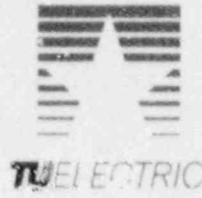

Log # TXX-88495
File # 10068
10010 clo
Ref. # 10CFR2.102

June 9, 1988

William G. Counsil
Executive Vice President

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION
DOCKET NOS. 50-445 AND 50-446
PROGRAMMATIC ENHANCEMENTS

Gentlemen:

During the past several years, Texas Utilities Electric Company has filed with the NRC detailed descriptions of the programs undertaken to validate the design and hardware installation at Comanche Peak, as well as a number of reports describing the results of these programs, including corrective and preventive actions taken by TU Electric.

TU Electric also recognized that it would be beneficial to enhance its management, organizational structure, staffing, procedures and programs in order to provide additional assurance that the validation of CPSES design and hardware and the completion of construction are implemented in accordance with the highest standards of excellence and that the Project continues to comply with applicable regulatory requirements. Such enhancements have been discussed or mentioned in numerous submittals to the NRC and the Atomic Safety and Licensing Board and at public meetings with the NRC or intervenors in the licensing hearings, but have not been described in a consolidated fashion, such as the description of the conduct of operations contained in Chapter 13 of the FSAR.

Accordingly, for the convenience of the NRC Staff, enclosed is a summary of the programmatic enhancements that appear to be most relevant to the NRC Staff's continuing review of the validation of design and hardware installation and the completion of construction.

D029

1/1

TU Electric management is confident that as additional opportunities arise to further enhance nuclear quality and safety, the Company is well prepared to respond and lead in their development.

Very truly yours,

W. G. Counsil

JEK/es
Enclosure

c- Mr. R. D. Martin, Regions IV
Resident Inspectors, CPSES (3)

ENCLOSURE TO TXX-88495

DESCRIPTION OF CPSES PROGRAMMATIC ENHANCEMENTS

TABLE OF CONTENTS

Page

I. Introduction..... 1

II. TU Electric Nuclear Management..... 2

A. Revised Organizational Structure..... 2

B. Addition of Officers..... 3

C. New Hierarchy of Procedures..... 4

D. "Quality First" Attitude..... 5

III. Engineering and Construction..... 9

A. Engineering and Construction Organization and EC Procedures..... 9

B. Engineering Department..... 10

1. Revised Organizational Structure..... 11

a. Mechanical Engineering Section..... 12

b. Electrical Engineering Section..... 12

c. Civil Engineering Section..... 12

d. Engineering Assurance Section..... 12

e. Engineering Projects Section..... 13

f. Engineering Contractors..... 13

2. Addition of Engineering Personnel..... 13

3. Enhanced Procedures and Controls..... 15

a. Design Control..... 16

b. Control of Documents in the Field..... 18

4. Special Programs..... 19

a. Specification, Procedure and Drawing Update (SPADU)..... 19

b. Review of Previously Dispositioned NCRs..... 20

c. Review for Design Changes..... 22

d. Vendor Technical Manual Review and Control..... 23

C. Construction Department..... 24

1. Revised Organizational Structure..... 24

2. Addition of Construction Personnel..... 25

3. Enhanced Procedures..... 26

4. Other Enhancements for Construction..... 26

D. Associated Programs..... 27

1. Configuration Management..... 27

2. Records Management Program..... 28

IV. Nuclear Engineering..... 29

A. Revised Organizational Structure..... 30

B. Quality Assurance Department..... 30

1. Revised Organizational Structure and Addition of Personnel..... 31

a. QA Section..... 31

i. QA Audit Unit..... 32

ii. Quality Site Surveillance Unit..... 32

iii. Technical Audit Unit..... 32

iv. Vendor Compliance Unit..... 33

b. QC Section..... 33

i. Inspection Unit..... 33

ii. ASME QC Unit..... 33

iii. QC Engineering Unit..... 34

iv. QC Services Unit..... 34

c. Operations QA Section..... 34

i. Quality Programs Unit..... 35

ii. QA Operations Services Unit..... 35

iii. Operations QC Unit..... 35

2. QA Programmatic Enhancements..... 36

a. Enhanced Procedures..... 36

b. Training, Qualification and Certification..... 36

c. Audits and Surveillances..... 37

d. Nonconformance Reporting and CAR Programs..... 37

e. Trend System..... 38

C. Nuclear Licensing Department..... 38

1. Revised Organizational Structure and Addition of Personnel..... 38

2. Licensing Programmatic Enhancements..... 39

a. Tracking of Licensing Commitments.... 40

b. Tracking of Open NRC Inspection Items 40

c. Reporting of 10CFR50.55(e) Deficiencies..... 41

V. Conclusion..... 41

I. Introduction

In 1984, after receipt of a report of the NRC Staff's Technical Review Team (TRT), TU Electric initiated the Comanche Peak Response Team (CPRT) to investigate and respond to the issues raised by the TRT. The CPRT program was subsequently revised on several occasions to include issues raised by additional sources, including the Atomic Safety and Licensing Board (ASLB), the intervenor in the NRC operating license hearings, a number of additional reports issued by the NRC Staff, Cygna and CPRT self-initiated reviews of the quality of construction and the adequacy of design of the Comanche Peak Steam Electric Station (CPSES). Based in part upon the preliminary results of the reviews by the CPRT, TU Electric initiated the Corrective Action Program (CAP) in 1986 to validate the CPSES safety-related design and hardware installation, and to develop procedures, an organization plan and documentation to maintain compliance with licensing commitments throughout the life of CPSES.

TU Electric also recognized that it would be beneficial to enhance its management, organizational structure, staffing, procedures and programs in order to provide additional assurance that the validation of CPSES design and hardware and the completion of construction are implemented in accordance with the highest standards of excellence and that the Project continues to comply with applicable regulatory requirements.

Improvements achieved by TU Electric in recent years have been described or mentioned in various submittals to the NRC Staff or the ASLB, including reports from the CPRT, Project Status Reports (PSRs), amendments to the Final Safety Analysis Report (FSAR), pleadings in the licensing hearings, and correspondence with the NRC Staff. They have also been reviewed by the NRC Staff in its inspections and discussed at public meetings with the NRC Staff and the intervenor.

For the convenience of the NRC Staff, this document provides a summary of the programmatic enhancements that appear to be most relevant to the NRC Staff's continuing review of the validation of design and hardware installation and the completion of construction. These relate to management, organizational structure, staffing and procedures, as well as specific programs.

The following three sections discuss, respectively, the enhancements in TU Electric's nuclear management, in the Engineering and Construction Function (including the Engineering and Construction Departments), and in the Nuclear Engineering Function (including the Quality Assurance and Nuclear Licensing Departments). The final section summarizes TU Electric's conclusions regarding the overall effect of these enhancements.

II. TU Electric Nuclear Management

The most important actions taken by TU Electric to enhance its management of CPSES have included the restructuring of the TU Electric nuclear organization at the senior management level, the hiring of officers with substantial nuclear experience on other projects, the adoption of a hierarchy of nuclear policies and procedures that provide clear direction from management specifying authority, interfaces and responsibilities, and the placement of additional emphasis on the maintenance of a "quality first" attitude. The following sections address these actions.

A. Revised Organizational Structure

In early 1985, TU Electric established the new position of Executive Vice President, Nuclear Engineering and Operations (NEO) reporting directly to the TU Electric Generating Division President. This action consolidated under a single officer full time responsibility for all of the TU Electric nuclear activities, with a charter clearly set forth in the corporate Nuclear Policy issued by the President of TU Electric Generating Division. The basic responsibilities of the Executive Vice President, NEO under that charter include assuring that CPSES is designed, constructed and operated safely and in accordance with all applicable government, corporate and industrial requirements; maintaining a corporate Quality Assurance (QA) program to prevent or correct deficiencies or unacceptable deviations during the design, construction and operation of CPSES; assuring that sufficient qualified personnel are provided to operate and maintain CPSES safely and efficiently; assuring that sufficient qualified technical and engineering support staffs are maintained; and implementing programs during construction and operation of CPSES to encourage the reporting of quality concerns and their timely investigation and resolution.

Assisting the Executive Vice President, NEO in the discharge of these responsibilities are Vice-Presidents in three principal functional areas: the Vice President, Engineering and Construction and the Vice President, Nuclear Operations, who previously reported to separate Executive Vice-Presidents, and the Vice President, Nuclear Engineering, a new position created in 1985. Each of these Vice Presidents heads an NEO Function discussed below. The Vice President, Engineering and Construction is responsible for design, engineering, construction, project management and technical support to other NEO Functions. The Vice President, Nuclear Operations is responsible for directing the operation, maintenance and testing of the CPSES Units. The Vice President, Nuclear Engineering is responsible for reactor engineering (e.g., reactor safety, core physics analysis and fuel procurement and management), QA, nuclear licensing, liaison with government regulatory agencies, and management and direction of the CPRT effort. This restructuring of responsibilities at the senior nuclear management level was accompanied by a number of organizational and programmatic improvements in these basic NEO functional areas, as later discussed.

B. Addition of Officers

Each of the foregoing senior nuclear management positions is held by a qualified and experienced individual. The Executive Vice President, NEO, who was appointed in May 1985, previously served as Senior Vice President for nuclear engineering and operations at Northeast Utilities. In 18 years with that utility, he held numerous positions involving the management of the company's four nuclear power reactors, including responsibility for engineering, construction and operation. He previously served seven years as a commissioned officer in the U. S. Navy, five of which were in the U. S. Navy nuclear power program.

The Vice President, Engineering and Construction, who was appointed in May 1986, had nine years of experience in commercial nuclear power before joining TU Electric. He had held positions in engineering and project management for Stone & Webster Engineering Corporation (SWEC) since 1977, including five years as SWEC Project Manager at Northeast Utilities' Millstone 3 plant during its completion and receipt of an operating license. He also served for 20 years as a commissioned officer in the U.S. Navy, including more than 10 years in the U. S. Navy nuclear power program.

The Vice President, Nuclear Engineering was appointed to that position in May 1985, after having served as TU Electric's Manager of Nuclear Licensing since 1984. He had more than 20 years of prior experience in various aspects of the nuclear power industry, including 10 years with Yankee Atomic Electric Company, four years as Executive Vice President of Vermont Yankee Nuclear Power Corporation, and four years as Vice President of a nuclear engineering and environmental consulting firm.

