the Project Engineering Manager and appropriate Division Chief Engineer. 12

The design control program incorporates measures for identification and control of design interfaces among the various engineering disciplines on the project, between the project and technical support groups within Bechtel, and of such external interfaces as C-E, APS, other equipment suppliers, and contractors performing design work. These measures include

P identification of technical responsibilities of the various design groups and coordination of design documents among them.

12 Engineering documents are prepared by project personnel and include drawings, specifications, design analyses, system descriptions, and technical reports. Engineering documents are checked or reviewed in accordance with project procedures by personnel having technical capabilities commensurate to those of the originating engineer or designer. Engineering Group Supervisors are responsible for approval of the above engineering documents prepared within their groups. Design work of specialists external to the project is checked, reviewed, and accepted by project personnel qualified in the originating engineering discipline in accordance with project procedures. 12 Design work may also be reviewed/accepted by members of the specialist group qualified in the originating engineering discipline, in accordance with specialist group procedures, and must be accepted by responsible project personnel.

P Selected design documents are specified in the Engineering Department Procedures Manual for an additional level of review. This review is the responsibility of the cognizant Chief Engineer and his staff and is performed by personnel independent of the project team in accordance with Engineering Department procedures. Identification of documents requiring this 12 additional level of control is provided by checklists or matrices prepared by the project during the initial design phase and approved by the cognizant Chief Engineer. Reviews may take the form of periodic in-process single or multidisP ciplinary reviews, final review meetings, independent detailed checks, comparison of results with those of the alternate simplified analysis, or comparison with proven standard designs. The specific review employed in each case is determined by the 12 Chief Engineer and his staff, based upon the importance of the item to safety, the specific attribute to safety, or its similarity with previously proven designs. Verification of the

design review/approval program is provided through appropriate signature on the documents and approval records.

In accordance with ANSI N45.2, Section 4.3, design verification may be provided by tests. The specific test programs and results are reviewed by project and technical staff personnel. 12

Design changes, including changes recommended by field personnel, are subjected to design control measures commensurate to those applied to the original design. Bechtel policy requires that proposed changes to the design require review and approval by the engineering group that was responsible for the original design. Specifically, changes to design requirements or completed designs produced by project engineering, which may be proposed by vendors, contractors, Bechtel construction or others, must be reviewed and accepted by project engineering prior to implementation. P 12 P 12

Materials, parts, equipment, and components which are considered "off-the-shelf" are reviewed and selected based on their suitability of application when such items are employed or related to Q-list systems, structures, equipment or components.

Suppliers are not allowed to make changes from Bechtel design or Bechtel approved supplier design documents without approval by Bechtel Project Engineering. P

Construction site requests or proposed changes in engineering design are documented by means of change notices or change requests which require authorization by Project Engineering.

The Project Engineer may give written authorization to the Field Engineer to make routine changes.

Design documents, design reviews, records, and changes thereto are distributed to responsible personnel and are filed and maintained through the document control centers as described in section 17.1B.6.

Design analyses such as physics, stress, materials, thermal, hydraulic, radiation and accident are performed when applicable. Accessibility for in-service inspection, maintenance and repair as well as delineation of acceptance criteria for inspections and tests is included.

The Design Criteria Manual is the base design document for the project. It includes Division Engineering Standards, industry standards and accepted design practices, and regulatory agency requirements. The design criteria are maintained current and serve as a basis for preparation of the final design. Design criteria and significant departures from division discipline engineering standards require approval by appropriate division Chief Engineers, project personnel and the applicant. APS.

The QA program provides that design errors and deficiencies which adversely effect safety related systems, structures, and components are documented and that appropriate corrective actions are taken. The documents used to report deficiencies are:

1. A Document Review Notice (DRN) is used to provide objective evidence of the document review and approval process. It also provides for documenting the resolution of comments.

2. Corrective Action Requests (CAR), Quality Audit Reports and Nonconformance Reports (NCR) are used to document deficiencies detected during design, procurement and construction. These documents provide objective evidence for problem identification and corrective action.

3. A Deficiency Evaluation Report (DER) is used to document significant reportable deficiencies, as defined in Regulation 10CFR50, Appendix B, Criterion XVI, 10CFR50.55(e), and 10CFR Part 21. The DER provides objective evidence for problem identification and corrective action.

4. A Supplier Deviation Disposition Request (SDDR) is used to document deviations from the procurement specifications or contract. | 12

17.1B.4 PROCUREMENT DOCUMENT CONTROL

All procurement actions for Q-List items, or services, include technical specifications and QA requirements established by the project engineering team. | P

Project Engineering is responsible for ensuring that applicable regulatory requirements, design bases, and other requirements such as supplier QA program requirements that are necessary to obtain and verify quality are included or referenced in the procurement documents. The Project QA Engineer reviews and audits procurement documents for conformance to the QA program. | P

Procurement documents include specific technical specifications for the equipment and services to be furnished by the supplier or subcontractor. The specific codes, standards, tests, inspections, and records to be applied or furnished are included. The procurement documents defines requirements for the supplier's QA program by incorporating the appropriate sections and elements of 10CFR50, Appendix B and the ASME Boiler and Pressure Vessel Code. The procurement document also establishes requirements for source inspection and audit and provides for extension of the applicable requirements to subtier procurements. Requirements for control and approval of supplier nonconformances, and for preparation and delivery of documentation that must be submitted for review and approval are also included. | 12

Changes and/or revisions to procurement documents and procurement documents for spares or replacement parts are reviewed to the same requirements as the original. | P

The PQAM reviews procurement documents for approval. Disagreements concerning procurement documents are resolved between the PQAM, the Project Procurement Manager and/or the Project Engineer. | 12 | P | 12

P 12 Final authority for quality program matters concerning procurement documents rests with the PQAM subject only to the appeal of the Project Manager to the Division QA Manager.

P 12 The PQPM requires a review of procurement specifications by the PQAM to determine:

P A. That the quality requirements are clear and unambiguous

12 B. That adequate acceptance and rejection criteria have been defined.

P C. The procurement document has been prepared, reviewed and approved in accordance with the QA Program requirements

12 (Review and approval is documented by signature on the Design Review Notice and retained in the project files.)

Project procedures require that procurement documents for Q items include the applicable requirements for supplier's QA programs consistent with pertinent provisions of 10CFR50, Appendix B, including provisions for preparation, retention, control, maintenance and delivery of documentation.

P Controls and QA requirements for spare or replacement parts for both design office and field procurement, are equivalent to those applied to the original equipment procurement. The extent of the controls imposed will be determined by the individual spare part purchased.

17.1B.5 INSTRUCTIONS, PROCEDURES, AND DRAWINGS

12 The documented instructions and procedures governing the program are identified in section 17.1B.2 and table 17.1B-2.

P 12 Written, formal instruction from Project Engineering to Construction contractors and suppliers is in the form of Engineering Specifications and addenda, Specification Change Notices, drawings, drawing change notices, design change packages, and supplier engineering documents. These documents contain

references to required procedures and instructions as appropriate and provide necessary acceptance criteria. These documents, when approved by Project Engineering, provide authorization for construction work. P

The requirements, procedures and instructions for construction QC activities are contained in the Work Plan Procedures/Quality Control Instructions (WPP/QCI) manual. The elements of this manual include qualifications, indoctrination, certification and training; inspection examination and test control; control of nonconforming items; field procurement control; control of measuring and test equipment; documentation and records control; final inspection and turnover; contractor and subcontractor control. 12

Bechtel procurement documents require suppliers and contractors to submit specified documents to Bechtel for review and/or approval prior to start of fabrication or construction. P 12

Bechtel review of these documents are performed to determine that interfacing design features are compatible with overall design and installation requirements, and that procedures are acceptable. P

Verification that work is accomplished in accordance with approved instructions, procedures, and drawings is obtained through the various levels of surveillance, inspection, and audit described in section 17.1B.7. 12

17.1B.6 DOCUMENT CONTROL P

The program documents identified in table 17.1B-1 include requirements for document control. This includes procedures that provide engineering, purchasing, procurement inspection, and preoperational testing control for review, approval, and release of documents and changes thereto. 12 P 12

Document control centers for the project are set up in the project engineering office and the jobsite. Controlled documents (drawings, specifications, vendor data) are released, P

received, controlled, and distributed through these centers.

Document control centers contain approved drawings and specifications prepared by Project Engineering. These documents are issued to organizations responsible for performing the work and to those responsible for inspection. Control registers identifying the drawings and specifications and their current status are issued periodically. Bechtel Procurement Supplier Quality Representatives receive copies of transmittal notices listing applicable documents and their approval status. These lists are used to verify current status of supplier documents. Transmittal forms are employed to forward drawings and specifications which require that signed acknowledgement receipts must be returned to the document control centers.

Changes made to approved documents are reviewed and approved in accordance with established procedures which provide that changes which effect the design of safety related structures, systems, or components are reviewed and approved in the same manner as the original issue or by assigned alternate qualified personnel.

Changes may not be implemented without appropriate documented approvals. Approved changes are included in instructions, procedures, and other appropriate documents in accordance with project design control procedures. Controlled change notices provide for interim implementation of the revision. When a specified number of change notices have been issued or after a designated period of time, change notices must be incorporated into the governing documents.

Vendor submitted documents such as drawings, specifications, procedures, manuals and other data are controlled through the use of the control logs which provide identification and status of vendor documents. Transmittal forms used to return documents to the vendor show approval status of the evaluated vendor documents. Bechtel shop inspectors are informed as to the

current status of vendor documents and copies of applicable vendor documents are formally transmitted to the construction site with provision for receipt acknowledgement.

