

SNUPPS

SNUPPS PROJECT QUALITY ASSURANCE  
PROGRAMS FOR DESIGN AND CONSTRUCTION

Rev. 6  
2/83

(List of Effective Pages for Standard Plant QA Program)

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SNUPPS PROJECT QUALITY ASSURANCE  
PROGRAMS FOR DESIGN AND CONSTRUCTION

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SNUPPS STANDARD PLANT

17.1-3/17.1-4

17.1-5/17.1-6

17.1-7/17.1-8

Figure 17.1-1

17B.0-1/-

17E.0-1/17E.0-2



hire/fire, position assignment) of his own utility management organization independent of the SNUPPS organizational structure. Each member of the SNUPPS QA Committee is individually responsible to his utility for providing a lead role in implementation of the quality assurance program policy and is responsible for reporting audit results to his own utility management. Each member of the QA Committee is also individually responsible for providing his own utility management with an objective evaluation of the effectiveness of implementation of the total quality assurance program and the conformance with established procedures.

#### 17.1.1.2 SNUPPS Organization

The SNUPPS organizational structure for the common design and procurement activities is shown on Figure 17.1-1. The organization consists of a Management Committee; Executive Director; Technical Committee and subgroups; Operations Committee; Technical Director; Manager, Nuclear Safety; Quality Assurance Manager, Licensing Manager, Administrative Manager, Site Representatives, and administrative and technical staff members.

The SNUPPS Management Committee consists of one management representative from each utility. The activities of the Committee are coordinated by an elected chairman. The Committee established the overall policies, plans, and objectives for the SNUPPS utilities. The Management Committee establishes the committees and staff necessary to coordinate and review the activities of the principal contractors for the project. The Management Committee reviews the status and adequacy of activities and has overall administrative authority for the SNUPPS organization.

The SNUPPS Technical Committee consists of one technical representative from each utility with a chairman appointed by the Management Committee. The Committee is responsible for providing the technical interface between each utility and the SNUPPS staff. The Technical Committee performs or provides for technical reviews and evaluations and provides the utility recommendation to the SNUPPS staff.

The SNUPPS Operations Committee consists of one representative from each utility with a chairman appointed by the Management Committee. The committee is responsible for the development of test, operational and maintenance programs and procedures, and the establishment of operator training programs and provides for technical review and evaluation in the area of plant operations.

The SNUPPS Executive Director is responsible to the Management Committee for implementation of its policies, plans, and objectives. He coordinates the activities of the Technical and

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Operations Committees and manages a staff as required to perform his assigned responsibilities. He is responsible for coordinating the review of the activities of Bechtel and providing them with direction as required. He also coordinates the interface requirements between each utility, Bechtel, and Westinghouse for the SNUPPS concept.

The Executive Director has responsibility for implementation of the quality assurance program requirements as stated in the SNUPPS Standard QA Manual and Standard QA Procedures as they apply to the SNUPPS organization. In doing so, he is responsible for the development, control, and implementation of detailed procedures or instructions which specify and define the quality related activities of his staff.

The SNUPPS Technical Director is responsible for providing technical solutions, evaluations, or alternatives to technical requirements arising from any aspect of the SNUPPS project. Other organizations may be utilized as necessary to fulfill these functions. His staff shall, as necessary, encompass the following engineering areas:

- a. Electrical systems
- b. Instrumentation and control systems
- c. Nuclear fuel
- d. Mechanical systems
- e. Civil/structural systems

Each staff member shall maintain cognizance of the design and procurement effort for equipment and systems for which he is responsible.

The SNUPPS Quality Assurance Manager is responsible for implementation of the utilities' quality assurance program used by the SNUPPS staff and supervises a staff as necessary to perform his activities. He is technically competent regarding the quality assurance requirements of the SNUPPS utilities as defined in the Standard Quality Assurance Manual and Standard QA Procedures. He reports administratively to the Executive Director. Replacement of the SNUPPS Quality Assurance Manager and approval of his staff is the responsibility of the Executive Director.

The Quality Assurance Manager attends SNUPPS QA Committee meetings to periodically review project progress with the Committee. He may seek guidance and/or participation from the

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SNUPPS QA Committee and assistance from outside consultants as necessary. He is responsible for the conduct of surveillance and audit activities of the SNUPPS staff and Bechtel, and selectively participates in audits and surveillance of Westinghouse conducted by Bechtel and other selected suppliers as specified in the utilities' quality assurance program.

The minimum qualifications for the SNUPPS Quality Assurance Manager are as follows:

- a. Have an engineering degree.
- b. Have a minimum of five years' responsible experience in design, construction or operation of nuclear facilities. A minimum of two of the five years of experience must be in quality assurance.

The Quality Assurance Manager provides the formal interface between the quality organizations or participating SNUPPS utilities, and those individuals or groups within the SNUPPS organization from whom a response is required or requested regarding items within the SNUPPS concept. He is also the formal interface for reverse action.

The SNUPPS Licensing Manager reports to the Executive Director. He is technically competent regarding all aspects of licensing and environmental requirements associated with the SNUPPS concept. He will coordinate individual licensing activities with the involved utility or utilities and the NRC. This will include processing of all licensing applications, arranging technical and legal consultation, and arranging availability of applicant representatives to appear as required before the NRC. The Licensing Manager will coordinate responses to or from the NRC regarding considerations applicable to one or all of the participating SNUPPS utilities.

The Manager, Nuclear Safety is responsible for coordination and review of safety and accident analyses, probabilistic risk assessments, and emergency and abnormal operating procedure development. He also provides technical assistance in the areas of personnel training, emergency support centers, and operations and he participates in independent safety reviews and assessments. The Manager, Nuclear Safety coordinates safety activities between each utility, Bechtel, and Westinghouse.

The Manager, Technical Services is responsible for monitoring Lead A/E activities and performance to ensure efficient use of manpower and resources in design and procurement activities and adherence to schedules. He also monitors the interfaces between the Lead A/E, NSSS supplier, other suppliers, and field activities to identify problems and recommend action to provide design data and equipment to support schedule requirements.



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The SNUPPS Administrative Manager reports to the Executive Director. He administers all aspects of SNUPPS responsibilities in at least the following categories regarding items and activities within the SNUPPS concept:

- a. Records Control
- b. Filing System
- c. Correspondence Control
- d. Facilities Planning
- e. Supervising the Secretarial Staff

SNUPPS site representatives report to the Executive Director and are responsible for documenting and assessing information concerning construction and startup testing of the lead SNUPPS units which could be used in resolving or avoiding problems for the follow on units.

### 17.1.1.3 Typical Utility Project Organization

The basic organizational structure and the relationship of the major participants in the project is similar for any single utility nuclear project. Details for a specific utility are described in the utility site addenda to this chapter, and individual project organization charts are provided for each utility in these addenda to clearly establish the relationship of all participants in the project. Each of the SNUPPS utilities is individually responsible for design, construction and operation of its respective plants. Each utility exercises control of the activities of Bechtel and Westinghouse through participation in the SNUPPS organization. Each utility exercises direct control of the activities of its site architect-engineer, construction manager or constructor, and site consultants.

For detailed information on the organizations of the site A/E, construction manager or constructor(s) and assignment of responsibilities for site-related activities, refer to the appropriate site addendum. Throughout this chapter the phrase "as applicable" is used in a general sense in reference to activities which may be performed by the site A/E, construction manager or constructor(s). The utility addenda provide specific detail for each utility to clarify the "applicability" for these organizations and to what degree.

Each of the SNUPPS utilities is individually responsible for establishing and implementing a quality assurance program. The quality assurance program for design and procurement has been jointly developed and is delineated in the same manual and standard QA procedures, for each utility. Each utility furnishes a representative on the Quality Assurance Committee who is responsible for assuring that this program is effectively

implemented. Additionally, the quality assurance program for design and procurement of site construction activities will utilize the standard manual, the standard procedures, and similar implementing procedures and forms. Each utility has an individual responsible for establishing and managing this program.

#### 17.1.1.4 Lead Architect-Engineer - Bechtel Power Corporation

Bechtel is assigned the task of designing the structures and systems (except the Nuclear Steam Supply System) within the standard Power Block. Bechtel is also responsible for designing all Seismic Category I structures and systems (except ponds, earthwork and dams) outside the standard Power Block. This will include preparation of the design criteria and civil, structural, mechanical, electrical, and instrumentation drawings and specifications. Bechtel will furnish the SNUPPS utilities with design interface information, as dictated by the Power Block requirements, for use by the site architect-engineers in designing structures and systems outside the Power Block.

Bechtel is assigned responsibility for procurement of equipment for systems within the Power Block (except the nuclear steam supply system and first core fuel fabrication) and as may be otherwise directed by the SNUPPS utilities. This will include preparing inquiries, soliciting quotations from suppliers, analyzing proposals, making purchase recommendations to the SNUPPS utilities, and issuing purchase orders and necessary supplements. Bechtel is responsible for evaluation of suppliers' quality assurance programs and for conducting periodic audits to assure compliance. Bechtel will provide surveillance inspection and witness selected tests during manufacture of equipment. Bechtel is also responsible for selective vendor surveillance inspection and witnessing selected tests during manufacture, and for conducting periodic audits on behalf of the SNUPPS utilities for Westinghouse (NSSS) supplied equipment.

Bechtel is responsible for and has established and executed a quality assurance program to control its activities for the SNUPPS project. Bechtel's SNUPPS Project Team is shown on Figure 17A.1-8 of the Bechtel section of this PSAR. Bechtel will also assign engineers to each construction site to interpret design drawings and specifications and the construction work plan. A full description of the Bechtel quality assurance program is provided in Section 17A.0.

#### 17.1.1.5 NSSS and Fuel Fabricator - Westinghouse Electric Corporation

Westinghouse, as the NSSS supplier and fuel fabricator, is assigned responsibility for designing and furnishing equipment and services for the nuclear steam supply system and detailed design and fabrication of the first core. Responsibility includes the overall design of the nuclear steam supply system,

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including fluid and electrical systems, mechanical equipment, control and electrical equipment, and the selection and application of materials, parts and processes. Westinghouse is responsible for providing the safety system performance requirements, safety system criteria, safety analysis methods, and safety evaluations to provide the required analytical and statistical verification of postulated accidents for the NSSS. The SNUPPS utilities will be furnished design interface information, as dictated by the NSSS requirements, for use by Bechtel in designing structures and other systems within the Power Block.

Westinghouse is responsible for procurement and manufacture of equipment for the NSSS and for first core fuel fabrication. A quality assurance program is established and executed by Westinghouse to control the design, procurement and manufacture of NSSS equipment and the fabrication of the initial core for the SNUPPS project. Source selection and approval, supplier surveillance, and inprocess audits of NSSS supplier activities will be provided by Westinghouse.

The Westinghouse SNUPPS Project Team is shown on Figure 17.1-3. Construction consultation and technical assistance will be provided by Westinghouse to the SNUPPS utilities and their construction managers or constructors at each site. Work on NSSS equipment will be monitored by Westinghouse representatives assigned to each construction site.

The Project Department of the PWR Systems Division, through the SNUPPS Project Manager, has the primary responsibility within Westinghouse Nuclear Energy Systems (NES) for supplying the NSS equipment, first core fuel, and services to each utility. The SNUPPS Project Team serves as the focal point for communications among the NES Divisions, the SNUPPS Utilities, and Bechtel Power Corporation.

Section 17B.0 references a description of the Westinghouse quality assurance program and the responsibilities of each contributing group within the SNUPPS Project Team.



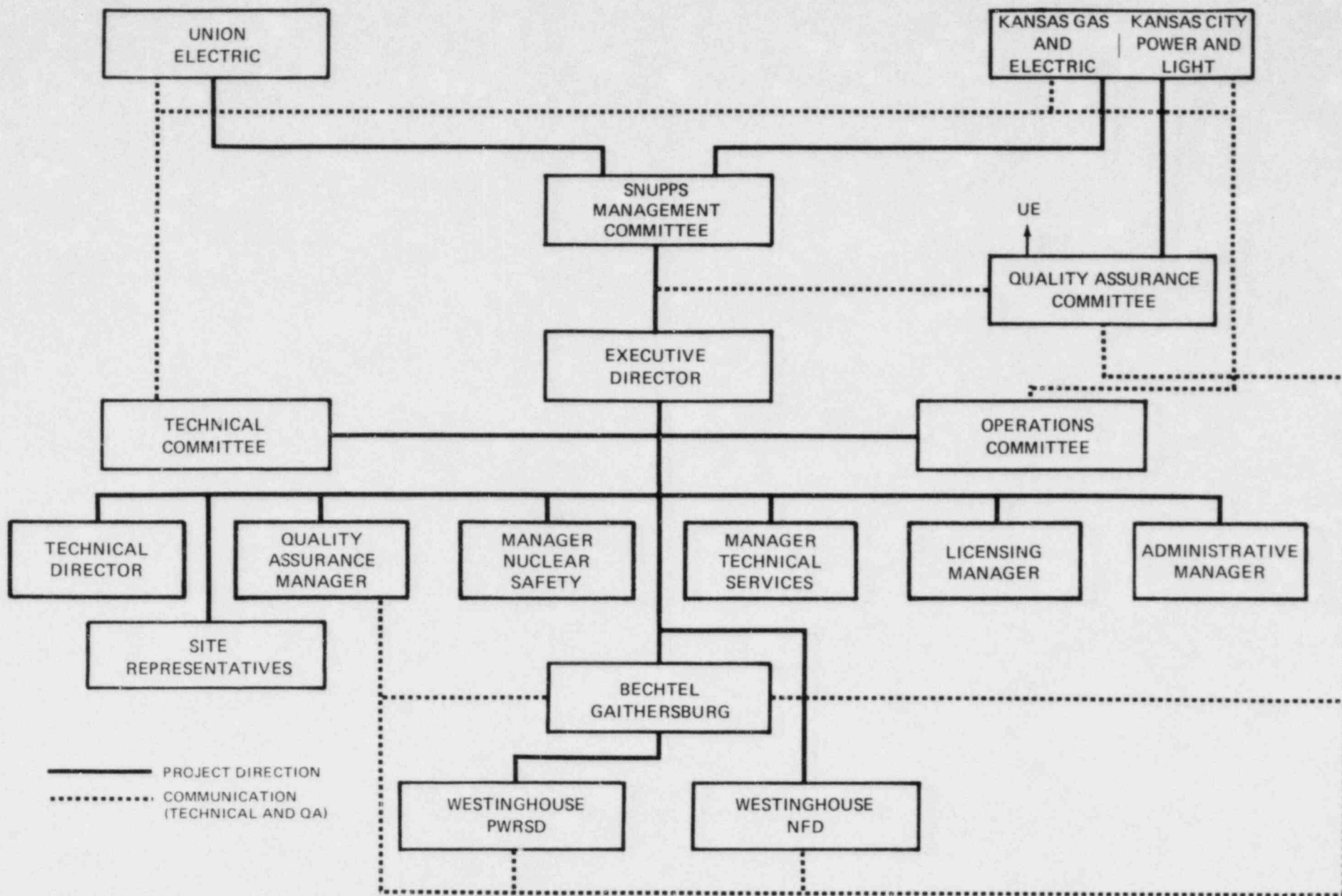


FIGURE 17.1-1  
SNUPPS PROJECT ORGANIZATION

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### 17B.0 WESTINGHOUSE NUCLEAR ENERGY SYSTEM DIVISION QUALITY ASSURANCE PLAN

The Westinghouse Quality Assurance Program (QAP) has been upgraded periodically to reflect changes in regulatory requirements and industry standards. The initial QAP implemented on SNUPPS was described in RESAR-3 through Amendment 5. This program was in effect from the start of the job until July 1974.

The first revision to the QAP implemented on SNUPPS is described in RESAR-3, Amendment 6, Chapter 17.0 which references WCAP-8370 (Revision 6). Note that the text of RESAR-3, Chapter 17.0 was deleted by Amendment 6 and replaced by a reference to WCAP-8370, which had just been revised (Revision 6) to include the RESAR-3, Chapter 17.0 text as well as to provide responses to the 19 questions on the RESAR-3 QAP. The questions of RESAR-3 Chapter 17.0 were also answered in Amendment 6 of RESAR-3 by referencing revised pages (of WCAP-8370, Revision 6). The QAP described in WCAP-8370, Revision 6, was in effect from July 1974 through January 1, 1975.