The Vice President, Nuclear Operations was appointed in November 1985, upon retiring from the U.S. Navy as Rear Admiral and Commander of the Submarine Forces of the U.S. Pacific Fleet. He has over 27 years of experience in engineering, operations and management of nuclear activities.

Also reporting directly to the Executive Vice President, NEO is the Director of Technical Interface. He provides assistance, as required, in nuclear plant engineering, construction and operation, including coordination of the technical interface between NEO Departments to assure consistency and compliance with CPSES licensing commitments. The Director of Technical Interface was appointed in 1987, after having served approximately one year as Director of Engineering. Previously, he had 16 years of commercial nuclear power industry experience, including 13 years in various engineering management positions with SWEC and three years as a senior engineer with Westinghouse. He also served six years as a commissioned officer in the U. S. Navy nuclear power program.

Experienced individuals also serve in such key positions as Director of Engineering, Director of Construction, Director of Projects, Director of Quality Assurance, Director of Reactor Engineering, and Manager of Nuclear Licensing. In addition to increasing the staffing in each of the departments headed by these Directors and Manager, the level of nuclear experience also has been raised. These augmentations in staffing and nuclear experience, as well as the qualifications and experience of the key Directors and Manager, are described throughout this summary.

C. New Hierarchy of Procedures

When the current organizational structure of the NEO Group was established in 1985, actions were taken to develop and implement a hierarchy of policies and procedures that would control the technical and administrative functions of the NEO Group in a consistent and effective manner.

The governing document is the Nuclear Policy statement issued by the President of the TU Electric Generating Division, which identifies TU Electric's corporate goals and objectives. This statement emphasizes that the principal corporate objective in the design and operation of CPSES is to protect the health and safety of the public and CPSES employees; the second objective is to provide reliable, economic electric power to TU Electric's customers. It then sets forth a comprehensive assignment of responsibilities to the Executive Vice President, NEO to achieve these corporate goals and objectives.

The Executive Vice President, NEO has in turn issued a series of NEO Policy Statements amplifying the corporate Nuclear Policy and specifying NEO policies governing the conduct of NEO activities. These statements provide corporate positions or directions with respect to such basic programs or activities as Quality Assurance (Policy No. 2), Nuclear Plant Safety (Policy No. 5), Employee Protection (Policy No. 12), Employee Concerns (Policy No. 13), Nuclear Licensing (Policy No. 33), Configuration Management (Policy No. 36) and Commitment Tracking (Policy No. 39). They also assign to individual Vice Presidents, Directors and Managers responsibilities for implementing and assuring compliance with the NEO policies.

To assure consistent and effective implementation of NEO policies, a comprehensive set of NEO Procedures has also been issued, with each procedure approved by the Executive Vice President, NEO. The basic purposes of the NEO Procedures are to delineate the responsibility and authority for the performance of functions within the NEO Group and supporting TU Electric organizations, and to provide directions and instructions to assure that CPSES is designed, constructed and operated in a safe and efficient manner. NEO Procedures control programs and activities that require documented interfaces and clear lines of responsibility, that are common to various NEO and supporting organizations, that require formal endorsement of a

program by NEO management or that require a formal statement of inter-Function responsibilities. They control nuclear activities in order to promote the efficiency of the NEO Group (such as the elimination of redundant procedures), and they identify whether lower-tier procedures are required for complete implementation.

Collectively, the foregoing clearly express TU Electric and NEO policies and positions; provide explicit direction and guidance from management; specifically identify authority, responsibility and interfaces within the NEO Functions, Departments and TU Electric supporting organizations; provide procedural controls to achieve consistent practices; and identify requirements for lower-tier implementing procedures. Thus, they provide a coherent and integrated framework for the effective management of the design and construction of CPSES.

D. "Quality First" Attitude

The corporate Nuclear Policy statement promotes a "quality first" attitude. The NEO policies and procedures state the commitment of TU Electric management to achieving quality in CPSES design and construction. That commitment is also demonstrated by management actions, such as the CPRT Program and CAP. Among the assignments to the Executive Vice President, NEO is the responsibility to maintain a corporate QA program to prevent or correct deficiencies or unacceptable deviations during the design, construction and operation of CPSES. The Nuclear Policy requires regular reports to TU Electric management of the overall effectiveness of the QA program, and that direct access be provided for any QA concerns requiring management action. In addition, the Executive Vice President, NEO is charged with the responsibility for implementing programs to encourage the reporting of quality concerns and the timely investigation and resolution of those concerns. Enhancements in the organizational structure and programs relating to QA, including related NEO Procedures, are discussed in Section IV.B.

In order to keep senior TU Electric management advised of the overall adequacy and effectiveness of the QA program, TU Electric has established the Senior Management QA Overview Committee. The Committee members include the Vice Presidents who report to the Executive Vice President, NEO and the Director of QA. The Directors of Construction, Projects and Engineering, and the Managers of the QA Section, the Operations QA Section, the QC Section, Engineering Assurance, Plant Operations, Nuclear Licensing and Start-up Testing regularly participate in Committee meetings. Members of the Committee receive copies of QA audit reports, trend analysis reports, 10CFR50.55(e) reports, and external evaluations of the QA program, such as NRC Inspection Reports. In addition to meeting approximately once a month to discuss quality issues, the Committee provides an annual written assessment of the effectiveness of the QA program to

the Executive Vice President, NEO. This includes the results of an annual, independent assessment by an outside organization of the QA audit program. The Senior Management QA Overview Committee thus assures both the active involvement of senior management in the QA program and a continuing dialogue among QA management and other senior management about quality issues.

TU Electric policies and procedures encourage all personnel to report any perceived safety deficiencies. NEO Policy No. 12, "Employee Protection" and Policy No. 13, "Employee Concerns," emphasize that employees of TU Electric or any contractor or subcontractor shall not be subject to discrimination for reporting any concern. NEO Procedure 2.15, "Nuclear Complaints and Concerns," issued in 1986 to implement Policies No. 12 and 13, provides guidance for employees in pursuing their complaints or concerns regarding nuclear matters with their supervisors until they feel that they are satisfactorily resolved; emphasizes the obligation and responsibility of managers to address and resolve nuclear concerns of employees; specifies that an employee who is not satisfied with the progress or resolution may at any time contact directly a Director, Manager, Superintendent, Vice President, the Executive Vice President, NEO or the President of the TU Electric Generating Division; and specifically prohibits any discrimination against employees raising concerns.

In addition, TU Electric policies and procedures provide two programs for the reporting of concerns by TU Electric or contractor employees who want to maintain confidentiality. The first is the 24-hour telephone Hot Line Program, which was initiated in 1983. In order to achieve independence from the nuclear organization, it is administered by the Director of Corporate Security, who documents allegations and concerns, conducts investigations, maintains records of dispositions and keeps the Executive Vice President, NEO informed as to program actions. Since the inception of the Hot Line Program, 67 concerns have been directly expressed to Corporate Security. Of this number, 24 concerns were classified as safety-related. Of the safety-related concerns, one was found to be substantiated and requiring corrective action.

The Safeteam[1] program, initiated in 1985, also provides a means of identifying and investigating safety concerns raised by site workers through personal interviews, correspondence or telephone calls. The identities of individuals who report concerns to Safeteam are kept confidential (unless confidentiality is waived) to provide further assurance that no retaliatory action will be taken against them and

---

(1) TU Electric has contracted with SYNDECO (a subsidiary of Detroit Edison) for a license to use, and for assistance in establishing the Safeteam.

to encourage reporting of concerns. Safeteam is administered by a dedicated staff under the direction of a full time Manager, who reports directly to the Executive Vice President, NEO. The investigation results are reviewed by a Steering Committee to assure that the underlying concerns have been fully addressed. Each employee who identifies a concern receives a written response describing the actions taken. Since the start of the program in January 1985, Safeteam has responded to over 2,000 worker concerns. Less than one third of the concerns were safety or quality related, and of the concerns that were safety or quality related about ten percent have been substantiated as valid and not already identified. None of these substantiated safety or quality related concerns were subsequently determined by TU Electric to be reportable under 10CFR50.55(e), however, one other concern (which had been identified previously) was reportable under 10CFR50.55(e). Experience to date indicates that workers are making use of Safeteam to voice concerns of all types.

To assure that employees of TU Electric and contractors at the site are familiar with their obligations to report safety-related concerns and with mechanisms for reporting concerns confidentially, these subjects are covered in an introduction/orientation session provided by TU Electric for new employees. At this session, employees receive an Information Packet, which includes a summary of relevant policies at CPSES, including the open door policy for reporting of concerns and a description of the Safeteam program. The contents of the Information Packet are explained; and a video presentation, entitled "Quality Is Your Job" and including a segment on the Safeteam and Hot Line programs, is shown to employees.

The NRC Staff recently conducted an inspection of TU Electric's policies, procedures and implementation relating to programs for identifying and resolving employee concerns. As documented in a NRC Inspection Report issued on May 9, 1988 (50-445/88-23 and 50-446/88-20), the inspection team was generally impressed with TU Electric's broad range of programs, which provide employees with many viable options to express concerns. It found that TU Electric was implementing an adequate program for its employees in areas dealing with the reporting of employee concerns. It also found that the Safeteam program appeared to be an effective means for site personnel to express concerns that might not be reported through normal management chains. In addition, in a survey of 32 employees of TU Electric and site contractors in various work areas, the inspection team found that all of the persons surveyed knew of a system available for the reporting of concerns and that none expressed any reluctance to do so. These findings are consistent with TU Electric's belief that the reporting mechanisms available at the CPSES are well understood by the work force and are functioning effectively.

