SOUTHERN CALIFORNIA EDISON COMPANY

TOPICAL REPORT

QUALITY ASSURANCE PROGRAM

SCE-1-A

APPROVALS

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Amendment 11

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ENCLOSURE I

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4	April, 1981- (Modified August 1981)
5	December, 1981 (Modified March 1982 to incorporate Change Notices 1-3)
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17. QUALITY ASSURANCE

17.0 INTRODUCTION

This topical report was prepared in accordance with the Nuclear Regulatory Commission's (NRC) "Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants" (NUREG-75/094, Regulatory Guide 1.70, Revision 2, September 1975). Guidance used in the preparation was obtained from the NRC's "Standard Review Plan" (NUREG-74/087, November 24, 1975). 2

The purpose of this report is to describe the Quality Assurance Program applicable to those Southern California Edison Company (SCE) nuclear generating stations which reference this topical report on their docket. Deviation from this program if required, will be described in the applicable SAR. Section 17.1 describes the quality assurance program which has been established and implemented for the design and construction phase of nuclear generating stations. Section 17.2 describes the operational phase quality assurance programs including Preoperational and Startup Tests. 1-421.1

The program is applied to all activities affecting the Safety-Related functions of those structures, systems and components which prevent or mitigate the consequences of postulated accidents that could cause undue risk to the health and safety of the public. It complies with the requirements, guides, and standards listed on Tables 17.1-1 and 17.2-1, as appropriate, for the design and construction and the operational phases of nuclear generating stations. The program also applies to activities governed by the Station Technical Specifications and other activities licensed by the NRC. 6

SCE as applicant, plant owner and operator, maintains full responsibility for the quality assurance program for all phases of nuclear generating station development and operations. Other organizations may be delegated the work of establishing and executing portions of the Quality Assurance Program. The quality assurance programs of these organizations and the scope of delegation are as described in the applicable Safety Analysis Report (SAR).

Changes to the SCE Quality Assurance Program will be incorporated into this topical report by amendment. Changes will be submitted to the NRC in accordance with the requirements of 10CFR50.54a. 6

17.0.1 DEFINITIONS

Following are definitions of terms used in this report. Additional terms not defined by this subsection are defined in ANSI N45.2.10, as endorsed by Regulatory Guide 1.74.

Architect-Engineer (A-E) - An organization contracted to design and construct a nuclear generating station.

Accept-As-Is - A disposition to accept a nonconforming item without further work as the deviation is judged not to degrade the quality or function of the item.

Administrative Authority - The responsibility of an individual to direct the work (excluding technical direction) of another individual or group including the responsibility for hiring, firing, salary review, and position assignment of an individual. See Technical Authority.

Auditor - An individual who performs any portion of an audit, including lead auditors, technical specialists and other such as management representatives and persons in training to become Lead Auditors. 2

Construction Tests - Tests conducted during jobsite construction activities to verify conformance of construction processes with design requirements stipulated in design disclosure documents.

Consultant - A person or organization retained under contract by SCE to provide expert advice, recommendations, or work.

Coordinating Agency for Supplier Evaluation (CASE) Register - A document published periodically as a service to the Aerospace and Nuclear industry containing quality assurance capability evaluation information on suppliers developed by member Aerospace and Nuclear companies.

Design Disclosure Documents - Drawings, P&I diagrams, calculations, or specificiations which define items and which are needed to translate engineering concepts into structures, systems and components.

Engineering Construction Project (ECP) - A major modification to an operating nuclear generating station.

Corporate Documentation Management (CDM) Centers - The locations where project documents including quality assurance records, are maintained in accordance with established documentation retention and control requirements. 11

17.0.1 (continued)

ECP Startup Tests - Those tests performed after completion of an ECP modification to demonstrate that the modification can perform its design function and that it is compatible with existing plant systems. Includes Prerequisite and Preoperational Tests.

Engineering Review Board (ERB) - Those cognizant individuals responsible for providing approvals of Accept-As-Is or repair dispositions of nonconformance reports.

Engineering Review Process - The procedure used to determine dispositions of nonconforming items.

Initial Startup Tests - Tests conducted after fuel loading and prior to commercial operation that confirm the design bases and demonstrate, where practical, that the plant is capable of withstanding the anticipated transients and postulated accidents.

In-Service Inspection - The planned and periodic nondestructive examinations performed on installed and/or operating structures, systems, and components, as required by Section XI of the ASME Boiler and Pressure Vessel Code.

Nuclear Fuel - Fuel assemblies including but not limited to the following items: fuel rods, poison rods (where applicable), spacer grids, control element assembly guide tubes, and end fittings.

Nuclear Steam Supply System (NSSS) Supplier - An organization contracted to design and manufacture a nuclear steam supply system for a nuclear generating station.

Qualification - Required acts to select a source for providing items or services. |3

Prerequisites Tests - Tests conducted after construction activities, modifications, or repairs have been completed to verify that prerequisite requirements, such as instrument calibration, electrical energization and control logic requirements, have been satisfactorily demonstrated in order to proceed with preoperational tests.

Preoperational Tests - Tests conducted after prerequisite tests but prior to fuel loading to demonstrate the capability of items to meet safety-related performance requirements.

Procurement Documents - Contract documents including purchase orders, work assignments, memoranda of changes, and applicable design disclosures.

Project Direction - Direction or instructions concerned with project operations and defining when work is to be accomplished. Includes coordination and day-to-day direction of activities of project entities receiving technical direction from others.

Project Engineer - An assigned engineer who performs project liaison activities between the Project Management Organization from which project direction is received and the engineering organization from which technical direction is received.

Project Group Leader - An individual assigned within a discipline which is providing support to a project who is responsible to provide functional direction for that support.

Prototype Tests - Tests conducted in support of design activities to demonstrate the adequacy of the design to perform under the most adverse conditions.

Quality-Affecting Activities - Activities of people which either do or could influence quality of Safety-Related items or work, including designing, purchasing, constructing, fabricating, handling, shipping, storing, cleaning, preserving, erecting, installing, inspecting, testing, operating, maintaining, repairing, refueling, or modifying. Also includes activities required by Station Technical Specifications or otherwise licensed by the NRC. | 6

Quality Assurance Functional Direction - Directions regarding quality assurance matters provided by the SCE Quality Assurance Organization to other organizations which have been delegated the work of establishing and executing portions of the Quality Assurance Program.

Reference Standards - Standards (this is primary, secondary and working standards, where appropriate) used in a calibration program. These standards establish the basic accuracy limits for that program. | 10CN#18

Reject - A disposition to remove a nonconforming item from use due to its unsuitability for the intended purpose.

Safety-Related - Applies to the prevention or mitigation of the consequences of postulated accidents that could cause undue risk to the health and safety of the public.

Shop Tests - Tests conducted at the source of fabrication to verify conformance with design requirements stipulated in design disclosure documents.

Station Orders - Procedures and/or instructions prepared by the station staff and approved by the Station Manager. |6

Station Tests - Tests to demonstrate that the work performed by the station staff or contractors is satisfactory and meets established requirements.

Stop Work - The authority to stop unsatisfactory work and control the further processing, delivery, or installation of nonconforming items. This does not include the authority to stop Prerequisite, Preoperational, and Initial Startup Tests or stop station operations.

Technical Authority - The authority to provide technical direction.

Technical Direction - Instructions and directions defining technical requirements for an activity.

Technical Specification - Appendix A (Safety) and Appendix B (Environmental) to the operating license of a station issued by the Nuclear Regulatory Commission.

Unreviewed Safety Question - A proposed change, test or experiment involves an Unreviewed Safety Question if: (1) the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the Safety Analysis Report (SAR) may be increased; or (2) the possibility for an accident or malfunction of a different type than any previously evaluated in the SAR may be created; or (3) the margin of safety as defined in the basis for any Technical Specification is reduced.

17.1 QUALITY ASSURANCE DURING THE DESIGN AND CONSTRUCTION PHASE |7

17.1.1 ORGANIZATION

17.1.1.1 SCOPE

This subsection describes the SCE organizational structure and responsibilities for the Quality Assurance Program for SCE nuclear generating stations during the design and construction phase in compliance with Regulatory Guide 1.28 (reference Table 17.1-1). It includes a description of the interfaces with other organizations which may be delegated the work of establishing and executing portions of the Quality Assurance Program. The methods used for maintaining responsibility for delegated quality assurance work are identified as well as the management measures that provide for independence of the SCE Quality Assurance Organization.

17.1.1.2 General Responsibilities

During the design and construction phase, the following departments within SCE are involved in quality-affecting activities: |6

Departments	Responsibilities	
Nuclear Engineering Safety and Licensing	Licensing, Nuclear Engineering, Nuclear Safety, Quality Assurance, Reporting of Defects and Noncompliance	7CN#7
Nuclear Generation Site	Training Program for Operators, Operating Procedure Development, Handling, Storage and Warehousing of Material and Equipment.	9CN#14
Fuel and Material Management	Procurement and Shipping of Nuclear Fuel, Material and Equipment	11CN#25
Administrative Services	Records Management	9CN#25
		11CN#25
System Planning and Research	Collection of Meteorological Data.	
Engineering & Construction	Design and Construction Management, and Prerequisite Test Program Management, ECP Project Management	9CN#15

17.1.1.2 (continued)

The SCE organizational structure of departments involved with implementing the SCE Quality Assurance Program during the design and construction phase as well as departmental interfaces is presented on Figure 17.1-1.

17.1.1.2 (continued)

The ultimate responsibility for design, procurement, construction testing, quality assurance, fuel supply, and operations rests with the SCE Chairman of the Board. He assigns project responsibilities to the various SCE organizations involved in nuclear generating station development and operations. | 4

An Executive Vice President reports to the Chairman of the Board and is responsible for Nuclear Engineering, Safety and Licensing, Nuclear Generation Site, Engineering and Construction, and Fuel and Material Management. | 11CN#25

An Executive Vice President reports to the Chairman of the Board and is responsible for System Planning and Research and Administrative Services.

A Senior Vice President reports to the Executive Vice President and is responsible for Power Supply.

A Senior Vice President reports to the Executive Vice President and is responsible for Administrative Services.

The Vice President, Nuclear Engineering, Safety and Licensing, reporting to the Executive Vice President, has been delegated the responsibility for establishment and assurance of implementation of the SCE Quality Assurance Program in compliance with 10CFR50, Appendix B, and other applicable regulations and standards. He is authorized to request the cooperation of all officers and management personnel of this program. | 10CN#17

SCE corporate management is involved with quality assurance matters on a continuous basis by means of regular Officer's Council meetings. Quality Assurance Organization weekly progress reports are prepared for the Vice President, Nuclear Engineering, Safety and Licensing, and are used, as appropriate, for discussion items at these meetings. These reports usually contain significant progress items, corrective action recommendations, and unresolved items. In addition, a quarterly report of information suitable for assessment of the status and adequacy of the SCE Quality Assurance Program is submitted to senior management by the Manager of Quality Assurance. | 7CN#7 | 9CN#15

17.1.1.3 Engineering and Construction Department

The Vice President, Engineering and Construction, has responsibility for the design and construction of nuclear generating stations. The Engineering and Construction Department is responsible for engineering, construction, and Construction and Prerequisite Test program management and project management. Engineering responsibilities include design and drafting services, and supporting the project in the various technical disciplines. Construction responsibilities include technical and administrative direction over project construction personnel, construction management, Construction and Prerequisite Testing, and handling, storage and warehousing of items. 9CN#15 10CN#19

17.1.1.4 Administrative Services Department 11CN#25

A Senior Vice President is in charge of Administrative Services. This Senior Vice President reports to the Executive Vice President.

The Manager of Real Properties and Administration reports directly to the Senior Vice President and is responsible for the corporate records management program. Corporate Documentation Services operates the Corporate Documentation Management (CDM) enter at the Corporate Offices which is responsible for processing, controlling, retrieving, distributing and storage of nuclear documentation. 10CN#22

11CN#25

17.1.1.5 Nuclear Engineering, Safety and Licensing Department

The Nuclear Engineering, Safety, and Licensing Department, under the Vice President, Nuclear Engineering, Safety, and Licensing has overall responsibility for nuclear engineering, safety, licensing and quality assurance activities associated with nuclear generating facilities. The Vice President, Nuclear Engineering, Safety, and Licensing reports directly to the Executive Vice President. Activities include conceptual engineering, nuclear systems analyses, engineering criteria and technical assistance pertaining to radiation protection programs, safety evaluations, emergency planning and regulatory interface with the Nuclear Regulatory Commission. 9CN#13 10CN#17 9CN#13

17.1.1.5 (continued)

The Vice President, Nuclear Engineering, Safety and Licensing, is responsible for establishment and assurance of implementation of SCE Quality Assurance Program in compliance with applicable regulations,codes, and standards, including those listed on Table 17.1-1. He is responsible for establishing quality assurance policies, goals, and objectives and for assuring that these policies are followed and the goals and objectives are achieved. 7CN#7

The Vice President, Nuclear Engineering, Safety and Licensing, is responsible for apprising the Management on the effectiveness of the Quality Assurance Program. The Vice President, Nuclear Engineering, Safety and Licensing is involved in the disposition of nonconformances of unusual complexity, and acts upon trending studies that indicate quality problems of a possible generic nature submitted to him by the Manager of Quality Assurance. 9CN#13

The Vice President, Nuclear Engineering, Safety and Lisensing, exercises through the Manager of Quality Assurance, the Administrative Authority for the Quality Assurance Organization. Direction for implementing the Quality Assurance Program is provided to individuals and groups by the Vice President, Nuclear Engineering, Safety and Licensing through the Manager Quality Assurance.