The Project Construction organization at the jobsite employs standard prescribed procedures for control of the distribution of approved drawings, specifications, and other documents. These procedures include provisions for field receipt, review and distribution of approved documents and for appropriate marking or destruction of obsolete documents. P

The transmittal of drawings and specifications is controlled in accordance with procedures which include provisions to prevent inadvertent use of obsolete or superseded documents.

Documents such as instructions, procedures, specifications, drawings, procurement documents, inspection plans, inspection records, supplier manuals, nonconformance reports, supplier deviation disposition requests, corrective action reports, memoranda and correspondence are included in document control.

As part of their quality verification inspection program, field QC ensures that construction work is not performed if current approved design documents are not available. 12

Control of documents in the engineering and construction offices are regularly audited by project QA personnel.

17.1B.7 CONTROL OF PURCHASED MATERIAL, EQUIPMENT AND SERVICES P

17.1B.7.1 Supplier Evaluation and Selection

Records of currently acceptable suppliers and subcontractors are maintained by procurement. These records identify suppliers and subcontractors who have demonstrated their conformance to the applicable criteria of 10CFR50, Appendix B, and their ability to provide quality material, equipment, or services, or have been established as acceptable by previous survey or audit. 12 P 12

Supplier and subcontractor records provide information on the scope of services and capability, and identify projects currently employing the supplier or subcontractor. Results of recent shop surveys and audits are also on file. Periodic reports identifying suppliers contained in these files are issued by Procurement Supplier Quality to interested groups within the divisions.

Procurement Supplier Quality Department procedures include provisions for source surveys that will be used to supplement data in a supplier's file in cases where the scope of services or quality requirements of new work exceed that for which the supplier was previously qualified. Also, in cases where new sources are being considered for selection, or when no work or report has been generated during the previous year.

Prior to award the following technical and quality requirements must be met.

A. Determination by Engineering that the source is responsive to the technical requirements of the specification

B. Determination by Engineering and Procurement Supplier Quality that the supplier QA program is capable of meeting the specified requirements

C. Determination by Engineering and QA that the subcontractor's QA program is capable of meeting the specified requirements.

The QA program evaluation is achieved by review of quality program manuals and procedures submitted to Bechtel as required by the specific procurement document or proposal.

17.1B.7.2 Supplier Inspection

Project Engineering identifies commodities requiring source inspection and audit. Procurement or QA may recommend additional

items when justified. Manufacturered or fabricated Q-List items such as vessels, heat exchangers, pumps, piping subassemblies, valves and electrical panels are included in source inspection and audit programs. Items that are typically excluded from the source inspection program include materials and standard manufacturered products (catalog items) where required quality can be adequately determined by receipt inspection or post-installation checkout or test. Also excluded are materials where important physical and chemical properties are independently verified on samples taken at the supplier's facilities or at the jobsite.

For Q-List items, Bechtel Procurement Supplier Quality Representatives (SQR) perform their inspection in accordance with approved inspection plans and instructions. These plans are prepared by Procurement Supplier Quality based on standards in the Procurement Supplier Quality Manual and may be extended by Project Engineering. They provide for the identification of witness and hold-points and identify the examinations and tests which are selected to be witnessed by the Bechtel SQR. Source inspection may be performed by resident or area SQR's assigned to several suppliers.

Reports documenting inspections performed, tests witnessed and discrepancies observed are prepared by the SQR and distributed to appropriate project personnel. Bechtel SQR are responsible for assuring that inspected material, equipment, and specified documentation conform to the requirements of the procurement documents prior to releasing inspected items for shipment. The SQR has the authority to refuse release of nonconforming material.

17.1B.7.3 Receiving Inspection

All items are examined on receipt at the jobsite for identification, quantity, and damage. These examinations are performed

P | by the Field QC Engineers with the assistance of field engineering and the field procurement group. For items not subject to source inspection, appropriate examinations or tests are performed. Examinations and tests are performed in accordance with work plan procedures/quality control instructions (WPP/QCI's) under the supervision of field QC.

P | Documentary evidence that the item conforms to procurement documents is on file and available to those concerned.

Items received without certifications of conformance and other required supporting documentation are judged nonconforming and are withheld, identified as nonconforming and segregated until documentation is received. Items determined to have discrepancies, are reported on a Nonconformance Report processed in accordance with applicable WPP/QCI's.

12 | Where complete documents verifying acceptance or certification cannot be sent to the jobsite with shipment, documentation will be available at the site which allowed shipment without the specified documentation. This equipment will be properly identified as "Nonconforming," and may be conditionally released for installation providing that an approved "Interim" disposition on an NCR identifies the limitations and conditions for locating the item in place.

Complete quality verification record packages are requested for delivery prior to or with the shipment. Documented control measures, with provisions for follow-up, are provided to expedite receipt of quality verification packages which are delayed

P | beyond the time of shipment. Completed quality verification record packages received at the construction site are checked for completeness and traceability by QC and are audited by QA. Project engineering may elect to have selected quality verification documentation delivered to the design office for review by so specifying in procurement documents.

17.1B.7.4 Supplier Audits

The supplier control program provides for periodic audits of suppliers' QA programs. Audits of suppliers performing continuing work for Bechtel projects are conducted on an annual basis; audits of suppliers performing limited duration assignments are conducted at least once during the life of the contract. Suppliers of Q-List items who are required to provide a QA program are subjected to procurement audits. P

Audits of suppliers, other than suppliers of ASME Section III materials, may be waived for one year if all the following conditions are met:

A. The supplier has been previously audited by Bechtel and no significant problems were found.

B. The supplier has a history of satisfactory quality performance on Bechtel work. PSQD audits, Quality Surveillance Reports and Non-conformance Reports will be used as a minimum for establishing a satisfactory history. 12

C. All recommendations for audit waiver will be presented in writing to Project Engineering and Quality Assurance. Concurrence with the audit waiver recommendation will be documented.

Audits cannot be waived two years in succession.

Construction subcontractor work is performed under the administrative control of the field contracts administrator with assistance from field engineering. Surveillance inspection of subcontractors activity is performed by Bechtel field QC. Subcontractor's quality verification documentation is also reviewed and checked by field QC. Routine construction site audits of subcontractors QA/QC program are performed by field QA personnel with the assistance of field QC. Subcontractor's of design and consulting work are reviewed/approved by project engineering and audited by QA. P 12

P 17.1B.8 IDENTIFICATION AND CONTROL OF MATERIALS, PARTS, AND COMPONENTS

12 Identification requirements are determined by engineering during the design process and are included in the technical specifications and drawings. Items that require traceability are so designated. Procurement documents also provide requirements for identification of purchased items.

P Parts, components, subassemblies, equipment, and partially fabricated items may be identified by markings such as stenciled or etched markings, strip marking, imprinted tape, color coding, and tags. Large quantities of small items may be identified to heat, batch, lot, or specification by applying markings to bags, bins, tanks, or other suitable containers.

12 Identification of installed or assembled items may be transferred to inspection records or as-built documents as required. Markings which are hidden or subject to obliteration during fabrication or installation shall be included on as-built records.

P Organizations receiving materials, parts, or components verify that they are properly identified and are accompanied by appropriate documentation. Provisions are made for handling and storing items to retain identification.

17.1B.9 CONTROL OF SPECIAL PROCESSES

12 Special processes requiring procedures and/or personnel qualification beyond those required by the ASME code are

P identified in specifications by reference to appropriate industry codes and standards, where available, or by specific identification in the specification. Supplier and subcontractor special process qualification data are subject to review

12 and/or approval by Bechtel.

P Special processes performed by Bechtel Construction, including welding, nondestructive examination, protective coating, and

cleaning and flushing, are performed by qualified personnel in accordance with qualified special process procedures. The requirements for welding and nondestructive examination comply with applicable portions of the ASME Boiler and Pressure Vessel Code, AWS Standards, and SNT-TC-1A and supplements, as applicable. Cleaning and flushing procedures and personnel qualifications conform to the requirements of ANSI N45.2.1. 12 P 12

Other special processes or work operations identified by the nuclear steam system supplier or project engineering are properly qualified and performed by trained personnel in accordance with specified technical requirements.

Current qualification records of procedures, equipment, and personnel are maintained at the jobsite. Controls are provided to ensure that personnel qualification records are regularly reviewed and appropriate requirements for requalification are implemented. Implementation of these controls is verified by field QC personnel and is audited by QA with the assistance of the M&QS Department. P

17.1B.10 INSPECTION 12

As described in section 17.1B.7, supplier and subcontractor programs are subject to source inspection by Bechtel Procurement Supplier Quality Representatives and Field QC Engineers, as applicable. The inspection of Bechtel construction work includes inprocess surveillance, examination, and inspection by Field Engineering personnel who are independent of direct construction craft supervision, and formal quality verification inspection and testing by Field QC personnel who are independent of Field Engineering and craft supervision. Field engineering receives day-to-day supervision from the Project Construction Manager. Field QC Engineers are assigned by and receive technical direction from the Chief Construction QC Engineer in the division or area office. The overall inspection program is monitored and audited by resident construction site QA personnel. P 12

12 P 12 P 12 P 12 P 12 P

Project Field Engineering provides technical guidance and surveillance of construction work which includes inprocess examination. The field engineer does not perform acceptance inspection or provide inspection results to QC inspection. Field QC is responsible for quality verification inspection and testing of safety related, "Q" class equipment, systems and installations.