In addition to the programs intended to assure that employees feel free to report any quality concerns, a number of actions beyond introduction/orientation sessions and job training have been taken to communicate TU Electric's commitment to quality and to instill and maintain a "quality first" attitude at CPSES. For example, in 1984 and 1985, the President of Texas Utilities Generating Company met with site QC personnel to emphasize management's commitment to quality and support for the performance of their jobs in a "quality first" manner. Another example, which was initiated in 1985 and is continuing, is a "Quality Supervisor" training program for Brown & Root employees. This 20 hour course, which teaches the principles of good management and proper communication skills, includes topics such as quality, safety, motivation, leadership and problem solving techniques. Surveys of craft personnel are used to monitor the program's effectiveness and retraining is given as required. Another mechanism used to communicate TU Electric's commitment to quality consists of brochures, letters or notices widely distributed to employees of TU Electric and site contractors. In 1986, employees within the NEO Group received a copy of a brochure explaining TU Electric's insistence that CPSES be designed and constructed to the highest standards of excellence and that personnel be dedicated to "doing the job right the first time," to paying close attention to detail and to anticipating what might go wrong. More recently, in December 1987, the Executive Vice President, NEO issued a notice to TU Electric and contractor employees responding to an anonymous letter from a group of workers facing layoff, who questioned certain design practices and threatened to make these concerns public unless they retained their jobs. The notice reemphasized TU Electric's commitment to protection of public health and safety, encouraged anyone with safety concerns to report them to management, Safeteam or the NRC and pointed out strongly that management would not be influenced by the threatening nature of the letter or tolerate such threats. A final example of TU Electric's long-standing commitment to quality is the recent decision by the Senior Management QA Overview Committee to institute a Quality Awareness Program. This program will promote and emphasize periodic program goals and quality themes throughout CPSES to provide constant reminders of the commitment to quality.

TU Electric has also increased the visibility of senior nuclear management at the CPSES site and its participation in and monitoring of day-to-day activities and decision making, in part to communicate management's "quality first" attitude to lower tier management and workers. Thus, for example, the Vice Presidents for Engineering and Construction and for Operations are stationed at CPSES; and the Executive Vice President, NEO and the Vice President, Nuclear Engineering are usually at CPSES several days each week. The Executive Vice President, NEO regularly attends status meetings at CPSES at selected Function, Department and contractor levels, as well as specific meetings on a variety of subjects. He regularly reviews

QA reports (including audit and status reports), licensing reports, and Project and contractor status and progress reports on engineering and construction. He helps to assure responsiveness to NRC inquiries and concerns, and frequently attends exit meetings following NRC inspections. In general, he assures senior nuclear management involvement in decision-making at CPSES. Similar actions taken by Vice Presidents, Directors and Managers within NEO have served both to provide direction to lower tier management and to demonstrate by example management's quality first policy.

III. Engineering and Construction

The Engineering and Construction (E&C) Function includes the Departments of Engineering, Construction and Projects. There have been enhancements in each of these Departments, including the hiring of Directors with substantial experience on other nuclear projects and a number of improvements of organizations, staffing, procedures and programs. The discussion below describes the principal enhancements in the E&C Function and the Engineering and Construction Departments.

A. Engineering and Construction Organization and EC Procedures

The Engineering and Construction (E&C) Function within NEO includes engineering, design, construction, project management and technical support for other NEO Functions. Establishment of the E&C Function placed these activities under the direction of a single Vice President, thereby enhancing communication and coordination among these highly inter-related activities.

These activities within the E&C Function are organized into three Departments, each of which is headed by a Director who has substantial nuclear experience. The Director of Engineering, appointed in 1987, has 22 years of engineering experience, including 12 years with SWEC in various engineering and supervisory roles. His assignments for SWEC included Lead Engineer for the design of piping, pipe support and mechanical equipment for the Beaver Valley Nuclear Power Station (Unit 2), Assistant Project Engineer for the Millstone 3 Nuclear Power Station and Evaluation Team Member responsible for performing an independent evaluation of the adequacy of the Enrico Fermi Atomic Power Plant design documentation.

The Director of Construction, appointed in 1987, has over 20 years of technical management experience before joining TU Electric in 1986. His 16 years in the nuclear industry included two years as Director, Nuclear Plant Engineering for Gulf States Power Company at its River Bend Nuclear Station, five years in nuclear engineering and project management at the Mare Island Naval Shipyard, responsible for nuclear submarine overhaul and repair, and four years as Management Group Leader and QA Manager at Lawrence Livermore National Laboratory, responsible for management and QA for a large high energy physics research project.

The Director of Projects, appointed in 1987, has 15 years of nuclear experience. In over seven years with the Tennessee Valley Authority (TVA), he served in various engineering capacities related to seven nuclear power plant projects, including membership on the TVA Nuclear Safety Review Staff. He also was employed by Technology for Energy Corporation for over 3 years, where he advanced from Senior Reactor Engineer to Director of Engineering Business Development. Thereafter, he was a Vice President of a consulting firm, and was assigned to Comanche Peak, where he served as CPRT Program Director.

The organization and responsibilities of each of the E&C Departments are defined in the NEO procedures. A series of policies and procedures issued by the Vice President, E&C amplify NEO policies and procedures, assign responsibility within E&C and provide direction for performance of various activities. The E&C policies and procedures are compiled and maintained within the E&C Policies and Procedures Manual (E&C Manual). Where NEO procedures require no amplification or further definition for E&C activities, the NEO policies and procedures are incorporated by reference into the E&C Manual. The E&C Manual complements the NEO Policy and Procedures Manual in providing clear direction and guidance for the effective management of the design and construction of CPSES.

The changes in the Engineering and Construction Departments are discussed below. The Projects Department is primarily responsible for NEO planning, cost and scheduling activities, coordination of Project completion activities and associated Project management, and coordination and management of NEO computer systems.

B. Engineering Department

The Comanche Peak Engineering Department (CPE)[2] organization has been substantially restructured to manage, oversee and coordinate the technical activities of the CAP engineering contractors in their performance of the design and hardware validation, as well as to enhance TU Electric's ability to complete the CPSES design and construction and to provide engineering support during CPSES operation. In conjunction with the restructured organization, CPE has hired additional experienced management and engineering staff personnel who have improved CPE's ability to manage and oversee the engineering work being performed by the CAP engineering contractors. In addition, the design control procedures have been reviewed and revised to provide further assurance that design work is performed, documented and verified properly.

---

(2) CPE is used herein consistently even though the TU Electric engineering organization for CPSES had other designations previously, e.g., TNE and CPPE. Similarly, various other organizations are identified by their current titles, even though they may have had different titles previously.

1. Revised Organizational Structure

Prior to May 1986, the CPE personnel were integrated with engineering contractors to form a site engineering group, and some TU Electric engineering personnel were assigned to the Vice President of Operations to provide technical support to Operations. In May 1986, CPE was reorganized as a group separate from the engineering contractor personnel. The personnel who previously were in the Technical Support group of Operations were transferred to CPE. This reorganization brought CPSES design and engineering functions (except Reactor Engineering, see Section IV.A) and direction into one organization under the Director of Engineering.

Under this reorganization, the Director of Engineering is assigned the responsibility and authority for technical management, oversight and coordination of the engineering contractors. The engineering contractors are assigned the responsibility for performing safety-related engineering and design consistent with TU Electric design control procedures, and in accordance with approved QA programs. These contractor responsibilities will be transferred to CPE in the future.

The CPE reorganization enhanced TU Electric's ability to manage and oversee the engineering contractors' work by focusing its attention on overall management of CPSES engineering activities rather than the detailed performance of engineering and design. This management and oversight role permits CPE to be involved in engineering decisions, to understand and concur with the design criteria developed by the engineering contractors, and to understand the procedures and methods used by the engineering contractors to perform the design and hardware validation. The consolidation of all CPSES engineering personnel under a single Department improves coordination and interfacing among engineering disciplines, optimizes the use of engineering resources by increasing the flexibility of engineering management in personnel assignments, and assures that engineering work is performed and supervised in a consistent manner.

CPE is located, and will continue to be located during CPSES operation, at the CPSES site. In addition, the majority of the engineering contractor personnel are located at the CPSES site. This facilitates their observation of field conditions and strengthens their interface and coordination with Construction, QA and Operations personnel.

The consolidated CPE organization consists of five Sections: Mechanical Engineering, Electrical Engineering, Civil Engineering, Engineering Assurance and Engineering Projects.

a. Mechanical Engineering Section

The Mechanical Engineering (ME) Section is responsible for providing management direction, oversight and coordination of safety-related mechanical engineering and design performed by the engineering contractors. Its responsibilities include fluid systems, fire protection systems, the systems interaction program, mechanical and seismic equipment qualification, chemistry and materials engineering. The ME Section reviews the Design Basis Documents (DBDs) developed by the engineering contractors in the mechanical area and must concur with them prior to approval. It is also responsible for performing design of non-safety-related mechanical fluid systems.

b. Electrical Engineering Section

The Electrical Engineering (EE) Section is responsible for providing management direction, oversight and coordination of safety-related electrical and instrumentation and control (I/C) engineering and design performed by the engineering contractors. Its responsibilities include AC and DC electrical systems, I/C for mechanical and electrical systems and electrical equipment environmental qualification. The EE Section reviews the DBDs developed by the engineering contractors in the electrical and I/C areas and must concur with them prior to approval. The EE Section is responsible for performing design of non-safety-related electrical and I/C systems.

c. Civil Engineering Section

The Civil Engineering (CE) Section is responsible for providing management direction, oversight and coordination of safety-related civil, pipe stress and pipe supports, cable tray hanger, conduit and HVAC supports engineering and design performed by the engineering contractors. The responsibilities of the CE Section include Seismic Floor Response Spectra, building structures and structural components, component supports, and pipe whip and moment restraints. The CE Section reviews the DBDs developed by the engineering contractors in the civil area and must concur with them prior to approval. It is also responsible for performing analyses and design of non-safety-related and nonseismic piping, pipe supports, cable tray, cable tray hangers, conduit, conduit supports and structures.

d. Engineering Assurance Section

A significant innovation for CPE during its reorganization was the creation of the Engineering Assurance (EA) Section, which provides further assurance of design quality. The EA Section is responsible for preparing and maintaining design control procedures, as well as providing the necessary training in their use. It conducts technical evaluations and surveillances of engineering activities (including those of engineering contractors) to assure that the requirements of the procedures for design and design control are satisfied and that the design documentation is technically correct.