The Manager of Quality Assurance, reports directly to the Vice President, Nuclear Engineering, Safety and Licensing, and has the responsibility for development, maintenance and surveillance of the Quality Assurance Program as described in quality assurance manuals. These manuals are reviewed and approved by the Manager of Quality Assurance, and the Vice President, Nuclear Engineering, Safety and Licensing. Other SCE organizations involved with Quality Assurance Program implementation, as described in Subsection 17.1.1, review and comment on the quality assurance manuals, particularly as they apply to their area of involvement. The Manager of Quality Assurance, is responsible for identifying any conditions adverse to quality and reporting them to the Vice President, Nuclear Engineering, Safety and Licensing. In addition, the Manager of Quality Assurance, is responsible for surveillance of Quality-Affecting Activities and has the authority to Stop Work, or delegate this authority in writing to other personnel. 9CN#13

The minimum qualification requirements for the position of Manager of Quality Assurance are as follows:

A. Bachelor of Science in one of the engineering disciplines from an accredited college or university.

17.1.1.5 (continued)

B. Ten years experience in design, fabrication construction, testing, operation, or quality assurance related to the nuclear power field.

C. Management and administrative ability demonstrated by experience and training.

D. Extensive knowledge of regulatory requirements for nuclear generating stations. 9CN#13

The Quality Assurance Organization under the direction of the Manager of Quality Assurance, develops and administers the Quality Assurance Program for the design and construction phase of SCE nuclear generating stations. It is comprised of engineers with expertise in the various disciplines required for performing quality assurance and quality control activities. This organization audits, inspects, or otherwise verifies that activities within the scope of the SCE Quality Assurance Program are correctly performed either by SCE or other organizations delegated work.

The Quality Assurance Organization has the authority and organizational freedom to:

A. Identify quality problems.

B. Initiate, recommend, or provide solutions through designated channels. 7CN#7

C. Verify implementation of solutions.

Additional responsibilities of "offsite" and "onsite" based Quality Assurance Organization personnel during the design and construction phase are listed on Table 17.1-3.

A Site Quality Assurance Manager and General Office and Site Quality Assurance Supervisors are assigned to each nuclear generating station under design and construction. They are responsible for directing and managing the activities of the "offsite" and "onsite" based quality assurance engineers. 9CN#13

A Site QC Manager and QC Supervisors are responsible for directing the activities of site QC personnel. QC personnel provide site inspection and surveillance of safety related items and activities and non-safety related activities when requested by Station or Project Management.

Quality Assurance and Quality Control Managers and Supervisors have the responsibility and authority, delineated in writing, to stop unsatisfactory work and to control further processing, delivery, and installation of nonconforming items.

17.1.1.6 (continued)

The Manager, Nuclear Safety reports directly to the Vice President Nuclear Engineering, Safety and Licensing. The Nuclear Safety Organization provides nuclear safety and nuclear radiological health support and corporate emergency planning for nuclear generating facilities. The staff requests and coordinates support from other organizations both in the company and outside consultants and engineering firms. 10CN#17

The Manager of Nuclear Engineering and Licensing, reports directly to the Vice President, Nuclear Engineering, Safety, and Licensing. The Nuclear Engineering and Licensing Organization provides nuclear engineering and licensing support for nuclear generating facilities. The staff requests and coordinates support from other organizations both in the company and outside consultants and engineering firms.

17.1.1.6 Nuclear Generation Site Department

The Nuclear Generation Site Department, under the Vice President, Nuclear Generation Site has the responsibility for operation of nuclear generating facilities.

The Station Manager, reports directly to the Vice President, Nuclear Generation Site. 7CN#7 The Nuclear Generation Site Organizations manage the operation, maintenance and technical service activities at nuclear generating facilities. They also are responsible for providing trained station operators; operating procedures and 9CN#14 instructions; and handling, storage and warehousing of items; and storage and retention of quality assurance records and 10CN#22 document/drawing control at the nuclear generation site.

17.1.1.7 Engineering and Construction Project (ECP) Management

Project Managers are assigned for each Engineering and Construction Project (ECP) from the Engineering and Construction Department. 10CN#17 Project Managers are responsible for the technical, schedule, economic and quality assurance aspects of nuclear projects. Project direction is maintained through key project personnel who support the Project Manager. 7CN#7 Administrative Authority and Technical Direction are provided from the specific engineering, construction or procurement organization from which these people are assigned.

17.1.1.8 Fuel and Material Management Department

The Vice President, Fuel and Material Management, is responsible for procurement and shipping of nuclear fuel, material and equipment for nuclear generating stations. 11CN#25

The Manager of Procurement and Material Management, reports to the Vice President and is responsible for procurement of

17.1.1.8 (continued)

items and services (excluding nuclear fuel), material shipping, and for preparation; negotiation and administration of procurement contracts. 11CN#25

The Manager of Nuclear Fuel Supply reports to the Vice President and is responsible for nuclear fuel procurement and shipment.

17.1.1.9 System Planning and Research Department

The System Planning and Research Department, under the direction of the Vice President, System Planning and Research, is responsible for collection of meteorological data in support of nuclear power plant activities. 9CN#15

17.1.1.10 Delegated Quality Assurance Work 7CN#7

SCE retains responsibility for the Quality Assurance Program describe herein but may delegate quality assurance work to other organizations. Other organizations which may be delegated the work of establishing and executing portions of the Quality Assurance Program during the design and construction phase are as follows:

Architect-Engineer (A-E).

Nuclear Steam Supply System (NSSS) Supplier.

Other SCE Contractors and Consultants.

The quality assurance programs of these organizations and the scope of delegation are as described in the applicable contract for the work perfomed. A typical interface organizational relationship between SCE and other organizations delegated quality assurance work is as shown on Figure 17.1-2.

17.1.1.11 Interfaces for Delegated Quality Assurance Work 7CN#7

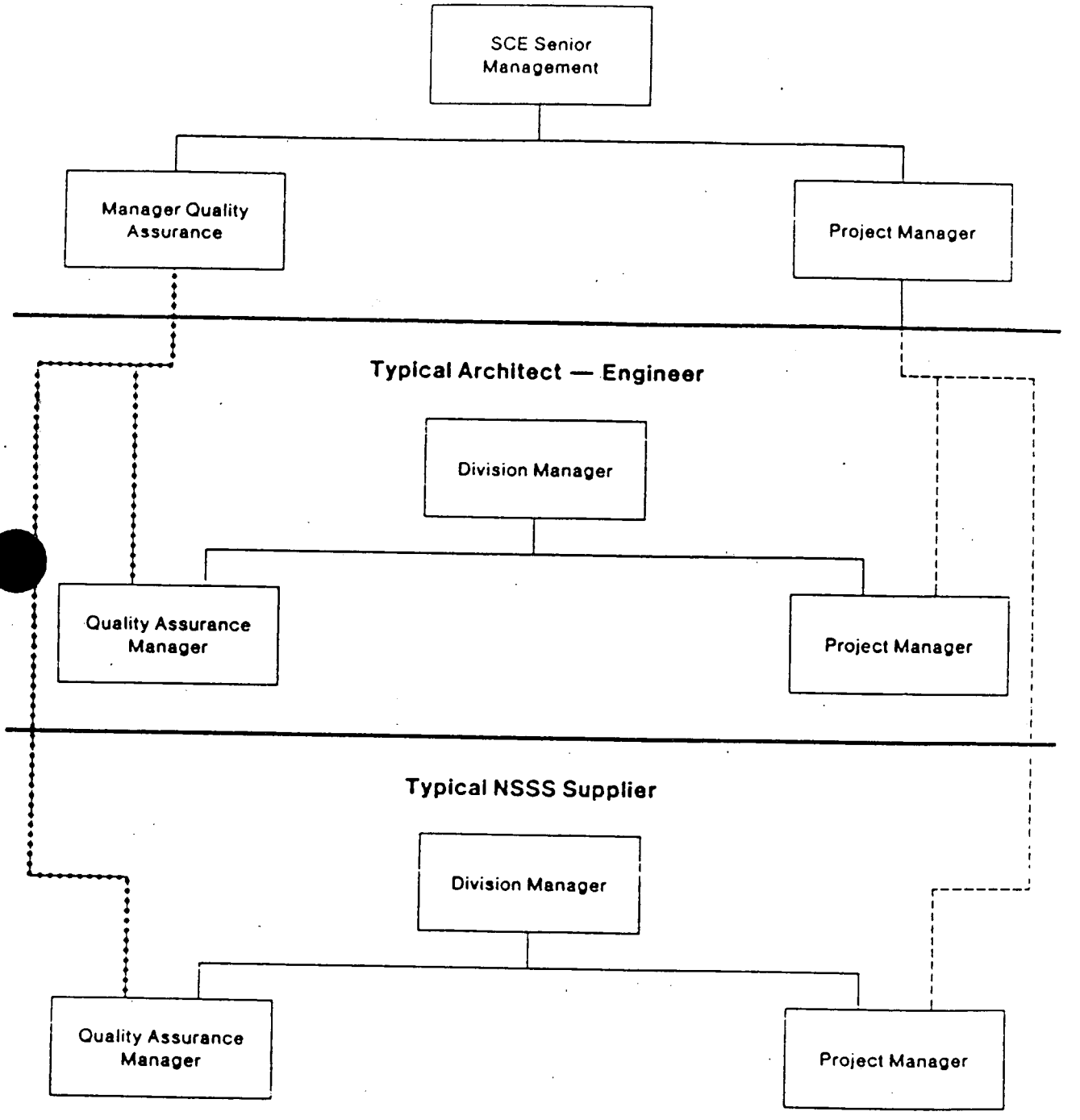
The SCE Manager of Quality Assurance, is responsible to communicate SCE quality assurance requirements directly with management of other organizations delegated the work of establishing and executing portions of the Quality Assurance Program. Compliance with SCE quality requirements and regulatory requirements is verified by means of review and approval of these organizations' quality assurance programs as described in Subsection 17.1.2 and by means of audits as described in Subsection 17.1.18. 9CN#13

Management of other organizations delegated quality assurance work is required to implement a reporting system concerning the delegated quality assurance work they are performing and to regularly review the status and effectiveness of that part of the program they are executing. Further, management of these organizations is required to submit to SCE management reports concerning correction of quality problems identified during SCE surveillance of delegated work.

Figure 17.1-1

(See Figure 17.2-1)

SOUTHERN CALIFORNIA EDISON COMPANY



Legend
——Technical/Administrative Authority
---Project Direction
----Q.A. Functional Direction

SCE QUALITY PROGRAM
TYPICAL INTERFACE ORGANIZATION
DESIGN & CONSTRUCTION

Figure 17.1-2

17.1.2 Quality Assurance Program

17.1.2.1. Scope

This subsection describes the SCE Quality Assurance Program established and implemented for the design and construction of nuclear generating stations in compliance with Regulatory Guide 1.28 (reference Table 17.1-1).

17.1.2.2 Quality Assurance Program

The basic policies, goals, and objectives for quality assurance are that SCE personnel have full responsibility to assure that nuclear generating stations are designed, constructed, tested and operated in a manner to protect the health and safety of the public. In this regard, SCE has committed its Quality Assurance Program for the design and construction phase to be in compliance with the provisions of 10CFR50, Appendix B, and the regulatory guides and standards listed on Table 17.1-1.

The SCE Quality Assurance Program described herein is applied to all activities affecting the Safety-Related functions of those structures, systems and components which prevent or mitigate the consequences of postulated accidents that could cause undue risk to the health and safety of the public. A listing of items designated Safety-Related is included in the PSAR for the applicable nuclear generating station. These lists are maintained and revised, as necessary, to reflect changes from the finalization of station design.