The next revision of the QAP implemented on SNUPPS is described in Revision 7A of WCAP-8370. This QAP was in effect from January 1, 1975 through October 1, 1977.

The latest revision of the QAP implemented on SNUPPS is described in Revision 9A, Amendment 1, effective February 1981.

The following supplements to Paragraph 17.1.17, Quality Assurance Records, of RESAR-3 through Amendment 5 to WCAP-8370, Revision 6, 7A, and 8A, apply for SNUPPS.

PWR-SD will develop a plan for the identification, maintenance, retention, and retrieval of quality assurance documentation. The plan will include a definition of the standard data packages plus additional information for SNUPPS NSSS equipment. For implementation of this plan, quality assurance documentation requirements for NSSS equipment will be included in purchase orders. The suppliers' quality assurance data packages will be transmitted to the appropriate SNUPPS utility within 60 days of equipment shipment. The purchase orders will also convey requirements for records identification, maintenance, retention, access and retrieval. The data package requirements to be included in purchase orders will show the specific additional data as required by SNUPPS contract, including:

- a. Certified stress reports (ASME)
- b. NDE personnel qualifications
- c. Certification of seismic analysis
- d. Instrument calibration records

A discussion of the Westinghouse Nuclear Fuel Division Quality Assurance Program Plan is contained in WCAP-7800. Prior to April 1975, Revision 2 to WCAP-7800 was implemented on SNUPPS. In November 1979, Revision 5A of WCAP-7800 was implemented on SNUPPS.

17E.0 QUALITY ASSURANCE PROGRAM FOR QUALITY GROUP D (AUGMENTED)

A quality assurance plan has been implemented for certain systems which contain radioactivity. These systems would not normally be covered by a QA Program; however, since they do or could contain radioactive materials, they are covered by a QA Program which is designated Quality Group D (augmented).

As noted below, these systems are provided with special design features and quality assurance considerations. The NRC Staff position paper, "Design Guidance for Radioactive Waste Management Systems Installed in Light-Water-Cooled Nuclear Power Plants," has been used for guidance.

Section IV of the Staff Technical Paper provides the guidance for augmenting the requirements inherent in the codes and standards, listed in Regulatory Guide 1.26 for Quality Group D, for use in designing applicable portions of various radwaste systems. The responses in the following paragraphs correspond to the positions presented in Section IV.

- a. The quality activities listed in Section V a through f of the Staff Technical Paper will be applied to Quality Group D (augmented) systems and components.

Quality Group D (augmented) systems and components will not fall under other criteria, including record-keeping of the Quality Assurance Program given in Chapter 17.0.

- b. Construction of the systems and components will use the following criteria to the maximum extent possible:
  1. Welded construction. Flanged jointed or suitable rapid-disconnect fittings are used only where dictated by maintenance or operational requirements.
  2. Process lines 2-1/2 inches nominal pipe size or above are butt welded (no backing rings will be used on resin or evaporator bottom lines). Process lines 2 inches or smaller, including instrument and sample lines up to the first root valve, will be socket welded. Instrumentation lines are not considered process lines, and screwed connections may be used. Manual valves will be butt welded except where flanges are dictated.
  3. Material used for construction of pressure-retaining components, primarily carbon steel or austenitic stainless steel, will comply with applicable sections of the codes and standards listed in Table 3.2-2. Malleable, wrought, or cast iron materials and plastic piping will not be used.
  4. All welding constituting the pressure boundary or pressure-retaining components is performed by qualified

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welders employing qualified welding procedures in accordance with the ASME Code Section IX.

- c. Hydrostatic testing is done in accordance with ANSI B31.1 at 1.5 times design pressure. In all cases, the system test will meet the requirements of applicable codes and standards. Temporary plugs or block valves are installed to isolate any atmospheric tanks from process lines being hydrostatically tested.
- d. A simplified seismic design method for the gaseous radwaste system supports is provided in Section 3.9.3.
- e. The radwaste building will be designed using simplified seismic design methods described in Section 3.8.6. All radwaste equipment (except for the steam generator blowdown heat exchanger) are located in a seismic Category I building or the radwaste building. The steam generator blowdown heat exchanger is located in the nonseismic turbine building to preclude high-energy line breaks in the auxiliary building and to locate it closer to associated interface systems. It is further noted from Table 10.1-2 that the specific activity of the blowdown stream is extremely low.

Table 3.2-1 has been amended to identify those systems whose Quality Group D portions meet the augmented requirements presented above. These systems are:

- a. Chemical and volume control systems (portions only)
- b. Boron recycle system
- c. Liquid radwaste system
- d. Solid radwaste system
- e. Steam generator blowdown system
- f. Gaseous radwaste system
- g. Secondary liquid waste system (portions only)

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UNION ELECTRIC COMPANY  
CHAPTER 17.0 - QUALITY ASSURANCE

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## 17.1 QUALITY ASSURANCE DURING DESIGN AND CONSTRUCTION

### 17.1.1 ORGANIZATION

As a participating member of the SNUPPS Project Organization, Union Electric Company has an established quality assurance organization which is designated to assure effective implementation of the QA program for design and construction. This QA program includes joint participation with other member utilities for control of SNUPPS quality activities of Bechtel and Westinghouse. These quality activities relate to the standard Power Block and all Seismic Category I structures, systems and equipment (except dams, ponds or earthwork) outside the standard Power Block. Quality assurance for these common activities is included in the descriptions of SNUPPS Standard Plant PSAR Sections 17.1.1 through 17.1.18.

Control of quality activities of the site A/E, construction manager or constructor, and field support consultants which are outside the scope of the SNUPPS concept, is handled directly by Union Electric Company. The site QA organization, shown on Figure 17.1-2, defines the intended staffing for the site QA activities. Personnel shall be selected and trained for this staff as dictated by the site activity requirements.

The Executive Vice President is responsible to the President of Union Electric Company for promulgating the QA requirements established by the utility. He has ultimate responsibility for quality assurance and for engineering, construction and preparation of the Callaway Plant for commercial operation.

Under the Executive Vice President, the Vice President, Nuclear is responsible for formulating the QA policy and authorizing and assuring implementation of the QA program. He has the responsibility for direction of all activities involving engineering, construction, testing and preparation of the Callaway Plant for commercial operation. This includes direct control of the site A/E, construction manager or constructor and field support consultants.

The Assistant to the Vice President, Nuclear reports to the Vice President, Nuclear and provides assistance in the planning, administration and organization for the preoperational, startup and operational activities.

The Manager, Quality Assurance reports directly to the Vice President, Nuclear who is responsible for the administrative control (hire/fire and salary review) of the Manager, Quality Assurance. The Manager, Quality Assurance has the responsibility and authority for directing the overall QA program for Union Electric Company. For

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SNUPPS quality activities within the SNUPPS concept, he fulfills this responsibility as a participating member of the SNUPPS QA Committee on behalf of Union Electric Company. He directs the QA program for all other activities outside the SNUPPS concept. He reviews the interface between the primary contractors for activities within the constructor, and field support consultants by conducting periodic audits. This includes audits conducted as a member of the QA Committee and those site activity audits conducted independent of activities within the SNUPPS concept. Communication from the quality assurance organization of these contractors to the appropriate member of the Union Electric Quality assurance staff is through the Manager, Quality Assurance. The Union Electric Company quality assurance department interfaces with the site architect-engineer's quality assurance organization through the Manager, Quality Assurance. Interface with quality assurance personnel of the construction manager or constructor is through the Union Electric Superintendent, Site Quality Assurance. The Manager, Quality Assurance is required to have the following minimum qualifications.

- a. He must be a graduate engineer.
- b. He must have a minimum of five years of responsible experience in the design, construction or operation of fossil or nuclear power plants of which two years is required in quality assurance. Additional experience in quality assurance may be used in lieu of the design, construction, or operation experience.

The Manager, Quality Assurance provides technical direction and administrative guidance to the Superintendent, Site Quality Assurance; a Supervising Engineer, Quality Assurance (General Office); and a Staff Engineer. The Supervising Engineer, Quality Assurance (general office) directs a staff of QA engineers whose primary duties involve the audit and surveillance of home office support organization and supplier quality activities. The staff engineer is responsible for general quality assurance indoctrination and training, and other assignments as directed by the Manager, Quality Assurance.

| The Superintendent, Site Quality Assurance directs three Supervising Engineers, Quality Assurance who are located at the Callaway Plant. One Supervising Engineer, Quality Assurance (Construction) (site QA Group Leader) directs a staff of QA engineers whose responsibilities include the surveillance and audit of the Manager Nuclear Construction, the construction manager or constructor, and field support consultants.

| One Supervising Engineer, Quality Assurance (Operations) directs a staff of QA engineers and is responsible for assuring the implementation of the Operating Quality Assurance Program at the Callaway Plant. It is the responsibility of all QA engineers to direct their efforts exclusively to quality assurance activities.



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| One Supervising Engineer, Quality Assurance (Startup) directs a staff  
| of QA engineers whose responsibilities include the surveillance and  
| audit of the Callaway Test Program activities.

The Manager, Quality Assurance, the Superintendent, Site Quality Assurance, and all Supervising Engineers, Quality Assurance are authorized by the Vice President, Nuclear to stop work on ongoing quality-related activities. The Manager, Quality Assurance notifies the Vice President, Nuclear when a stop work action has been taken. QA engineers are authorized to recommend stop work action where considered necessary.

The Manager, Quality Assurance is responsible for maintaining quality assurance record files for those activities performed by the quality assurance organization.

| The General Manager-Engineering reports to the Vice President,  
| Nuclear and is responsible for engineering, licensing, fuel, project  
| services, procurement other than that done by the Purchasing  
| Department and that associated directly with construction and  
| operations, and an independent overview of plant safety. He provides  
| administrative coordination between the various departments under his  
| direction to assure effective operation of the various disciplines  
| involved in the offsite support and onsite overview of Callaway  
| Plant.

| The Manager, Nuclear Services reports to the General Manager-  
| Engineering, and is responsible for providing direction and  
| administrative guidance for the departments under his control. These  
| groups provide cost control and schedule monitoring activities and  
| various nontechnical functions, i.e., document control and  
| stenographic services. He is also responsible for personnel matters  
| and other miscellaneous nonsafety-related administrative matters for  
| the Nuclear Department.

| The Manager, Nuclear Engineering reports to the General Manager-  
| Engineering and supports the quality assurance effort. He is  
| responsible for directing activities of a staff of engineering  
| personnel. These engineering activities relate to the standard Power  
| Block, NSSS, nuclear safety analyses, site A/E activities, and  
| nuclear requirements imposed by NRC regulations. The Manager,  
| Nuclear Engineering is responsible for assuring implementation of  
| these engineering responsibilities in accordance with established  
| procedures.

The Manager, Nuclear Engineering is responsible for directing the activities of the site geotechnical and meteorological consultant (Dames & Moore) to assure that these activities are conducted in a controlled and orderly manner. The Manager, Quality Assurance is responsible for auditing the activities of this consultant to assure that these activities are conducted in a quality manner.

The Superintendent, Licensing reports to the Manager, Nuclear Engineering, and has engineering responsibilities which include coordination of the utility licensing function.

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| The Manager, Nuclear Safety and Emergency Preparedness reports to the General Manager-Engineering and is responsible for providing an independent overview of nuclear safety and coordinating offsite activities related to the Radiological Emergency Response Plan. The Manager, Nuclear Safety and Emergency Preparedness and staff are located onsite and this staff comprises the Independent Safety Engineering Group (ISEG) and Shift Technical Advisor (STA) personnel. A communication path exists between the Manager, Nuclear Safety and Emergency Preparedness and the Vice President, Nuclear thus providing a direct path to inform management with corporate responsibility for Callaway Plant in matters of safety.

| The Manager, Nuclear Fuel, reports to the General Manager-Engineering, and has overall responsibility for all aspects of the nuclear fuel cycle, including responsibility for preparation of fuel cycle economic studies and for certain aspects of in-core fuel management.

| The Coordinator, Nuclear Development reports to the General Manager-Engineering and is responsible for generic nuclear matters. He maintains an awareness of advanced nuclear activities outside Union Electric Company.

The Manager, Nuclear Construction reports to the Vice President, Nuclear. He is responsible for site fabrication, installation construction, construction completion testing, preoperational testing, and related startup group activities. He is responsible for development and implementation of preoperational tests in accordance with established procedures. The construction manager or constructor is responsible for conducting site activities and directing the field support consultants in accordance with applicable quality assurance requirements and established construction procedures. Field support consultants are those consultants reporting to the construction manager or constructor and whose work would be directed to specific technical activities.

| The Manager, Callaway Plant reports to the Vice President, Nuclear, and is responsible for staffing, training, and operating the Callaway Plant. He coordinates his reviews of design and procurement activities through Nuclear Engineering.

The Purchasing Agent reports to the Vice President, Supply Service who in turn reports to the Executive Vice President. The Purchasing Agent is responsible for commercial aspects involved in the procurement of materials, systems, components and services (excluding engineering services) not delegated to others. He is responsible for maintaining procurement record files for utility purchased materials, parts and services. Bechtel, Westinghouse, and the construction manager or constructor have been assigned procurement responsibilities by Union Electric Company.

| The Manager, Mechanical Engineering reports to the Vice President (or Director), Engineering and Construction who in turn reports to the Executive Vice President. The Manager, Mechanical Engineering provides technical support, as necessary, to the nuclear engineering

staff.

| The Manager, Electrical Engineering reports to the Vice President (or Director), Engineering and Construction. The Manager, Electrical Engineering provides technical support, as necessary, to the nuclear engineering staff.

Utility technical support personnel may be utilized in identifying quality related problems for design and construction activities. These engineers perform checks, surveillances, inspections, or utilize other means for verifying quality in all cases where special technical competence is required. They do not have direct responsibility for the particular phase of work being reviewed.

Where reference is made to the utility's Project Management in the SNUPPS standard text for approval of the potential bidders list or approval of the bid for purchase, this means the Manager, Nuclear Engineering.

Quality assurance records are filed and maintained in a manner to assure they are complete and are readily retrievable. The Document Control Supervisor, who reports to the Manager, Nuclear Services has been assigned the responsibility for filing and maintaining the engineering records except for drawings. The Chief Draftsman, who reports to the Manager, Mechanical Engineering has been assigned responsibility for filing drawings.

In performance of their duties, all Union Electric Company QA personnel are granted sufficient authority and freedom to:

1. Identify quality problems.
2. Initiate, recommend or provide solutions to management through designated channels.
3. Verify implementation of solutions.
4. Control further processing, delivery, or installation of a nonconforming item until the proper disposition of the deficiency or unsatisfactory condition has been approved.

The Union Electric Company Organization is shown on Figure 17.1-1.  
 | The Site Quality Assurance Organization is shown on Figure 17.1-2.  
 The Callaway Plant design and construction organization is shown on Figure 17.1-3.



### 17.1.2 QUALITY ASSURANCE PROGRAM

Union Electric Company, as a SNUPPS utility, has established the overall quality assurance program described in SNUPPS Standard Plant PSAR Section 17.1.2. Specifically, this quality assurance program applies to the design and construction of the Callaway Plant. A commitment to this program is made through a statement in the Standard Quality Assurance Manual which is signed by the Vice President, Nuclear on behalf of Union Electric Company. The Manager, Quality Assurance is responsible to assure implementation of this quality assurance program as applied to quality-related activities.

The SNUPPS Standard Quality Assurance Manual and the SNUPPS Standard Quality Assurance Procedures Manual apply to Union Electric Company. The preparation, issuance, control and revision of this manual and these procedures is described in the SNUPPS utilities section 17.1.2. The SNUPPS Standard Quality Assurance Manual and the SNUPPS Standard Quality Assurance Procedures Manual are supplemented by Union Electric Company quality assurance procedures. The procedures are provided to control particular activities which are unique to Union Electric Company. The Manager, Quality Assurance is responsible for the issuance and control of all initial and revised issues of these procedures. The preparation, issue, control and revision of Union Electric Company quality assurance procedures is controlled by written and approved procedures. The Union Electric Company procedures which were issued and implemented or anticipated at original PSAR Submittal Stage are in the topical listing of Table 17.1-2 of this addendum.