The EA Section strengthens TU Electric's assurance that (1) the procedures that govern engineering and design activities adequately control the performance and documentation of those activities, and (2) that those activities are performed in compliance with the applicable procedures.

e. Engineering Projects Section

The Engineering Projects Section's responsibilities include: administrative coordination of CAP engineering contractors for resolution of engineering issues to support the Unit 1 completion schedule; engineering document control (processing of drawings, specifications, design change authorizations (DCAs) and non-conformance reports (NCRs)); management of Computer Aided Design (CAD) operation and production; and management of various engineering procurement responsibilities and activities related to spare parts, vendor technical manuals and specifications.

f. Engineering Contractors

The engineering contractors report to the CPE Director of Engineering for the performance of safety-related and selected non-safety-related engineering and design at CPSES. The CAP engineering contractors (SWEC, Ebasco and Impell) are performing the CAP design and hardware validation activities in accordance with the TU Electric program or TU Electric approved QA programs and consistent with the requirements of the TU Electric design control procedures. Each of these engineering contractors has extensive recent experience, at nuclear power plants that have received operating licenses, in the performance of design activities similar to those they are now performing at CPSES.

The interfaces among the engineering contractors and with CPE are procedurally controlled. Each engineering contractor has developed procedures (task descriptions) which define and control their interfaces with the other engineering contractors, the NSSS vendor and CPE. The EA Section of CPE performs surveillances of the engineering contractors to assure that the interface procedures are satisfactory and that they are complied with.

2. Addition of Engineering Personnel

In conjunction with the re-organization of CPE, experienced engineering management and staff have been added to augment CPE's ability to manage the work of the engineering contractors and to support future operation of CPSES. The new CPE management personnel include the Director of Engineering (Section III.A) and the EA and CE Section Managers.

Each of the CPE Sections is headed by a Manager who has substantial professional experience in the nuclear industry. The Manager of the ME Section has 16 years of professional experience with TU Electric, 14 years of which have been devoted to nuclear engineering activities for CPSES, including 13 years of engineering support in the Operations Department prior to the consolidation of its engineering activities into CPE. While in the Operations Department he participated in operator training at CPSES and at the Zion Nuclear Station, where he received the Westinghouse Senior Reactor Operator Certification.

The Manager of Electrical Engineering has 15 years of professional experience, including 7 years with CPE performing electrical design and nuclear engineering supervision activities for CPSES. Prior to joining TU Electric he was engaged in the design and construction of commercial and industrial electrical and instrumentation systems for six years and was employed as an engineer by Westinghouse Electric Corporation in its Steam Turbine Division for two years.

The Manager of Civil Engineering has 16 years of professional experience, including approximately 13 years in the nuclear industry. His nuclear experience includes three and a half years as the Chief of the Plant Systems Section and as a Reactor Inspector for the NRC (Region III), two years as Engineering Manager for Nutech Engineers, over three years as a senior engineer with EG & G Idaho, and three years as a stress analyst with Sargent & Lundy Engineers.

The Manager of Engineering Assurance has over 20 years of nuclear experience, including over five years with the NRC as a Senior Reactor Construction Engineer, Senior Resident Inspector, and Reactor Inspector. He was also an engineering manager involved in the design of another nuclear power reactor for four years, first for the architect/engineer and subsequently for the utility. He was employed by General Electric as a Senior Training Engineer, where he was certified as a Senior Reactor Operator at Dresden Unit 2. He also served for approximately 11 years in the U.S. Navy nuclear power program, first as an enlisted man and thereafter as an officer.

The Manager of Engineering Projects has 16 years of professional experience, including 15 years of nuclear engineering experience on CPSES. For eight years he was an engineer or supervisor in nuclear fuels, during which time he was certified by Westinghouse as a Senior Reactor Operator at the Zion Nuclear Plant. For the past seven years he has been in engineering management at CPSES. His responsibilities included the conceptual design of the modifications required as a result of the Three Mile Island accident.

Additional staff and experience level have reinforced CPE's ability to perform the management, oversight and coordination of the engineering contractor design activities. Between April 1986 and April 1988 CPE added 110 engineers, who averaged approximately nine years of prior nuclear experience.

3. Enhanced Procedures and Control

The provisions of the NEO Policies and Procedures Manual and the E & C Manual are implemented by the Engineering Department through the Engineering Procedures Manual (ECE procedures[3]). The ECE procedures govern the activities of CPE personnel and control CPE interfaces with other organizations such as Construction, QA, Operations and engineering contractors.

To assure uniformity and useability, the ECE procedures are organized and formatted in the same manner as the higher level NEO procedures. ECE procedures have been developed and implemented to supplant many of the procedures previously utilized by Engineering and, in some instances, to provide additional procedural control.

Each procedure clearly states its purpose and applicability. A single section identifies the other documents referenced by or establishing the basis for the procedure. Organizational and individual responsibilities are identified. Specific instructions are provided and, where useful for better control and understanding, supplemented by figures and attachments. Each procedure also identifies documents to be generated as a result of application of the procedure.

The ECE procedures assure that design activities are controlled and documented in accordance with current interpretations of 10CFR50, Appendix B and ANSI N45.2.11. Where appropriate, multiple control systems have been consolidated to provide uniform controls and aid the ability to train users. The current procedures emphasize understanding through the use of detailed instructions and additional guidance and examples. The procedures typically incorporate standard forms which assist in guiding implementation and also provide an auditable record of key associated engineering and design activities.

Engineering contractors performing design activities at CPSES are required to utilize either the ECE procedures or design control procedures consistent with the ECE procedures. Further, an ECE procedure (ECE 1.01) specifically requires the development and use of procedures to control the interfaces among organizations (engineering contractors, NSSS vendor and/or CPE). The CPE EA Section reviews the design control procedures utilized by engineering contractors to assure that the requirements of the ECE procedures are appropriately addressed.

---

(3) ECE is used herein even though CPSES engineering procedures have or previously had other designations, e.g., EC-DC, TNE-DC.

The ECE procedures developed to control the design process will continue to be used after the transfer of safety-related design responsibility from the engineering contractors to CPE. Similarly, the detailed technical design manuals used by the engineering contractors for performance of CAP activities will be turned over to CPE and serve as the basis for CPE design manuals to be used upon assumption by CPE of safety-related design responsibility.

The following discussion highlights some of the enhancements to the design controls embodied in the ECE procedures.

a. Design Control

A significant feature of the design control process is the establishment of a procedure (ECE 5.01-01) requiring the development and control of DBDs. DBDs are neither required by regulations nor widely used within the nuclear industry. However, they have recently been recognized by the industry to be an excellent vehicle for collecting and controlling design basis information. DBDs specify the design criteria necessary to assure that the design of safety-related and selected non-safety-related structures, systems and components complies with licensing commitments. The design validation was accomplished using these design criteria. The procedure requires that the DBDs be maintained consistent with the licensing commitments and design requirements. Thus, DBDs not only provide the framework for consistent design validation efforts, but also are key input documents for controlling the design basis of the plant throughout its life.

Revisions have been made to the procedures governing the development and control of calculations (ECE 5.03), specifications (ECE 5.02) and drawings (ECE 5.05). The content and format of calculations have been more clearly defined to achieve greater consistency and further the effectiveness of design reviews. Emphasis is placed on the proper selection and documentation of design inputs and the identification and justification of assumptions, methods and engineering judgments. The procedures governing development and control of calculations, drawings and specifications also govern the revision of these documents. These procedures provide for the clear identification of new or changed information in revised documents. The procedures also provide specific criteria which establish requirements for revision. These criteria address, as appropriate for particular types of drawings or specifications, generic and one-time design changes, limits on the number of design changes that may be posted against a document, and limits on the amount of time that may elapse following implementation of a change prior to incorporation. This assures that design changes are incorporated on a timely basis.

The design control procedures were revised to specifically limit the methods used for preparing, approving and implementing design changes. This provides added assurance that design changes are accomplished in a consistent, careful manner with full Engineering control. Three design changes methods are provided: design document revision, DCAs and NCRs.

The ECE procedures require review and evaluation of all changes by Engineering. The DCA procedure (ECE 5.01-03) requires that the reason for change be identified and its validity evaluated by Engineering. The design change must be prepared by Engineering. Design inputs and affected design documents must be clearly identified, and the engineering basis must be provided. The extent of any required backfit for installation and inspection must be defined for changes to generic design requirements.

DCAs are reviewed and approved in a manner consistent with the original design document being changed. Interdiscipline Review (IDR) by affected organizations and Design Verification (DV), when appropriate, are required before final management approval of a design change. IDR and DV are procedurally defined and controlled (ECE 5.09-01). Specific instructions are provided regarding determination of reviewing organizations and acceptable design verification methods.

Strict procedural controls have been placed on the implementation of design changes prior to complete and final approval. Under specific circumstances, DCAs with Confirmation Required (DCA w/CR) may be used. A DCA w/CR may be implemented to support ongoing field activities while IDR and DV are being completed. Importantly, a DCA w/CR, like any DCA, must have been prepared by the responsible Engineering organization and have a supervising engineer's approval prior to being implemented, in accordance with ECE 5.01-03. It may not be used to disposition a nonconforming or deficient condition, or to change a generic requirement. Work may not be authorized by a DCA w/CR unless it can be reworked or repaired if final approval is not obtained following IDR and DV. All DCAs w/CR are tracked in the design control data base, and must be confirmed prior to incorporation into affected design documents.

The NCR procedure (ECE 3.05) was revised, in part, to explicitly allow and control the use of "use-as-is" and "repair" dispositions of NCRs as formal design change mechanisms. This enables an NCR to be a stand-alone design change document. The requirements for preparation, documentation, review and control of such NCRs are equivalent to those for DCAs.

The procedural control of deficiencies (ECE 3.06) also has been enhanced. Deficiencies, including design deficiencies, involve documentation concerns or departures from procedural requirements as differentiated from hardware nonconformances. Deficiency Reports

(DRs) are used to document the identification, control and correction of deficiencies, including design deficiencies. The procedure requires, for disposition of design deficiencies, identification of cause, extent, corrective action, preventive action and adverse conditions affecting safe operation as appropriate.

Design changes are trended (ECE 2.11-I1) to monitor the effectiveness of the design control process. In accordance with specific instructions, design changes are coded to categorize them by unit affected, safety classification, responsible organization and reason for change. These data are compiled and analyzed monthly to identify trends which may require corrective action or management attention. Trends so identified are documented and controlled using a DR.

b. Control of Documents in the Field

TU Electric has enhanced the control of documents to provide added assurance that design, construction and QC inspection activities are conducted utilizing only current, approved documents. The processing, distribution and revision of Construction and QC procedures, design drawings, design specifications, task descriptions and Field Verification Methods are controlled through the Document Control Center (DCC). In 1984, TU Electric assumed from the construction contractor full control over the DCC and the distribution of such documents.