In addition, expendable or consumable items necessary for the functional performance of Safety-Related structures, systems and components are subjected to quality assurance requirements as specified in written procedures. These procedures include provisions for review and control in accordance with industry standards and specifications and the safety-related function of the expendable or consumable items.

This program includes Safety-Related activities initiated prior to submittal of a PSAR, such as design and procurement, preparation of the PSAR, and site evaluation and preparation, and remains in effect until initiation of preoperational testing.

The program is periodically reviewed by the Quality Assurance Organization during the design and construction phase. Revisions are made in a controlled fashion, as necessary to reflect changes in the program which may be required to improve its efficiency or increase its effectiveness.

SCE quality assurance policies, goals and objectives are defined in corporate jurisdiction statements, organization plans, and quality assurance manuals and procedures. These

17.1.2.2 (continued)

documents transmit the SCE quality assurance philosophy and requirements to all levels of management and to groups and individuals involved with program implementation. Training programs, personnel certifications, meetings, review of working documents, programs, and manuals, and management directives, are some of the methods utilized to assure that these policies, goals, and objectives are properly understood and complied with.

The Manager, Quality Assurance, is responsible for establishing and maintaining quality assurance manuals in compliance with applicable regulations and standards as listed in Table 17.1-1 and PSAR commitments. These manuals are developed by the Quality Assurance Organization from established quality assurance policies, goals, and objectives, which are mandatory requirements. Controlled distribution of quality assurance manuals is maintained by the Quality Assurance Organization.

Disputes arising between departments and organizations on any quality assurance matter that cannot be resolved are referred to the Vice President, Nuclear Engineering, Safety and Licensing, of if necessary to the Executive Vice President for resolution. |7CN#7

Written and approved procedures, instructions, and revisions thereto, necessary to activate the Quality Assurance Program originate from departments or organizations within SCE that have jurisdictional responsibility for performing specific tasks. All procedures that support the SCE Quality Assurance Program are reviewed and approved by responsible supervision and management of the originating organization. They are also reviewed and may be approved or disapproved by the Quality Assurance Organization. Promulgation and control of the procedures and instructions developed pursuant to the Quality Assurance Program are maintained by the originating organization. All procedures are included in procedure manuals maintained by the respective organizations. Table 17.1-2 presents a list of these manuals and a summary of their content. By means of inspections and audits, Quality Assurance Organization personnel verify that these procedures are followed.

Indoctrination and training programs are established within SCE by those organizations responsible for performing Quality-Affecting Acitivities. These programs are implemented by appropriate training plans or procedures which describe the scope and objectives. The Quality Assurance Organization provides assistance in the development and implementation of these programs, as requested, and performs periodic audits to assure effective implementation.

17.1.2.2 (continued)

The indoctrination and training programs are established to assure that personnel responsible for performing Quality-Assurance Activities are:

- o Instructed as to the purpose, scope and implementation of the quality manuals, procedures, and instructions.
- o Trained and qualified in the principles and techniques of the activity being performed.
- o Retrained, reexamined, and/or recertified, as necessary, to maintain proficiency.

Indoctrination and training programs include, as appropriate, the following types of training for key project personnel:

- o Audit techniques
- o Nondestructive testing.
- o Specialized technical subjects.
- o NRC regulations, guides, codes and standards.
- o Intra- and interdepartmental presentations regarding quality assurance activities and requirements.
- o Presentations on the proper use of procedures and instructions affecting quality assurance activities.

A record of each training session is prepared and maintained which identifies the subject, attendees, and date training was conducted.

During the design and construction phase, project review meetings are held regularly to assess the design and construction status and provide an interface between the responsible SCE departments and organizations as identified in Subsection 17.1.1 Schedules are maintained throughout this phase, and as the design and construction progresses, plans are made by the Engineering and Construction Department and Nuclear Generation Site Department for Preoperational Testing and Initial Startup Testing. These plans are reviewed by the Quality Assurance Organization to assure that the test program is developed and controlled in accordance with the SCE Quality Assurance Program. The Engineering and Construction and Nuclear Generation Site Departments, as well as representatives of the A-E and NSSS Supplier, participate in the planning and scheduling for transfer of the nuclear

9CN#15

9CN#15

17.1.2.2 (continued)

generating station from the design and construction phase to the operations phase. Prior to actual turnover, written procedures are developed by these organizations for the control of the transfer of all portions of the nuclear generating station, including associated documentation. The Quality Assurance Organization verifies that these procedures are developed and followed by means of inspections and audits, and assures that Quality-Affecting Activities are performed by trained and qualified personnel using specified equipment under suitable environmental conditions.

The SCE Quality Assurance Program for the design and construction phase of nuclear generating stations is described in detail in subsequent subsections of this topical report. The descriptions follow the criteria presented in 10CFR50, Appendix B.

The Vice President, Nuclear Engineering, Safety and Licensing, through use of independent consultants, periodically assesses the scope, implementation, and effectiveness of the program to assure that it is meaningful and effectively complies with 10CFR50, Appendix B, criteria. 7CN#7

For a full-time construction project, such an assessment is made within one year following issuance of the NRC construction permit, at approximately the mid-term of the construction effort and prior to commencement of major startup activities. 1-421.2
Assessments will be made by qualified individuals and firms with primary emphasis on the activities of SCE, and they result in written reports submitted to the Vice President, Nuclear Engineering, Safety and Licensing. These reports may then be referred to approriate departments for response to any findings or recommendations. 7CN#7

Quality-related work delegated to other organizations (A-E's), NSSS Suppliers, and other contractor and consultants to SCE must comply with applicable provisions of 10CFR50, Appendix B. Additonally, these programs must comply with the Regulatory Guides and ANSI Standards listed in Table 17.1-1 or acceptable alternatives must be described. The quality assurance programs must be reviewed and approved by the SCE Quality Assurance Organization. Regular planned audits of these quality assurance programs are conducted by the Quality Assurance Organization to assure continued compliance with applicable regulatory requirements.

17.1.3 DESIGN CONTROL

17.1.3.1 Scope

This subsection describes the measures utilized by SCE to plan and control design activities in compliance with Regulatory Guide 1.64 (reference Table 17.1-1).

17.1.3.2 Design Control

SCE may contract the majority of work of design of nuclear generating station to A-E's and NSSS Suppliers but may also retain a portion of design responsibility consistent with available engineering manpower and other considerations. An SCE Project Manager is responsible for project design activities including management of design interfaces with other participating organizations. 6

The SCE Quality Assurance Program includes procedures for establishing and maintaining design control throughout the design and construction phase of nuclear generating stations. Internal and external design interface control procedures are established which include the review, approval, release, distribution, and revision of documents involving design interfaces with participating design organizations. These procedures and instructions are referenced in quality assurance manuals for the applicable project or contained in procedures manuals as listed on Table 17.1-2.

The Engineering and Construction Department, the Nuclear Engineering, Safety and Licensing Department, and Nuclear Generation Site Department are responsible for SCE-prepared Design Disclosure Documents. The Project Engineer thru the Project Group Leader is responsible for primary engineering input, overall design document preparation and coordination with other organizations which have design review responsibilities. 7

Review and approval of SCE-prepared design documents and changes thereto are performed per established quality assurance procedures by individuals other than the original designer and the designer's immediate supervisor. These procedures describe the positions responsible for design reviews and other design verification activities and identifies their authority and responsibilities.

Internal procedures describe design review interfaces and review and documentation requirements to assure that design documentation complies with PSAR commitments and contains the following, where applicable:

- Sufficient identification of regulatory requirements and the documents' agreement with these requirements.

17.1.3.2 (continued)

- o Sufficient identification of the item's functions and incorporation of design basis.
- o Adequate delineation of values controlling the item's critical design parameters.
- o Sufficient identification of quality standards, tests and inspection criteria.
- o Specification of appropriate acceptance criteria for tests and inspections.
- o Inspectability of item's critical design parameters.
- o Suitability for service, including technical evaluation for standard commercial (off-the-shelf) or previously approved items.
- o Inclusion of performance characteristics.
- o Material compatibility.
- o Accessibility to maintain, repair or inspect the pertinent item while in service.
- o Design interfaces have been adequately established and supporting calculations have been checked.

The Project Engineer through the Project Group Leader is responsible for assuring that design documentation, and changes thereto, including field changes, are distributed to responsible individuals with established review request forms in a timely manner. They are also responsible for assuring that errors and deficiencies in design, including the design process, that could adversely affect structures, systems and components are documented, and corrective action is taken to preclude repetition.

Documentation reflecting a design change is required to be reviewed and approved by the same groups cognizant in the discipline affected by the change which reviewed and approved the original documentation (refer to Subsection 17.1.6 concerning changes in responsible organization). Work may proceed in accordance with field changes, which have been approved by cognizant representatives of only those groups responsible for the design area affected by the field change. Field changes are reviewed for impact on affected design documents. Specific criteria are provided to determine whether a field change requires incorporation in a design document. | 2 | 1-421.5 | 2

17.1.3.2 (continued)

Field changes requiring incorporation are incorporated in affected documentation within 20 days of approval of each field change or when 10 field changes have been accumulated, whichever occurs first.

Design documentation prepared by the A-E and NSSS Supplier are controlled in accordance with their SCE-approved quality assurance programs. Selected design documents prepared by the A-E and NSSS Supplier are reviewed and may be approved or disapproved by SCE in accordance with internal written procedures. The Project Engineer through the Project Group Leader is responsible for assuring that all comments are resolved and/or incorporated prior to acceptance by SCE.

Design controls are applied by SCE, A-E's or NSSS Suppliers, as applicable, to such activities as reactor physics, seismic, stress, thermal, hydraulic, radiation, and accident analyses. Consultants may be utilized to review and verify the design of certain items.

Where design verification cannot be adequately accomplished by the design review process, alternate calculations or qualification testing under adverse design conditions shall be employed. These alternate methods are required to be defined in design documentation. 1-421.4

Records of SCE design reviews and associated design documents are required by internal written procedures to be maintained and controlled in the CDM Center. 5

The SCE Quality Assurance Organization is responsible for performing periodic audits, as described in Subsection 17.1.18, of SCE departments, A-E's and NSSS Suppliers to verify effective implementation of design control requirements. These audits include verification that appropriate design review records are maintained and deviations from quality standards are controlled.

17.1.4 PROCUREMENT DOCUMENT CONTROL

17.1.4.1 Scope

This subsection describes the measures utilized by SCE to control documentation associated with procurement of items and services in compliance with the requirements and guidelines of ANSI N45.2.13 (reference Table 17.1-1).

17.1.4.2 Procurement Document Control

Procurement Documents defining the technical requirements for Safety-Related items and services are prepared and controlled by responsible engineers within SCE, A-E's and NSSS Suppliers. Determination of responsibility for Procurement Document preparation is approved by the SCE Project Manager. Procurement Documents for Nuclear Fuel are prepared and controlled by the SCE Fuel Supply Department. The Procurement Division of the SCE Material Services Department is responsible for contract negotiations and the issuance of purchase orders, except for nuclear fuel.

Contracts with A-E's and NSSS Suppliers for items and services include the requirement for control of procurement documentation as part of their quality assurance program requirements. The SCE Project Manager is responsible for preparation and control of these contracts. The Procurement Division controls the contract negotiations and issuance.

For procurement of items and services by SCE, a multilevel procurement system is established. This system controls the following areas:

a) Extent of procurement document requirements necessary for procurement of items and services.

b) Level of review and approval of procurement documents by cognizant engineering and quality assurance personnel.

c) Degree of qualification of the supplier from a quality assurance aspect.

d) Method of product acceptance.

This procurement system assures that the appropriate technical and quality requirements are specified for procurement of items and services considering the safety-related function, complexity of design and manufacturing, degree of inspectability and testability upon receipt and other factors which affect product quality.

3

17.1.4.2 (continued)

Procurement Documents prepared by SCE identify the applicable 10CFR50, Appendix B, requirements, regulatory guides, codes, and standards which must be complied with and described in suppliers' quality assurance programs. These programs are reviewed by the Quality Assurance Organization.

Written procedures are established which define the sequential activities necessary for preparation, review, approval, and control of Procurement Documents. These procedures identify the responsible organizations and functions of individuals performing the Procurement Document control activities. Table 17.1-2 lists the manuals which contain these procedures.

Procurement Documents, and revisions thereto, are reviewed by responsible engineers to verify that they contain or reference technical requirements appropriate to the item or service to be provided including: 3

- o Regulatory requirements, codes, and industry standards.
- o Component and material identification requirements.
- o Design requirements, including drawings and specifications.
- o Test and inspection requirements.
- o Special process instructions.
- o Handling, storage, and shipping instructions.
- o Documentation to be prepared, maintained, and submitted to SCE for review and approval.
- o Records to be retained, controlled and maintained by the supplier and those to be delivered to SCE prior to use or installation of the item.