Responsibilities of Bechtel and Westinghouse for development and implementation of a quality assurance program to control design and procurement activities are described in SNUPPS Standard Plant PSAR Section 17.1.2. Sverdrup & Parcel and Associates, Inc., as the site A/E for the Callaway Plant, is responsible for establishing and implementing a quality assurance program to control the design of safety-related materials, structures and systems which are outside the scope of the SNUPPS concept. This program, including a listing of company procedures with applicable criterion cross referenced is described in the Sverdrup & Parcel and Associates, Inc., Addendum 17A.0. Union Electric Company reviews the QA program of these major contractors to determine the acceptability. The Manager, Quality Assurance has primary responsibility for these reviews.

The construction manager or constructor is responsible for developing and implementing a quality assurance program to control construction activities for safety-related materials, structures, systems and components. This program is described in the Daniel International Corporation, Addendum 17B.1. Union Electric Company reviews the QA

## 17.1.15 NONCONFORMING MATERIALS, PARTS OR COMPONENTS

Union Electric Company has established controls to assure that safety-related materials, parts and components not in compliance with requirements of applicable codes, standards, drawings, specifications and other procurement documents are not inadvertently used or installed at the Callaway Plant.

For items within the SNUPPS concept, Bechtel and Westinghouse are delegated responsibility for implementing nonconforming material controls within their scope of work. The responsibility for conduct of audits of Bechtel relative to these controls is delegated to the SNUPPS organization. Bechtel is responsible for conducting audits of Westinghouse. Union Electric Company, through participation by the Manager, Quality Assurance, on the SNUPPS QA Committee, conducts audits of the SNUPPS organization. Union Electric Company requires that all safety-related item nonconformances be documented, reviewed, properly dispositioned and transmitted to responsible organizations for corrective action.

SNUPPS Standard Plant PSAR Section 17.1.15 provides a comprehensive listing of control measures to be implemented for control of nonconforming materials, parts or components. These control measures apply to the Union Electric Company quality assurance program.

SNUPPS Standard Plant PSAR Section 17.1.15 includes a provision for auditing of the nonconforming materials control system of the site A/E by the utility QA organization. The site A/E for Union Electric Company is responsible for review and dispositioning of nonconforming items within their scope of engineering design.

If purchasing of safety-related items outside the scope of the SNUPPS concept is handled by Union Electric Company, engineering is responsible for these controls at supplier locations. Nonconformances are identified, documented and transmitted to responsible organizations for corrective action. The QA organization audits these control measures to assure they are adequate.

The construction manager or constructor is responsible for implementing adequate controls at the site location to identify nonconformance of safety-related items and provide for proper dispositioning. The construction manager or constructor is also responsible for transmitting nonconformance reports to utility management and affected organizations.

If the nonconforming item identified at the site location is included within the scope of the SNUPPS concept, the construction manager or constructor transmits the nonconformance report to the site QA group leader, utility management, and lead A/E. The lead A/E is responsible for review and disposition of these nonconformance reports. For nonconformances involving safety-related items outside the scope of

the SNUPPS concept, the construction manager or constructor transmits the nonconformance report to the site QA group leader, utility management and the site A/E or other affected organization. The Manager, Nuclear Engineering provides for documented review and concurrence of recommended dispositions for items requiring engineering analysis.

The site QA group leader is responsible for auditing the construction manager or constructor to assure nonconformances are properly identified, controlled, reported and dispositioned in accordance with established procedures.

The Superintendent, Site Quality Assurance, the site QA group leader, and the Supervising Engineer, Quality Assurance (Startup) have the authority to initiate stop work action related to nonconformances at the site, as necessary. Prompt notification shall be given to the Manager, Quality Assurance who notifies the Vice President, Nuclear of such action.

The Manager, Nuclear Engineering will provide for a review of nonconformance reports which require disposition by the lead A/E's home office design group. This review will take place after disposition by the lead A/E and will be documented. Review will replace the review done by SNUPPS and will be done to become familiar with the nonconforming conditions and the disposition recommended by the lead A/E. Any concerns which develop from this review will be forwarded to the lead A/E for resolution.

They will be reviewed for quality trends by the construction manager or constructor in conjunction with the other nonconformance reports generated at the Callaway site. The results are documented and submitted to utility management.

## 17.1.18 AUDITS

The Union Electric Company quality assurance program requires that a comprehensive system for planning and conducting audits be implemented in conjunction with performance of activities. Audits are conducted to verify compliance with all aspects of the quality assurance program and to determine the effectiveness of the program.

The Union Electric Company audit program includes the following:

- a. Audits of activities of the SNUPPS organization through joint participation by the Manager, Quality Assurance, as a member of the SNUPPS QA Committee on behalf of Union Electric. Audits of Bechtel are assigned to the SNUPPS organization and audits of Westinghouse are assigned to Bechtel. However, the Manager, Quality Assurance, as a member of the SNUPPS QA Committee, may also participate in selected audits of Bechtel and Westinghouse. The following types of audits are conducted.
  1. Design audits - control of design documents, design verification process, control of issuance of design documents and design interface with other organizations.
  2. Procurement audits - incorporation of SNUPPS requests on procurement documents, adequacy of scheduling, planning and surveillance of procurement progress and design/procurement interfaces.
  3. Quality assurance audits - to provide for analysis of audit data to indicate quality trends and effectiveness of the QA program implementation for the SNUPPS concept.
- b. Internal audits conducted by Union Electric Company personnel on quality related activities at the general office and site locations. These audits are primarily concerned with engineering and procurement activities.
- c. Audits conducted by Union Electric Company personnel on design activities of the site A/E, on construction activities of the construction manager or constructor, and on quality-related activities of the site geotechnical and meteorological consultants and field support consultants.
- d. Management assessment audits conducted by or for Union Electric Company management personnel. These audits are concerned with evaluation of the adequacy and implementation of the Union Electric Company quality assurance program, and analysis of quality trends. Areas audited include engineering, procurement, construction and quality assurance.



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The above audits are performed in accordance with written procedures and are conducted by appropriately trained personnel. These personnel do not have direct responsibility for the area audited. Audit frequencies are established and audits are scheduled on the basis of the relative safety-related significance of the activity and the quality record of the organization performing the quality-related activity.

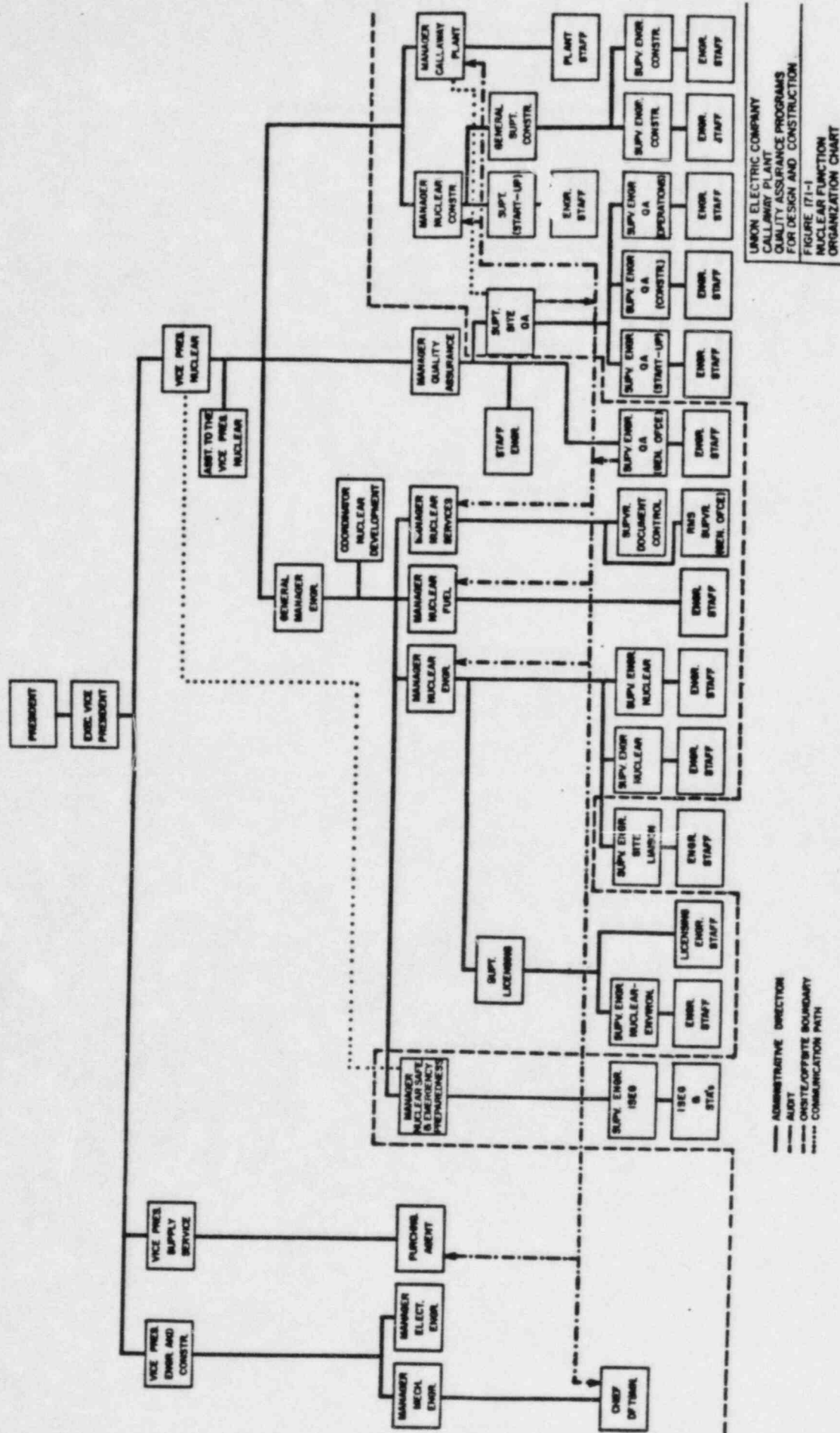
All audits are documented and reviewed with management responsible for the audited activity to assure proper identification of the deficiency, the cause of the deficiency and necessary corrective action required. The audit team leader is responsible for followup action to verify proper implementation of corrective action.

SNUPPS Standard Plant PSAR Section 17.1.18 specifies that the SNUPPS utilities audit program includes an audit by the major contractors to verify and evaluate their suppliers' QA programs. This includes the site A/E. For Union Electric Company, this auditing function does not apply to the site A/E since no procurement responsibilities are delegated to the site A/E.

If purchasing of safety-related items outside the scope of the SNUPPS concept is handled by Union Electric Company, QA personnel with the assistance of engineering and purchasing personnel, as necessary, are assigned this auditing responsibility.

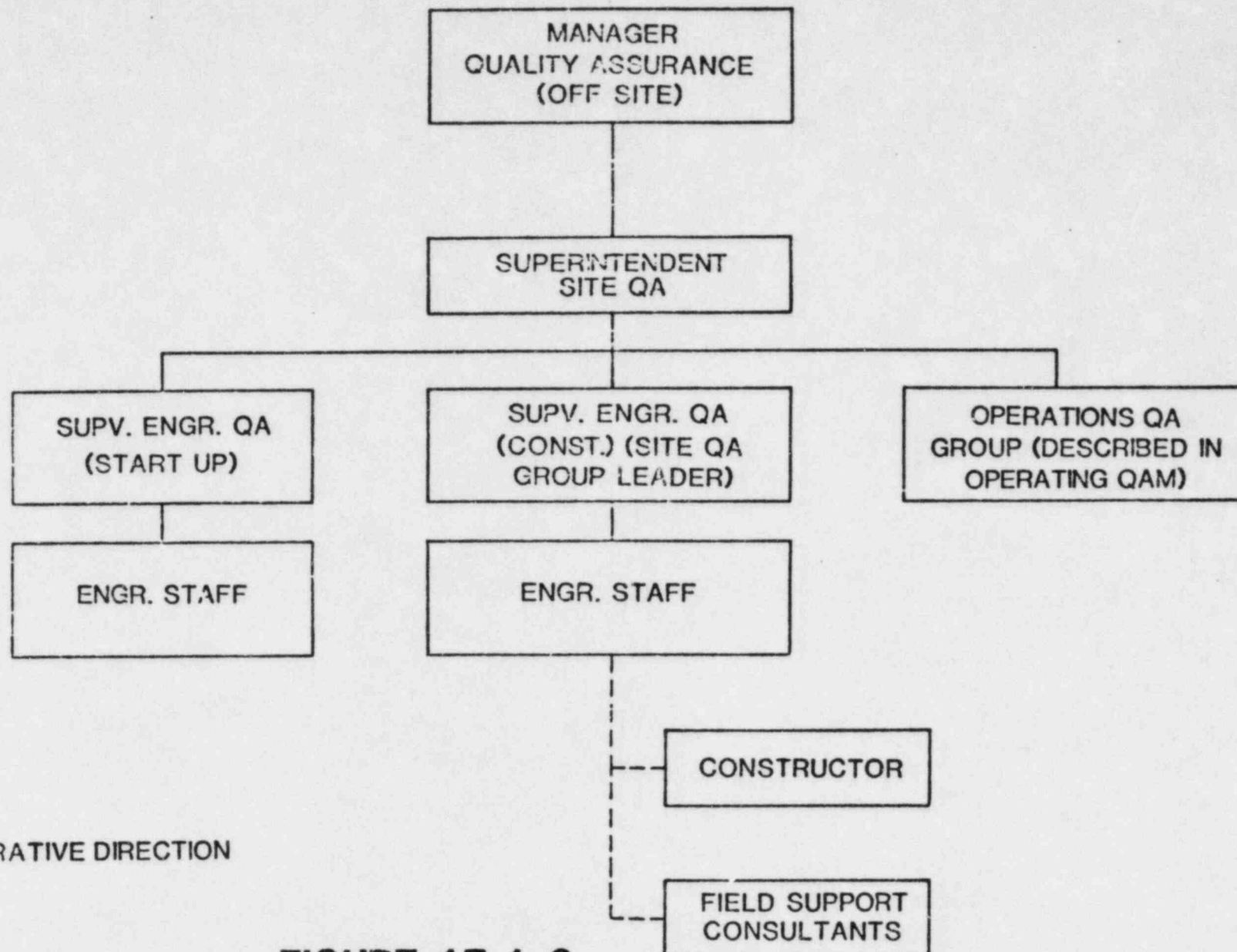
The Manager, Quality Assurance has established a program which provides for the qualification and training of audit personnel. He is responsible for assuring the implementation of a comprehensive system of planned audits.

The Supervising Engineer, Quality Assurance (general office) has the responsibility for implementing audits of Union Electric Company personnel at the general office location, the site A/E, and of the site geotechnical and meteorological consultants. The site QA group leader has the responsibility for implementing audits of the Manager, Nuclear Construction, the construction manager or constructor, and field support consultants at the site location. The Supervising Engineer, Quality Assurance (Startup) has the responsibility for implementing audits of the Callaway Test Program activities. Audits are conducted in accordance with written procedures.