Inspection and testing activities are performed in accordance with procedures contained in the Project WPP/QCI Manual. Inspection planning is prepared for Receiving Inspection, Construction and Installation Inspection, and testing. Inspection planning considers:

- Suitable environmental conditions
- Quality characteristics to be inspected
- Individual or groups responsible for performing the inspection
- Acceptance and rejection criteria
- Suitable equipment for inspections
- Description of the method of inspection
- Evidence of completion and certification of inspection operation
- Results of the inspection operation
- Verification that all inspection operations are complete and acceptable

Inspection of modifications, repairs, and replacements is performed in accordance with the original design and inspection requirements, or acceptable alternatives.

12 P

The Construction WPP/QCI Manual includes procedures for certifying all grades of inspectors, including specified renewal periods. The procedure is administered by the Project QC

Engineer, monitored by the Chief Construction QC Engineer, and audited by the Project QA Manager. P 12

The Procurement Supplier Quality Manual provides for a formal system of certifying all grades of source inspectors, including specified renewal periods. This system is administered by the Procurement Supplier Quality Department and audited by the PQAE. P 12

17.1B.11 TEST CONTROL P 12

Tests required to verify acceptance of completed installations, equipment or systems are defined in engineering drawings, specifications, or test procedures. Construction tests are an extension of construction inspection procedures. Construction testing is conducted to demonstrate that the equipment installation is complete and that the electrical systems are properly wired. Test plans or procedures, test reports, and records are used to demonstrate that completed tests have met test objectives. Written test procedures include: P

A. Instructions for conducting the test and test equipment to be used 12

B. Test prerequisites which include, but are not limited to, the following:

   1. Calibrated instrumentation
   2. Adequacy of the test equipment
   3. Requirement for trained, qualified, and/or licensed/certified personnel P
   4. Preparation, condition, and completeness of item to be tested
   5. Suitable environmental conditions
   6. Where applicable, mandatory inspection hold points, for witness by APS, contractor, or authorized inspector

7. Provisions for data collection and storage

8. Acceptance and rejection criteria

9. Methods of documenting or recording test results

System cleaning, flushing, instrument and control settings, and performance demonstration are part of the startup prerequisite test program. Prerequisite/preoperational testing is under the control of APS. Bechtel Startup Engineers provide assistance to APS as described in section 14.2.1.

17.1B.12 CONTROL OF MEASURING AND TEST EQUIPMENT

The Bechtel field QC program provides for calibration, maintenance, and control of measuring and test equipment used in the construction, testing, and QC inspection activity. Calibration is conducted using certified equipment having known valid relationship to nationally recognized standards. Procedures provide for unique identification of each measuring or test equipment item requiring calibration or checking. Calibration schedules are established based upon the amount of usage, accuracy, and type of equipment. Procedures provide for identification of calibration status by tags, labels, or markings applied to the item.

The identification of measuring and test equipment used in performing tests is entered in the test records when the validity of the test result is dependent on the accuracy of the test equipment. Also, whenever inspection, test, or measuring equipment is found to be uncalibrated or out of calibration limits, all items that have been inspected, tested, or measured since the last recorded calibration of the equipment, will be evaluated to determine acceptability.

The evaluation of performance and effectiveness of the control of measuring and test equipment is verified by supplier surveys and audits performed by Bechtel Procurement supplier quality and field QA surveillance and audit of subcontractors and

Bechtel Construction. Field QC is responsible for verifying the current calibration status and proper functioning of equipment prior to use. 12

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17.1B.13 HANDLING, STORAGE, AND SHIPPING 12

The requirements for packaging, marking, and shipping are included in Procurement documents for Q-List items, which meet the intent of ANSI N45.2.2. P 12

Procedures for equipment and system cleaning, flushing, and cleanness control are contained in Work Plan Procedures/Quality Control Instructions (WPP/QCI's) which conform to the appropriate requirements of ANSI N45.2.1. P 12

Special handling, storage, shipping, and preservation requirements are identified in technical specifications that provide, or require supplier's or subcontractor's to provide, the required procedures and instructions. The packaging, handling, and shipping practices of the suppliers are subject to review by Bechtel Procurement Supplier Quality Representatives prior to shipment, to verify compliance with requirements defined in Procurement documents. P 12 P

Materials and equipment received at the construction site are inspected, stored, and maintained in accordance with standard field procedures supplemented by special procedures and requirements issued by project engineering or furnished by suppliers. Materials and equipment are physically inspected upon arrival at the jobsite, and moved into prescribed storage areas or to the installation site if adequate protection is available. Direct movement to the installation site is permitted, to eliminate multiple handling provided direct installation is compatible with the construction schedule. Special environmental conditions such as inert gas, specific moisture content levels, and temperature levels prescribed in procedures or specifications are controlled at the site. 12 P

Procedures are provided, as appropriate, for handling special items and for the care and maintenance of material handling equipment. Otherwise, standard material handling methods are used to ensure care and protection from physical damage. Special handling instructions and procedures for major or special items are included in procedures reviewed by Project Engineering or Bechtel Construction specialists. Personnel responsible for handling major or special items are qualified to the extent required by these special handling instructions and procedures. Preparation and performance of rigging operations involving major equipment such as reactor vessels, steam generators, and pressurizers are witnessed by Bechtel rigging specialists.

P

Appropriate requirements are achieved through these approved procedures, through inspection planning and QC instructions.

Assurance that special handling and cleaning is accomplished as specified is provided by engineering review and approval of procedures, field QC inspection of special handling and cleaning and audits of these activities by QA.

17.1B.14 INSPECTION TESTS AND OPERATING STATUS

12

Construction procedures and inspection plans provide for identification of inspection status of receipt inspection or work-in-process by using work sequence plans, inspection records, tags, markings, or other devices compatible with the item, system, or operation being inspected or tested. Progress of work is entered in records, and status identification is changed to reflect current conditions. At the completion of construction, a tagging system is employed to visually indicate the operating status of equipment and systems that are in test or rework. Records of test results are recorded and maintained in the site document control center.

P

Procedures and instructions include identification of the individuals or groups responsible for application and removal of status indicators.

Work is performed and inspected according to prescribed sequences to assure quality. Tests, inspection points or other critical operations may be bypassed only when the element can be inspected at a later time in the sequence and a later hold point exists. Bypassed inspections/operations or tests are concurred with by the signature approvals consistent with the original approvals. In these cases, the inspection point is picked up at a later date. If physical control of the item is required to prevent its inadvertent use or installation beyond the point where the inspection can be performed, the item is tagged as nonconforming and conditionally released with limit placed on future work operations. P

Procedures and instructions include identification of individuals or groups responsible for application and removal of status indicators, and for documenting the bypassing of inspections, tests or other operations. Participation of QA personnel is as follows: 12

A. Quality Assurance reviews and accepts QC instructions, receiving and construction inspection planning and changes thereto.

B. Quality Assurance assures through audits that the status of items is correct and maintained throughout construction and inspection activities. P

C. Quality Assurance assures through audits that required inspections of test operations are performed, test results are recorded, and that the construction, installation and inspection status of items is known and current at all times.

Nonconformances discovered are clearly identified and controlled as described in section 17.1B.15. Nonconforming items are required to be identified, tagged, and/or segregated. No further work can proceed on any nonconforming item until an approved disposition is implemented. Suppliers and subcontractors are required to have a Bechtel approved program for handling nonconformances. Activities at the site will comply with standard QC procedures which assure adequate control of nonconformances. Both supplier and subcontractor activities regarding nonconformances will be audited by Bechtel QA.

17.1B.15 NONCONFORMING MATERIAL, PARTS, OR COMPONENTS

Suppliers and subcontractors are required to advise Bechtel of all nonconformances from procurement documents or Bechtel approved designs for which the recommended disposition is "repair" or "use as is." Bechtel reserves the right to accept or reject the disposition. Bechtel requires suppliers to submit proposed repair procedures for nonconformances for approval by Project Engineering and review by the Project QA Engineer prior to their use. Reports of nonconforming conditions are prepared by the supplier, Bechtel Procurement Supplier Quality Representatives, or Project Engineering to ensure complete and adequate documentation. Copies of completed nonconformance reports are forwarded to the jobsite prior to, or included with the documentation submitted with the equipment. Procurement Supplier Quality Representatives verifies inclusion of approved nonconformance report at time of equipment release.

Nonconformances discovered during receiving inspection or construction activities (jobsite) are controlled and documented in accordance with standard project QC procedures. The procedures provide for identification, documentation and control of the nonconforming item. The authority for approval of the proposed resolution, and documentation of reinspection results is also provided.

Important elements of the procedure include requirements for:

A. Tagging and segregation whenever practical due to size, quantity, and complexity of the item

B. Determination of interim disposition by Project Engineering and field QC

C. Approval by Project Engineering of "repair" or "use as is" dispositions prior to correcting significant or unique nonconformances

D. Advising Project Engineering after implementation of standard approved repair procedures

E. Monthly review of completed nonconformance reports by QA to trend analysis requirements established by the PQPM, which prescribes conditions significant to quality that require corrective action P

F. Participation of ASME authorized inspector for nonconformance disposition on code covered items

G. Providing APS QA Manager copies of all "repair" or "use as is" nonconformance reports

Repair and reinspection instructions must be prepared and submitted for Project Engineering approval before repair may proceed. These repair and reinspection instructions will be reviewed to assure that the acceptability of repair is verified by field QC reinspection of the item as originally inspected or by a method at least equivalent. Suppliers are contacted when necessary to provide input to the reinspection instructions as required. Quality Assurance will audit for compliance.