The ability of the DCC to process and distribute controlled documents and changes thereto was aided by the use of computerized data bases. Control was also aided in mid-1983 by the creation of DCC satellites to receive, store and distribute controlled documents, thereby reducing the number of individual, long-term holders of controlled documents.

The computerized data bases identify controlled documents and their required holders, and generate routing lists that facilitate prompt, accurate distribution of controlled documents, including changes and revisions thereto. A data base maintains accurate listings of current and historical information (e.g., DCAs and NCRs) affecting controlled documents, and generates printouts of document locations, aperture card labels and other reports for controlled documents. The computerized data bases thus provide enhanced accountability for controlled documents and assure that current information affecting controlled documents is readily available and provided to document users (e.g., CPE, Construction, QC and Operations personnel).

TU Electric created a full time monitoring team when it restructured the document control activities in 1984. This monitoring team, now a unit in the Process Control Section of the Projects Department, continues to monitor regularly the document control activities. The monitoring team performs administrative checks to assure that holders of controlled documents, including the DCC and Document Control

Satellites, have required inventories of current revisions. The monitoring team verifies the controlled document holdings of each satellite monthly, except the SWEC-Boston satellite which is verified quarterly. The controlled documents of long-term, individual holders are verified at least semi-annually. The monitoring team periodically checks document packages issued by each satellite to assure that they are complete with all current information. The efforts of the monitoring team have reduced document control error rates to a fraction of one percent.

Frequent executive summaries of the team's activities and the adequacy of document control are submitted directly to the Vice President, Engineering and Construction. These efforts are in addition to the audits of document control activities regularly performed by the QA Department.

4. Special Programs

TU Electric has performed a number of reviews and revisions of various aspects of past engineering and design work, including (1) a comprehensive review and update of installation specifications, procedures and drawings, (2) a review of NCRs and TUGCO Design Deficiency Reports (TDDRs) to assure that the dispositions are technically acceptable and consistent with the validated design, (3) a review of the various methods previously used to transmit technical information to assure that design changes were properly documented and dispositioned and (4) a review of vendor technical manuals to assure they are current, complete and applicable to CPSES. Each of these reviews is described below.

a. Specification, Procedure and Drawing Update (SPADU)

The Specification, Procedure and Drawing Update (SPADU) was initiated in October 1986 as a part of the CAP. SPADU was coordinated by CPE and included a Task Force comprised of experienced Engineering, Construction, QC and Operations personnel. Its purpose was to assure that the safety-related installation specifications and related detail drawings (drawings which contain fabrication or installation requirements) contain the technical and QC inspection requirements necessary to satisfy the licensing commitments, the design criteria specified in the DBDs and applicable industry standards. SPADU further assured that the Construction procedures, QC inspection procedures and applicable Operations procedures are consistent with the installation specifications and detail drawings.

The installation specifications and related detail drawings are the primary documents by which Engineering transmits technical installation requirements to Construction and inspection requirements to QC. Construction implements the installation requirements through Construction procedures and QC implements the inspection requirements through QC inspection procedures. The installation specifications

were reviewed under SPADU by experienced CAP contractor engineering personnel. During this review, the installation specifications were revised as necessary to assure that the technical requirements are consistent with the validated design and that they identify the technical requirements needed to install the hardware in compliance with the design criteria. The installation specifications were also revised by Engineering to identify the QC inspection attributes and acceptance criteria necessary to assure that the installed hardware complies with the design requirements. The revised installation specifications also incorporate CPRT recommendations related to hardware installation and QC inspection requirements.

The related drawings that contain installation requirements were similarly reviewed and revised to assure that they are consistent with the installation requirements and to transfer any generic requirements they contained to the installation specifications.

Construction procedures and QC inspection procedures were revised as necessary to be consistent with the requirements of the revised installation specifications and detail drawings, and to incorporate any applicable CPRT recommendations. Operations' maintenance procedures were reviewed and revised as required to be consistent with the installation specifications or to reference them.

The SPADU Task Force was comprised of personnel from Engineering, Construction, QC and Operations. The inputs, interfaces and requirements of each organization were identified and incorporated in the appropriate installation specifications, detail drawings and procedures.

The revised installation specifications form the basis for the Post Construction Hardware Validation Program (PCHVP). The inspection requirements identified in the revised and validated installation specifications were used to develop the final acceptance attributes identified on the PCHVP Commodity/Attribute Matrix.

The previously discussed installation specifications, detail drawings, Construction procedures, QC inspection procedures and applicable Operations procedures are being used for current and future installation, modification and maintenance of CPSES safety-related hardware.

b. Review of Previously Dispositioned NCRs

TU Electric has undertaken a self-initiated review of past NCRs. TUGCo Design Deficiency Reports (TDDRs) that contain dispositions which could affect hardware were also reviewed.

The review program was initiated in response to a Corrective Action Request (CAR) which identified certain NCRs judged to have inadequate documentation of the technical justifications for the dispositions. A new corporate procedure, NEO 3.05, "Reporting and Control of

Nonconformances", was developed in response to this CAR to preclude recurrence of the concern. This procedure consolidated and replaced a number of procedures that had previously controlled the NCR process and promotes consistency in the engineering disposition of NCRs. It clarified the requirement that Engineering provide a justification of the technical acceptability of NCR dispositions that affect design. In addition, training was provided to Engineering personnel emphasizing the need for engineering justification for repair and use-as-is dispositions. The review program assesses NCRs dispositioned prior to December 22, 1986, the effective date of NEO 3.05.

TDDRs were used between April, 1984 and December, 1986 for the documentation, control and correction of design deficiencies at CPSES. The TDDR system was replaced with the DR system (discussed in Section III.B.3.a, above) on December 22, 1986, with the implementation of NEO 3.06, "Reporting and Control of Deficiencies." TDDRs whose dispositions had not been approved by that date were incorporated under the new procedure. Dispositioned TDDRs approved prior to that date, and which could affect hardware, were added to the scope of the NCR review program.

SWEC is the lead contractor responsible for the review of the previously dispositioned NCRs and TDDRs. It is performing this review in accordance with SWEC Project Procedure PP-041. SWEC performed an initial screening of the NCRs to identify those that have dispositions that might affect engineering requirements (i.e., use-as-is, repair or void) and that are not the subject of other engineering validation efforts as part of the CAP, which would obviate the need for further review. These other validation efforts are Pipe Stress and Pipe Support, Equipment Qualification, Cable Tray Hangers, Conduit and HVAC. The determination that an NCR disposition is already being addressed by these efforts must be concurred in by the engineering contractor responsible for the effort or it is included for further review by SWEC.

SWEC assesses the technical adequacy of the dispositions of the applicable TDDRs and those NCRs identified by the screening as requiring further review. Additional justification or documentation is provided when necessary to support an otherwise adequate disposition. When the disposition is found to be inadequate, or cannot be verified to be adequate by SWEC, the condition is documented on an NCR or a DR for disposition by the responsible organization in accordance with NEO 3.05 or 3.06 as appropriate. A significant portion of the review has been completed without identification of any reportable deficiencies.

This review program assures that NCRs and TDDRs dispositioned prior to December 22, 1986, were technically adequate and in compliance with all licensing commitments, or assures implementation of appropriate corrective action. Thus, it provides a high degree of confidence that previously dispositioned NCRs and TDDRs are consistent with the validated design.

c. Review for Design Changes

As discussed in Section III.B.3.a, TU Electric has more clearly specified and restricted the methods used to prepare and approve design changes. To assure itself that design changes implemented or approved by CPE had been properly reviewed and documented in accordance with established programs, TU Electric conducted a self-initiated review of historical engineering documents which may have embodied design change information.

CPE personnel researched CPSES documents to identify the document types that potentially could have initiated and implemented design changes. These included the following categories of documents: requests from outside Engineering, requests from within Engineering, work instructions, known design change documents, engineering packages, deficiency documents, contractor internal documents and correspondence. CPE eliminated from further review the document types that were historically, and continue to be, controlled by approved procedures that require engineering review and approval and that are subject to audit and surveillance. It was judged that the applicable procedural controls assured that the documents were properly reviewed and documented and that any deficiencies in implementation would be detected and addressed by the QA program. Other document types were eliminated from further review because they were of a nature that made it unlikely that they had been utilized to initiate or implement design changes.

CPE personnel then further screened the remaining document types by reviewing documents, typically 60 or more, from each document type. The balance of the documents in a given document type were then reviewed by CPE personnel if at least one document of that type was found to contain an improperly documented design change, a request for engineering to address a nonconforming condition, or a known design change not included in the DCC/DCA Data Base. (Note: one function of the DCC/DCA Data Base is to index design changes and identify them against their parent design documents.)

The latter review encompassed more than 100,000 individual documents. NCRs, DRs or DCAs were issued as appropriate to address questions about documents raised in the review. These NCRs, DRs and DCAs are being dispositioned by the CAP engineering contractors in accordance with approved procedures. Completion of the review and disposition or approval of the resulting NCRs, DRs and DCAs will assure that any design changes that might have been inappropriately documented are now identified on approved design documents, and that any deficient conditions which were not previously corrected are properly dispositioned. A significant portion have been dispositioned or approved; to date no reportable deficiencies have been identified.

d. Vendor Technical Manual Review and Control

TU Electric is implementing a Vendor Technical Manual Review (VTMR) program consisting of an engineering review of the manuals to assure that they are current, complete and applicable to CPSES. In conjunction with the VTMR program, CPE has developed an ECE procedure (ECE 5.19-02) that controls the engineering review of new or revised Vendor Technical Manuals to assure that they are current, complete and applicable to CPSES. The VTMR program and procedural controls are implemented in compliance with the NRC position in NRC Generic Letter 83-28 that requires Vendor Technical Manuals to be "current, complete and applicable". The VTMR program and procedural controls are consistent with the intent of the guidelines of INPO DE-102, TS-403, 84-010 and 84-009 as they relate to the control of Vendor Technical Manuals.