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**FIGURE 17.1-2**  
UNION ELECTRIC SITE  
QUALITY ASSURANCE ORGANIZATION

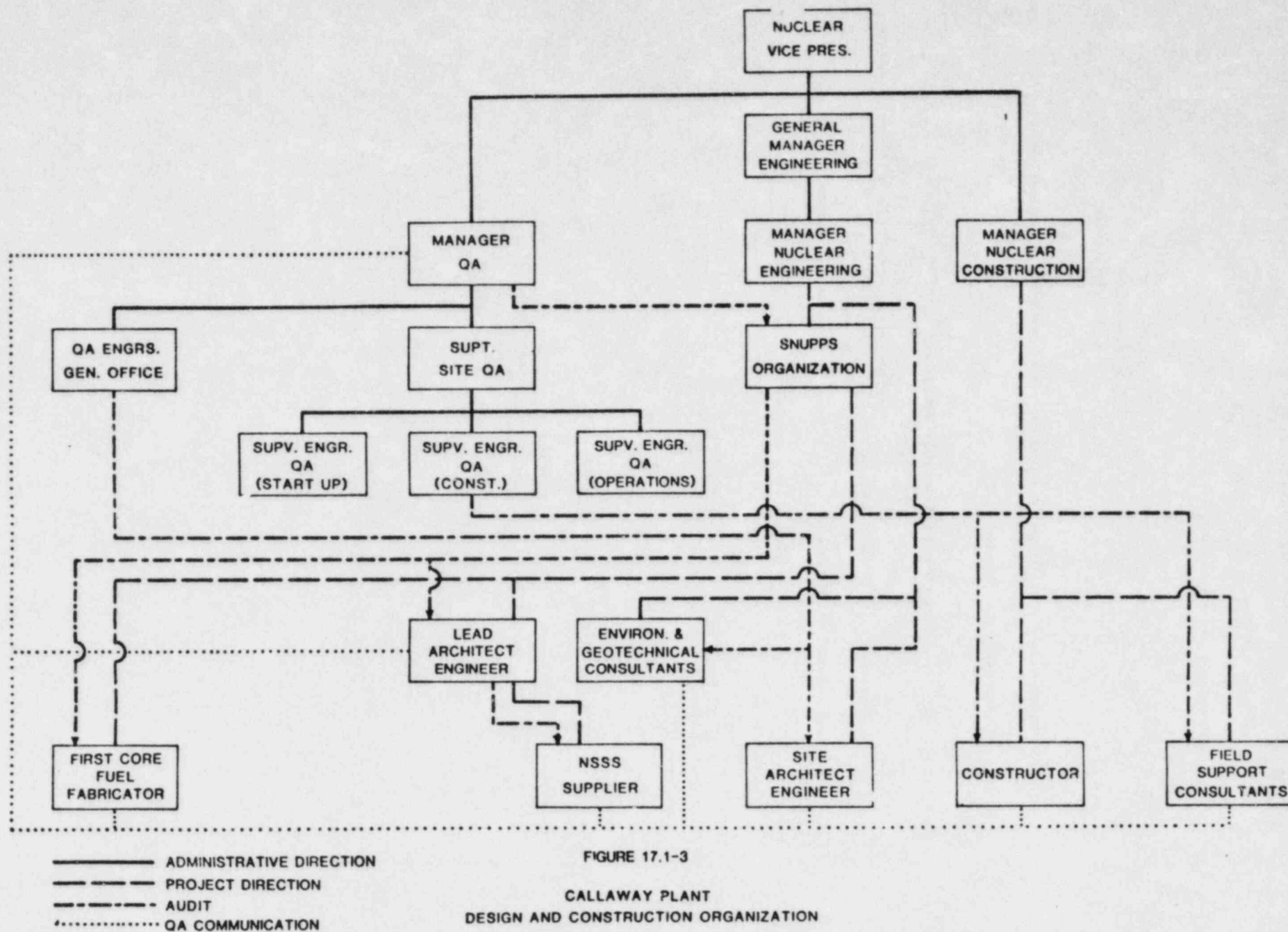


FIGURE 17.1-3

CALLAWAY PLANT  
DESIGN AND CONSTRUCTION ORGANIZATION

## 17B.1 DANIEL QUALITY ASSURANCE (QA) DURING DESIGN AND CONSTRUCTION

Daniel International Corporation here after referred to as Daniel, acting as Agent for Union Electric Company has been assigned the contractor responsibilities for the Callaway Plant Units Number 1 and 2. Daniel's scope of work will consist of receiving design information as prepared by Bechtel, Westinghouse, Sverdrup & Parcel, and Union Electric; receiving manufactured items and materials as procured by Bechtel, Westinghouse, and Union Electric; procuring additional bulk materials and consumable items; procuring and/or administering the services of various subcontractors; planning and scheduling the activities of Daniel and subcontractor forces to perform construction, testing and inspection activities in accordance with the design.

This section of the addendum contains a description of the quality assurance program for the scope of work performed by Daniel or its subcontractors. This program is incorporated into and is an integral part of the total Quality Assurance Program for the Callaway Plant. The program has been established to implement the applicable requirements of 10 CFR 50, Appendix B, and the regulations, guides and standards described in Section 17B.1.2 of this addendum.

Daniel will maintain a staff of quality assurance personnel at the site to perform verification activities which are necessary to provide adequate confidence that site construction activities are being carried out in accordance with the established program.

## 17B.1.1 ORGANIZATION - DANIEL INTERNATIONAL CORPORATION

Figure 17B-1 shows the structure and interrelationship of the Daniel International Corporation organizations involved in construction of the Callaway Plant.

The President and Chief Operating Officer has assigned the responsibility for the construction management of power projects to the President, Power Group, and the quality management to the Group Vice-President, Operations Support.

The Vice-President of Quality and Technical Services reports to the Group Vice-President, Operations Support, and is responsible for formulating the Quality Assurance Program for work assigned to Daniel and for assuring that the assigned safety-related activities are carried out in conformance with the program. He communicates directly with the President of the Power Group, as necessary, to resolve quality problems.

| The Division Manager, Quality and Technical Services reports directly  
| to the Vice President, Quality and Technical Services. The Division  
| Manager, Quality and Technical Services is responsible for all  
| Quality and Technical Services support to Daniel projects and for  
| personnel assigned to the Greenville office as well as project sites.

| The Director, Quality Support Services; Director, Corporate Quality;

| Manager, Technical Services; and Manager, Quality Engineering report directly to the Division Manager, Quality and Technical Services.

| The Director, Corporate Quality reports to the Division Manager, Quality and Technical Services and is responsible for the management and administration of all project quality personnel and for the proper implementation of the quality portion of the Quality Assurance Program.

| The Quality Engineering Manager reports to the Division Manager, Quality and Technical Services and has additional responsibility for Quality Engineering at the project. He communicates directly with the Director, Corporate Quality and the Project Quality Engineer as necessary to resolve quality problems.

| The Director, Quality Support Services reports to the Division Manager, Quality and Technical Services. He is responsible for formulating the Quality Assurance Program for work assigned to Daniel and for auditing the assigned safety-related activities to verify that they are carried out in conformance with the program. He communicates directly with the President, Power Group and the Director, Corporate Quality as necessary, to resolve quality problems.

The Manager, Technical Services reports to the Division Manager, Quality and Technical Services and is responsible for providing construction services to the Power Group and other Daniel organizations. The Manager, Welding Technology and Manager, Civil Technology report to the Manager, Technical Services and are responsible for providing procedures such as special process control procedures and other technical services to the Power Group and other organizations.

The following paragraphs describe the safety-related functions and responsibilities of the Quality and Technical Services Division, Power Group, and Project Management.

#### 17B.1.1.1 Quality And Technical Services Division

##### 17B.1.1.1 (A) Corporate Quality

The Director, Corporate Quality is assisted by Regional Quality Managers who are delegated the responsibility and authority for managing the required activities for the assigned projects. The Regional Quality Manager is responsible for implementing the Quality Assurance Program and assuring that the program is in compliance with the applicable job requirements. The Director, assisted by the Regional Quality Managers, is responsible for the following:

- a. Selecting, training, and supervising a staff of qualified project Quality personnel to implement the project portion of the Quality Assurance Program. These Quality personnel are totally independent of construction project management.



- b. Coordinating the Quality Assurance Program and detailed procedures; reviewing and evaluating the project Quality Assurance Program and procedures for adequacy and effectiveness.
- c. Providing assistance to and working with project management and subcontractors in developing, maintaining and implementing the detailed procedures and instructions necessary to correctly implement this program and the job requirements.
- d. Providing an independent channel of communication to corporate management on quality-related problems, initiating necessary corporate management action to resolve program deficiencies and assuring satisfactory solutions have been achieved.
- e. Reviewing and approving changes to the Quality Assurance Program.
- f. If necessary, shall initiate stop work action until acceptable solutions to identified deficiencies have been obtained.
- g. Provide an independent channel of communications between projects on quality related problems and initiating actions to assure that problems experienced on other Daniel projects are not repeated at Callaway.

The Regional Quality Manager assigns a Project Quality Manager to be resident Quality administrator for the Project Quality Organization. He is under the direct administrative control of the Regional Quality Manager (administrative control being the authority to hire, discharge, and approve payrate). The Project Quality Manager shall have six years of related work experience and/or education with a minimum of two years' experience in Nuclear Quality Assurance functions. He has the responsibility, authority and organizational freedom to independently identify quality related problems, to initiate management action which results in acceptable solutions, and to verify satisfactory implementation of such solutions. He is responsible for all activities performed by the project quality organization. He is responsible for the following:

- a. Assuring that all quality operations and materials are in compliance with job requirements, the quality assurance program and the detailed procedures and instruction.
- b. Obtaining necessary services from corporate organizations.
- c. Reviewing and approving detailed project Quality procedures.
- d. Consulting with the Project Manager on coordination of Project Quality activities to meet the overall project objectives.

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- e. Consulting with the Project Manager on problems affecting the quality of construction operations and materials.
- f. Stopping work at his discretion. He has the authority to stop field construction work any time the quality of the work is in question.
- g. Advising the Project Manager and Regional Quality Manager of Quality Program status.
- h. Assuring project Quality personnel are properly trained and qualified.

He is assisted by a Project Quality Assurance Engineer, Project Quality Inspection Manager, Project Quality Engineer, and Project Quality Services Engineer. The Project Quality Assurance Engineer reports to the Project Quality Manager and is responsible for the following:

- a. Developing and executing a comprehensive program of surveillance and audit to assure that the project control program is correctly implemented and documented to satisfy construction requirements and that it is in compliance with the Quality Assurance Program.
- b. Providing documentation of his audit activities to affected management for review and necessary corrective action.
- c. Reauditing deficient areas or items as necessary to assure acceptable completion of required corrective actions.
- d. Stopping work at his discretion. He has the authority to stop field construction work at any time the quality of work is in question.
- e. Consulting with and advising the Project Quality Manager on problems affecting the quality of construction.
- f. Providing assistance to project management in developing adequate control procedures and instructions.
- g. Auditing and evaluating the project control procedures and instructions for adequacy, effectiveness, and conformance to requirements.
- h. Auditing the QA programs of Daniel suppliers and subcontractors providing materials, equipment, or services.

He is assisted by a trained staff of Quality Assurance Engineers. The corporate and project quality assurance audits within the Daniel organizations are in addition to the surveillances and audits performed by the Union Electric Company.

The Project Quality Inspection Manager reports to the Project Quality

Manager and is responsible for the development, implementation and administration of the project Quality Inspection Program. He directs the work of discipline Quality Supervisors and Quality personnel that perform inspection, examination, testing, and documentation activities. The performance of subcontractor supplied test services are also directed by discipline Quality Supervisors. The Project Quality Inspection Manager is responsible for the following:

- a. Controlling nonconforming materials, parts, and components with a documented procedure to prevent their inadvertent use or installation.
- b. Selecting, training, and assigning experienced and qualified Quality Supervisors and Inspectors to perform inspections.
- c. Controlling nondestructive examination in accordance with approved project procedures
- d. Providing a system of inspections to assure that the provisions of the quality assurance program and the Quality procedures are complied with in the performance and documentation of construction activities.
- e. Consulting with the Project Quality Manager on problems affecting the quality of construction operations and materials.
- f. Initiating work stoppage as required to achieve conformance with requirements. The Project Quality Inspection Manager has the authority to stop the further processing of, or performance of work on, items/areas found to be in nonconformance with project requirements. Work stoppage is accomplished through use of a QC hold tag, or other suitable control methods, as prescribed in the work stoppage and nonconformance control procedures.
- g. Identification of quality problems; initiation of action which results in solutions; and, verification that corrections have been satisfactorily implemented.

He is assisted by a trained staff of Quality Supervisors/Inspectors.

The Project Quality Engineer reports to the Project Quality Manager and is assigned responsibility for technical input and the development of Project Quality Programs. The Project Quality Engineer is responsible for:

- a. Reviewing and concurring with the QA programs of Daniel suppliers and subcontractors providing materials, equipment or services prior to purchase award.
- b. Providing technical assistance in supplier/subcontractor audits and receiving of materials, equipment or services as requested by the Project Quality Services Engineer.



- c. Reviewing and concurring that Project documents such as Construction Procedures, purchase requisitions and design specifications are in compliance with codes, standards and project Quality requirements.
- d. Providing technical direction and preplanning for the Project Quality Department by translating the applicable requirements of the owner supplied design documents into procedures, checklists, and instructions used to perform examinations, testing and inspections of the construction work, provide identification of calibration tools and calibration requirements.
- e. Providing technical input and control of nonconformance applicable to the Quality organization as generated by Project personnel and assist in follow-up and close-out of approved corrective actions.
- f. Selecting, training and assigning experienced and qualified engineers to perform the Quality Engineering function.
- g. Providing Quality Department input to the client, NRC and Daniel audits.
- h. Performing as technical interface for the Quality Organization with Daniel Construction Engineering and others as required.
- i. Develop quality inspection, engineering and services procedures and instructions. Assist the Project Quality Assurance Engineer in the development and issuance of Quality Assurance procedures.

The Project Quality Engineer is assisted by a trained staff of Discipline Quality Engineers.

The Project Quality Services Engineer reports to the Project Quality Manager and is responsible for the implementation and administration of quality vendor programs, quality receiving, quality documentation and the quality calibration program. The Project Quality Services Engineer is specifically responsible for:

- a. Reviewing and qualifying suppliers and subcontractors Quality programs and providing pre and post award surveillance and audit of off site suppliers and subcontractors.
- b. Selecting, training and assigning experienced and qualified personnel to perform Receiving inspections, vendor surveillance activities, documentation reviews/processing, and calibration functions at the project.
- c. Controlling the calibration of test and measuring equipment in accordance with documented approved procedures.



- d. Inspecting equipment and materials at the time of receipt to assure compliance to the purchase order, specification and other applicable project requirements.
- e. Providing a Quality Document distribution, review, and filing program to assure legible records which verify that the specified quality activities were performed and that construction operations and materials are in conformance with the design documents.

The Project Quality Services Engineer is assisted by a trained staff of qualified Quality Engineers/Supervisors/Inspectors.

17B.1.1.1 (B) QUALITY SUPPORT SERVICES

The Director, Quality Support Services, assisted by an appropriate staff of managers, engineers and technicians is responsible for the following:

- a. Develop and maintain the Corporate Quality Certification Program. Review and concur with project quality certification procedures, and perform periodic audits on projects to assure compliance with project and corporate certification requirements.
- b. Develop, maintain and implement corporate quality audit programs, procedures and schedules.
- c. Assure that auditors participating in quality audits are properly indoctrinated, trained and qualified.
- d. Perform audits of projects and follow-up to assure effective corrective action and to verify implementation of the Quality Assurance Program as it applies to those safety-related structures, systems and components identified in Table 3.2-1 of the Standard Plant PSAR.
- e. Perform audits of the corporate quality organization.
- f. Coordinate project and corporate supplier qualifications and surveillances.
- g. Develop and maintain quality programs and addenda.
- h. Collect and analyze data which will provide quality related trend information to the project.
- i. Develop and maintain standard administrative procedures.
- j. Coordinate corporate review of site quality procedures.
- k. Provide corporate support services in areas of auditing record maintenance, calibration, non-conformance controls, procedures development, etc.

1. Reviewing and concurring as required with the QA programs of Daniel suppliers and subcontractors providing materials, equipment, or services prior to purchase award on a selected basis.

The Daniel corporate and site quality assurance audits are in addition to the surveillances and audits performed by the Union Electric Company.

| 17B.1.1.1 (C) QUALITY ENGINEERING

| The Quality Engineering Manager (QEM) is responsible for providing the initial overall direction to the Project Quality Engineer (PQE) relative to the PQE's responsibilities. The QEM will monitor the PQE to evaluate consistency of that operation with the overall requirements and take the lead in assuring that the consistency is maintained as appropriate.