Quality Assurance periodically reviews and monitors supplier, onsite subcontractor, and Bechtel nonconformance reports for the identification of significant conditions adverse to quality, the cause of the condition, and corrective action taken.

These are documented and reported to appropriate levels of management. Verification by the PQAM that corrective action to preclude recurrence has been taken is reported to QA management and project management for impacts on other phases of the project.

Nonconformance reports are reviewed by Project Engineering and QA to determine if the nonconforming condition is potentially reportable under the requirements of Federal Regulations 10CFR50.55(e) or 10CFR Part 21. Project procedures provide for reporting of significant deficiencies to the licensee and substantial safety hazards to the Nuclear Regulatory Commission.

17.1B.16 CORRECTIVE ACTION

The correction action program provides procedures for prompt identification of conditions adverse to quality that may require corrective action.

Within the Bechtel program, the identification of situations that may need corrective action is accomplished through review of nonconformance reports, Procurement supplier quality audits of supplier activities, and QA surveillance and audit program. Corrective action is controlled by project procedures and documented by means of Corrective Action Reports. The procedures provide for the following:

A. Identifying and reporting by any member of the project team those conditions that warrant corrective action including proposed recommended actions

B. Determination of cause and identification of corrective action to be taken by the responsible organization

C. Reporting cause and corrective action to Bechtel and APS management

D. Final verification by the Project QA Engineer that corrective action has been taken

E. Review by QA management, project management, and Project Engineering of the implication or effect on other work P

F. Consideration for "Stop Work" by the PQAM, when continued operations will result in unsafe conditions/ further nonconforming work or extensive evaluation. 12

This program also provides for evaluation of conditions reported by project management and APS that may require reporting to the NRC by APS in accordance with the requirements of 10CFR50.55(e). P

17.1B.17 QUALITY ASSURANCE RECORDS 12

Records produced as a result of the quality program are prepared and maintained by Bechtel, suppliers, and subcontractors, as their work is being performed. P The types of records include approved procedures, procurement records, specifications, drawings, qualifications, quality verification records, operating logs, results of reviews, inspections, tests, audits, and material analyses. 12 P

Project Engineering records are retained by the Project Engineering document control centers as design work is performed. It is normal practice to microfilm documents at regular intervals, unless duplicate copies are available at an alternate location. Provisions for collection of completed records in the design office, or at the jobsite, and the criteria for storage and retention recommended in ANSI N45.2.9 are applied to permanent quality records.

Documentation of the design review process is prepared and maintained in accordance with sections 17.1B.3 and 17.1B.6. Design changes may be issued on an interim basis by means of change notices. However, these are ultimately incorporated in revisions to the governing documents, unless the change is a limited waiver (e.g., "use as is" on a nonconformance report) which does not generally apply to the design document. Copies 12

of released drawings, specifications, technical reports, and similar documents are placed in Engineering or Construction document control center files, and submitted to the client. At the completion of engineering, final copies of these records are provided to the client. Bechtel Engineering retains control of design calculations and analyses. These are available for review by client and appropriate regulatory bodies.

Supplier records which identify "as built" status and verify the quality of their work are requested from the supplier and 12 are placed in construction site quality record files. In some instances, with the agreement of Bechtel and APS, suppliers are permitted to retain custody of certain records, if retention procedures and storage facilities are adequate and access is provided to APS.

Completed quality verification records including nonconformance reports for "repair" and "use as is" dispositions are placed in quality record files. Appropriate regulatory groups and APS P are provided access to these files while they remain in Bechtel custody. At the completion of Bechtel assignments, these files 12 are turned over to APS Nuclear Records Management Group in accordance with procedures established by the client.

P The requirements and guidelines for receipt, control, and 12 retention of permanent QA records contained in ANSI N45.2.9 P are employed for the control of construction site quality record 12 files. The recommended retention periods of ANSI N45.2.9 or the requirements of ASME Boiler and Pressure Vessel Code, Section III, as applicable, are followed for Bechtel-produced or acquired records. Supplier's nonpermanent records are P generally retained by the supplier. Retention periods for these records will be established based upon the date of shipment or acceptance of the item and not the commercial operating date of the power plant.

Bechtel's Construction WPP/QCI Manual will require that the following listed information be noted in inspection and/or test records: 12

- A description of the type of operation
- Evidence of completion of each construction inspection, or test operation
- The results of the inspection or test
- Information related to nonconformance(s)
- Inspector or data recorder
- Date
- Acceptance or nonconformance report number P

Quality Assurance will audit for compliance during their review of these documents.

For suppliers, Bechtel's Procurement Supplier Quality Department personnel, during source inspection, will assure that suppliers' inspection and test records contain the listed information. Examples of these reports and records are submitted with the supplier's QA program. Quality Assurance Engineers will audit suppliers records to assure they contain the listed information.

17.1B.18 AUDITS 12

A comprehensive program of audits is conducted by Bechtel covering the various activities of the QA program.

The Bechtel audit program includes scheduled or unscheduled audits conducted by project QA personnel at the construction site or home office as well as periodic team audits performed by personnel independent of project activities. Audit activities include the following: P

A. Audits of Project Engineering activities by office QA personnel assigned to the project. These audits are

P | planned, scheduled, and documented. Results are reported to the Project Engineer, Project Manager, Project QA Manager and the QA Manager of Domestic Projects. Audit results are also submitted to APS.

12 | B. Audits of field construction and subcontractor activities by resident field QA personnel assigned to the
P | project. These audits are planned, scheduled, and documented. Results are reported on the site Construction Manager, Project Manager, QA Manager of Domestic Projects and to APS.

12 | C. Audits of Bechtel supplier activities by Procurement Supplier Quality Department, with assistance if required from appropriate QA, Engineering, and M&QS. Audits are conducted annually or as described in section 17.1B.7.4. Supplier audit results are reported to the Project Engineer, Project Procurement Supplier Quality, project QA, and APS.

Results of these audits are retained in Project Procurement Supplier Quality and QA files.

D. Audits of Project Engineering, design, Procurement, Construction, and QC activities at the jobsite by QA audit teams under the direction of the Division QA Manager, assisted by M&QS specialists and others, as
P | required. These audits are conducted at least annually and results are reported to the management of the function audited, cognizant project management, division management, and the BPC Manager of QA.

E. Audits of Division Engineering Technical Staff and services activities are performed on an annual basis under the direction of the Division QA Manager. These audits cover those groups doing design and/or review outside of direct control of the Project Engineer. Results of these audits are reported to the manager or supervisor

of the function audited, affected project management, division management, and BPC Manager of QA.

F. Audits of Procurement and M&QS are conducted annually by QA personnel under the direction of BPC Manager of QA. These audits are conducted for the benefit of all divisions, and division QA personnel participate in the audits. Results of these audits are reported to cognizant management of the audited group, QA management in each division, and the BPC Manager of QA. P

Audit programs include provisions for identification of deficiencies, determination that corrective action is defined, and followup to verify that corrective action has been taken and is effective. Audits include selective review of procedures, work practices, and examination of items and records. Records of audits are available to projects.

In accordance with the provisions of ANSI N45.2.12, the audit program is carried out to verify compliance with all aspects of the QA program which is defined in documents listed in table 17.1B-1. Specifically, the audit program includes audits of: 12 P 12 P

A. Construction/subcontractor site activity which affect plant safety 12

B. The preparation, review, approval, and control of designs and specifications

C. Request for proposals and evaluations of bids

D. The preparation, review, approval, and control of procurement documents P

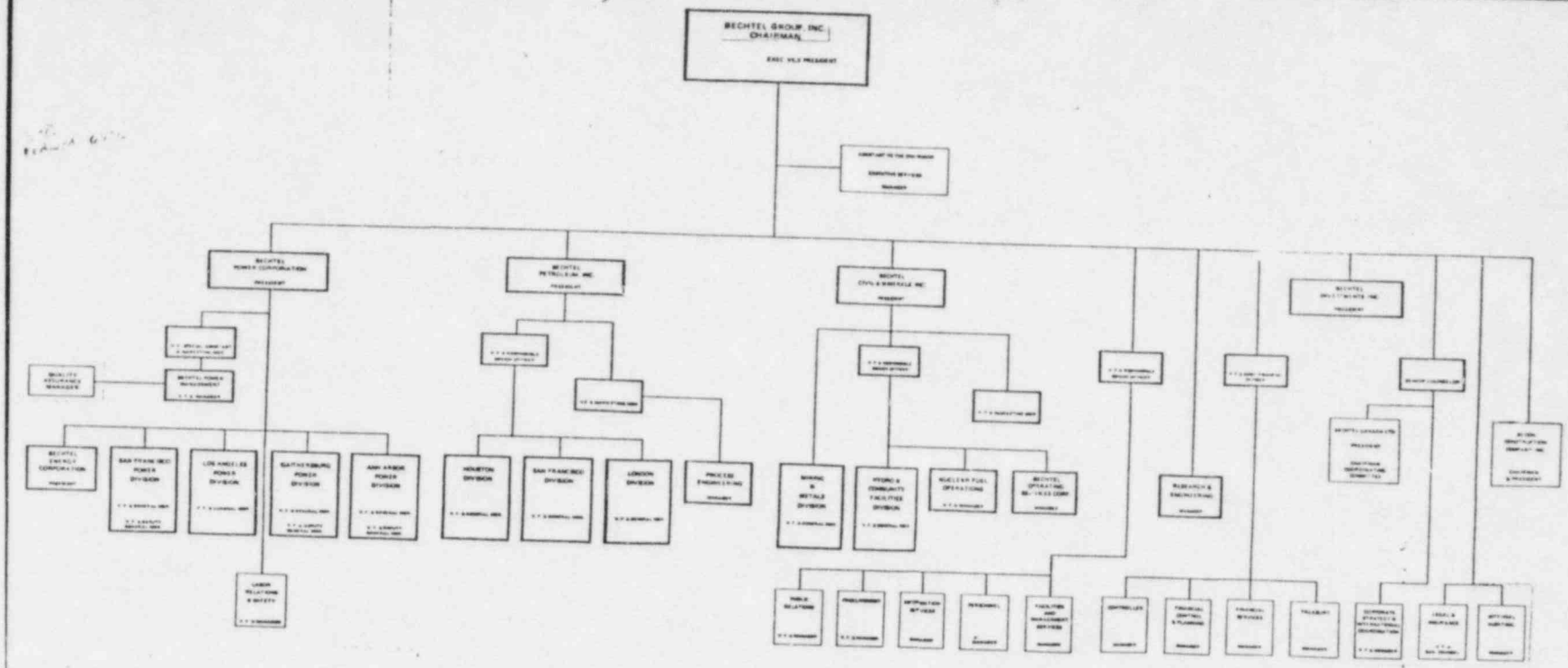
E. The preparation, review, approval, and control of instructions, procedures (including test procedures), and drawings