The VTMR for existing manuals is being performed by SWEC and encompasses the CPSES safety-related equipment (system, structure, component, subcomponent or part). The manuals are reviewed against the most current revision of the applicable procurement specifications to assure that they include the parameters necessary to operate and maintain the equipment in accordance with design requirements and licensing commitments. These parameters include calibration and testing instructions; acceptance criteria for tests, inspections and performance of equipment; replacement/spare parts list; and start-up, operation, shutdown and maintenance instructions. The VTMR program will be completed prior to fuel load.

Procedure ECE 5.19-02, "Vendor Technical Manual Review," requires an engineering review of new Vendor Technical Manuals and revisions of existing manuals received from vendors to assure that they comply with CPSES design and procurement requirements. The parameters reviewed encompass those reviewed during the VTMR program. Any revisions to design documents required as a result of this review are identified.

Vendor Technical Manuals approved by Engineering in accordance with the VTMR program (existing manuals) or ECE 5.19-02 (new manuals and revisions to existing manuals) are transmitted to Operations. Operations reviews the manuals in accordance with Procedure STA-206, "Control of Technical Manuals" to identify any required changes to Maintenance or Operations Procedures.

Thus, the VTMR program and ECE 5.19-02 assure that the Vendor Technical Manuals contain current, complete and applicable information for all safety-related equipment. Operations Procedure STA-602 assures that Maintenance and Operations Procedures are maintained consistent with the intent of the Vendor Technical Manuals.

C. Construction Department

TU Electric has adjusted its role in CPSES construction activities in order to introduce construction management experience from recently completed commercial nuclear power projects. This adjustment has resulted in a reorganization of the Construction Department, an increased and more experienced staff and the development of revised construction procedures which reflect recent industry experience. In addition, procedures have been revised to improve controls and other actions have been taken to enhance the performance of construction activities. These changes are described below.

1. Revised Organizational Structure

Construction management activities, including work planning and scheduling, that were previously performed by the construction contractors are now performed by the TU Electric Construction Department. The assumption of these responsibilities has enhanced TU Electric's control of construction activities and has improved coordination of construction activities with QA and Engineering activities.

The Construction Department has three Sections: The Unit 1 Construction Section, the Unit 2 Construction Section and the Site Facilities Section. Each Section is headed by a TU Electric Manager. The Unit 1 and Unit 2 Construction Sections are responsible for management of the construction activities associated with their respective reactor units. The Site Facilities Section is responsible for activities associated with "non-unit" or support functions, such as roads, telephones, non-power block buildings and landscaping. In addition to these principal responsibilities, each Section provides support to the other two Sections when necessary.

Detailed construction planning is now performed by Construction Engineers. This expanded role of the Construction Engineers enhances the quality and efficiency of construction activities in the areas of technical support to contractor craft superintendents, and coordination among construction activities and among Construction, QA and Engineering.

Construction Engineers, with the assistance of planning and clerical personnel, are responsible for the development of Construction Work Packages (CWPs) which contain the documents that control the construction or modification of systems, structures and components. CWPs include such documents as design drawings, DCAs, NCRs, Weld Data Sheets, a traveler that provides specific instruction (e.g. inspection hold points), and a generic traveler with instructions which address such matters as housekeeping and protection of permanent plant equipment. As described in Section IV.B.1.b.iii, Quality Engineering personnel also participate in the development of CWPs to assure that QC inspection attributes and hold points are properly included.

In developing the CWPs, the Construction Engineers review design documents to assure that they provide clear definition of the work to be performed, to evaluate physical interferences and constructibility issues, and to identify any such issues to Engineering for resolution. The Construction Engineers also monitor construction activities to assure compliance with design documents, procedures, quality standards and workmanship requirements, and provide assistance to craft supervisors to assure the coordination of other field construction activities. They are responsible for coordination with Engineering for technical issues and with Quality Engineering for QA/QC matters. The Construction Engineers assist construction personnel in the interpretation of engineering documents, but may not authorize any deviations from the engineering documents.

The Unit Construction Sections also include Construction Superintendents, who provide direction to construction contractor supervision to assure that their personnel are trained and knowledgeable in the required installation specifications and construction procedures and that craft labor is aware of any special requirements.

Construction craft labor and craft first-line supervisors (Foremen, General Foremen and Superintendents) are provided by construction contractors. The two principal construction contractors are Brown & Root and Fluor Daniel. Brown & Root has been the general site contractor since the start of construction. Fluor Daniel, which assumed certain construction responsibilities in 1987, has participated in the design or construction of ten commercial nuclear units, and its participation in CPSES has strengthened the level of nuclear experience of construction contractor personnel.

2. Addition of Construction Personnel

Each Construction Section Manager has substantial experience. The Unit 1 Construction Manager is a degreed and registered professional engineer and a member of the American Society of Mechanical Engineers. He has 17 years of construction engineering and construction supervisory experience, including five years of commercial nuclear power plant construction experience. The Unit 2 Construction Manager has thirty-five years of professional experience, including 18 years of nuclear power plant construction and testing experience. The Site Facilities Manager has five years of nuclear experience.

The level of Construction Department staffing and the level of nuclear experience have been increased to perform these expanded responsibilities. TU Electric has hired 12 Construction Engineers who have an average of eight years of nuclear experience. These TU Electric Construction Engineers supervise the work of approximately 320 Construction Engineers, who are seconded to TU Electric by various contractors. Procedures require that Construction Engineers be degreed engineers with a minimum of four years of nuclear experience, or equivalent.

3. Enhanced Procedures

The Construction Department has adopted a system of procedures (ECC procedures) that amplify and implement the applicable NEO and E&C Policies and Procedures. The administrative ECC procedures are consistent with NEO procedures and policies in content and format to assure that they are readily understood within the procedural hierarchy. ECC procedures provide greater detail on the duties and responsibilities of the Construction Sections and the Units within each Section, establish a standard format and content for technical construction procedures, describe the methods to be utilized for training and qualification of personnel and the methods to be utilized to control construction activities. For example, ECC procedures (ECC 2.13-3, ECC 2.13-4, ECC 2.13-5, ECC 2.13-5A, ECC 2.13-6 and ECC 2.13-7) provide detailed direction on the generation of CWPs and their implementation to assure that construction activities are consistent with the Engineering and QA requirements.

Another example is the procedure (ECC 2.32) which defines the responsibilities of TU Electric and contractor personnel for observation of housekeeping requirements, including the establishment and posting of housekeeping zones, prescribes the use of surveillance and assigns to supervisors accountability for housekeeping in designated zones. TU Electric has strengthened its procedures that control the preservation of installed equipment and the prevention of damage to completed construction work.

In addition to the ECC procedures, the construction contractors have procedures that control construction methods. As described in Section III.B.4.a above, one of the accomplishments of the CAP was SPADU which, among other things, upgraded the CPSES installation specifications and technical construction procedures. In addition to incorporation of the validated design requirements, SPADU also assured that the specifications provide adequate details and that constructibility and occupational safety are considered appropriately. The contractor construction procedures are being converted to TU Electric procedures, and will be available for use by TU Electric for future maintenance and modification activities.

4. Other Enhancements for Construction

In addition to these changes in organization, staffing and procedures, the Construction Department has undertaken a number of other actions to increase the assurance of the quality of construction activities. Craft training programs are structured to incorporate prompt feedback as skill-related problems arise in the field, and to provide cross-training of certain craft disciplines to increase and improve skills. Construction Department personnel review the monthly QA Trend Reports (discussed in Section IV.B.2.e) to assess the quality of performance of construction activities. Trend Reports provide data on deficiencies down to the level of the individual craftsman involved. Based on this information, the Construction Department directs the implementation of corrective actions such as retraining of personnel.

Many craft helpers have been replaced with journeymen, thereby increasing the level of craft skills in the working crews. An additional level of superintendents (assistant superintendents) has also been added to improve supervision in the field, increasing the supervisor-to-craft ratios in some specific crafts. In addition Construction Engineers have been assigned on a crew-by-crew basis.

Trend Reports indicate improvement in craft performance and consequently increased assurance that construction is being completed in accordance with design requirements.

D. Associated Programs

The E&C Function also has substantial responsibility with respect to certain programs that involve all of the principal Function areas. Significant enhancements in two such programs, Configuration Management and Records Management, are described below.

1. Configuration Management

In order to assure that the CPSES safety-related design documentation, installed safety-related hardware and operations remain in compliance with the design criteria and licensing commitments, NEO Policy No. 36, "Configuration Management" defines the CPSES Configuration Management objectives and responsibilities. Configuration Management is the process which assures that:

- A current listing of licensing commitments is maintained.
- The design criteria (DBDs) are maintained in compliance with the licensing commitments.
- The design documentation (calculations, drawings, and specifications) is maintained in compliance with the design criteria.
- The installed safety-related hardware is maintained in compliance with the design documentation and licensing commitments.
- Operating, maintenance, test, surveillance and training procedures are maintained in compliance with the licensing commitments (e.g., operating license and technical specifications) and design criteria.

The foundation or baseline for Configuration Management is validated during the CAP. The licensing commitments have been identified and the design criteria that assure compliance with the licensing commitments have been established and documented in DBDs. The design validation has developed validated calculations, drawings and installation specifications that comply with the design criteria and

licensing commitments. Completion of the PCHVP and final QC inspection assure that the installed hardware complies with the design criteria and licensing commitments. The Test procedures are being developed and maintained consistent with the design documentation. The Operating procedures and Maintenance procedures have been reviewed and revised, and are being maintained consistent with the licensing commitments, design criteria, installation specifications and Technical Specifications. The training materials and simulator configuration are being validated to be consistent with the CPSES design documentation and Technical Specifications. TU Electric is developing an improved Commitment Tracking System (discussed in Section IV.C.2.a, below) to assure that licensing commitments are maintained current and satisfied.

Design change procedures (discussed in section III.B.3, above) have been adopted which prevent the approval of any safety-related design change that is inconsistent with the design criteria specified in the DBDs or the FSAR unless and until a revision of the DBD and/or FSAR is approved by appropriate Engineering management. These procedures require that design changes be appropriately reviewed to determine the impact on design, operation, training and maintenance documents, as well as on the Technical Specifications. They also require that, in the development of design changes, consistency is maintained among the various baseline documents and the installed hardware. Design changes (documentation and hardware) can be initiated by various organizations, but can be prepared and approved only by Engineering.