17B.1.1.1 (D) TECHNICAL SERVICES

| Technical Services is responsible for providing the following as required:

- a. Technical support to Corporate Quality and Quality Support Services.
- b. Qualified Welding Procedure Specifications and other procedures necessary for control of special processes including inspector and testing procedures, assistance in personnel training and qualification.
- c. The Corporate Level III nondestructive examination function including procedures, training and certification of personnel, and has final authority for NDE interpretation.
- d. Coordination of authorized inspection agency services.

| Technical Services will provide assistance as required in the following areas:

- a. Qualified consulting services to the projects in engineering disciplines and in specialty areas such as concrete, rigging, insulation and roofing.
- b. Assistance in developing and reviewing project procedures.
- c. Indoctrination and training services in areas of technical expertise.
- d. Code interpretation and uniform fabrication and construction procedures necessary to meet code requirements in the electrical, instrumentation, mechanical and civil disciplines.

17B.1.1.2 (Incorporated into 17B.1.1.1)

17B.1.1.3 Power Group

The Power Group is headed by the President, Power Group who reports to the President and Chief Operating Officer. The Power Group is assigned responsibility for the construction of nuclear power generating facilities undertaken by the company. The Group Vice-President of the Power Group is responsible for the administration of construction operations for all power projects. He is assisted by Regional Managers who administer the nuclear power construction assigned to their regions.

17B.1.1.4 Project Management

The Daniel Project Manager reports to the Power Group Regional Manager and represents Daniel in all matters relating to the Callaway Plant; and is fully responsible for the proper Construction, Construction Engineering and Services implementation and satisfactory operation of the construction Quality Assurance Program.

The Project Manager is completely responsible for satisfactorily executing the construction of the assigned work in conformance with the job requirements and the contractual interest of the Owner in terms of construction quality, safety, efficiency, and schedule. He is responsible for the following:

- a. Assuring that all construction operations and material are in compliance with job requirements, the Quality Assurance Program and the detailed procedures and instructions.
- b. Obtaining necessary services from corporate organizations.
- c. Reviewing and approving detailed project procedures.
- d. Consulting with the Project Quality Manager on problems which affect the quality of construction operations and materials.
- e. Stopping work at his discretion. He has the authority to stop field construction work any time the quality of the work is in question.
- f. The control of purchased material, equipment and services. Procurement is controlled by implementing procedures in Daniel's Construction Procedures Manual which assure that the procurement documents contain or reference applicable requirements of 10 CFR 50, Appendix B, including reference that subcontractor and supplier personnel performing QA functions have sufficient authority and organizational freedom to effectively implement their respective QA Programs.

The Project Manager is assisted in the discharge of his responsibilities by the Construction Manager and the Services



Manager. He receives on-site staff assistance in planning and cost control, and as the unit approaches construction completion will monitor and coordinate this work with Union Electric startup and operating staff.

The Construction Manager is assigned responsibility for Managing and directing the construction engineering and construction labor activities at the project site, he is responsible for providing the project with authoritative interpretation of the Owner provided design documents and job requirements and for providing the construction operation with the technical support required to assure that construction conforms to the job design requirements. He is responsible for developing and implementing procedures and other instructions necessary to perform engineering and construction functions in accordance with the QA program and job requirements. The Construction Manager is assisted by an appropriate staff of discipline managers. He is responsible for the following:

- a. Reviewing design documents to verify that they contain sufficient detail to provide a complete basis for the assigned construction.
- b. Translating the applicable requirements of the Owner supplied design documents into supplementary project specifications, drawings, procedures and instructions as required to correctly perform procurement, fabrication, and installation of the assigned construction.
- c. Preparing, reviewing and approving purchase requisitions.
- d. Assisting in the evaluation of bids and proposals.
- e. Controlling fabrication and installation with a system of documented procedures and instruction.
- f. Dispositioning nonconforming items.
- g. Controlling special processes such as welding, NDE, and heat treating with documented procedures.
- h. Working closely with contractors to assure proper control of job surveying activities, including field layout of lines and grades.
- i. Assisting in planning and scheduling, in the preparation of estimates, work orders, and changer orders, and in the cost control program.
- j. Performing construction in accordance with project requirements and in accordance with documented control systems and procedures.
- k. Performing construction operations in conformance with qualified procedures and with personnel qualified to these



procedures when applicable.

- l. Requiring all subcontractors to perform their assigned work in accordance with approved procedures and design requirements using personnel qualified to these procedures, when applicable. He has the authority to assign and remove construction personnel as required to assure quality workmanship.
- m. Stopping work at his discretion and he shall in all cases stop work at the direction of the Project Manager.
- n. Coordination/supervision of various subcontractors in the performance of their assigned scope of work and for execution of the work in a manner that is consistent with the quality intent of the project.
- o. Generating contract packages in conjunction with the Purchasing function.
- p. Coordinating engineering matters with the Design Engineer.
- q. Establishing and implementing procedures for the collection and consolidation of as built information.

The Construction Completion Coordinator reports to the Project Manager and is responsible for the following:

- a. Reviewing, and commenting on procedures issued by Bechtel for hydrostatic tests, flushing/cleaning and component inspection tests, and plant system.
- b. Preparing procedures for system turnover to the client.
- c. Identifying and procuring test equipment required to conduct the assigned construction testing.
- d. In conjunction with the client Startup Supervisor, planning the system turnover program, conducting system walkdown and turnovers, and in working-off construction release exceptions (deficiencies) after system turnover.
- e. In conjunction with the Discipline Managers, ensuring that systems are ready for construction testing and preparing system turnover packages.
- f. In conjunction with the client Startup Supervisor, defining the scope of systems and partial systems to be turned over.
- g. Developing, implementing and documenting required department training and indoctrination programs.
- h. Monitor construction progress to ensure that systems will be sufficiently completed to allow construction testing and

turnover to Union Electric per project schedule with minimal number of release exceptions (deficiencies). Work closely with Construction Superintendents and Project Planner/Scheduler to accomplish this.

The Services Manager reports to the Project Manager and is responsible for providing warehouse, purchasing, subcontract administration, and document control services. He is responsible for the following:

- a. Receiving, storing, and maintaining accountability of equipment, materials, and tools; coordinating with the Construction Manager who shall provide necessary equipment required in handling materials; and notifying Quality Control when materials and equipment are available for inspection and tests.
- b. Obtaining bids from suppliers or subcontractors, coordinating pre-award surveys and post-award surveillance, inspection and audit, and issuing purchase orders and subcontractors.
- c. Maintaining a properly protected project file of legible records that verifies that the specified quality control activities were performed and that construction operations and materials are in conformance with the design documents.
- d. Providing a document distribution and control procedure which shall assure that the latest approved documents and job requirements are available for construction.

The Service Manager is assisted by the Material Control Manager, the Purchasing Manager, the Document Control Manager, and the Subcontractor Manager.

#### 17B.1.2 QUALITY ASSURANCE PROGRAM

The Quality Assurance Program has been established to control assigned construction, purchasing, engineering, and related services. The program applies to those safety-related structures, systems, equipment, and components that prevent or mitigate the consequences of postulated accidents that could cause undue risk to the health and safety of the public. Safety-related items are identified in the SNUPPS Standard Plant PSAR, Table 3.2-1.

A Corporate Management commitment to the program is made through a Statement of Authority in the Construction Procedures Manual which is signed by the Group Vice-President, Power Group. The applicable portions of the SNUPPS Standard Quality Assurance Manual apply to Daniel International Corporation.

The Daniel Construction Procedures Manual contains the procedures and instructions which describe the implementation of the Quality Assurance Program in this addendum. The procedures and instructions are developed and administered by the project organization with

review and concurrence by Project Quality Assurance. Prior to issuance, the procedures and instructions in the administrative section of the Construction Procedures Manual are forwarded to Union Electric Company for review and approval. Construction procedures and instructions are issued prior to performing the activity which they control. Table 17B-1 lists the topics or activities which shall be controlled by documented procedures and instructions. The Construction Procedures Manual includes provisions for control and revision of Construction Procedures.

The Construction Procedures Manual also includes appropriate procedures and provisions for indoctrination, training and qualification, as applicable, of personnel as to the purpose, scope and implementation of quality related instructions and procedures including the principles and techniques of the activity being performed.

The President of the Power Group and Vice-President Quality and Technical Services shall provide for regular management review of the adequacy and effectiveness of the Quality Assurance Program. This review shall be performed by management above and/or outside the project organization to assure achieving an objective program assessment.

The Quality Assurance Program for construction activities complies with the requirements of 10 CFR 50, Appendix B and follows the guidance of NRC Regulatory Guides and ANSI Standards listed in Chapter 17.0, Section 17.1.2 of the SNUPPS Preliminary Safety Analysis Report with one minor variation in relation to Regulatory Guide 1.146. The crediting of experience points will place more value on nuclear Quality Assurance auditing. Credit for experience varies in assignment of total point value; Daniel allows eleven (11) points as compared to ten (10) points in Regulatory Guide 1.146. Specifically, Daniel places more emphasis on QA auditing experience and allocates five (5) points as compared to four (4) points in Regulatory Guide 1.146.

The elements of this Quality Assurance Program apply only to those safety-related structures, systems, and components identified in Table 3.2-1 of the Standard Plant PSAR. (The current version of this table is located in the SNUPPS Standard Plant FSAR).

### 17B.1.3 DESIGN CONTROL

Architect-engineering is not performed by Daniel International Corporation on nuclear power plant projects, and it is not the intent of the Quality Assurance Program to describe any internal relationships or responsibilities for fulfilling this function. Daniel functions principally as the Contractor, Daniel translates the applicable requirements of the Owner supplied design documents into supplementary project specifications, drawings, and develops and provides the procedures, instructions and control systems to assure that assigned construction, fabrication, installation, and procurement are in conformance with specified codes, approved



specifications, drawings, and other job requirements. Field design control, to assure that construction is in conformance with the design documents, is accomplished through design document control and field change control procedures.

QA audits of this section of the program are planned, scheduled, performed, and documented in accordance with section 17B.1.18 of this addendum.

#### 17B.1.3.1 DESIGN DOCUMENT CONTROL

Daniel provides procedures which control the review, release, distribution, and use of design documents received at the site to assure their adequacy for construction and to determine the types of supplemental project specifications, drawings, procedures or instructions required to properly plan, control, and implement the prescribed work.

Implementing specifications drawings, procedures, and instructions are reviewed and approved by appropriate project management prior to start of the affected activity according to procedures contained in the Construction Procedures Manual. The detailed project procedures and instructions are contained in the Construction Procedures Manual.

A document control procedure shall describe the controls which assure that revisions and design changes are distributed to document holders. Superseded design documents shall be controlled to prevent their incorrect use.

#### 17B.1.3.2 FIELD CHANGE CONTROL

Daniel shall request changes to and assure implementation of changes in design documents in accordance with a procedure for the control of field changes. Project personnel shall request changes in design documents due to potential or actual materials, equipment, or structure interferences. Field change requests shall be approved by the organization that performed the original design or by another responsible organization as designated by Union Electric Company.

#### 17B.1.4 PROCUREMENT DOCUMENT CONTROL

Daniel employs procurement document control procedures which assure that procurement documents receive review and concurrence by quality control personnel knowledgeable in the Quality requirements. This review verifies that quality requirements are appropriate, are correctly stated, are capable of being verified and controlled, that the document includes or references appropriate acceptance and rejection criteria, and has been prepared in accordance with Quality Assurance Program requirements. Engineering personnel shall review procurement documents to assure that technical requirements in the design documents have been correctly imposed. This review will be performed by personnel other than those responsible for preparing the documents. Documented evidence of this review and concurrence shall be provided and available for verification. Revisions or changes to



procurement documents that affect technical or quality assurance aspects of the procurement are subjected to the same review requirements as the original document.

Procurement documents issued by Daniel shall identify those pertinent requirements of 10 CFR 50, Appendix B, which must be complied with and described in the subcontractor's or supplier's QA Program. Subcontractors and suppliers shall be evaluated before the award of the procurement order or contract to assure that procurement requirements can be met. Supplier and subcontractor QA Programs are subjected to a review and concurrence by personnel knowledgeable in QA prior to implementation of activities affected by the program. Procurement documents contain the following information, as appropriate:

- a. Applicable design basis technical requirements, including regulatory requirements, component and material identification, drawings, specifications, codes and industrial standards, including their revision status, tests, and inspection requirements, and process instructions for such activities as fabrication, special cleaning, erecting, packaging, handling, shipping, storing, preserving and inspecting.
- b. Requirements which identify the documentation to be prepared, maintained, submitted, and made available to Daniel for review and/or approval, such as drawings, specifications, procedures, inspection and fabrication plans, inspection and test records, personnel and procedure qualifications, and materials, chemical, and physical test results.
- c. Requirements for the retention, control, maintenance, and disposition of records.
- d. Daniel's and Owner's right of access to supplier's or subcontractor's facilities and records for inspection and audit.

QA audits of this section of the program are planned, scheduled, performed, and documented in accordance with section 17B.1.18 of this addendum.

#### 17B.1.5 INSTRUCTIONS, PROCEDURES AND DRAWINGS

The Quality Assurance Program requires that activities affecting quality at the Callaway Plant be prescribed by and accomplished in accordance with documented instructions, procedures, drawings, or checklists appropriate to the circumstances.

The program established to control activities affecting quality provides measures for:

- a. The preparation of drawings, procedures, instructions, checklists or their equivalent of a type appropriate to the

activity and its importance to safety.

- b. The inclusion in these documents of appropriate quantitative and qualitative acceptance criteria for verifying that an activity affecting quality has been satisfactorily accomplished.
- c. The approval of these documents by responsible personnel prior to accomplishing an activity.
- d. The use of approved drawings, procedures, instructions, checklists or their equivalent to accomplish an activity.

QA audits of this section of the program are planned, scheduled, performed, and documented in accordance with section 17B.1.18 of this addendum.

#### 17B.1.6 DOCUMENT CONTROL

The Quality Assurance Program requires procedures to control documents which prescribe activities affecting the quality of safety-related structures, systems and equipment. Documents controlled by this system include, but are not limited to:

- a. Daniel's Construction Procedures Manual (includes project administrative, inspection, test, work, engineering and other required project control procedures and instructions).
- b. Design drawings and specifications.
- c. Construction and installation drawings.
- d. Procurement documents.

Daniel shall establish measures for document control which include:

- a. Review of documents, such as instructions, and drawings, and changes thereto, prior to release to assure that the quality requirements are sufficiently, clearly, and accurately stated and authorized. Reviewers shall have access to required background information and possess an understanding of the requirements and intent of the original document.
- b. Identification of individuals or groups responsible for reviewing, approving, and issuing documents and revisions thereto.
- c. Review and approval of changes to documents by the same organizations that performed the original review and approval unless delegated by Union Electric Company to another qualified organization.
- d. Control of the distribution of documents to responsible Daniel and subcontractor individuals at the location where

the prescribed activity is to be performed in a timely manner and prior to the onset of work.

- e. Assurance of prompt inclusion of approved changes where applicable into instructions, procedures, drawings, or other appropriate documents associated with the change.
- f. Control of documents, including approved changes thereto, at use locations to preclude inadvertent use of obsolete or superseded documents.
- g. Providing document lists that identify the current revision number of each document and to update and distribute the lists to predetermined responsible personnel on a timely basis in accordance with written procedures or instructions.

Measures which Daniel has implemented for document control are contained in the Construction Procedures Manual. These procedures specify how document control activities performed by Daniel personnel shall be carried out and designate who is responsible for performing the activity.

QA audits of this section of the program are planned, scheduled, performed, and documented in accordance with section 17B.1.18 of this addendum.

#### 17B.1.7 CONTROL OF PURCHASED MATERIAL, EQUIPMENT AND SERVICES

The Quality Assurance Program establishes controls to assure that purchased material, equipment, and services whether purchased directly or through subcontractors, conform to the procurement documents. These measures shall include provisions, as appropriate, for source evaluation and selection, inspection, surveillance and audit at the source, and examination of products upon delivery.