Responsible quality assurance engineers review Procurement Documents to determine that they have been prepared, reviewed and approved in accordance with SCE Quality Assurance Program requirements and to assure the adequacy of quality requirements. This review includes, but is not limited to, verification of the following as appropriate to the item or service being provided: 3

- o Appropriate quality requirements are correctly stated and include applicable 10CFR50, Appendix B, requirements.

17.1.4.2 (continued)

- o Quality requirements can be inspected and controlled.
- o Adequate acceptance and rejection criteria are specified.
- o Provisions are included for documenting and controlling deviations from the Procurement Document.
- o Provisions are included for the right of access by the purchaser to the supplier's facilities and records for source inspection and audit.

The control measures, described herein, apply to original items as well as spare or replacement parts, and to changes to Procurement Documents. Procurement Document reviews including reviews of changes and revisions are verified by checking the signatures of assigned responsible individuals on appropriate documents. The review and approval of Procurement Documents is documented prior to release and is available for verification.

SCE, A-E's and NSSS Suppliers are required to maintain records of the review and approval of Procurement Documents. The SCE Quality Assurance Organization is responsible for performing periodic audits, as described in Subsection 17.1.18, of these participating organizations, to verify that Procurement Documents have been prepared, reviewed, approved, controlled, and maintained in accordance with SCE Quality Assurance Program requirements. Internal audits are also required by A-E's and NSSS Supplier's quality assurance organizations to verify that these activities have been correctly performed in their organizations and in the organizations of their suppliers, as appropriate. |2-421.14

17.1.5 INSTRUCTIONS, PROCEDURES, AND DRAWINGS

17.1.5.1 Scope

This subsection describes the measures utilized by SCE to assure that activities affecting quality are prescribed by, and accomplished in accordance with, appropriate instructions, procedures, and drawings.

17.1.5.2 Instructions, Procedures, and Drawings

The SCE Quality Assurance Program includes provisions which require that work be accomplished in accordance with documented instructions, procedures, and drawings.

Instructions, procedures, and drawings are prepared, reviewed, approved, and controlled by organizations which implement Quality-Affecting Activities. These documents specify the requirements and/or methods to be utilized for compliance with the requirements of the SCE Quality Assurance Program. They include appropriate qualitative and quantitative acceptance criteria, as applicable, to determine that designated activities are accomplished in a satisfactory manner. | 1-421.6

Instructions, procedures, and drawings, including revisions, thereto, prepared by SCE are reviewed are approved by organizations responsible for the work. The Quality Assurance Organization reviews and approves prior to issuance quality assurance programmatic procedures and procedures which define inspection/nondestructive examination requirements. In addition, other quality affecting procedures are subject to review by the Quality Assurance Organization at its discretion. Appropriate surveillance and audits will be conducted by the Quality Assurance Organization to assure that quality affecting procedures comply with the quality assurance program requirements. Maintenance, modification and inspection procedures and work order documentation are reviewed by the Quality Assurance Organization to determine: (1) the need for inspection, identification of inspection personnel and documentation of inspection results; and (2) that the inspection requirements, methods and acceptance criteria are identified. Drawings and specifications are reviewed and approved by the Quality Assurance Organization to assure inclusion of appropriate quality assurance requirements. | 11CN21

Changes to instructions, procedures, specifications, and drawings are reviewed and approved in the same manner as original documents. Project Management personnel are responsible for assuring that instructions, procedures, and drawings, including revisions thereto, are reviewed by the appropriate SCE organizations. | 11CN21

17.1.5.2 (continued)

Instructions, procedures, and drawings, prepared by A-E's and NSSS Suppliers are controlled in accordance with their respective quality assurance programs as described in the applicable PSAR. Inspection plans, test, calibration, and special process procedures, drawings and specifications, and changes thereto prepared by these participating organizations may be subject to the review and approval of the SCE Quality Assurance Organization. The SCE Quality Assurance Organization verifies by means of audits, as described in Subsection 17.1.18, that these documents are maintained and controlled by CDM in compliance with established program commitments. 5

17.1.6 DOCUMENT CONTROL

17.1.6.1 Scope

This subsection describes the measures utilized by SCE to control the preparation, review, approval, issuance and distribution of documents affecting quality.

17.1.6.2 Document Control

Document control, as described herein, applies to the following documents, and changes thereto, as a minimum:

- Design specifications.
- Design, manufacturing, construction and installation drawings.
- Procurement documents.
- Quality Assurance topical report and manuals.
- Safety Analysis Reports (SAR), related design criteria documents and referenced topical reports. 1-421.9
- Manufacturing, inspection, and testing instructions.
- Test procedures.
- Design change requests.
- Nonconformance Reports.
- Corrective Action Requests.
- Audit Reports.

These documents are prepared, reviewed, approved, issued, maintained and controlled in accordance with approved written procedures. Table 17.1-2 lists the manuals which contain these procedures. These procedures provide instructions to assure that documents are adequately checked, approved, and released by authorized personnel in a timely manner, and that the documents are transmitted and available at appropriate locations prior to commencement of activities requiring use of the document. Personnel or groups authorized to check, approve, and release documents are identified in quality assurance manuals and departmental procedures for the applicable project. 3 1-421.7

17.1.6.2 (continued)

Changes to instructions, procedures, and drawings, and other documents are approved prior to implementation of the change. Changes to documents can be requested by any reviewing or using organization or individual. Such requested changes are subjected to the review and approval by the same groups cognizant in the discipline affected by the change unless this work has been delegated to another organization. Where a group or organization which originally was responsible for approving a particular document is no longer responsible, the group or organization to approve changes to the document shall be designated and determined to be qualified by the SCE Project Manager. | 4 | 2 | 1-421.8

Design information transmitted from one organizational unit to another, including to organizations delegated design work, is documented and controlled by written approved procedures. These procedures require that design information transmittals identify the status of the design information or document provided and, where necessary, identification of incomplete items which require further evaluation, review or approval.

Each issuing organization prepares or delegates the preparation of a master list that identifies the latest revision number of instructions, procedures, specifications, drawings and Procurement Documents. These master lists are updated and distributed to designated responsible persons to preclude the use of obsolete or superseded documents.

SCE Project Manager personnel are responsible for assuring that selected Design Disclosure Documents developed by A-E's and NSSS Suppliers are reviewed and approved by SCE. A-E's and NSSS Suppliers are required to control the preparation and issuance of drawings and specifications in a manner approved by SCE. The SCE Quality Assurance Organization periodically audits the document control systems of all participating organizations, as described in Subsection 17.1.18, to verify compliance with established requirements.

17.1.7 CONTROL OF PURCHASED MATERIAL, EQUIPMENT, AND SERVICES

17.1.7.1 Scope

This subsection describes the measures utilized by SCE to control the procurement of material, equipment, and services purchased directly or through contractors and subcontractors in compliance with applicable codes and standards. |3

17.1.7.2 Control of Purchased Material, Equipment and Services

Prior to award of purchase order or contract, suppliers to SCE are subject to technical, and quality assurance evaluations as applicable by qualified SCE Engineering and Quality Assurance personnel. Quality Assurance evaluation of suppliers shall not apply to standard off-the-shelf items and basic commodities where required quality can adequately be determined by receipt inspection or post-installation checkout or test. The Quality Assurance evaluation may be accomplished by one or more of the following methods: |6 |3

- Review of objective evidence establishing suppliers' capability to comply with the 10CFR50, Appendix B, criteria, applicable to the type of material, equipment, or service to be procured.
- Review of available previous records and performance of suppliers that provide similar products and services of the type to be procured.
- Through the Coordinating Agency for Supplier Evaluation (CASE) initially using the current revision of the CASE Register (Nuclear Section). Prior to any award based on qualification using CASE, the qualification file would be obtained and reviewed to ensure applicability. |3
- Survey of suppliers' facilities and quality assurance programs to determine suppliers' capability to supply a product or service which meets the design, manufacturing, and quality requirements.

Results of these reviews and surveys are documented and forwarded to the Material Services Department and to the CDM Center. |5

Surveillance of suppliers when required, is performed during fabrication, inspection, testing, and shipment. This surveillance activity, as further described in Subsections 17.1.10 and 17.1.18, is planned and performed in accordance with written procedures to assure compliance to purchase order requirement. These procedures provide for the following: |3

17.1.7.2 (continued)

- Instructions that specify the characteristics or processes to be witnessed, inspected or verified, and accepted; the method of surveillance, the extent of documentation required and those responsible for implementing the instructions.

- Audits and surveillance which assure that suppliers comply with all appropriate quality requirements established, as described in Subsection 17.1.4, consistent with the importance of an item includes consideration of the quality involved. Surveillance is performed primarily on manufacturers of those items where verification or procurement requirements cannot be determined on receipt. 1-421.10

- Audits are scheduled of suppliers as described in Subsection 17.1.18. Surveillance is scheduled based on considerations described above, results of previous audits and quantity of the item involved. Audits and surveillance assure the effectiveness of the control of quality by suppliers.

Receiving inspection of material and equipment furnished by suppliers, as further described in Subsection 17.1.10, is performed in accordance with written procedures to assure that:

- Material, components, and equipment are properly identified and correspond with the receiving documentation.

- Inspection of the material, components, or equipment and acceptance records is performed and judged acceptable in accordance with predetermined inspection instructions prior to installation and use.

- Inspection records or certificates of conformance attesting to the acceptance of materials, components, and equipment are available at the nuclear generating station prior to installation and use.

- Items accepted and released are identified as to their inspection status prior to forwarding them to a controlled storage area or releasing them for installation of further work.

- Nonconforming items are segregated, controlled, and clearly identified until proper disposition is made.

17.1.7.2 (continued)

SCE may delegate the work of vendor surveillance and /or receiving inspection to A-E's quality assurance organizations. Monitoring of this delegated work is performed by the SCE Quality Assurance Organization. Written procedures for performing delegated receiving inspection are subject to review by the SCE Quality Assurance Organization.

Procurement specifications require suppliers to furnish the following records to SCE, as a minimum, with delivered items:

- Certifications that specifically identify the purchased material and equipment, and the specific procurement requirements such as codes, standards, specifications, procedures, and drawings that are met by the items.

- Certifications that identify procurement requirements that were not met, together with a description of those Accept-As-Is or repair.

Certifications are reviewed and approved at receiving inspection by SCE or A-E's inspectors. Quality Assurance Engineers audits these certifications for completeness and accuracy. SCE or A-E's periodically evaluate suppliers' certificates of conformance by audits, independent inspections, or tests to assure they are valid. In addition, the effectiveness of the control of quality by suppliers is assessed by SCE or A-E's at intervals consistent with the importance, complexity, and quantity of the item. 6

The verification of the validity of supplier certificates and the effectiveness of the certification system is accomplished as an integral part of the total supplier control and product acceptance program. 2

Spare or replacement parts of structures, systems, and components are subject to controls at least equivalent to those used for the original equipment.

Material, equipment, and services purchased through A-E's and NSSS Suppliers and controlled as specified in their quality assurance programs which are described in the PSAR.

17.1.8 IDENTIFICATION AND CONTROL OF MATERIAL, PARTS, AND COMPONENTS

17.1.8.1 Scope

This subsection describes the measures utilized by SCE for identifying and controlling material, parts, and components.

17.1.8.2 Identification and Control of Material, Parts, and Components

Identification and control requirements for material, parts, and components, including partially fabricated assemblies, are specified in SCE Procurement Documents for the item to be purchased. These requirements are established by cognizant SCE engineers during the development of specifications and drawings, and include the following:

- Items are identified by means which permit traceability to supporting documentation such as purchase orders, manufacturing records, and quality assurance records and documentation.

- If required by codes, standards, or specifications, materials are traceable to records of heat, batch or lot number.

  Method and location of identification are controlled to assure the function, fit and quality of the item are not impaired.

- Verification of correct identification of material, parts, and components is accomplished and documented prior to release for fabrication, assembling or shipping and the record of verification is maintained for the period provided in the specification.

Material, parts, and components purchased through A-E's and NSSS Suppliers are identified and controlled as specified in their quality assurance programs which are described in the applicable PSAR.

SCE maintains responsibility for control of material, parts, and components at a jobsite but may delegate the work to qualified organizations. Written procedures for control of material, parts, and components are prepared and are subject to the review of the SCE Quality Assurance Organization.

Procedures require that material, parts, and components delivered to the jobsite are quarantined until a determination is made that such items are properly identified, the required documentation is available, and the items are acceptable for use.