In summary, Configuration Management represents a significant commitment by TU Electric, which involves the entire NEO Group in assuring that the CPSES design, hardware and operation remain in compliance with its licensing commitments.

2. Records Management Program

In early 1987, based in part on recommendations from a detailed survey of CPSES records management activities performed for TU Electric by SWEC. the Executive Vice President, NEO issued NEO Policy Statement No. 38, "Records Management". It created the position of Project Manager, Records and provided for the development of an NEO records management plan that would integrate and enhance the existing records management programs. Shortly thereafter, NEO procedures established the objectives, functions, requirements, processes and responsibilities for a centralized, integrated records management program (NEO 2.13, "Management of Nuclear Power Plant Records"; and NEO 2.23, "Turnover of Nuclear Power Plant Records").

Based on the NEO Policy and Procedures, a Records Management Program Manual has been issued that contains specific implementation requirements, defines records management responsibilities for all NEO organizations, and specifies the controls necessary for

classification, turnover, processing, storage and retrieval of records. A formal training program to provide system users an overview of the records management program has been developed. The records management program has been implemented by the NEO organizations. Audits of records management activities are conducted periodically by the QA Department to assure compliance with applicable requirements.

Record classification has resulted in the assignment of over 320 record type codes as well as the identification of approximately 50 NEO and NEO support organizations responsible for the compilation of records for turnover to Records Management. A records turnover schedule has been developed that provides for a systematic turnover of records.

In order to meet the requirements for records preservation and storage, records are being microfilmed to the extent practicable. Four records processing satellites have been provided on site to facilitate microfilming/indexing and immediate capture of completed records.

The Records Management System (RMS) maintains consistent entry of formatted data through the use of Indexing Exhibits developed for individual record types. On-line edit files and a keyword edit file validate input data prior to system acceptance.

An automated record retrieval system has been set in place to provide rapid and accurate retrieval of records and records-based information Records retrieval is facilitated by the capability to perform keyword searches to readily access required records-based information that has been entered into the data base. In order to provide ready access to the records retrieval process, six satellite retrieval stations have been established. Each one contains a computer terminal with access to the computerized data, as well as the appropriate microfilm reading and printing facilities so that users can readily access records and obtain hard copy if necessary.

This integrated approach to records management assures that records turnover from the contractors at the completion of their assignments will be accomplished successfully and that required records will be stored in a manner that provides the necessary level of protection and retrievability and meets applicable regulatory requirements.

IV. Nuclear Engineering

TU Electric has established a Nuclear Engineering Function within the NEO Group, to be responsible for the Quality Assurance, Nuclear Licensing and Reactor Engineering Departments. It has hired to direct these Departments, individuals who have substantial experience in the nuclear industry, and has enhanced the organization and programs of both of these Departments. These changes are described below.

A. Revised Organizational Structure

The Nuclear Engineering (NE) Function was established in 1985 as part of the establishment of the NEO Group. Its principal responsibilities during CPSES design and construction are encompassed within the Nuclear Licensing and QA Departments. NE also includes the Reactor Engineering Department, which performs reactor safety analysis, reactor physics analyses, fuel procurement and management, and related activities, and the Administration Department, which provides various types of administrative support for CPSES activities. In addition, the Vice President, Nuclear Engineering is the chairman of the Senior Review Team and provides administrative direction to the Director of CPRT. Each of the three technically oriented NE Departments (Nuclear Licensing, QA and Reactor Engineering) is headed by a Director or Manager who has substantial experience in the nuclear industry.

The Director of QA was appointed in 1986, after brief service as an Executive Assistant to the Executive Vice President, NEO. His experience includes three years with the U.S. Navy nuclear power program, three years as a licensed Senior Reactor Operator on research reactors, and 15 years with the NRC as a Reactor Engineer, Project Inspector, and in supervisory and management positions in NRC Region III. During his tenure at the NRC, he held regional positions with responsibility for both resident and region-based NRC inspection program activities for nuclear plants in the construction, pre-operational testing, start-up and operational phases.

Prior to joining TU Electric in 1987, the Manager of Nuclear Licensing had approximately 26 years of nuclear experience, including six years with the U.S. Navy nuclear power program, seven years with General Electric in reactor operations and training, and 13 years with the NRC in various inspection and management positions. He has held a Senior Reactor Operator license on a dual unit 800 MWE BWR and a Reactor Operator license on a commercial PWR test reactor.

The Director of Reactor Engineering, who joined TU Electric in 1986, has a PhD in Nuclear Engineering and over 15 years of experience in the nuclear industry, primarily devoted to the performance and supervision of nuclear analyses for the Yankee Atomic Electric Company.

B. Quality Assurance Department

In recent years TU Electric has enhanced the QA organization and programs for CPSES. These enhancements include improvements in the structure, staffing and experience levels within the QA Department, and programmatic improvements to QA procedures, training, audits and surveillances, quality engineering, and nonconformance and corrective action systems.

1. Revised Organizational Structure and Addition of Personnel

The QA Department consists of three Sections. The QA Section is responsible for the CPSES surveillance program, the QA audit program, the Technical Audit Program (TAP), and the vendor compliance program. The QC Section is responsible for the CPSES QC inspection activities for construction, testing and modifications, and for assuring that identified nonconformances are adequately statused and resolved. The Operations QA Section is responsible for QA activities to assure that the plant is operated, tested, maintained and modified in accordance with applicable requirements, and for certain QA Department-wide activities such as QA trending and training of QA Department personnel.

Each Section is headed by a Manager and contains a number of Units headed by Supervisors. The changes in the structure, staffing and experience levels of each of the three Sections and the respective Units within these Sections are detailed below.

a. QA Section

The QA Section, consisting of the QA Audit, Vendor Compliance, and Quality Engineering Units, was relocated from Dallas to the CPSES site during 1986-87. Subsequently, the Quality Engineering Unit was transferred to the Operations QA Section and the Site Surveillance Unit was transferred to the QA Section. The realignment and relocation of personnel has aided communication with other site organizations and furthered the effectiveness of the QA Section.

The QA Section is headed by the Manager of QA, who assumed his responsibilities in March, 1985. He had more than 20 years of QA and management experience with AVCO Corporation, Westinghouse and Daniel International, including corporate and project QA responsibility for a number of nuclear and industrial projects.

The QA Section's professional staff has grown to a present staffing level of more than 125, with experience levels averaging over 14 years. The increased staff is primarily the result of implementing the TAP to assess the effectiveness of the CAP implementation, and the expansion of the Surveillance Unit and its transfer to this Section. The QA Section is organized into four technical Units and an administrative support Unit. The functions, supervisors and staffing levels of the four technical Units, and enhancements to those Units, are described below.

(i) QA Audit Unit

This Unit reviews NEO compliance with licensing commitments and performs independent in-depth audits of safety-related activities, including design, procurement, construction, inspection, testing, start-up and operations activities. The size of the Unit has increased significantly, to support an expanded program of technical (i.e., performance-based) as well as programmatic audits. These personnel have added experience covering the QA aspects of nuclear plant design, construction and operation. The Unit Supervisor has over 15 years of U.S. Navy and commercial nuclear power experience, including experience in control room operation, reactor controls, and quality surveillance and auditing.

(ii) Quality Site Surveillance Unit

This Unit assures through scheduled surveillances that safety-related activities in the areas of engineering walkdowns, construction, QC inspection and operations are performed and documented as prescribed by approved procedures. Specialized, technically qualified personnel have been recruited to increase this Unit to its current level of approximately 50 specialists, ranging from degreed engineers to ANSI N45.2.6 certifiable Level II and III inspection personnel. The increased level of staffing enables this Unit to undertake surveillances of additional scope and depth. The Supervisor is a degreed engineer with nine years of experience as a construction engineer, contracts engineer, QC inspection supervisor, and inspection process control supervisor working in both fossil fuel and nuclear power generating facilities.

(iii) Technical Audit Unit

This Unit was established in early 1987 to provide an additional level of assurance that the CAP is implemented properly. The TAP audits emphasize technical rather than programmatic assessments, and in-depth evaluations by highly qualified and experienced personnel. TAP audits are planned and scheduled to cover discrete elements of each CAP engineering contractor's design and hardware validation activities from design criteria identification and validation through reconciliation of the installed hardware with the final validated design. In addition, the Unit is responsible for performing engineering surveillances as a supplement to the TAP audits.

This Unit is staffed by approximately 20 full-time professionals in addition to approximately 90 degreed technical specialists who participate in audits as required. The TAP lead auditors and technical specialists have an average of over 20 years of experience, including experience in application of design criteria to nuclear plants. The Supervisor has 23 years of experience in quality engineering and management, gained while employed by SWEC, Burns and Roe, and Daniel International.

(iv) Vendor Compliance Unit

This Unit was realigned in 1987 to draw personnel for performance of inspections, surveillances and audits of vendor activities from the QA Department as a whole rather than maintaining a separate vendor surveillance staff. This change provides a broader base of qualified individuals to perform vendor inspections, surveillances and audits. To implement this approach, a staff of four individuals is maintained within the Unit to coordinate, track, status, and direct these activities. The personnel performing vendor inspections, surveillances and audits are selected based on their inspection or auditing experience and qualifications, the specific vendor activity to be examined, and the compliance criteria to be applied. The Supervisor has 12 years of nuclear experience involving the procurement, manufacture, inspection, receipt and documentation of procured materials, parts, equipment and services for nuclear power plants. He also has extensive technical experience with ASME material requirements, auditing and safety-related material control programs.

b. QC Section

The QC Section is based at the CPSES site and is headed by the Manager of QC, who assumed his responsibilities in March 1985. He had 14 years of QC experience with Daniel International, where he held various inspection, construction, management and technical positions for a number of industrial and nuclear power construction projects.

The QC Section has grown to a present staffing level of more than 500 having an average of 12 years of technical experience. This increase provides timely support of the CAP.

The Section is composed of four Units. The functions, supervisors and staffing levels of each of the Units, and enhancements to these Units, are described below.

(i) Inspection Unit

This Unit performs QC inspection activities for CPSES excluding ASME QC inspections, which are performed by Brown & Root. It is comprised of over 250 inspectors, supervisors, and staff. The Supervisor has over 20 years of experience in inspection, non-destructive testing and QA, including 10 years supervising QC activities.