Daniel is responsible for establishing measures for the control of purchased material, equipment and services, which include:

- a. Procedures for evaluation of suppliers which are developed by knowledgeable personnel competent in determining the ability of supplier to provide acceptable quality products. The QA, QC, and Engineering organizations participate in the evaluation of those suppliers providing critical components. Purchase of simple off-the-shelf items may be made without requiring a pre award audit.
- b. An evaluation of supplier which is based on one or more of the following:
  - 1. An evaluation of supplier's Quality Assurance Program to verify the ability of the supplier to comply with those elements of 10 CFR 50, Appendix B that are applicable to the type of material, equipment, and services being procured.



2. A review of previous records and performance of suppliers, which have supplied similar articles of the type being procured.
  3. A survey and evaluation of the supplier's facilities and Quality Assurance Program must be conducted if no previous records are available to determine capability to supply a product which meets design, manufacturing, and quality requirements.
- c. Documentation and filing of the results of surveys and evaluations. Where surveys and audits cannot be conducted, inspection and surveillance are provided as acceptable alternatives.

Based upon the complexity of purchased items and supplier performance history, Daniel determines the need for and performs source evaluations, inspections or audits to assure the required quality of the items. Surveillance of supplier's fabrication, inspection, testing, and shipment of materials, equipment and components is planned and performed in accordance with written procedures which assure conformance to the purchase order requirements. These procedures provide for:

- a. Instructions which specify those characteristics or processes to be witnessed inspected or verified, and accepted including the acceptance criteria; which describe the method of surveillance and the extent of documentation required; and which specify those responsible for implementing these instructions.
- b. Audits or surveillances which assure that the supplier complies with quality requirements. Surveillance is performed on those items where verification of procurement requirements cannot be determined upon receipt.

Daniel establishes procedures for receiving inspections at the construction site of supplier furnished material and equipment to assure the following:

- a. The material, equipment or component is properly identified and corresponds with the procurement documentation.
- b. Inspection of the material, component, equipment and associated records is performed and judged acceptable in accordance with predetermined quality instructions.
- c. Documentary evidence, when required, of material, equipment or component conformance to procurement requirements is available at the plant site prior to use or installation.
- d. Items accepted and released are identified as to their inspection status and forwarded to a controlled storage area or released for installation or further work.



- e. Nonconforming items are controlled, segregated where practical, and identified until proper disposition, correction, and acceptance is accomplished.

The extent of the acceptance methods and associated verification activities will vary and be a function of the relative importance to safety and complexity of the purchased item or service and the suppliers past performance. Procedures will provide for the acceptance of simple "off-the-shelf" items based exclusively on receiving inspection with no supplier-generated quality verification documentation requirements. Site receiving inspection activities will be documented. Supplier documentation, when required, is reviewed and accepted by appropriate Daniel Quality Control personnel prior to or during receipt acceptance of the item procured.

Daniel requires as a minimum, supplier documentation which meets the specific procurement requirements and is traceable to the item procured.

Daniel suppliers are required to provide documentation which identifies any procurement requirements which have not been met, together with a description of those nonconformances dispositioned "use as is" or "repair".

QA audits of this section of the program are planned, scheduled, performed, and documented in accordance with section 17B.1.18 of this addendum.

#### 17B.1.8 IDENTIFICATION AND CONTROL OF MATERIALS, PARTS AND COMPONENTS

The Quality Assurance Program requires procedures which implement a system of identification and control of materials, parts and components, including partially fabricated assemblies, important to safety such that traceability to associated documentation is assured. Documentation is required to verify that materials, parts and components are correctly identified prior to release for assembling, shipping and installation.

Daniel is responsible for establishing measures for identification and control of materials, parts and components which include the following:

- a. Procedures which describe identification and control of materials, parts, and components, including partially fabricated subassemblies.
- b. Identification requirements which are compatible with the identification requirements specified in the design drawings and specifications.
- c. Traceability of items as required by codes, standards or specifications, the associated documentation, such as drawings, specifications, purchase orders, manufacturing and inspection documents, deviation reports or physical and

chemical mill test reports. Identification may be either on the item or on records traceable to the item, as appropriate.

- d. Consideration, when physical marking is employed, to assure that the location and the method of identification do not affect the function or quality of the item being identified. Where physical identification is either impractical or insufficient, physical separation, procedural control or other appropriate means may be employed.
- e. Verification of correct identification of materials, parts, and components prior to release for assembling, shipping, and installation. Identification and control measures shall be provided to prevent the use or installation of incorrect or defective material, parts, and components.
- f. Identification and marking of purchased materials be stipulated to subcontractors and suppliers in procurement documents.

QA audits of this section of the program are planned, scheduled, performed, and documented in accordance with section 17B.1.18 of this addendum.

#### 17B.1.9 CONTROL OF SPECIAL PROCESSES

The Quality Assurance Program requires that special processes be controlled. Special processes will be accomplished under specified and controlled conditions by qualified personnel using qualified procedures and equipment in accordance with applicable codes, standards, specifications, criteria or other special requirements.

The following are examples of special processes for which controls are required:

- a. Welding
- b. Heat treating
- c. Nondestructive examination
- d. Paint applications
- e. Special Cleaning

Daniel is responsible for establishing measures for the control of special processes which include:

- a. Assurance of adequate performance and control of special processes.
- b. Assurance that procedures, equipment, and personnel connected with special processes are qualified in accordance with applicable codes, standards, and specifications or when

necessary, supplementary procedures. Equipment used shall be calibrated, as required.

- c. Assurance that special processes are performed by qualified personnel, are documented and are accomplished by following written process sheets, procedures, checklists, travelers or equivalent and provide for recording evidence of verification and, if applicable, inspection and process results.
- d. An active file to maintain and keep current the qualification records associated with special processes, procedures, equipment, and personnel performing special processes.

QA audits of this section of the program are planned, scheduled, performed, and documented in accordance with section 17B.1.18 of this addendum.

#### 17B.1.10 INSPECTION

The Quality Assurance Program has established requirements for control of inspection of activities affecting quality to verify conformance with documented instructions, procedures and drawings. Such inspections are performed by individuals, under the supervision of the Project Quality Control Manager, who are independent from those who perform the activity being inspected. Examinations, measurements, or tests of materials or products processed are required to be performed for each work operation where necessary to assure conformance to requirements. Both inspection and process monitoring is provided when control is inadequate without both. When mandatory inspection hold points are required, the specific hold points are indicated in appropriate documents. Work will not proceed beyond these specified hold points without the consent of the organization that specified the hold point.

Daniel is responsible for establishing provisions for auditing the implementation of activities regarding the inspection of activities affecting quality.

Daniel is responsible for establishing inspection programs which provide for:

- a. Inspection personnel being independent from the individual or group performing the activity being inspected.
- b. Controlled inspection procedures, instructions and/or checklists being provided and containing the following:
  - 1. Identification of quality characteristics to be inspected.
  - 2. Identification of those individuals or the organization responsible for performing the inspection operation.
  - 3. Accept and reject criteria.



4. A description of the method of inspection.
5. Evidence of completion and certification of inspection operation.
6. Record of the results of the inspection operation.
- c. Inspection procedures or instructions be available for use by the inspector prior to performing the inspection operation.
- d. Qualifying the inspectors in accordance with requirements of governing codes and standards, and maintaining the current status of each inspector's qualifications. As appropriate, inspectors will attend training sessions to maintain their proficiency.
- e. Assuring that inspection equipment is within calibration prior to performing an inspection operation.
- f. Inspection of modifications, repair, rework, and replacement items, which is made after initial inspection, be performed in accordance with original design and inspection requirements or acceptable alternatives, to verify acceptability.
- g. Assuring required quality when direct inspection is either not possible or disadvantageous.

Union Electric Company may participate with Daniel in performing audits and surveillance of inspection activities conducted by subcontractors and suppliers.

#### 17B.1.11 TEST CONTROL

The Quality Assurance Program has established test program requirements to ensure that required testing is identified, documented and performed in accordance with controlled and written test procedures.

Daniel is responsible for establishing a test program to control its testing activities. This test program will cover required tests, including, where appropriate, prototype qualification tests, hydrostatic tests of pressure boundary components, in-process tests of manufactured items, and proof tests prior to installation. These test programs are designed to demonstrate that structures, systems, and components will perform satisfactorily in service. The program shall specify the system for developing, issuing, revising, review and approval of written test procedures.

Daniel performs tests in accordance with written procedures. These written tests procedures will incorporate or reference the requirements and acceptance limits specified in applicable design and procurement documents. These test procedures, as appropriate, will also include test objectives; test prerequisites; instructions for



performing each test; operating instructions for test and measuring equipment, or reference thereto, and documentation and evaluation of test results to assure satisfaction of test requirements. The test documentation will be retained as quality records. As applicable, the test prerequisites specified by these procedures include, but are not limited to: preparation, condition and completeness of the item to be tested, stipulations for the use of calibrated instruments; adequate and appropriate equipment; and requirements for trained, qualified, and, as appropriate, licensed and/or certified personnel. Test prerequisites also include suitable and, if appropriate, controlled environmental conditions and mandatory inspection and hold points. These inspection and hold points may require witnessing by designated personnel. Test procedures will provide provisions for data collection and storage, acceptance and rejection criteria, and methods for documenting and recording the test results.

QA audits of this section of the program are planned, scheduled, performed, and documented in accordance with section 17B.1.18 of this addendum.

#### 17B.1.12 CONTROL OF MEASURING AND TEST EQUIPMENT

The Quality Assurance Program has established requirements to assure that tools, gages, instruments, fixtures, reference standards, transfer standards, nondestructive examination equipment, and other measuring and testing devices used in activities affecting quality are properly controlled, calibrated, and adjusted at specified periods to maintain accuracy within necessary limits. This requirement is not intended to imply a need for special calibration and control measures on rulers, tape measures, levels and other such devices, if normal commercial practices provide adequate accuracy.

Daniel is responsible for establishing measures for control of measuring and test equipment which include the following:

- a. Written procedures which control the calibration technique, calibration frequency, maintenance and control of all measuring and test instruments, tools, gages, fixtures reference standards, transfer standards, and nondestructive examination equipment which is to be used in the measurement, inspection, and monitoring of safety-related components, systems, and structures.
- b. Identification of measuring and test equipment and traceability to the calibration test data.
- c. Calibration and maintenance of measuring and test instruments at specified intervals which will be based on the required accuracy, purpose, the degree of usage, stability characteristics, and other conditions affecting the measurement.
- d. Calibrations of measuring and testing equipment on or before the designated use date.

- e. When measuring and test equipment is found to be out of calibration, conducting and documenting an investigation to determine the acceptability of those items previously inspected, including repeating original inspections or tests using calibrated equipment when necessary.
- f. Uncertainty (error) requirement of calibration standards be less than the error of the production measuring and test equipment.
- g. Maintenance of records which indicate the complete status of all items under the calibration system.
- h. Certification and traceability of reference and transfer standards having known valid relationship to nationally recognized standards or where national standards do not exist, provisions are established to document the basis for calibration. The laboratory standards against which calibrations or recalibrations of measuring and testing devices are measured, are maintained, calibrated and used in an environment compatible with the required accuracy and operating characteristics.

QA audits of this section of the program are planned, scheduled, performed, and documented in accordance with section 17B.1.18 of this addendum.

#### 17B.1.13 HANDLING, STORAGE AND SHIPPING

The Quality Assurance Program assures that the special cleaning, handling, storage, shipping and preservation of appropriate materials and equipment is controlled in accordance with written procedures.

The special cleaning, handling, storage, shipping and preservation of materials and equipment are accomplished by appropriately trained individuals in accordance with written work and inspection procedures. When necessary for particular products, special protective environments such as inert gas atmosphere, specific moisture content levels, and temperature levels are specified and provided, and methods for verifying the existence of these environments during handling, shipping and storage are specified.

Daniel has primary responsibility for handling, storing and preserving material upon delivery to the plant site.

QA audits of this section of the program are planned, scheduled, performed, and documented in accordance with section 17B.1.18 of this addendum.

#### 17B.1.14 INSPECTION, TEST AND OPERATING STATUS

The Quality Assurance Program assures identification of the inspection, test and operating status of structures, systems, and components throughout fabrication, installation and preoperational

phases. Markings such as stamps, tags, labels, routing cards or other suitable means are utilized for status indication.

Daniel is responsible for establishing inspections, tests and operating status using approved procedures which include measures for:

- a. Identification of the inspection, test, and operating status of structures, systems and components throughout site fabrication and installation.
- b. Control of the use of inspection and welding stamps and status indicators, including the authority for application and removal of tags, markings, labels, and stamps.
- c. Precluding bypassing of required inspections, tests, and other critical operations through documented measures.
- d. Identification of the status of nonconforming, inoperative or malfunctioning structures, systems, or components to prevent inadvertent use or erroneous operation.
- e. Providing notification of inspection test and operating status to affected organizations.

QA audits of this section of the program are planned, scheduled, performed, and documented in accordance with section 17B.1.18 of this addendum.

#### 17B.1.15 NONCONFORMING MATERIALS, PARTS OR COMPONENTS

The Quality Assurance Program provides measures to prevent inadvertent use or installation of safety-related materials, parts and components which are not in compliance with the requirements of applicable codes, standards, drawings, specifications and procurement documents. The program requires identification, classification, resolution and followup of material nonconformances. Measures provided by the program include:

- a. Procedures to control the identification, documentation, segregation, review, disposition and notification of materials, parts, or components.
- b. Documentation which clearly identifies the nonconforming items, describes the nonconformance, the disposition of the nonconforming items, the inspection requirements, and includes signature approval of the disposition.
- c. Documentation and definition of the responsibility and authority for determining the disposition of nonconforming items.
- d. Segregation, if practical, of nonconforming items from acceptable items and identification as discrepant until



properly dispositioned for use. Access to the items will be controlled.

- e. Verification of acceptability of rework and repair of materials, parts, components, systems and structures by reinspecting the item as originally inspected or by method which is at least equal to the original inspection method and documentation of inspection rework and repair procedures. Reinspections are performed in accordance with written work instructions and are documented.
- f. Reporting to the SNUPPS organization as directed by Union Electric Company those material non-conformances which are recommended to be dispositioned "use as is" or "repair".
- g. Perform and forward periodic analysis of material nonconformance reports to responsible management to show quality trends.
- h. Incorporation of nonconformance reports dispositioned "use as is" or "repair" as part of the inspection and test records. These records include reports covering nonconforming items identified at supplier locations and at the site.

Nonconforming items that can be restored to drawing and specification requirements may be reworked to drawing and specification.

After receipt of material, parts or components at the plant site, nonconformances will be identified and classified by Daniel personnel.

Documented approval of the nonconformance disposition is provided to Daniel for those items dispositioned "repair" or "use as is" before Daniel may repair the items or "use as is".

QA audits of this section of the program are planned, scheduled, performed, and documented in accordance with section 17B.1.18 of this addendum.

#### 17B.1.16 CORRECTIVE ACTION

The corrective action program determines the need for corrective action and assures that conditions adverse to quality are promptly identified, reported, and corrected. The program requires that, in the case of significant conditions adverse to quality, the cause of the adverse condition be determined, corrective action be taken to preclude repetition, and verification be made that these actions have been implemented in accordance with specified requirements.

The program provides for systematic analysis of deficiencies including nonconformance reports, the determination of the need for corrective action and the reporting to appropriate levels of management the condition, cause, and corrective action taken. Records are maintained to substantiate that these corrective action



## SNUPPS-C

measures have been properly implemented.

Daniel shall establish measures for corrective action which include:

- a. The evaluation of nonconformances and determination of the need for corrective action in accordance with established procedures.
- b. The determination of the cause of the nonconformances and prompt corrective action to preclude the recurrence of those significant conditions adverse to quality.
- c. The followup of corrective actions to assure proper implementation and close out of the corrective action documentation.
- d. The documenting and reporting to appropriate management levels of significant conditions adverse to quality, the evaluation and cause of the conditions, and the corrective action taken.
- e. Reporting potential significant deficiencies within the scope of the requirements of Section 50.55, paragraph (e), of 10 CFR 50 to Union Electric Company.