17.1.8.2 (continued)

This documentation is then transmitted to the CDM Center for control and maintenance as described in 17.1.17. |5

17.1.9 CONTROL OF SPECIAL PROCESSES

17.1.9.1 Scope

This subsection describes the measures utilized by SCE to control special processes such as welding, heat treating, cleaning, and nondestructive testing in compliance with Regulatory Guides 1.31, 1.39 and 1.54 (reference Table 17.1-1).

17.1.9.2 Control of Special Processes

SCE engineers and technicians performing special processes are trained, examined, and qualified in accordance with applicable codes, standards, specifications and other supplementary requirements as applicable. Procedures and equipment utilized in performing these processes are similarly qualified.

Inspection records associated with special processes include verification that the activity was performed utilizing qualified personnel, equipment, and procedures. These records, as well as current qualification records of personnel, equipment, and procedures, are filed and maintained in the CDM Center. 5

Special process procedures, equipment, and associated personnel certifications of A-E's and NSSS Suppliers are reviewed and approved by their respective quality assurance organizations. A-E's, NSSS Suppliers, and SCE Suppliers are periodically audited by the SCE Quality Assurance Organization as described in Subsection 17.1.18, to assure continuing compliance with special process controls of the applicable contract document or procurement specification.

17.1.10 INSPECTION

17.1.10.1 Scope

This subsection describes the measures utilized by SCE to control the inspection activities affecting quality in compliance with Regulatory Guides 1.30, 1.58, and 1.94, and the requirements and guidelines of ANSI N45.2.8 and N45.2.13 (reference Table 17.1-1).

17.1.10.2 Inspection

The SCE Quality Assurance Program requires that activities affecting quality be inspected by individuals other than those that performed the activity being inspected. Inspection of these activities is performed for these items in accordance with written and approved procedures and inspection plans.

Approved inspection procedures, instructions, and checklists are provided to perform the inspections and contain, but are not limited to, the following:

- Identification of characteristics and activities to be inspected.
- Identification of the individuals or group(s) responsible and qualified to perform the inspection operation.
- Acceptance and rejection criteria, both qualitative and quantitative.
- Description of the inspection method.
- Recording evidence of completing and verifying a manufacturing, inspection, or test operation.
- Recording inspector or data recorder and the results of the inspection operation.

For inspections performed at a jobsite, the SCE Quality Assurance Organization has the responsibility for inspections, inspection procedures, implementation of inspection plans, and documentation of inspection findings. These inspections and associated work may be delegated to A-E's or other contractor's quality control inspection organizations provided they can demonstrate sufficient qualifications and independence from costs and schedules. In addition, the SCE Quality Assurance Organization assigned to a jobsite periodically audits the inspection activities of SCE and other organizations delegated the inspection work to verify that:

17.1.10.2 (continued)

- Inspection procedures or instructions are developed with necessary drawings and specifications prior to performing inspection operations.

- Inspectors are qualified in accordance with appropriate codes, standards, and training programs and their qualifications are documented and maintained current.

- Modifications, repairs, and replacements are inspected in accordance with the original design and inspection requirements or acceptable alternatives.

- Inspection operations are performed and documented in compliance with the appropriate quality assurance manuals and inspection records are forwarded to CDM Center. 5

- Source inspections are performed by SCE, or its designated agents, on a selective basis at suppliers' facilities. Designated agents may be the A-E, NSSS Supplier, or other contracted inspection agencies. Also, source inspection, as part of the vendor surveillance activities, may be included in the work delegated to others as described in Subsection 17.11.7. These source inspections do not relieve the organization performing the activity being inspected from performing all the inspections required. The need for source inspection is determined by the SCE Quality Assurance Organization or other organizations delegated quality assurance work and is based on the following criteria:

- The significance of the activity to the functions of the item.

- Audit results, results of inspections or tests, lack of previous experience with the contractor or supplier, or indications from other areas that source inspections would be prudent.

Mandatory inspection hold points for witness are specified in Procurement Documents if established at the time of approval of such documents. If established during the review of contractor's or supplier's procedures or plans for manufacturing, examination, test or inspection, these witness and hold points are designated in correspondence from SCE, usually in the contract documents requiring conformance from a contractor or supplier.

Procurement Documents include the requirement that modifications, repairs, and replacements are inspected in accordance with the original design and inspection requirements or acceptable alternatives. In addition, these documents contain provisions for indirect control by monitoring processing methods, equipment, and personnel where direct inspection is not possible. Contractors and suppliers are required to qualify their inspectors in accordance with appropriate codes, standards, and training programs and to maintain current records of these certifications.

17.1.11 TEST CONTROL

17.1.11.1 Scope

This subsection describes the measures utilized by SCE to control testing activities in compliance with Regulatory Guides 1.30, 1.58 and 1.94, and the requirements and guidelines of ANSI N45.2.8 (reference Table 17.1-1).

17.1.11.2 Test Control

All testing conducted during the design and construction phase is documented, and accomplished in accordance with approved written procedures. These procedures apply to Prototype, Shop, Construction, and Prerequisite Tests. Written test procedures, for the tests described herein, incorporate or reference:

- The requirements and acceptance limits contained in applicable design and Procurement Documents.
- Instructions for performing the test.
- Test prerequisites that include, but are not limited to, the following provisions:
  - a) Calibrated instrumentation.
  - b) Adequate and appropriate equipment.
  - c) Completeness of items to be tested.
  - d) Suitable and, if required, controlled environmental conditions.
  - e) Mandatory inspection hold points for witness by owner, contractor or inspector.
  - f) Acceptance and rejection criteria, either qualitative or quantitative.
  - g) Methods for documenting or recording test data and results.

Provisions for personnel training, data collection, and storage are contained in other internal SCE documentation.

Procedures for Prototype and Shop Tests are normally prepared by the organization conducting the test; however, SCE A-E's, or NSSS Suppliers may prepare these procedures where they have design or procurement responsibility. These procedures require appropriate preparing organization quality assurance management and associated engineering organization review and approval prior to test implementation.

17.1.11.2 (continued)

Construction Tests are conducted in compliance with test procedures normally prepared by the A-E and testing contractors performing the tests. The A-E is responsible for approval of construction test procedures and for the review and evaluation of test results. The Engineering and Construction Department is responsible for management of the test program.

Prerequisite Tests are conducted in accordance with a Startup and Test Manual for the applicable station. These manuals are the responsibility of the Engineering and Construction Department and Nuclear Generation Site Department. They contain descriptions of organization's functions, authority, responsibility, and the policies and procedures for the conduct of the test program as well as Preoperational and Startup Tests. The technical portions of these programs, including quality assurance requirements, are contained in test procedures prepared by SCE, A-E's, NSSS Suppliers, and other major contractors. These procedures are approved by appropriate members of a Test Working Group and by the SCE Quality Assurance Organization. The Test Working Group consists of cognizant SCE, A-E, NSSS Supplier, and other major contractor representatives involved in the applicable project. Evaluation and approval of test results is also the responsibility of this group. | 9CN#15

Implementation of the Construction and Prerequisite Test Program may be delegated to the A-E with program management retained by the Engineering and Construction Department. The Quality Assurance Organization performs audits and inspection surveillance of the test program to assure compliance with SCE Quality Assurance Program requirements.

The SCE test program policy requires that modifications, repairs, and replacements of items be tested in the same manner, using the same design and test requirements as the original items. If alternatives are required, they must be reviewed and approved by the same organizations that established the original requirements or alternate organizations which have been provided sufficient background information.

Records of tests, described herein, which are performed at a jobsite, are forwarded to the CDM Center and are available for audit by the Quality Assurance Organization. | 5

17.1.12 CONTROL OF MEASURING AND TEST EQUIPMENT

17.1.12.1 Scope

This subsection describes the measures utilized by SCE to control measuring and test equipment, used in activities affecting quality.

17.1.12.2. Control of Measuring and Test Equipment

Measuring and test equipment utilized by suppliers are required to be controlled in accordance with 10CFR50, Appendix B, requirements.

Measuring and test equipment used in the measurement, testing or monitoring of components, systems, or structures is controlled by SCE or by the A-E's quality control organizations with the exception of that equipment used by the NSSS Suppliers. SCE and these organizations are required to establish a calibration program including calibration manuals for measuring and test equipment to be used at a jobsite and written procedures to implement the program. Calibration programs contain the following minimum requirements for each piece of measuring and test equipment to be used at the jobsite:

- Description of equipment.
- General use.
- Date received on site.
- Manufacturer.
- Manufacturer's serial number, initial calibration, and certificate.
- A list of governing regulation codes, and standards applicable to calibration.
- Method of labeling or tagging the equipment to indicate date of next calibration.

  Calibration intervals based on the required accuracy, purpose, degree of usage, stability characteristics, and other conditions affecting the measurement.
- A system for recalling equipment whose designated period of legitimate use prior to recalibration has expired.

17.1.12.2 (continued)

- Calibration procedures including techniques and methods for adjustment of equipment.
- List of individuals, organizations, and companies authorized to calibrate and/or use the equipment.
- Organizations responsible for performing calibration.
- Method for identification, control, and distribution of calibration data.
- Provisions for proper storage of the equipment.
- Provisions for review by the responsible quality assurance representative.

Calibration programs include provisions for determining the validity of previous measurements performed when measuring and test equipment are found to be out of calibration and for documenting the investigation results. These programs specify accuracy requirements and limit the error requirement of calibration standards to not more than 1/4 of the tolerance of the equipment to be calibrated. A greater uncertainty may be acceptable when limited by the state-of-the-art.

Measuring and test equipment are calibrated to recognized national standards on or before calibration expiration. Reference or transfer standards are traceable to nationally recognized standards or if non-existent, the calibration programs include provisions for documenting the basis for calibration. The complete status of all equipment controlled by the calibration program is recorded and maintained by the organization responsible for the calibration program.

The SCE Quality Assurance Organization reviews calibration programs prepared by A-E's or designated SCE contractors and performs periodic audits to verify conformance with established calibration program requirements.

NSSS Suppliers control their measuring and test equipment in accordance with their quality assurance programs which are described in the PSAR.

17.1.13 HANDLING, STORAGE, AND SHIPPING

17.1.13.1 Scope

This subsection describes the measures utilized by SCE to control handling, storage, shipping, packaging, preservation, and cleaning activities in compliance with Regulatory Guide 1.38 (reference Table 17.1-1).

17.1.13.2 Handling, Storage, and Shipping

The SCE Engineering and Construction Department and Nuclear Generation Site Department are responsible for implementation of handling, packaging, preservation, storage and cleaning requirements for items delivered to a jobsite and for identifying shipping requirements to be implemented by the Material and Information Services Department. The work associated with these activities may be delegated to A-E's, and NSSS Suppliers; however, in all cases, the work is performed in accordance with written approved procedures by individuals qualified to perform these activities. 9CN#14

Special instructions, procedures, or drawings necessary to define handling, storage, shipping, packaging, preservation, and cleaning methods and requirements are prepared in accordance with design and specification requirements by SCE, A-E's, and NSSS Suppliers, as appropriate. These procedures are reviewed and approved by the originator's quality assurance organization. A-E's and NSSS Suppliers' procedures are subject to review by SCE. The SCE Quality Assurance Organization conducts periodic audits of these organizations to assure proper implementation of these procedures.

SCE, A-E's, and NSSS Suppliers, as delegated, define handling, storage, shipping, packaging, preservation, and cleaning requirements to suppliers in procurement specifications. Compliance with these requirements is verified by means of periodic audits conducted by their respective quality assurance organizations.

17.1.14 INSPECTION, TEST AND OPERATING STATUS

17.1.14.1 Scope

This subsection describes the measures utilized by SCE to indicate the status of inspections and tests and the associated clearance procedures.

17.1.14.2 Inspection, Test, and Operating Status

The methods used to indicate the status of inspections and tests and for the control of status indicators are described by written procedures. These procedures are prepared and implemented by SCE, or A-E's, and NSSS Suppliers organizations delegated the work of performing the inspections and tests. The SCE Quality Assurance Organization conducts periodic audits of participating organization's activities to assure proper implementation of these procedures.

Inspection data sheets are developed to describe the inspection plan and inspection status for each item during the inspection phase. A sign-off by a cognizant inspector is required upon satisfactory completion of each inspection step which provides the record of inspection or test results.

A system of marking with stamps or tags is used to identify inspection, test, and operating status of structures, systems, components throughout manufacturing and installation. This marking system identifies the inspection status and tests performed on individual items. Markings also indicate the status of nonconforming, inoperative, or malfunctioning structures, systems or components to prevent inadvertent use. The system for control of nonconforming items is described in Subsection 17.1.15.