F. Indoctrination and training programs

Audit data are derived from project design office QA audits, Procurement Supplier Quality audits of suppliers, QA audits of Construction and subcontractor activity at the site.

The PQAM is responsible for analysis of audit data to determine the effectiveness of the quality assurance program. The results will be reported to QA management and Project Manager. The data is also reviewed to determine if a quality trend has been established which requires corrective action.

Audit results are sent to and reviewed by responsible management. Corrective action is taken by the management of the group audited. Project audit programs include provisions that corrective action is defined and scheduled completion dates determined. Re-audits are conducted to verify that corrective action has been taken and is effective.



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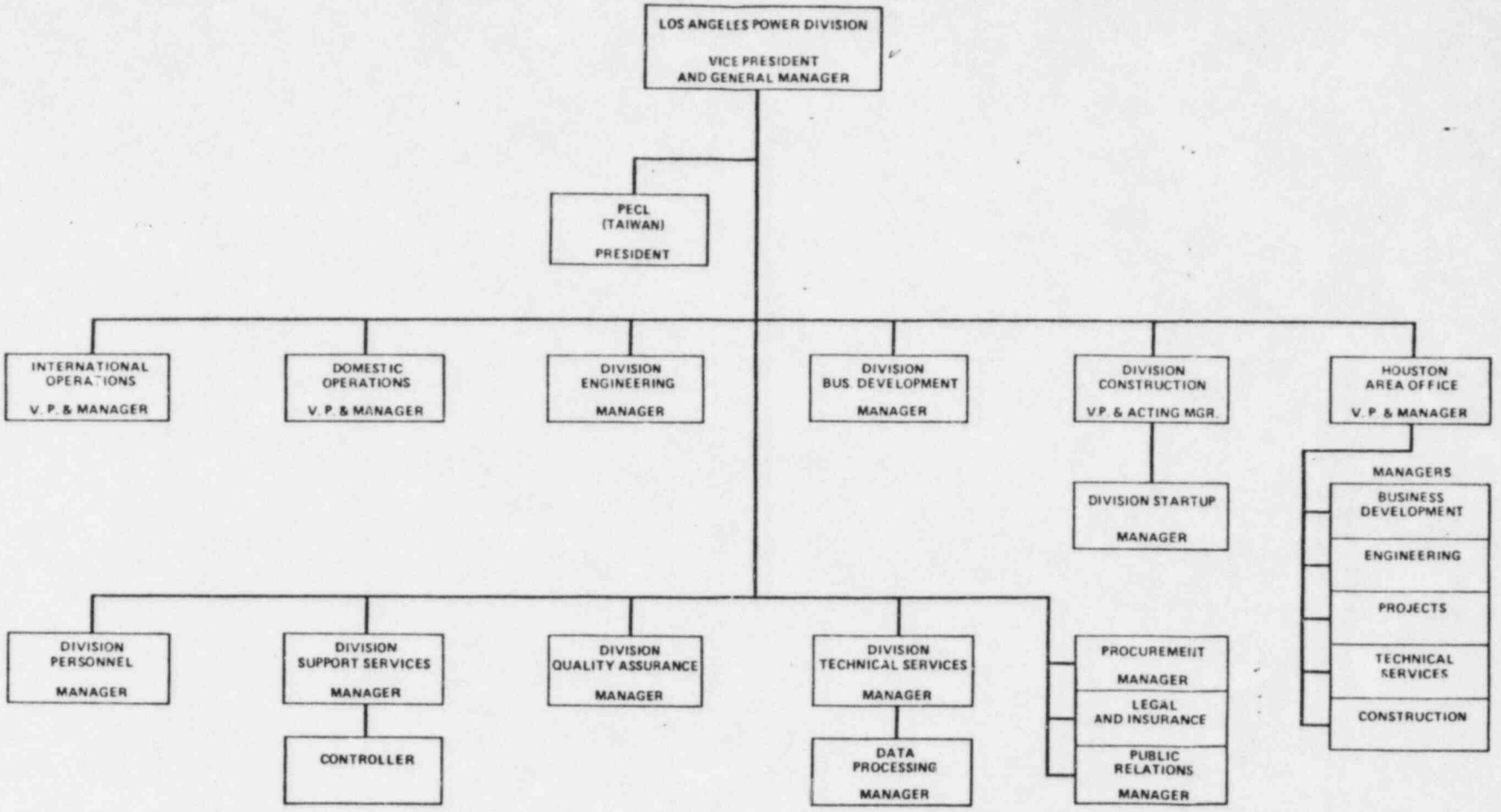
(THE BECHTEL GROUP)

Figure 17.1B-1)

June 1983 Amendment 12

6-01-83



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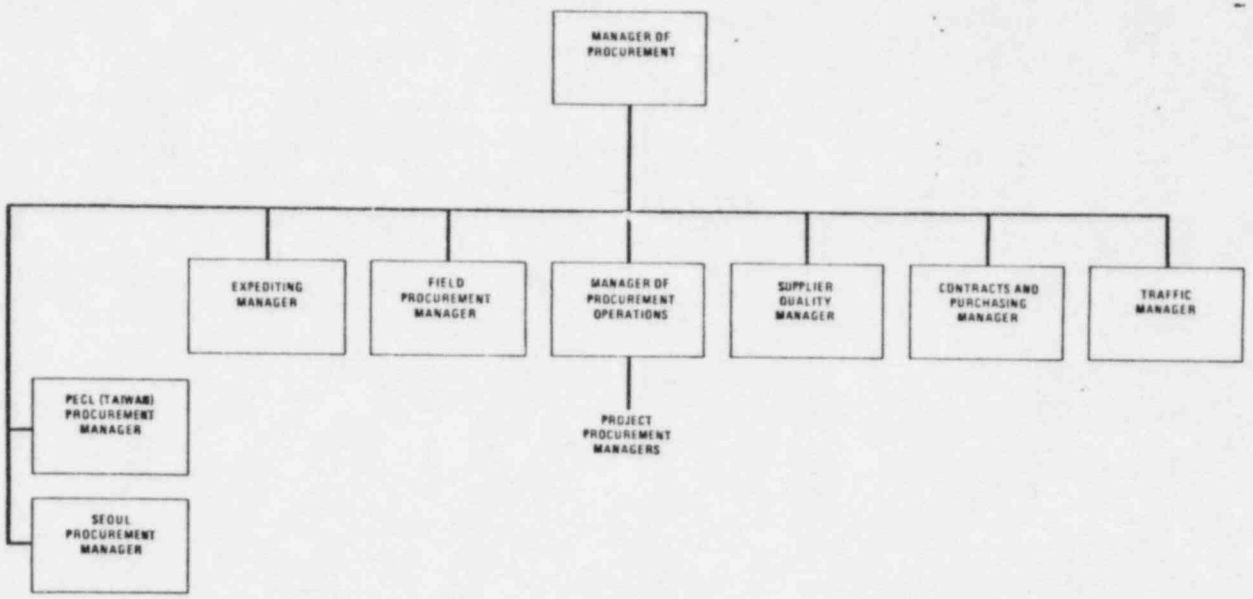
LOS ANGELES POWER DIVISION