The circumstances creating or contributing to the adverse condition, the action necessary to correct the condition and to preclude recurrence are determined and documented for implementation of corrective action. If the specified corrective action affects design of structures, systems, or equipment, a technical review for concurrence is made by the organization that established the original design basis.

The Daniel Project Quality Control Manager is assigned the responsibility for verifying proper implementation of corrective action. Upon the verification that the specified corrective action has been properly implemented, the associated documentation is closed out and filed for subsequent reference.

QA audits of this section of the program are planned, scheduled, performed, and documented in accordance with section 17B.1.18 of this addendum.

### 17B.1.17 QUALITY ASSURANCE RECORDS

The Quality Assurance Program includes a quality assurance records system for the identification, accumulation and retention of quality records which furnish documentary evidence of the acceptability of items and activities affecting quality.

The quality assurance records system requires that sufficient records be maintained to furnish evidence of the quality of items and of activities affecting quality. The records will include at least the following: procurement documents, audit reports, results of tests

and inspections, calibration procedures, calibration reports, nonconforming and corrective action documentation, and quality documentation as defined in the Construction Procedures Manual. The records also include data such as qualifications of personnel, procedures and equipment. Records are maintained; retrievable and consistent with requirements of ANSI N45.2.9. Quality assurance records shall provide sufficient information to permit identification of the record with the item(s) or activity to which it applies.

Daniel has established a records system which controls record receipt, storage, and retention. The records system includes provisions for facilities for permanent records retention; identification of retention periods; steps taken to assure controlled access; preservation, and protection from fire, flooding, theft and deterioration; storage records filing system and methods for verifying that records received agree with transmittal letters.

Records documenting inspections and tests shall as a minimum:

- a. Describe the inspection or test performed.
- b. Provide evidence of completion verification, and acceptability of manufacturing, inspection, or test operations.
- c. Identify the inspector or data recorder and the date and results of the inspection or test.
- d. Cross references to other pertinent records including nonconformance documentation.

Daniel provides for the orderly transfer of appropriate documents and records generated during the construction and pre-operational testing phase.

Quality assurance records in the possession of a subcontractor or supplier are made accessible to Daniel and the Owner by appropriate requirements in the procurement documents.

QA audits of this section of the program are planned, scheduled, performed, and documented in accordance with section 17B.1.18 of this addendum.

#### 17B.1.18 AUDITS

The audit program provides a comprehensive, independent evaluation and verification of quality-related activities associated with the construction of the Callaway Plant to assure they are in compliance with the established Quality Assurance Program, and that the program is effective.

The Project Quality Assurance Manager implements a system of planned and periodic audits to verify compliance with and determine the effectiveness of the implementation of the construction Quality

Assurance program and the implementation of the QA Programs of subcontractors and suppliers. These audits are planned, documented and followed-up in accordance with written procedures. The audit program includes written procedures to schedule the scope, frequency, and depth of the various audits conducted by the site QA organization.

QA audits are conducted in accordance with requirements established in Daniel's Construction Procedures Manual, which include:

- a. Audits are performed using pre-established written procedures or checklists and are conducted by appropriately trained and qualified personnel not having direct responsibilities in the areas being audited.
- b. Management having responsibility in the area audited reviews audit results and takes the necessary action to correct the deficiencies revealed by the audit.
- c. Deficient areas are reaudited as necessary until corrections have been accomplished.

Daniel audit procedures establish the content, schedule and post-audit evaluation sequence for Daniel audits, to include the following requirements;

- a. Audits provide an objective evaluation of quality-related practices, procedures, instructions, and of the effectiveness of their implementation; an objective evaluation of work areas, activities, processes and items; a review of documents and records pertaining to the subject work, including implementation of corrective action; and a review of conformance with policy objectives.
- b. Audits are scheduled on the basis of the status and safety importance of the activities being performed, and are initiated early enough to assure effective quality assurance during the procurement and contracting activities.
- c. Audit results are reviewed by the appropriate levels of project management. Indicators of QA Program effectiveness, such as quality trends and significant or repetitive quality assurance program problems are reported to the Regional Quality Manager.
- d. Audit reports are distributed to Union Electric Company personnel and others as designated by Union Electric Company.

CHAPTER 17B.1  
APPENDIX A

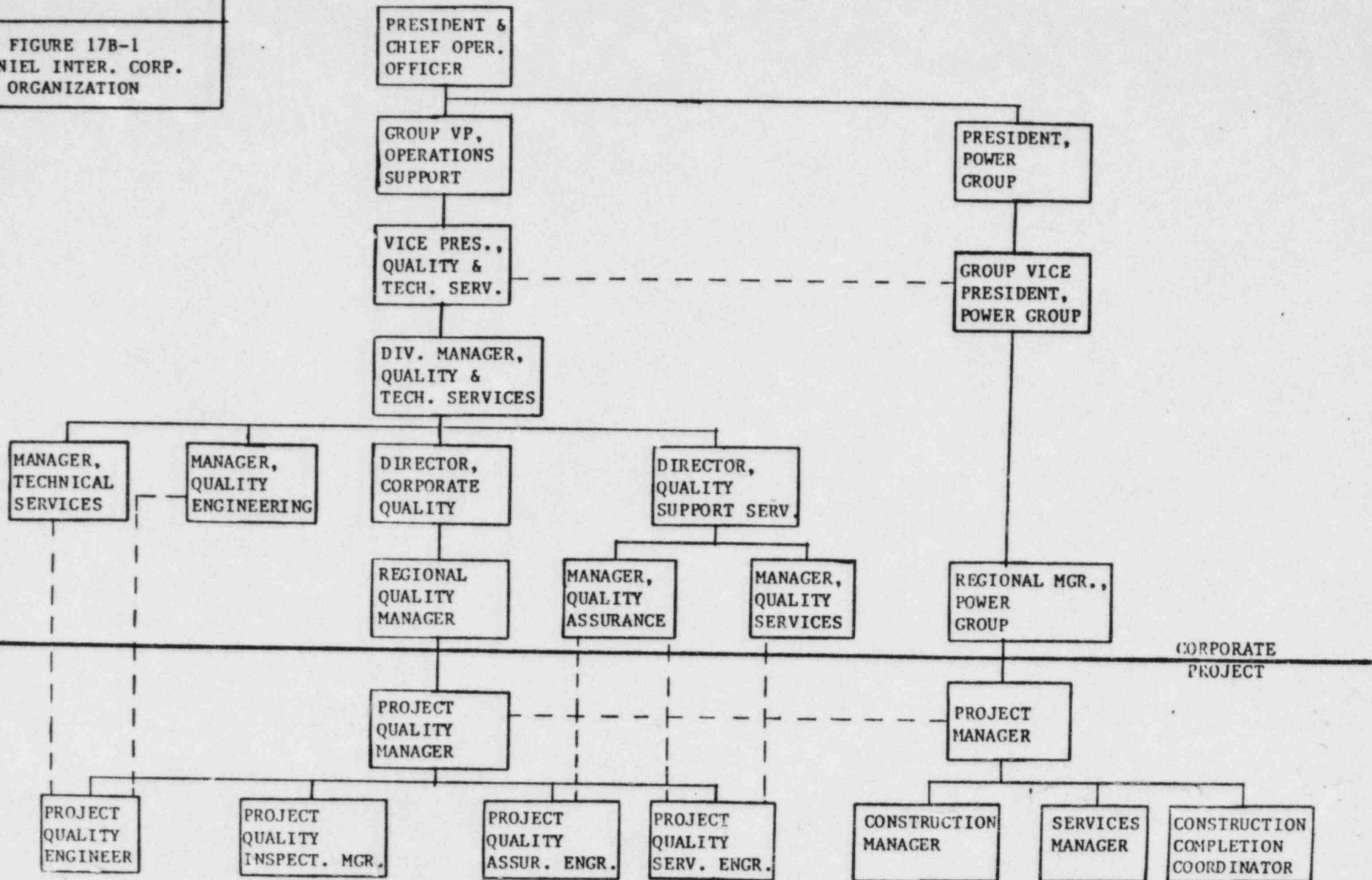
1. Daniel takes exception to ANSI N45.2.5-1974, Section 5.4 in regard to methods of structural bolt tightening and requirements for number of threads which are to be exposed beyond the nut of a tightened bolt assembly. Structural bolts are tightened in accordance with American Institute of Steel Construction Specifications for "Structural Joints Using ASTM A235 or A490 Bolts," using the direct tension indicator. As a result, the requirements for acceptance of tightened bolt assemblies is that "the length of the bolts shall be such that the point of the bolt will be flush with or outside of the face of the mat when completely installed."

Daniel performs this type of work under the controls of section 11 of Bechtel Specification 10466-C-122 (Q).



CANALWAY PLANT

FIGURE 17B-1  
DANIEL INTER. CORP.  
ORGANIZATION



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### 17D.1 NON-CATEGORY I SEISMIC SYSTEMS (II/I) QUALITY ASSURANCE PROGRAM

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#### Introduction

The Quality Assurance Program for non-Category I seismic systems is developed sufficiently to assure that the requirements for design, procurement and installation are satisfied. Design and procurement controls for non-Category I seismic design are described in the SNUPPS Standard Non-Category I Seismic Program description for the design and construction phase. The QA program for non-Category I seismic systems is a graded QA program under the management control of the Union Electric QA organization.

#### 1. Design Control and Procurement Document Control

Non-Category I seismic design activities are carried out by Bechtel on a standard plant basis. The QA program applicable to the standard design and procurement document control effort is described in Table 17D.0-1 of the SNUPPS Standard Program Description.

Design and procurement document controls for future design activities during the operating phase will include the following:

- a) Measures to assure that quality standards are specified in design documents and include applicable codes and standards and, further, that deviations and changes from these standards are controlled.
- b) Design reviews by personnel knowledgeable and independent of the design production process.
- c) Measures to assure procurement documents adequately state, and are reviewed for applicable technical and quality requirements, that the requirements are capable of being verified by inspection and/or test and that acceptance criteria are adequately stated.
- d) Measures to assure design and procurement changes, including field changes, are subject to the same controls, reviews and approach applicable to the original document.

#### 2. Instruction, Procedures and Drawings

Design, installation, inspection, maintenance and modification of non-Category I seismic systems are accomplished in accordance with documented instructions, procedures, and drawings.

### 3. Control of Purchased Material, Equipment, and Services

Receipt inspection or installation inspection assures that material and equipment for non-Category I seismic systems conform to procurement documents.

### 4. Inspection

Documented inspections and/or process monitoring operations are performed in accordance with procedures or checklists by individuals other than those who performed the activities being inspected. The adequacy and implementation of the inspection effort shall be monitored through audit/surveillance.

Installation, maintenance or modifications to non-Category I seismic systems governed by this program are subject to inspection to assure conformance to design and installation requirements.

### 5. Test and Test Control

Tests required by design or procurement documents to be performed onsite are conducted in accordance with procedures or checklists to verify conformance with design and system performance requirements. These test results shall be documented and evaluated.

### 6. Inspection and Test Status

Measures are established to provide for the identification of test and inspection status for applicable portions of non-Category I seismic systems, components and structures. Designation of operation status is considered non-applicable to these items.

### 7. Document Control

Measures are established to control the issuance of documents such as instructions, drawings and procedures, including changes thereto.

### 8. Identification and Control of Materials, Parts, and Components

Measures are established for the control of material, parts and components sufficient to prevent use of incorrect, indeterminate or defective items. Identification of such materials, parts and components is maintained on a bulk basis.

WOLF CREEK SITE ADDENDUM

17A-1/17B-1  
17B-1a/17B-2  
17B-2a/17B-3  
17B-4/17B-4a

17B-8/17B-8a  
17B-19/17B-20  
17B-27/17B-28  
Figure 17B-1



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17A.0 SARGENT & LUNDY QUALITY ASSURANCE

17A.1 QUALITY ASSURANCE DURING DESIGN AND CONSTRUCTION

Sargent & Lundy has been assigned design responsibility for the Wolf Creek Generating Station ultimate heat sink, the cooling lake, and dams and related structures required to maintain the integrity of those bodies of water. The Sargent & Lundy scope of responsibility does not include the Essential Service Water Structure, pumphouse, pumps and other associated equipment. Design and procurement responsibilities for these items are assigned to Bechtel.

Services related to Sargent & Lundy's work, such as rock and soil testing, have been procured by Kansas Gas and Electric Company (KG&E) from Dames & Moore.

Construction of the ultimate heat sink and backfill operations will be accomplished by a constructor selected by KG&E.

17A.1.1 TOPICAL REPORT

Sargent & Lundy's Quality Assurance Program SL-TR-1A, Rev 5, October 31, 1977, replaces Sections 17.A.1.1 through 17A.1.18, inclusive. Rev 5 of SL-TR-1A was accepted by NRC on November 8, 1977.

17B.0 DANIEL QUALITY ASSURANCE

17B.1 QUALITY ASSURANCE (QA) DURING DESIGN AND CONSTRUCTION

Daniel International Corporation hereinafter referred to as Daniel has been assigned construction and construction management responsibilities for the Wolf Creek Generating Station. Daniel's scope of work will consist of receiving design information as prepared by Bechtel, Westinghouse and Sargent & Lundy; receiving manufactured items and materials as procured by Bechtel and Westinghouse; procuring additional bulk materials and consumable items; procuring the services of various subcontractors; planning and scheduling the activities of the construction forces and directly supervising the construction forces to assemble the power plant in accordance with the design.

This section of the addendum contains a description of the quality assurance program for the scope of work performed by Daniel. This program is incorporated into and is an integral part of the total quality assurance program for the Wolf Creek Generating Station. The program has been established to implement the applicable requirements of 10 CFR 50 Appendix B, and the regulations, guides and standards described in Section 17B.1.2 of this addendum.

Daniel will maintain a staff of quality assurance personnel at the project to perform verification activities which are necessary to provide adequate confidence that project construction activities are being carried out in accordance with the established program.

17B.1.1 ORGANIZATION - DANIEL INTERNATIONAL CORPORATION

Figure 17B-1 shows the structure and interrelationship of the Daniel International Corporation organizations involved in construction of the Wolf Creek Generating Station.

The President and Chief Operating Officer has assigned the responsibility for the construction management of power projects to the President, Power Group and the quality management to the Group Vice-President Operations Support.

The Vice-President Quality and Technical Services reports to the Group Vice-President Operations Support and is responsible for formulating the Quality Assurance Program for work assigned to Daniel and for assuring that the assigned safety-related activities are carried out in conformance with the program. He communicates directly with the President of the Power Group as necessary, to resolve quality problems.

The Division Manager, Quality and Technical Services reports directly to the Vice President, Quality and Technical Services. The Division Manager, Quality and Technical Services

is responsible for all Quality and Technical Services support to Daniel projects and for personnel assigned to the Greenville office, as well as to project sites. The Director, Quality Support Services; Director, Corporate Quality; Manager, Technical Services; and Manager, Quality Engineering report directly to the Division Manager, Quality and Technical Services.

The Director, Corporate Quality reports to the Division Manager, Quality and Technical Services and is responsible for the management and administration of all project quality personnel

and for the proper implementation of the quality portion of the quality assurance program.

The Director, Quality Support Services reports to the Division Manager, Quality and Technical Services. He is responsible for formulating the Quality Assurance Program for work assigned to Daniel and for auditing the assigned safety related activities to verify that they are carried out in conformance with the program. He communicates directly with the President, Power Group and the Director Corporate Quality as necessary, to resolve quality problems.

The Manager, Quality Engineering reports to the Division Manager, Quality and Technical Services and has functional responsibility for Quality Engineering at the project. He communicates directly with the Director, Corporate Quality and the Project Quality Engineer as necessary to resolve quality problems.

The Manager, Technical Services reports to the Division Manager, Quality and Technical Services and is responsible for providing construction services to the Power Group and other Daniel organizations. The Manager, Technical Services is responsible for providing procedures such as special process control procedures and other technical services to the Power Group and other organizations. The following paragraphs describe the safety-related functions and responsibilities of the Quality and Technical Services Division, Power Group and Project Management.