Bypassing or waiving required inspections, tests, and other critical operations is controlled by written procedures that require justification, approval, and documentation of the action. The Quality Assurance Supervisor or the Quality Control Supervisor or their designee approves such waivers for those activities affecting items which are under the jurisdiction of SCE. 6

SCE Preoperational and Startup Test Manuals establish requirements for clearances and tagging of structures, systems, and components to prevent inadvertent use during Construction and Prerequisite Testing. These manuals are independently reviewed by qualified individuals, as designated by approved procedures.

SCE, A-E's and NSSS Suppliers, as delegated, define requirements for controlling the status of inspections and tests to suppliers in procurement specifications. Compliance with these requirements is verified by means of periodic audits conducted by their respective quality assurance organizations.

17.1.15 NONCONFORMING MATERIALS, PARTS, OR COMPONENTS

17.1.15.1 Scope

This subsection describes the measures utilized by SCE to control materials, parts, or components that do not conform to established requirements.

17.1.15.2 Nonconforming Materials, Parts, or Components

The measures used to control nonconforming items are described by written procedures. These procedures are prepared and implemented by cognizant SCE organizations performing the work of controlling nonconformances. The SCE Quality Assurance Organization conducts periodic audits to assure proper implementation of the procedures and the effectiveness of the nonconformance controls.

Deviations pertaining to a characteristic of a material, component, system or structure, from those specified in the design documents are treated as nonconformances. Procedures for processing and controlling nonconforming items contain the following requirements:

- Measures to identify the nonconforming item.
- Measures to document the nonconforming item, including cause and corrective action.
- Measures to segregate the nonconforming item.
- Method to review and disposition the nonconforming item, including approval authority.
- Method of notification to the affected organizations.
- Method for evaluating deviations to determine if reportable under the requirements of 10CFR50.55(e). 2

Nonconformances are documented on a Nonconformance Report (NCR), which is initiated by responsible SCE personnel when a nonconforming item is discovered at a jobsite. NCR's contain the item's identification, description of the nonconformance, cause, dispositioning activities, inspection requirements, corrective action, approval signatures, and the organizations notified of the nonconformance. An SCE nonconformance log book is maintained by the "onsite" SCE Quality Assurance Organization. This log book indicates the status of each nonconforming item.

Nonconforming items are segregated from acceptable items, where possible, and maintained in a controlled area until properly dispositioned. Nonconforming items discovered after installation of the item are not used until final disposition of the nonconformance and associated disposition implementation. Stamps or tags are utilized to identify the

17.1.15.2 (continued)

nonconformance as described in Subsection 17.1.4. Nonconforming items may be dispositioned Accept-As-Is, repair, rework, or Reject.

An Engineering Review Process is utilized to provide approval of dispositions associated with nonconforming items discovered at the jobsite where SCE is responsible for the work or where SCE technical review of the nonconformance is required. An SCE Engineering Review Board (ERB) is established on each project for Accept-As-Is and repair dispositions and is comprised of the following members who must unanimously concur on the disposition:

- QA Supervisor, or designee. | 10CN19
- Project Engineer, or designee.
- E&C Field Manager, or designee.
- Supplier design representative, where supplier design is involved.

When unanimous agreement cannot be reached among ERB members, the disposition will be determined jointly by the Manager, Quality Assurance, and the Project Manager. The Vice President, Nuclear Engineering, Safety and Licensing shall assign the disposition for a nonconformance when normal processes fail to reach a decision. | 7

For Reject and Rework dispositions, the approval of the following individuals is required:

- QA Supervisor, or designee. | 10CN19
- E&C Field Manager, or designee.

Nonconforming items may be authorized for conditional use either prior to or after installation, providing the following conditions, as applicable, have been met:

- The NCR specifically describes the activity.
- The allowed activity does not constitute actual use in the sense that the item could be called upon to perform its safety-related function of actually preventing or mitigating the consequences of postulated accidents that could cause undue risk to the health and safety of the public. | 4
- The nonconforming condition will not adversely affect the allowed activity or implementation of the disposition. | 9

17.1.15.2 (continued)

- o Identification and traceability of the item is maintained. | 4

- o The authorization is approved by the same ERB members required for the disposition approval. | 4

Depending on contract scope of work assignments, an A-E may be required to implement a similar Engineering Review Process and formulate an (ERB) to work in conjunction with the SCE (ERB). Interface procedures are developed by both participating organizations in this event.

When the nonconformance report disposition specifies a rework or repair, these actions are accomplished in accordance with approved procedures, drawings, and instructions. The cognizant SCE or A-E quality assurance organization representative verifies that acceptance of the dispositioned nonconforming item is completed by reinspection according to methods initially used. When reinspection methods differ from those initially used, methods at least equal to the original inspection are employed. Items are designated as nonconforming, and are so identified, until repair or rework and the required inspections are satisfactorily performed. | 4

Rejected or scrapped items are promptly removed from the jobsite work areas. The status of these items is displayed by appropriate tags. The cognizant SCE or A-E quality assurance organization person verifies the proper use of these tags. | 3

The SCE or A-E design organization responsible for the affected design document reviews and approves Accept-As-Is dispositions for design impact. For an approved disposition, the responsible design organization must issue a written justification for the deviation from the design document or revise the design document in accordance with applicable requirements.

NCR's and associated inspection records are forwarded to the CDM Center for retention purposes. Nonconformance data are periodically analyzed by the SCE Quality Assurance Organization to establish quality trends. The results of these analyses are reviewed by the Manager, Quality Assurance, for possible corrective action and referred to the Vice President, Nuclear Engineering, Safety and Licensing, when a potential serious condition is determined. Deficiencies identified by 10CFR50.55(e) are reported to the NRC by the Manager, Quality Assurance. | 5 | 7

A-E's and suppliers must provide nonconformance controls that are equivalent to the controls set forth herein. The four options to disposition nonconformances as described in this subsection are required to be identified, or a suitable alternative scheme used. Nonconformances dispositioned Accept-As-Is or repair by suppliers must be made part of the | 1-421.11

17.1.15.2 (continued)

inspection records and forwarded to the responsible design organization for review and assessment. The SCE Project Engineer reviews and approves these dispositions for SCE procured items or onsite supplier activities. |7

Conditions adverse to quality discovered by SCE personnel at a jobsite, contractor's manufacturing facility or design office, supplier's manufacturing facility, or SCE internal organizations are processed as described in Subsection 17.1.16. |10CN#20

17.1.16 CORRECTIVE ACTION

17.1.16.1 Scope

This subsection describes the measures utilized by SCE to assure that corrective action is promptly identified and implemented when conditions adverse to quality are determined to exist.

17.1.16.2 Corrective Action

As described in Subsection 17.1.15, nonconformance and corrective action associated with material, parts, or components are controlled at a jobsite by the nonconformance reporting system. Additionally, a system for initiating corrective action associated with conditions adverse to quality is controlled by the SCE Quality Assurance Organization by means of written procedures. This system implements corrective action system forms to document conditions adverse to quality discovered by SCE personnel at the SCE General Office or jobsite, at A-E's design offices, and at NSSS Suppliers and other suppliers' facilities. This corrective action documentation is also used for hardware problems discovered at NSSS Supplier or other suppliers' facilities. Procurement specifications may specify the requirement for SCE approval of nonconforming hardware disposition if discovered by SCE at a supplier's facility. 10CN#20

The corrective action documentation provides for item or system identification, description of the adverse condition, cause of the condition, corrective action to resolve problem, and the corrective action to prevent recurrence as appropriate to the problems identified.

Corrective action documentation is promptly initiated with a request for corrective action directed to the responsible organization as a result of review, inspection, audit or surveillance activities.

The responsible organization to which corrective action documentation is directed determines the cause of the adverse condition, the action taken to resolve the problem, and the action to be taken to prevent recurrence as appropriate to the problems identified. They also provide dates for implementation of the corrective action where appropriate. The corrective action documentation is returned to the responsible SCE Quality Assurance Organization Supervisor for review and concurrence. Revised corrective action documentation is requested if corrective action proposed is unacceptable. Follow-up reviews, inspections, audits, or surveillance are performed by SCE personnel to verify corrective action implementation. 10CN#20

Trending studies may be performed on corrective action data by the SCE Quality Assurance Organization as directed by the Vice President, Nuclear Engineering, Safety and Licensing, or the Manager of Quality Assurance. Results of trending studies are

17.1.16.2 (continued)

documented and retained on file in the CDM Center. The Vice President, Nuclear Engineering, Safety and Licensing, issues directives for corrective action resulting from trending studies, as necessary, and assures appropriate management involvement in correcting significant conditions adverse to quality. 7CN#7

In addition to the corrective action system controlled by the SCE Quality Assurance Organization, other corrective action systems may exist within other SCE organizations which provide a means for identification of the deficiency; documentation of corrective action to resolve the issue and corrective action to preclude recurrence; a means to track the status of the deficiency; and a means to assure followup and closeout of the corrective action. When these optional systems exist, they shall be defined by written and approved procedures which contain program elements and administrative controls which are compatible with the SCE Quality Assurance Program. These systems are periodically audited by the SCE Quality Assurance organization to determine effectiveness of implementation. 10CN#20

A-E's, NSSS Suppliers, and other suppliers are required by contract or procurement specification to implement a corrective action system equivalent to that described herein for their scope of work, including appropriate management involvement in the review and assessment of significant conditions adverse to quality.

17.1.17 QUALITY ASSURANCE RECORDS

17.1.17.1 Scope

This subsection describes the measures utilized by SCE to assure that required design documents and quality assurance records are properly stored, maintained, retained, and retrievable to provide objective evidence of activities affecting quality in compliance with Regulatory Guide 1.88 (reference Table 17.1-1).

17.1.17.2 Quality Assurance Records

Corporate Documentation Management Centers (CDMC) are established at predetermined locations for indexing, storage, maintenance, and retention of quality assurance records. The CDM Centers are established and maintained by representatives of Administrative Services at the Corporate Offices and Material and Administrative Services at the nuclear generation site in accordance with the Quality Assurance Program. Documents established as quality assurance records which are released for scheduled retention may be retained by designated organizations other than CDMC. Quality assurance records so retained shall be stored, maintained and controlled as required by Regulatory Guide 1.88. The Quality Assurance Organization assures that the requirements for documentation imposed by SCE and regulatory agencies are identified in a documentation list(s) and implemented through written procedures. 10CN#22

Quality assurance records to be stored and maintained include, but are not limited to, the following:

- Results of reviews, inspections, tests, audits, and material analyses;
- Operating logs;
- Records of monitoring of work performance;
- Qualifications (certifications) of personnel, procedures, and equipment;
- Specifications and drawings, including as-built drawings and stress reports or calculations;
- Procurement Documents and purchasing records;
- Calibration manuals, procedures, and reports;
- Nonconformance and corrective action reports;
- Inspection and test records which contain, as a minimum, the following;

  a) A description of the type of observation;

17.1.17.2 (continued)

b) Evidence of completion and verification of manufacturing, inspection, or test operations;

c) Date and results of inspections or tests;

d) Information related to conditions adverse to quality;

e) Inspector or data recorder identification;

f) Evidence as to the acceptability of results.

Access to quality assurance records in the CDM Centers is controlled by CDMC personnel and in the other organizations by the designated organization personnel. Access control is audited by the Quality Assurance Organization. Access to and retrieval of quality assurance records which are being maintained within scheduled retention is based on a need to know and is controlled by written procedures. 10CN#22

Requirements and responsibilities for record transmittals, retention, and maintenance subsequent to completion of work are consistent with applicable codes, standards, and Procurement Documents.

The review, identification, indexing, categorizing and filing of design documents and quality assurance records is accomplished in accordance with written procedures. These procedures include provisions for ready identification and retrievability of stored documents. 10CN#22

Documents released for scheduled retention by the responsible organization are protected against deterioration or destruction from fire, flooding, theft, and environmental conditions such as temperature and humidity. 10CN#22

17.1.18 AUDITS

17.1.18.1 Scope

This subsection describes the measures utilized by SCE to verify compliance with, and overall effectiveness of the SCE Quality Assurance Program by means of a system of planned and periodic audits in compliance with the requirements and guidelines of ANSI N45.2.12 (reference Table 17.1-1).

17.1.18.2 Audits

The SCE Quality Assurance Program requires a comprehensive system of planned and periodic audits to verify the effectiveness of the program, and evaluates compliance with applicable 10CFR50, Appendix B, criteria. Quality assurance audits are planned and performed in accordance with written procedures by Quality Assurance Engineers trained in audit techniques, or other qualified engineers or inspectors as designated by the Manager, Quality Assurance. Individuals performing audits are independent of the areas to be audited.

Quality assurance audits provide an objective evaluation of quality-related practices, procedures, and instructions, and the effectiveness of implementation of policy directives. Audits include the evaluation of work areas, activities, processes, items, and the review of documents and records.