Figure 17.1B-2



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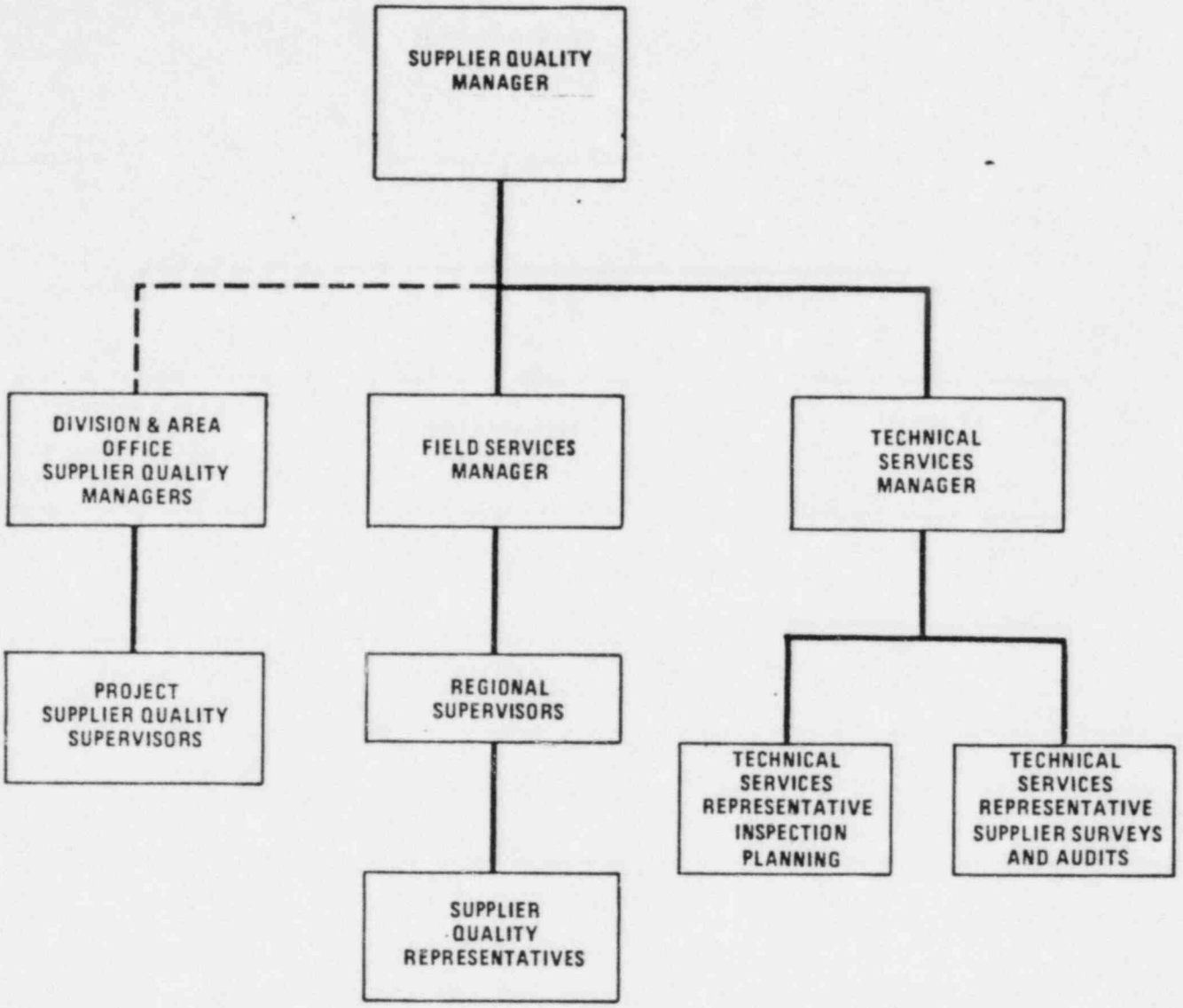
LOS ANGELES POWER DIVISION
PROCUREMENT ORGANIZATION

Figure 17.1B-3



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SUPPLIER QUALITY DEPARTMENT

Figure 17.1B-4

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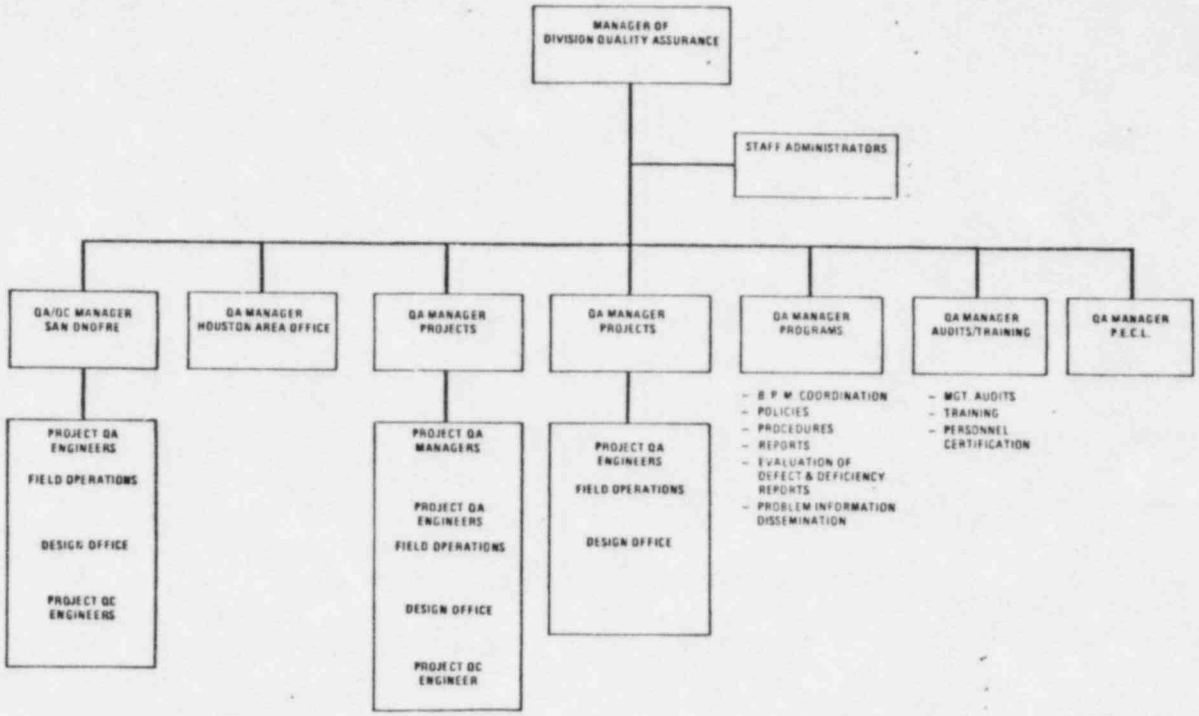

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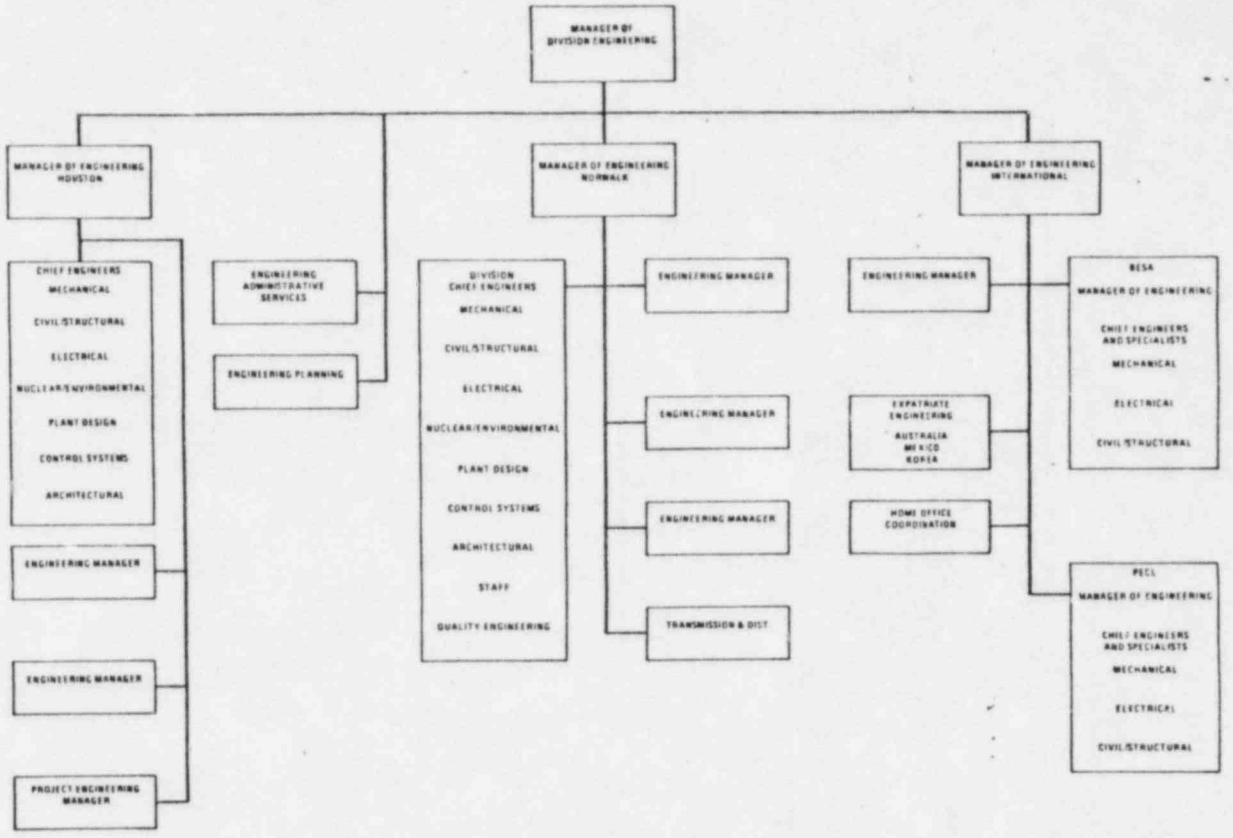
DIVISION
QUALITY ASSURANCE ORGANIZATION

Figure 17.1B-5



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LAPD ENGINEERING ORGANIZATION