#### 17B.1.1.1 Quality and Technical Services Division

##### 17B.1.1.1.1 CORPORATE QUALITY

The Director Corporate Quality is assisted by Regional Quality Managers who are delegated the responsibility and authority for managing the required activities for the assigned projects. The Regional Quality Manager is responsible for implementing the Quality Assurance Program and assuring that the program is in compliance with the applicable job requirements. The Director assisted by the Regional Quality Managers is responsible for:

- a. Selecting, training, and supervising a staff of qualified project quality personnel to implement the project portion of the Quality Assurance Program. These quality personnel are independent of project construction management.
- b. Coordinating the quality assurance program and detailed procedures; reviewing and evaluating the project quality assurance program and procedures for adequacy and effectiveness.



- c. Providing assistance to and working with project management in developing, maintaining and implementing the detailed procedures and instructions necessary to correctly implement this program and the job requirements.

- d. Providing an independent channel of communication to corporate management on quality-related problems, initiating necessary corporate management action to resolve program deficiencies and assuring that satisfactory solutions have been achieved.
- e. Reviewing and approving changes to the quality assurance program.
- f. If necessary, initiate stop work action until acceptable solutions to identified deficiencies have been obtained.
- g. Provide an independent channel of communications between projects on quality-related problems and initiating actions to assure that problems experienced on other Daniel projects are not repeated at Wolf Creek.

The Regional Quality Manager assigns a Project Quality Manager to be the on site manager for the quality organization. He is under the direct control of the Regional Quality Manager. (Control being the authority to hire, discharge, and approve pay rate).

The Project Quality Manager shall have 6 years of related work experience and/or education with a minimum of 2 years' experience in Nuclear Quality functions. He has the responsibility, authority, and organizational freedom to: independently identify quality-related problems; to initiate, recommend, concur in management action which results in acceptable solutions; and to verify implementation of such solutions. He is responsible for the project quality organization, as follows:

- a. Assuring that all quality operations and test and inspection equipment are in compliance with job requirements, the Quality Assurance Program, and the detailed procedures and instructions.
- b. Obtaining necessary Quality Services from corporate organizations.
- c. Preparing and issuing detailed project quality procedures.
- d. Consulting with the Project Manager on coordination of Project Quality activities to meet the overall project objectives.
- e. Consulting with the Project Manager on problems affecting the quality of construction operations and materials.
- f. Stopping work at his discretion. He has the authority to stop field construction work any time the quality of the work is in question.

#### 17B.1.1.1.3 QUALITY ENGINEERING

The Manager, Quality Engineering (QEM) is responsible for providing the initial overall direction to the Project Quality Engineer (PQE) relative to the PQE's responsibilities. The QEM will monitor the PQE to evaluate consistency of that operation with the overall requirements and take the lead in assuring that the consistency is maintained as appropriate.

#### 17B.1.1.1.4 TECHNICAL SERVICES

The Manager, Technical Services is responsible for providing the following as required:

- a. Qualified Welding Procedure Specifications and other procedures necessary for control of special processes including inspection and testing procedures, assistance in personnel training and qualification.
- b. The Corporate Level III non-destructive examination function including procedures, training and certification of personnel and has final authority for NDE interpretation.
- c. Coordination of authorized inspection agency services.
- d. Technical Support to Corporate Quality and Quality Support Services.

Technical Services will provide assistance as required in the following areas:

- a. Qualified consulting services to the projects in engineering disciplines and in specialty areas such as concrete, rigging, insulation and roofing.
- b. Assistance in developing and reviewing project procedures.
- c. Indoctrination and training services in areas of technical expertise.
- d. Code interpretation and uniform fabrication and construction procedures necessary to meet code requirements in the electrical, instrumentation, mechanical and civil disciplines.

17B.1.1.2 Power Group

The Power Group is headed by a President who reports to the President and Chief Operating Officer. The Power Group is assigned responsibility for the construction of nuclear power generating facilities undertaken by the company. The Group Vice President of the Power Group is responsible for the administration of construction operations for power projects.



He is assisted by Regional Managers who administer the nuclear power construction assigned to their regions.

#### 17B.1.1.3 Project Management

The Daniel Project Manager reports to the Power Group Regional Manager, represents Daniel in all matters relating to the Wolf Creek Generating Station, and is fully responsible for proper Construction, Construction Engineering, and Services implementation and satisfactory operation of the construction quality assurance program.

The Project Manager is completely responsible for satisfactorily executing the construction of the assigned work in conformance with the job requirements and the contractual interest of the Owner in terms of construction, quality, safety, efficiency, and schedule.

He is responsible for:

- a. Assuring that all construction operations and materials are in compliance with job requirements, the quality assurance program, and the detailed procedures and instructions.
- b. Obtaining necessary services from corporate organizations.
- c. Reviewing and approving detailed project procedures.
- d. Consulting with the Project Quality Manager on problems affecting the quality of construction operations and materials.
- e. Stopping work at his discretion. He has the authority to stop field construction work any time the quality of the work is in question.
- f. Controlling purchased material, equipment, and services. Procurement is controlled by implementing procedures in the Construction Procedures Manual which assure that the procurement documents contain or reference applicable requirements of 10 CFR 50, Appendix B, including reference that contractor and subcontractor personnel performing QA functions have sufficient authority and organizational freedom to effectively implement their respective QA Programs.

The Project Manager is assisted in the discharge of his responsibilities by the Construction Manager and the Services Manager. He receives on-site staff assistance in planning and cost control and, as each unit approaches trial operation,

The Service Manager reports to the Project Manager and is responsible for providing warehouse, purchasing, and document control services. He is responsible for:

- a. Receiving, storing, and maintaining accountability of equipment, materials, and tools; coordinating with the Construction Manager who shall provide necessary equipment required in handling materials; and notifying the Project Quality Manager when materials and equipment are available for inspection and tests.
- b. Obtaining bids from suppliers or subcontractors, coordinating pre-award surveys and post-award audits, and issuing approved purchase orders.

- c. Maintaining a properly protected project file of legible records that verifies the specified quality control activities were performed and that construction operations and materials are in conformance with the design documents.
- d. Providing a document distribution and control procedure which shall assure that the latest applicable documents and job requirements are available for construction.

The Services Manager is assisted by the Warehouse Manager, the Purchasing Agent, and the Document Control Manager.

accomplished by following written process sheets, procedures, checklists, travelers or equivalent and provide for recording evidence of verification and, if applicable, inspection and process results.

- d. An active file to maintain and keep current the qualification records associated with special process procedures, equipment, and personnel performing special processes.

#### 17B.1.10 INSPECTION

The quality assurance program has established requirements for control of inspection of activities affecting quality to verify conformance with documented instructions, procedures, and drawings. Such inspections are performed by individuals, under the supervision of the Project Quality Manager, who are independent from those who perform the activity being inspected. Examinations, measurements, or tests of materials or products processed are required to be performed for each work operation where necessary to assure conformance to requirements. Both inspection and process monitoring is provided when control is inadequate without both. When mandatory inspection hold points are required, the specific hold points are indicated in appropriate documents. Work will not proceed beyond these specified hold points without the consent of the organization that specified the hold point.

Daniel is responsible for establishing provisions for auditing the implementation of activities in regards to the inspection of activities affecting quality.

Daniel is responsible for establishing inspection programs which provide measures for:

- a. Inspection personnel being independent from the individual or group performing the activity being inspected.
- b. Controlled inspection procedures, instructions and/or checklists being provided and containing the following:
  - 1. Identification of quality characteristics to be inspected.
  - 2. Identification of those individuals or the organization responsible for performing the inspection operation.
  - 3. Accept and reject criteria.
  - 4. A description of the method of inspection.



## SNUPPS-WC

5. Evidence of completion and certification of inspection operation.
6. Record of the results of the inspection operation.
- c. Inspection procedures or instructions be available for use by the inspector prior to performing the inspection operation.
- d. Qualifying the inspectors in accordance with requirements of governing codes and standards, and maintaining the current status of each inspector's qualifications. As appropriate, inspectors will attend training sessions to maintain their proficiency.
- e. Assuring that inspection equipment is within calibration prior to performing an inspection operation.
- f. Inspection of modifications, repair, rework, and replacement items, which is made after initial inspection, be performed in accordance with original design and inspection requirements or acceptable alternatives, to verify acceptability.
- g. Assuring required quality when inspection is not possible.

KG&E may participate with Daniel in performing audits and surveillance of inspection activities conducted by site sub-contractors and suppliers.

### 17B.1.11 TEST CONTROL

The quality assurance program has established test program requirements to ensure that required testing is identified, documented and performed in accordance with controlled and written test procedures.

Daniel is responsible for establishing a test program to control its testing activities. This test program will cover required tests, including, where appropriate, prototype qualification tests, hydrostatic tests of pressure boundary components, in-process tests of manufactured items, and proof tests prior to installation. These test programs are designed to demonstrate that structures, systems, and components will perform satisfactorily in service. The program shall specify the system for developing, issuing, revising, review and approval of written test procedures.

#### 17B.1.17 QUALITY ASSURANCE RECORDS

The quality assurance program includes a quality assurance records system for the identification, accumulation and retention of quality records which furnish documentary evidence of the acceptability of items and activities affecting quality.

The quality assurance records system requires that sufficient records be maintained to furnish evidence of the quality of items and of activities affecting quality. The records will include at least the following: procurement documents, audit reports, results of tests and inspections, calibration procedures, calibration reports, nonconforming and corrective action documentation, and documentation as defined in the Construction Procedures Manual. The records also include data such as qualifications of personnel, procedures and equipment. Records are maintained, retrievable and consistent with applicable requirements of ANSI N45.2.9. Quality assurance records shall provide sufficient information to permit identification of the record with the item(s) or activity to which it applies.

Daniel has established a records system which controls record receipt, storage, and retention. The records system includes provisions for facilities for permanent records retention; identification of retention periods; steps taken to assure controlled access; preservation, and protection from fire, flooding, theft and deterioration; storage records filing system and methods for verifying that records received agree with transmittal letters.

Daniel provides for the orderly transfer of appropriate documents and records generated during the construction and preoperational testing phase.

Quality assurance records in the possession of a subcontractor or supplier are made accessible to Daniel and the Owners by appropriate requirements in the procurement documents.

#### 17B.1.18 AUDITS

The audit program provides a comprehensive, independent evaluation and verification of quality-related activities associated with the procurement and construction of the Wolf Creek Generating Station to assure they are in compliance with the established quality assurance program, and that the program is effective.

The Project Quality Assurance Engineer implements a system of planned and periodic audits to verify compliance with and determine the effectiveness of the implementation of the construction QA program and the implementation of the QA programs of subcontractors and suppliers. These audits are planned, documented and followed-up in accordance with the Daniel audit program. The audit program includes written procedures to schedule the scope, frequency, and depth of the various audits conducted by the Project QA organization.

QA audits are conducted in accordance with requirements established in the Construction Procedures Manual, which includes:

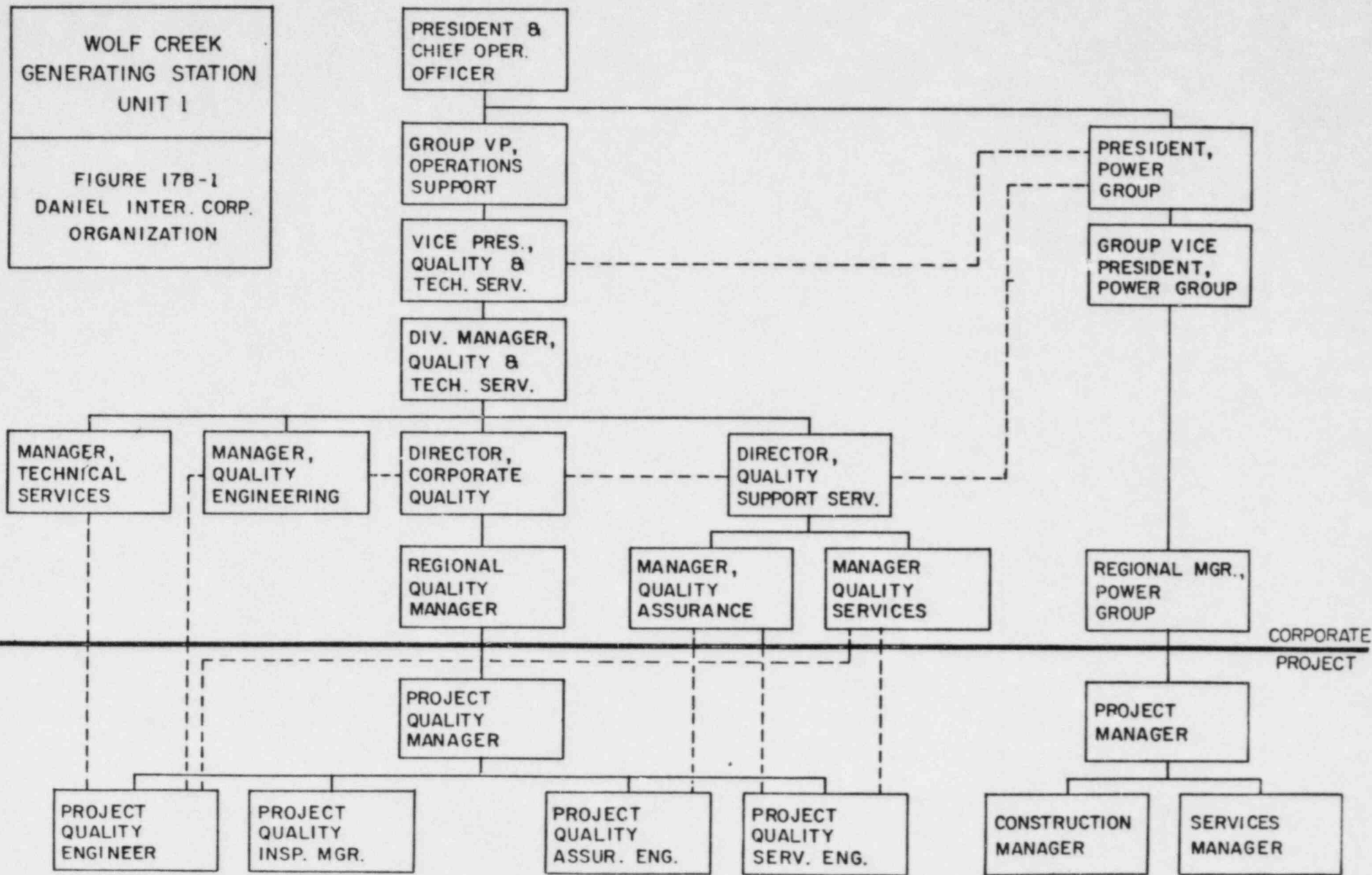
- a. Audits are performed in accordance with preestablished written procedures or checklists and conducted by appropriately trained and qualified personnel not having direct responsibilities in the areas being audited.
- b. Management having responsibility in the area audited, reviews audit results and takes the necessary action to correct the deficiencies revealed by the audit.
- c. Deficient areas are reaudited as necessary until corrections have been accomplished.

Daniel audit procedures establish the content, schedule and post-audit evaluation sequence for Daniel audits, to include the following requirements.

- a. Audits provide an objective evaluation of quality-related practices, procedures, instructions, and of the effectiveness of their implementation; and objective evaluation of work areas, activities, processes and items; a review of documents and records pertaining to the subject work, including implementation of corrective action; and a review of conformance with policy objectives.
- b. Audits are scheduled on the basis of the status and safety importance of the activities being performed, and are initiated early enough to assure effective quality assurance during the procurement and contracting activities.
- c. Audit results are reviewed by the project management. Indicators of QA program effectiveness, such as quality trends and significant or repetitive quality assurance program problems are reported to the Regional Quality Manager and Manager Quality Assurance.
- d. Audit results are distributed to KG&E personnel as designated by KG&E.

WOLF CREEK  
GENERATING STATION  
UNIT 1

FIGURE 17B-1  
DANIEL INTER. CORP.  
ORGANIZATION



KEY: ——— ADMINISTRATIVE DIRECTION  
 - - - - - LINE OF COMMUNICATION AND SERVICE