The Quality Assurance Supervisors are responsible for assuring that sufficient audits are performed in those areas where the requirements of 10CFR50, Appendix B, are being implemented. These areas include, as a minimum, those activities associated with: |6

- The determination of site features which affect plant safety, such as core sampling and foundation preparation, and meteorology.
- The preparation, review, approval, and control of early procurement.
- Indoctrination and training programs.
- Interface control among the applicant and the A-E and NSSS Supplier.

The following types of audits are performed to assure that quality assurance procedures and activities are meaningful and comply with SCE Quality Assurance Program requirements:

- Internal audits conducted by SCE, A-E's and NSSS Suppliers' quality assurance organizations.

17.1.18.2 (continued)

- o External audits by the SCE Quality Assurance Organization on A-E's, NSSS Suppliers, and other suppliers.

- o External audits by the A-E's and NSSS Supplier's quality assurance organizations on suppliers. The SCE Quality Assurance Organization may participate in these audits, on a selective basis, as an observer or active participant.

Each supplier's quality assurance program acceptability is determined initially prior to work commencement. This determination is made by means of: | 2-421.15

- o Audits performed by the licensee/principal contractor, or

- o evaluation of documented results of audits performed by sustaining members of CASE (Coordinating Agency for Supplier Evaluation).

If acceptable, the supplier is placed on the approved supplier list.

Audits are scheduled based upon the status of work progress, importance to safety of the activities being performed, and prior experience with the organizations being audited. Audits are initiated early to assure effective quality assurance during design, procurement, and contracting activities. Audit schedules are prepared compatible with the progress of work. These schedules provide for coverage of applicable 10CFR50, Appendix B criteria implementation.

A formal evaluation of suppliers performing continuing work is performed each year. This evaluation determines for which suppliers a reaudit is required during the upcoming year. This evaluation considers pertinent factors such as the results of other audits, history of performance of product and/or purchased service and effectiveness of implementation of the supplier's quality assurance program. In addition, the complexity of the component concerned and the degree of quality and process control required during manufacturing are considered. | 2-421.15

This evaluation is documented and approved by the Manager, Quality Assurance and placed in supplier quality history files.

Regardless of the results of the evaluation, the suppliers performing continuing work are subjected to an initial audit and are reaudited every three years. Audits of suppliers performing limited duration assignments are conducted at least once during the life of the contract. If at the time of the | 6 (CN#4)

17.1.18.2 (continued)

pre-award survey, the supplier is already implementing the same quality assurance program for other customers that he proposes to use on the auditing party's contract, then the pre-award survey may serve as the first triennial audit. | 6 (CN#4)

The audit requirement shall not apply to standard off-the-shelf items and bulk commodities where required quality can adequately be determined by receipt inspection or post-installation checkout or test.

Results of audits conducted by the SCE Quality Assurance Organization are reviewed with the organization being audited during exit interviews and are documented in the formal audit reports. Responsible management in the areas audited implement the necessary actions required to correct deficiencies. These actions are documented and retained as part of the total audit record. Reaudits are conducted to verify proper implementation of corrective action or until corrective action is implemented.

Audit data are summarized and analyzed by the SCE Quality Assurance Organization and reported to the Manager, Quality Assurance, and the Vice President, Nuclear Engineering, Safety and Licensing, on a regular basis. These reports indicate quality trends and the effectiveness of the SCE Quality Assurance Program. The Vice President, Nuclear Engineering, Safety and Licensing, issues directives for corrective action resulting from these reports, as necessary, and assures appropriate management involvement in correcting significant conditions adverse to quality. | 7 | 7 CN#7

TABLE 17.1-1

SCE QUALITY ASSURANCE PROGRAM COMPLIANCE
TO GUIDES, REQUIREMENTS, AND STANDARDS

DESIGN AND CONSTRUCTION

NOTE: Commitments made herein regarding compliance with specific issues of NRC Regulatory Guides and ANSI Standards may be modified in applicable PSAR's. |1

Guide, Requirement, or Standard	Compliance Status	Remarks
10CFR50, Appendix B – Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants	Complies	
Regulatory Guide 1.28 – Quality Assurance Program Requirements (Design and Construction) (Safety Guide 28, 6/7/72)	Complies	Endorses ANSI N45.2
Regulatory Guide 1.30 – Quality Assurance Requirements for the Installation, Inspection, and Testing of Instrumentation and Electrical Equipment (Safety Guide 30, 8/11/72)	Complies	Endorses ANSI N45.2.4
Regulatory Guide 1.37 – Quality Assurance Requirements for Cleaning of Fluid Systems and Associated Components of Water-Cooled Nuclear Power Plants (3/16/76)	Complies	Endorses ANSI N45.2.1
Regulatory Guide 1.38 – Quality Assurance Requirements for Packaging, Shipping, Receiving, Storage, and Handling of Items for Water-Cooled Nuclear Power Plants (Revision 1, 10/76)	Complies	Endorses ANSI N45.2.2

|1-421.13

Table 17.1-1 (continued)

Guide, Requirement, or Standard	Compliance Status	Remarks
Regulatory Guide 1.39 - Housekeeping Requirements for Water-Cooled Nuclear Power Plants (Revision 1, 10-76)	Complies	Endorses ANSI N45.2.3 |1-|421.13
Regulatory Guide 1.54 - Quality Assurance Requirements for Protective Coatings Applied to Water-Cooled Nuclear Power Plants (6/73)	Complies	Endorses ANSI N101.4
Regulatory Guide 1.58 - Qualification of Nuclear Power Plant Inspection, Examination, and Testing Personnel (8/73)	Complies	Endorses ANSI N45.2.6
Regulatory Guide 1.64 - Quality Assurance Requirements for the Design of Nuclear Power Plants (Revision 2, 6/76)	Complies	Endorses ANSI N45.2.11 |1-|421.13
Regulatory Guide 1.70 - Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants (Revision 2, 9/75)	Complies	
Regulatory Guide 1.74 - Quality Assurance Terms and Definitions (2/74)	Complies	Endorses ANSI N45.2.10
Regulatory Guide 1.88 - Collection, Storage, and Maintenance of Nuclear Power Plant Records (Revision 2, 10/76)	Complies	Endorses ANSI N45.2.9 |1-|421.13

Table 17.1-1 (continued)

Guide, Requirement, or Standard	Compliance Status	Remarks
Regulatory Guide 1.94 - Quality Assurance Requirement for Installation, Inspection, and Testing of Structural Concrete and Structural Steel During the Construction Phase of Nuclear Power Plants (Revision 1, 4/76)	Complies	Endorses ANSI N45.2.5 1-421.13
Regulatory Guide 1.116 - Quality Assurance Requirements for Installation, Inspection, and Testing of Mechanical Equipment and Systems (6/76)	Complies	
Regulatory Guide 1.123 - Quality Assurance Requirements for Control of Procurement of Items and Services for Nuclear Power Plants (10/76)	Complies	
ANSI N45.2.12 (Draft 3, Revision 4, February 1974) - Requirements for Auditing of Quality Assurance Programs for Nuclear Power Plants	Complies	

TABLE 17.1-2

SOUTHERN CALIFORNIA EDISON COMPANY
QUALITY ASSURANCE PROGRAM IMPLEMENTING PROCEDURES

Implementing Procedure Documents	10CFR50 Appendix B Criteria 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18	Summary	
Quality Assurance Organization			
Quality Assurance Manual (applicable project)	x x x x x x x x x x x x x x x x x x	Quality Assurance manuals describe the SCE Quality Assurance Program policies for all 10CFR50 Appendix B, criteria and provide appropriate general implementation procedures. The Reference Procedures Manual provides specific implementation procedures required by the Quality Assurance Organization to implement 10CFR50, Appendix B, criteria.	3
Quality Assurance Reference Procedures Manual	x x x x x x x x x x x x x x x x x x		
Engineering & Construction Department			
Quality Assurance Reference Procedures Manual (These procedures are also used by Nuclear Engineering, Safety and Licensing Organizations)	x x x x x x x x x x x x x x x x x x	Emphasis of Engineering & Construction Department procedures is on preparation and control of drawings, specifications, and procedures, and procurement activities	7CN7
Fuel and Material Management			
Quality Assurance Reference Procedures Manual	x x x x x x x x x	Emphasis of Procurement and Material Management Procedures is on control of purchase orders, contracts and vendor proposals and documentation. Emphasis of Fuel Supply procedures is on preparation and control of procurement specifications and contracts for nuclear fuel.	11CN#25

TABLE 17.1-2

SOUTHERN CALIFORNIA EDISON COMPANY
QUALITY ASSURANCE PROGRAM IMPLEMENTING PROCEDURES

Implementing Procedure Documents	10CFR50 Appendix B Criteria 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18	Summary	
Nuclear Generation Site Department			
Station Orders, Procedures and Operating Instructions	x x x x x	Station orders procedures and operating instructions contain implementation procedures to implement 10CFR50, Appendix B, criteria.	11CN21
Corporate Documentation Services			
Quality Assurance Reference Procedures Manual	x x x x x x	Emphasis of Corporate Documentation Services procedures is on processing, control, retention and retrival of documents.	7CN7

TABLE 17.1-3

QUALITY ASSURANCE ORGANIZATION ACTIVITIES
DESIGN AND CONSTRUCTION | 4

The following are "offsite" SCE Quality Assurance Organization personnel activities during the design and construction of nuclear generating stations: | 4

1. Review design and procurement documents to verify incorporation of appropriate quality assurance requirements.

2. Develop quality assurance chapters for PSAR's and FSAR's and prepare quality assurance Topical Reports.

3. Prepare and maintain quality assurance manuals, procedures and instructions.

4. Review and approve quality assurance procedures and instructions developed by other internal organizations.

5. Evaluate and approve potential bidder's quality assurance manuals.

6. Perform quality assurance preaward surveys of bidders' facilities and quality assurance programs.

7. Perform inspection/surveillance at suppliers' facilities. | 4

8. Conduct internal audits of SCE organizations and external audits of A-E's, NSSS Suppliers and other contractors and suppliers to SCE. Participate on a selective basis in supplier audits performed by A-E's and NSSS Suppliers.

9. Initiate nonconformance reports, corrective action reports, and followup to assure proper implementation of corrective action.

10. Participate in and provide quality assurance training.

11. Provide written reports to management regarding status of "offsite" activities, corrective actions required, or unresolved problems.

12. Support the Corporate Documentation Management Centers to assure proper filing and retention of appropriate quality assurance documentation. | 5

17.1-3 (continued)

The following are "onsite" SCE Quality Assurance Organizational personnel activities during the design and construction of nuclear generating stations: |4

1. Write and maintain jobsite quality assurance procedures and instructions.

2. Review and approve jobsite quality assurance procedures and instructions developed by other organizations.

3. Perform inspection/surveillance over all Safety-Related jobsite activities. |4

4. Conduct internal audits of SCE organizations and external audits of A-E's and other contractors' activities at the jobsite.

5. Initiate jobsite nonconformance reports, corrective action reports, and followup to assure implementation of corrective action.

6. Participate in and provide quality assurance training at the jobsite.

7. Provide written reports to management regarding status of "onsite" activities, corrective action required, and unresolved problems.

8. Support the Corporate Documentation Management Centers and Documentation Control Centers to assure proper filing and retention of quality assurance documentation. |5

17.2 QUALITY ASSURANCE DURING THE OPERATIONS PHASE

17.2.1 ORGANIZATION

17.2.1.1 SCOPE

This subsection describes the SCE organizational structure and responsibilities for establishing and executing the Quality Assurance Program for SCE operational nuclear generating stations, in compliance with Regulatory Guides 1.8, 1.28 and 1.33 (reference Table 17.2-1). It includes a description of the interfaces with other organizations who may be delegated the work of establishing and executing portions of the Quality Assurance Program. The methods used for maintaining responsibility for delegated portions of the Quality Assurance Program are identified as well as the management measures that provide the independence of the SCE Quality Assurance Organization. | 4

17.2.1.2 General Responsibilities

During the operational phase, the following departments within SCE are involved in quality-affecting activities: | 6

Departments	Responsibilities	
Nuclear Engineering, Safety and Licensing	Licensing, Nuclear Engineering, Nuclear Safety, Radiological Environmental Monitoring, Corporate Emergency Planning, Quality Assurance, Reporting of Defects and Noncompliances	7
Nuclear Generation Site	Station Operation, Maintenance, Refueling, Testing, In-Service Inspection, Station Safety, Handling, Storage and Warehousing of Material and Equipment	9CN#14
Fuel and Material Management	Procurement and Shipping of Nuclear Fuel, Material and Equipment, Spent Fuel Shipping Services, Special Nuclear Material Accountability	11CN#25
Administrative Services	Records Management	
Engineering & Construction	Design and Construction, Pre-operational and Start-up Testing, ECP Project Management	9CN#15

17.2.1.2 (continued)

System Planning and Research	Collection of Meteorological Data and Environmental Monitoring Support	9CN#15
Power Supply	Maintenance and Technical Support and Equipment Repair and Calibration	7CN#7

The SCE organizational structure of departments involved with implementing the SCE Quality Assurance Program during the operational phase as well as departmental interfaces is presented on Figure 17.2.1.