Figure 17.1B-6

June 1983 Amendment 12

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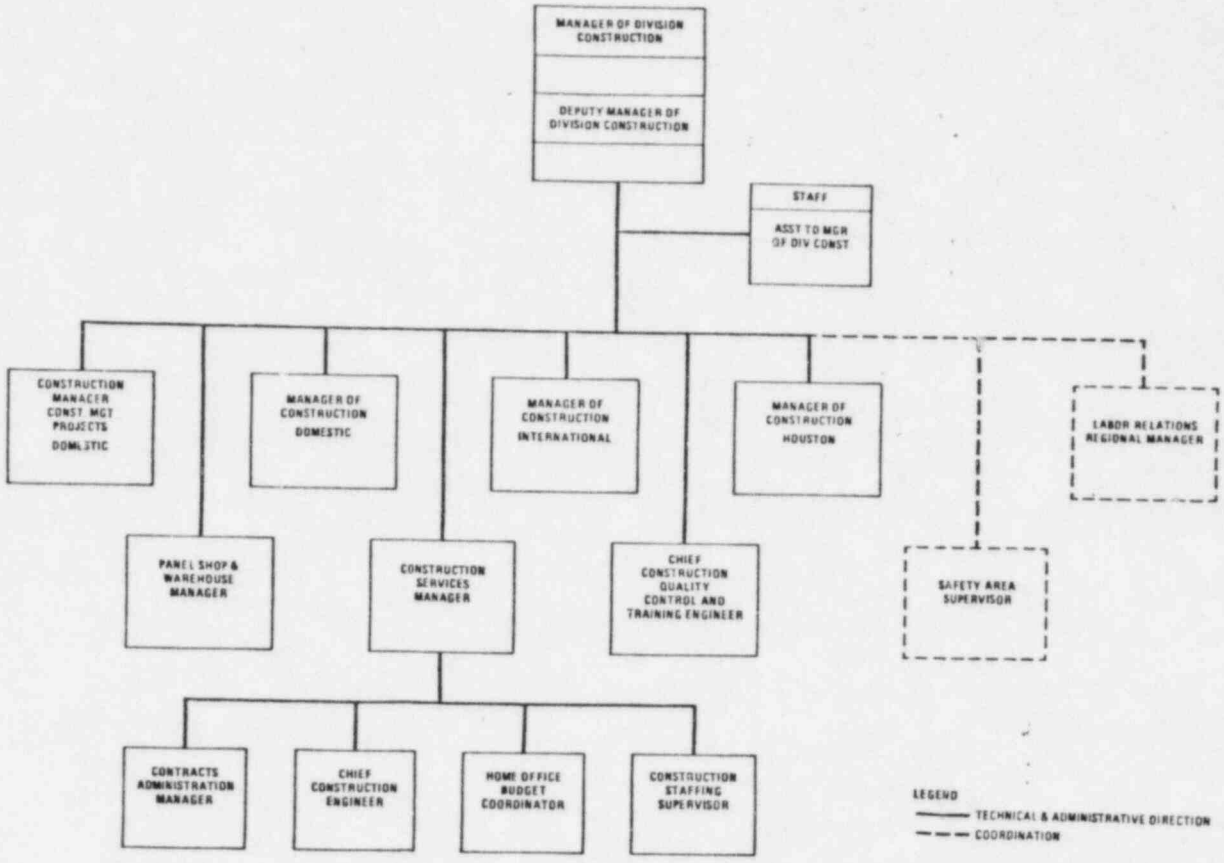

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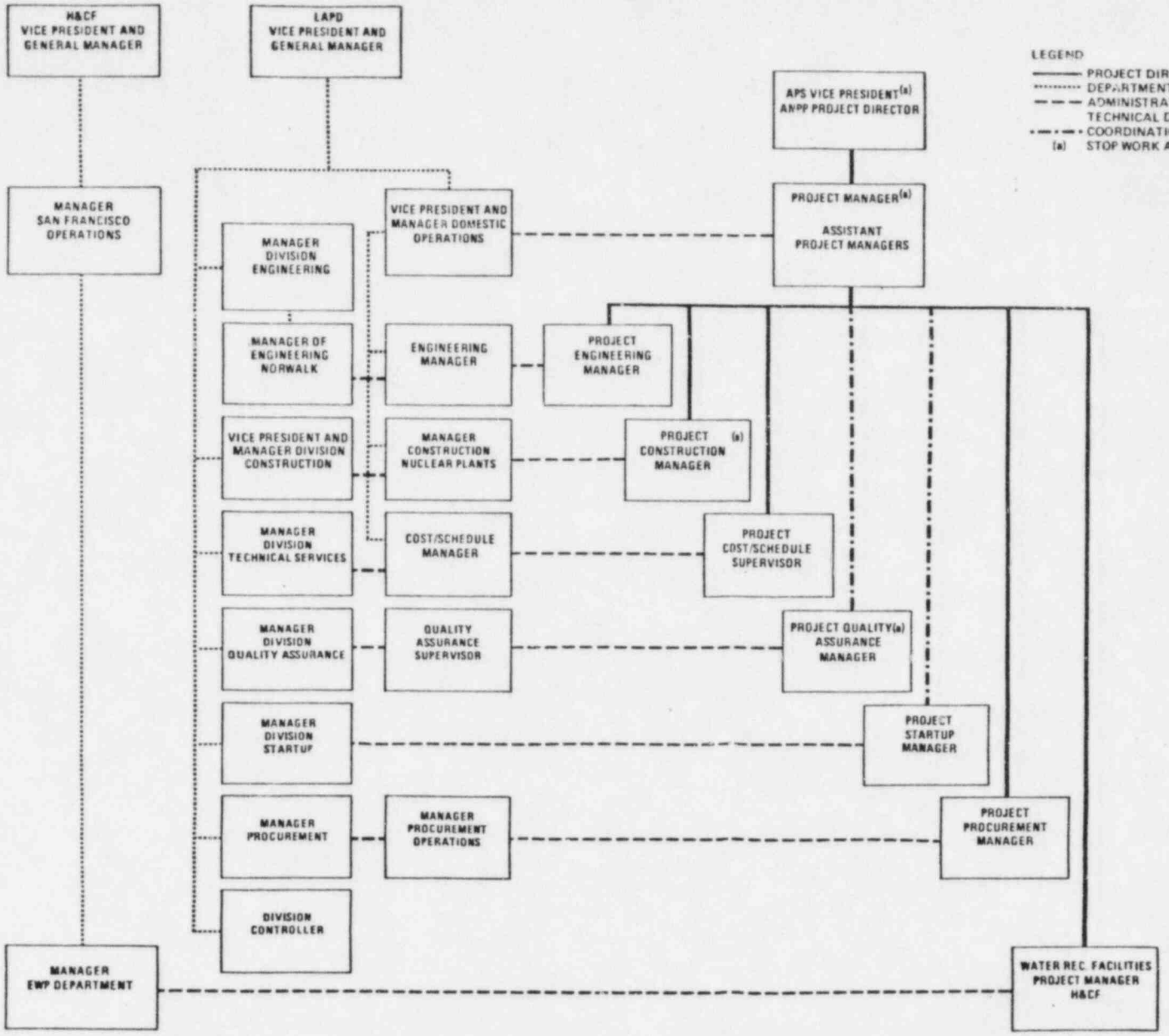
LAPD CONSTRUCTION ORGANIZATION

Figure 17.1B-7



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PROJECT MANAGEMENT ORGANIZATION

Figure 17.1B-8

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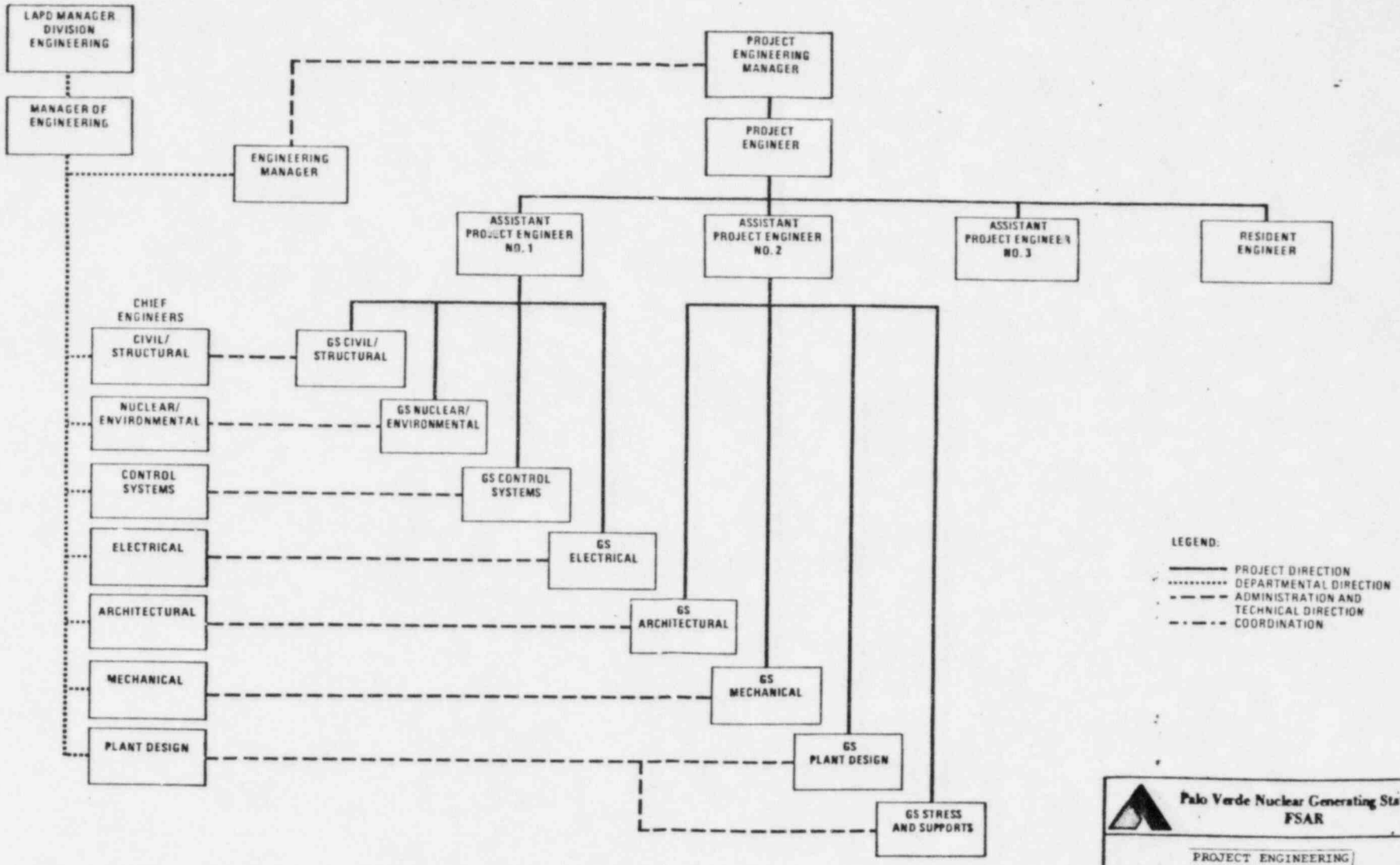