In addition to the departmental responsibilities listed, Technical Specifications for operating nuclear generating stations describe the Safety-Related functions of the On-Site Review Committee (OSRC), Nuclear Safety Group (NSG), and Independent Safety Engineering Group (ISEG), a summary of these responsibilities is as follows: | 5

Committee/Board/Group	Responsibility	4
OSRC	Advise the Station Manager on all matters related to safety.	
NSG	Provide independent review and audit of designated activities in the area of safety.	5
ISEG	Provide onsite independent review of station activities and feedback of operating experience.	4 5

The organizational structure, administrative requirements, responsibilites and authorities specific to each committee/group is described in the Technical Specification for the applicable station and in internal procedures. | 9CN#13

The ultimate responsibility for operating, maintaining, repairing, inspecting, testing, refueling, and modifying operational nuclear generating stations rests with the Chairman of the Board. He assigns responsibilities to the various SCE organizations involved in nuclear generating station operations. | 4

An Executive Vice President reports to the Chairman of the Board and is responsible for Nuclear Engineering, Safety and Licensing, Nuclear Generation Site, Engineering and Construction, Power Supply, and Fuel and Material Management. | 11CN#25

17.2.1.1 (continued)

An Executive Vice President reports to the Chairman of the Board and is responsible for System Planning and Research and Administrative Services.

A Senior Vice President reports to the Executive Vice President and is responsible for Power Supply. A Senior Vice President reports to the Executive Vice President and is responsible for Procurement and Material Management and Administrative Services. 11CN#25

The Vice President, Nuclear Engineering, Safety and Licensing reporting to the Executive Vice President, has been delegated the responsibility for establishment and assurance of implementation of the SCE Quality Assurance Program in compliance with 10CFR50, Appendix B. and other applicable regulations and standards. He is authorized to request the cooperation of all officers and management personnel in support of this program. 10CN#17 7CN#7

SCE corporate management is involved with quality assurance matters on continuing basis by means of regular Officer Council meetings. Quality Assurance Organization weekly progress reports are prepared for the Vice President, Nuclear Engineering, Safety and Licensing, and are used, as appropriate, for discussion items at these meetings. These reports usually contain significant progress items, corrective action recommendations, and unresolved items. In addition, a quarterly report of information suitable for assessment of the status and adequacy of the SCE Quality Assurance Program is submitted to senior management by the Manager of Quality Assurance. 7CN7 10CN#17

The Nuclear Control Boards (NCB), which includes corporate officers and upper managment personnel, are additional means by which SCE corporate management is involved with quality assurance matters. As a member of the NCBs, the Vice President, Nuclear Engineering, Safety and Licensing, apprises these boards of significantquality assurance matters related to station operations and modifications. 7CN#7

17.2.1.3 Nuclear Generation Site Department

The Nuclear Generation Site Department, under the Vice President, Nuclear Generation Site, is responsible for operation of nuclear powered generating facilities. 7CN#7

The Vice President, Nuclear Generation Site is responsible for the safe and reliable operation, maintenance, testing, refueling, and In-service Inspection of his assigned station.

The Vice President, Nuclear Generation Site is responsible for the routine administration and implementation of the Quality Assurance Program at the station, including the following station organization functions, where appropriate: 9CN#14

17.2.1.3 (continued)

- o Review and approval of Design Disclosure Documents for station modifications.
- o Review and approval of Procurement Documents.
- o Review and approval of administrative and technical procedures.
- o Handling, Storage and Warehousing of Material and Equipment
- o Operation and Maintenance of plant systems and equipment
- o Conducting Performance Tests and In-Service Inspections and Evaluations.
- o Refueling
- o Review of station operations and surveillance requirements of the Technical Specifications.
- o Safety 9CN#14
- o Security
- o Training and examination of station personnel.
- o Storage and retention of quality assurance records and document/drawing control at the nuclear generation site. 10CN22

17.2.1.4 Engineering and Construction Project (ECP) Management

Project Managers are assigned from the Engineering and Construction Department to manage design initial construction including Preoperational and Start-up Test Program management and for ECP implementation. Project Managers have overall responsibility for their assigned projects, which includes technical, schedule, economic and quality aspects. 9CN#15

17.2.1.5 Nuclear Engineering, Safety and Licensing Department 7

The Nuclear Engineering, Safety and Licensing Department, under the Vice President, Nuclear Engineering, Safety and Licensing is responsible for nuclear engineering, safety and licensing and corporate emergency preparedness.

The Vice President, Nuclear Engineering, Safety and Licensing reports to the Executive Vice President and is responsible for establishment and assurance of implementation of the SCE Quality Assurance Program in compliance with applicable regulations, codes, and standards, including those listed in Table 17.2-1. He is responsible for establishing quality assurance policies, goals and objectives and for assuring that these policies are followed and the goals and objectives are achieved. 10CN#17 7CN#7

17.2.1.5 (continued)

The Vice President, Nuclear Engineering, Safety and Licensing, is responsible for apprising the Management of the effectiveness of the Quality Assurance Program. He is involved in the disposition of nonconformances of unusual complexity, and acts upon trending studies that indicate quality problems of a possible generic nature submitted to him by the Manager of Quality Assurance. 7CN#7

The Vice President, Nuclear Engineering, Safety and Licensing, through the Manager of Quality Assurance, exercises the Administrative Authority for the Quality Assurance Organization. Direction for implementing the Quality Assurance Program is provided to individuals and groups by the Vice President, Nuclear Engineering, Safety and Licensing, through the Manager of Quality Assurance.

The Manager of Quality Assurance, reports directly to the Vice President, Nuclear Engineering, Safety and Licensing, and has the responsibility for development, maintenance, and surveillance of the Quality Assurance Program as described in Quality Assurance manuals. These manuals are reviewed and approved by the Manager of Quality Assurance, and the Vice President, Nuclear Engineering, Safety and Licensing. Other organizations involved with Quality Assurance Program implementation, as described in Subsection 17.2.1, review and comment on the Quality Assurance manuals, particularly as they apply to their area of involvment. 9CN#13 The Manager of Quality Assurance, is responsible for identifying any conditions adverse to quality and reporting them to the Vice President, Nuclear Engineering, Safety and Licensing, and to the Nuclear Control Board (NCB) of which he is a member. In addition, the Manager of Quality Assurance, is responsible for surveillance of Quality-Affecting Activities and has the authority to Stop Work or delegate this authority, in writing, to other personnel.

The minimum qualification requirements for the position of Manager of Quality Assurance, are as follows:

- Bachelor of Science Degree in one of the engineering disciplines from an accredited college or university.
- Ten years experience in design, fabrication, construction, testing, operation, or quality assurance related to the nuclear power field.
- Management and administrative ability demonstrated by experience and training.
- Extensive knowledge of regulatory requirements for nuclear generating stations.

17.2.1.5 (continued)

The Quality Assurance Organization, as presented on Figure 17.2-1, under the direction of the Manager of Quality Assurance develops and administers the Quality Assurance Program for the operational phase of nuclear generating stations. It is comprised of engineers with expertise in the various disciplines required for performing quality assurance and quality control activities. This organization audits, inspects, or otherwise verifies that activities within the scope of the SCE Quality Assurance Program are correctly performed either by SCE or other organizations delegated the work.

The Quality Assurance Organization has the authority and organizational freedom to:

- o Identify quality problems.
- o Initiate, recommend, or provide solutions through designated channels.
- o Verify implementation of solutions.

Additional activities performed by "offsite" and "onsite" based Quality Assurance Organization personnel during the operations phase are listed on Table 17.2-3.

A Site Quality Assurance Manager and General Office and Site Quality Assurance Supervisors are assigned to operating nuclear generating station. They are responsible for directing and managing the activities of quality assurance personnel performing the activities described on Table 17.2-3.

A Site QC Manager and QC Supervisors are responsible for directing the activities of site QC personnel. QC personnel provide site inspection and surveillance of safety related items and activities and non-safety related items and activities when requested by Station or Project Management. 9CN#13

Quality Assurance and Quality Control Managers and Supervisors have the responsibility and authority, delineated in writing, to stop unsatisfactory work and to control further processing, delivery, and installation of nonconforming items.

The Nuclear Safety Organization provides nuclear safety, radiological health support and corporate emergency planning for new and existing nuclear powered generating facilities. The Nuclear Engineering and Licensing Organization provides nuclear engineering and licensing support for new and existing nuclear generating facilities. 10CN#17

17.2.1.6 Power Supply Department

The Power Supply Department, under the direction of a Senior Vice President is responsible for providing maintenance services and technical assistance mainly during periods of refueling operations and equipment repair and calibration when requested by the Project Manager or Station Manager. 10CN#17

The Division Chemical Staff assists generating stations with water chemistry control. 7CN#7

The Division Maintenance Organization, provides supervision and manpower capability for major overhauls and equipment repair.

The Shop Services and Instrumentation Division, provides equipment repair andcalibration for generating stations when requested by the Station Manager or Project Manager. 9CN#13

17.2.1.7 Fuel and Material Department

The Fuel and Material Management Department, under the direction of the Vice President, Fuel and Material Management, is responsible for procurement of nuclear fuel, materials and equipment, spent fuel shipping services and for special nuclear material accountability for nuclear generating stations. 11CN#25

The Manager of Procurement and Material Management reports to the Vice President, and is responsible for procurement of items and services (excluding nuclear fuel), material shipping, and for preparation, negotiations, and administration of procurement contracts. 11CN#25

The Manager of Nuclear Fuel Supply reports to the Vice President and is responsible for procurement of nuclear fuel, spent fuel shipping services and for nuclear material accountability.

17.2.1.8 Engineering and Construction Department 7CN#7

The Engineering and Construction Department under the direction of the Vice President, Engineering and Construction, is responsible for engineering and initial plant construction including Preoperational and Start-up testing as well as engineering, construction and start-up testing associated with ECP development. Engineering responsibilities include design and drafting services, and supporting the projects in the various technical disciplines. Construction responsibilities include technical and administrative direction over project construction personnel and construction management, and Preoperational and Start-up testing. 3 6 3

17.2.1.9 Administrative Services Department

A Senior Vice President is in charge of Administrative Services. The Senior Vice President reports to the Executive Vice President. 11CN#25

17.2.1.9 (Continued)

The Manager of Real Properties and Administration reports directly to the Senior Vice President and is responsible for the corporate records management program. Corporate Documentation Services operates the Corporate Documentation Management (CDM) Center at the Corporate offices which is responsible for processing, controlling, retrieving, distributing and storage of nuclear documentation. |11CN#25 |10CN#22

17.2.1.10 System Planning and Research Department

The System Planning and Research Department, under the direction of the Vice President, System Planning and Research, is responsible for collection of meteorological data, environmental monitoring support and environmental reviews in support of nuclear power plant activities. |9CN#15

17.2.1.11 Delegated Quality Assurance Work |7CN#7

SCE retains responsibility for the Quality Assurance Program described herein but may delegate quality assurance work to other organizations. Other organizations which may be delegated the work of establishing and executing portions of the Quality Assurance Program during the operational phase are as follows:

- o Architect-Engineer (A-E,s).
- o Nuclear Steam Supply System (NSSS) Supplier.
- o Other suppliers contractors including consultants to SCE. |9CN#13

The quality assurance programs of these organizations and the scope of delegated work is as described in the applicable contract for the work performed. A typical interface organizational relationship between SCE and other organizations delegated quality assurance work is as shown on Figure 17.2-2.

17.2.1.12 Interface for Delegated Quality Assurance Work |7CN#7

The SCE Manager of Quality Assurance, is responsible to communicate SCE quality assurance requirements directly with quality assurance managers of other organizations delegated the work of establishing and executing portions of the Quality Assurance Program. Compliance with SCE quality requirements and regulatory requirements is verified by means of review and approval of these organizations' quality assurance programs as described in Subsection 17.2.2 and by means of audits as described in Subsection 17.2.18. |9CN#13

Management of other organizations delegated quality assurance work is required to implement a reporting system concerning the delegated quality assurance work they are performing and to regularly review the status and effectiveness of that part of the program they are executing. Further, management of these organizations is required to submit to SCE management reports concerning correction of quality problems identified during SCE surveillance of delegated work.