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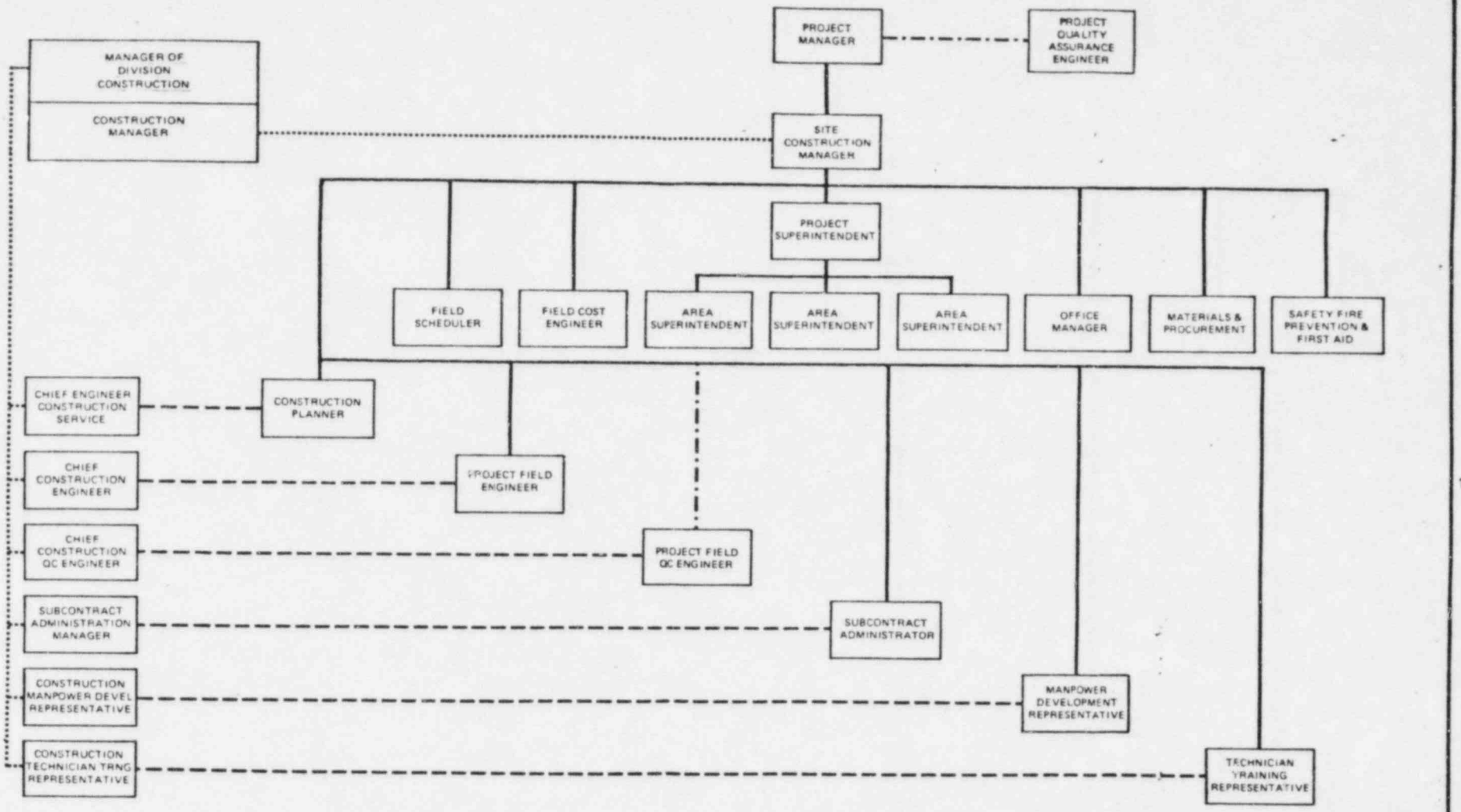
PROJECT ENGINEERING ORGANIZATION

Figure 17.1B-9



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PROJECT - CONSTRUCTION ORGANIZATION

Figure 17.1B-10

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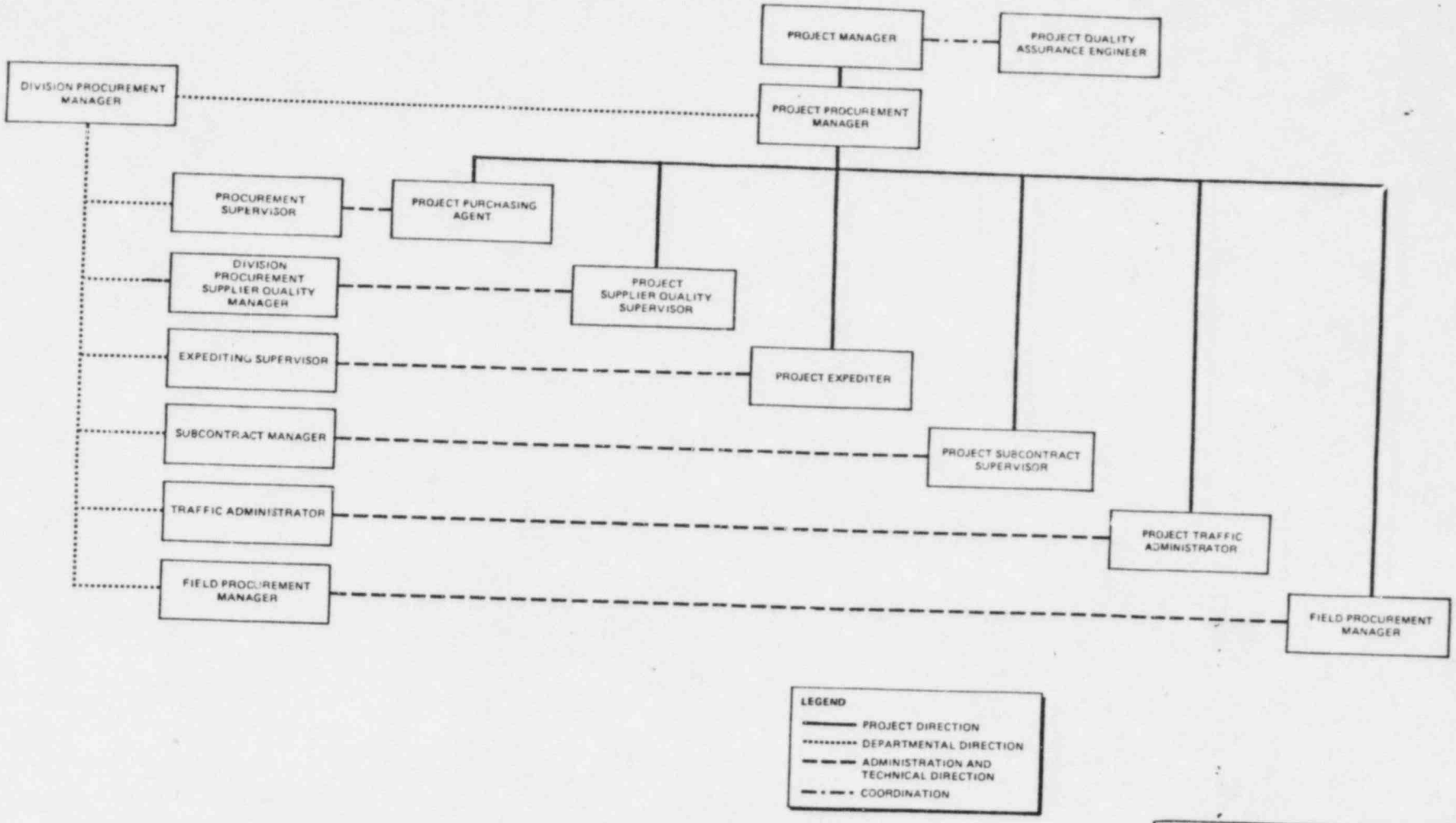

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PROJECT PROCUREMENT ORGANIZATION

Figure 17.1B-11

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17.1C COMBUSTION ENGINEERING (C-E) QUALITY ASSURANCE DURING DESIGN AND CONSTRUCTION

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Refer to CESSAR Section 17.0.