(ii) ASME QC Unit

This Brown & Root Unit implements the applicable quality requirements defined within Brown & Root's, TU Electric-approved QA program and site procedures related to the ASME Code, Section III, for all ASME Code construction and equipment installation. Its professional

staff, consisting of approximately 125 inspection specialists, interfaces with ASME, NRC, the National Inspection Board, and the State of Texas Department of Labor and Standards representatives with respect to ASME Code requirements. The Manager of the ASME QC Unit has over 27 years of nuclear experience in construction, operation and maintenance of marine and commercial power plants, including service as a Nuclear Project Quality Manager for Brown & Root since 1979.

(iii) QC Engineering Unit

In March 1985, this Unit was established to provide a dedicated organization staffed with experienced personnel to address QC quality engineering activities. Prior to the establishment of the Unit, these activities were performed in various organizations throughout the Project.

The Unit currently includes approximately 75 professional staff members. Its activities include the development of technical standards and acceptance attributes, consistent with the installation specifications, to be utilized during inspection of particular construction installations and processes; development and review of QC procedures and instructions; and interface with Engineering and Construction management to assure that work planning adequately addresses the areas applicable to QC. The Supervisor was previously employed by Daniel International for 14 years in nuclear QA/QC positions involving civil, electrical, welding, and NDE technical applications. This experience includes over eight years quality supervision at several nuclear power plants.

(iv) QC Services Unit

This Unit's responsibilities encompass evaluation and statusing of DRs and NCRs, control and issuance of QC procedures, and interface coordination between QC and other Project organizations. The professional staff is trained and experienced in QC program functions and document processing. The Supervisor has over nine years of experience in power plant construction and QA supervision.

c. Operations QA Section

The Operations QA Section is headed by the Manager of Operations QA, who has served in this position since its transfer to the QA Department in 1986. He had seventeen years of prior QA experience in the nuclear industry, including six years as Operations QA Supervisor of CPSES. He is chairman of the Quality Surveillance subcommittee of the American Society of Quality Control (ASQC), and is a member of the ASQC Executive Council for Quality Assurance of Operating Power Plants.

Staffing levels in the Operations QA Section have increased to approximately 95 QA specialists, primarily to accommodate expanding responsibilities in the Quality Engineering and Services Units. Operations QA personnel average more than 12 years of nuclear experience. The functions, staffing levels and supervisory personnel of each Unit within the Section, and enhancements to those Units, are described below.

(i) Quality Programs Unit

This Unit is responsible for preparation and maintenance of QA Department procedures and for QA review of NEO, Operations, Construction, CPE, Purchasing and contractor procedures. It also coordinates the activities of QE, QA and QC personnel in the review of Engineering procedures, specifications, procurement documents and design modifications. QE functions, including those related to the completion of construction, have been consolidated under this Unit (with the exception of the ASME and QC Engineering functions previously discussed), assuring that these activities are performed in a consistent, coordinated fashion. In addition, the Unit provides technical support to other QA Units for audit and surveillance activities. The Unit was transferred from Dallas to the CPSES site in July 1986, providing for additional involvement in site activities. The Unit currently includes a staff of 20, who have an average of more than 10 years of nuclear experience. The Supervisor has over 12 years of QA and supervisory experience at nuclear power plants.

(ii) QA Operations Services Unit

This Unit was established in July 1986. Its functions include development of QA/QC training programs, training and qualification of QA/QC personnel, corrective action administration and implementation of the QA trending program. QA/QC training activities, including those related to design and construction QA/QC activities (with the exception of ASME QA/QC training activities), have been consolidated under this Unit, and are now performed under a single set of implementing procedures. This assures consistency in indoctrination, certification, lesson plans, practical field examinations, proficiency requirements, and requalification/recertification requirements. The Unit staff has increased to 45 to accommodate its added training and trending responsibilities. The Supervisor is an ASQC certified Quality Engineer and has over 12 years of nuclear QA/QC experience.

(iii) Operations QC Unit

This Unit is responsible for QC inspection of maintenance, modifications and adjustments performed on plant systems, structures and components that have been turned over to Operations from

Construction. The Unit staff of 29 individuals has technical inspection expertise in the areas of discipline inspection, source inspection for vendor and supplier activities, non-destructive examination, maintenance, and instrumentation and controls. The Supervisor has over 20 years of experience in the Quality field, including military, commercial and nuclear QA/QC. He has held Level III Certifications in nondestructive examinations utilizing Radiography, Ultrasonic, Magnetic Particle, and Liquid Penetrant techniques. He presently holds Level III Certifications in Visual Weld Inspection, Mechanical Inspection, Leak Testing, and ASME Section XI.

2. QA Programmatic Enhancements

Since 1984, TU Electric has enhanced the QA program for CPSES in a number of areas including procedures; training, qualification and certification; audits and surveillances; the nonconformance and CAR Programs and the trend system. Each of these areas is discussed below.

a. Enhanced Procedures

In order to consolidate similar procedures and provide more uniform guidance for QA/QC activities at CPSES, TU Electric consolidated and rewrote the QA procedures during 1987.

The NEO QA procedures upgraded earlier QA procedures in a number of ways. First, the inspection criteria in QA procedures were revised to assure consistency with the revised installation specifications, and instructions unique to the activity being inspected were incorporated into the procedures. Second, the revision and consolidation of procedures provided added assurance of consistency and eliminated duplication. The procedures governing QA/QC activities are comprehensive and provide detailed guidance for QA Department activities.

In February 1988, TU Electric established and implemented the TU Electric Quality Assurance Manual (QA Manual), which consolidated the existing QA documents (i.e., Corporate QA Plan, CPSES QA Plan, Startup QA Plan, Operations Administrative Controls and QA Plan). The QA Manual provides references to the TU Electric policies, procedures and instructions that are used to implement the QA program. Creation of the QA Manual permits quick identification of the TU Electric procedural documents that implement each of the requirements of 10CFR50, Appendix B and provides a single concise document for administrative ease.

b. Training, Qualification and Certification

As described above, the TU Electric QA Training Program was consolidated under the QA Services Unit in 1987 in order to increase efficiency, effectiveness and uniformity. Actions since 1985 have included:

- Centralizing all training, qualification and certification activities under one responsible organization with a full-time supervisor and increased staff.

- Establishing a central QA Department training procedure, supplemented by a series of related procedures which address specific applications, to provide consistent application of training requirements.

- Providing detailed lesson plans, comprehensive task-oriented on-the-job training, and written examinations, and requiring demonstration of job proficiency.

- Establishing improved methods of maintaining and documenting training and certification data, including a computerized tracking system.

c. Audits and Surveillances

A number of steps have been taken to assure that technical audits and surveillances are comprehensive, include performance-based technical assessments, and are of high quality. These steps have involved a number of different QA Department Units. For example, the Vendor Compliance Unit began an increased in-depth evaluation of engineering technical criteria in 1985, with audits of technical design output from EBASCO, SWEC, and IMPELL. As the level of technical responsibilities increased for these engineering firms, this technical review was turned over to the Technical Audit Unit, which was formed in early 1987. (The functions of the Technical Audit Unit have been described above.) In addition, the scope of activities of the Quality Site Surveillance Unit was expanded to include surveillance of engineering, inspection, and records activities. These surveillances evaluate the technical adequacy of the specific activities under review. The Supervisor of Technical Audits coordinates surveillance of engineering activities to assure efficiency and eliminate duplication of effort.

d. Nonconformance Reporting and CAR Programs

The CPSES nonconformance/deficiency reporting and CAR programs were enhanced during 1986 by the issuance of several NEO procedures, including NEO 3.01, "Corrective Action Process"; NEO 3.05, "Reporting and Control of Nonconformances"; and NEO 3.06, "Reporting and Control of Deficiencies," as described below.

The NCR program was consolidated under a single nonconformance reporting system, eliminating the multiple nonconformance programs (i.e., the Non-ASME, ASME, Operations, and

contractor internal programs) that existed previously. This created a more consistent approach to reporting nonconformances. NCRs are reviewed by QC Services to determine if a CAR is necessary, if the disposition adequately addresses the nonconformance, and that they are statused by a project data system. A single Unit (the QC Services Unit) is responsible for closure of NCRs.

Uniform directions have been established (NEO-3.06) for identifying and correcting quality-related deficient non-hardware conditions utilizing a Deficiency Report (DR). This establishes a specific method for documenting and controlling conditions, including design conditions, that depart from procedures or other requirements, but that do not necessarily render the quality or function of a quality-related item unacceptable or indeterminate.

The CAR program has been revised to provide a more organized and consistent approach to format, routing, input, approval, and follow-up actions for CARs. As with the revised NCR and new DR systems, corrective action is obtained from those organizations responsible for the area of concern and is evaluated by the QA Department for adequacy.

e. Trend System

A procedure (NQA-2.11) has been developed to enhance the trending of conditions adverse to quality. Under this procedure, conditions adverse to quality are identified by cause, personnel involved, locations, when identified, reporting media (form), and the Department responsible for the affected area. This information is gathered, coded, sorted, evaluated and analyzed. Each month, a report is prepared analyzing the findings and corrective actions from the preceding month to determine if there are adverse trends, such as an increase in the numbers of particular findings, types of findings or corrective actions for which a Department is responsible. Actions taken to highlight adverse trends and to expedite their resolution can include: contacting the responsible Department for resolution, issuing internal reports or letters, requesting additional audits or reviews, or initiating a DR or CAR to require the responsible Department to resolve the concern. The actions taken to resolve adverse trends are reported to senior NEO management at the Senior QA Overview Committee meetings.

The information data base used for trending is available to any CPSES organization to assist management in reviewing the types and causes of findings and to prevent future conditions adverse to quality.

C. Nuclear Licensing Department

1. Revised Organizational Structure and Addition of Personnel

Since early 1985 a number of organizational and programmatic changes have been made to strengthen the performance of the CPSES nuclear licensing activities. In 1985, the Nuclear Licensing Department was

divided into two Units, Generic Licensing and Docket Licensing. This identification of separate functions assured that concentrated attention would be given both to docket-specific matters, such as responses to NRC correspondence and submittal of FSAR amendments, and to generic matters, such as NRC notices and changes to regulations or regulatory guides.

TU Electric has continued to improve both its organizational structure and staffing of these nuclear licensing activities. These two Units are now headed by Managers and the number of licensing engineers within these Units has increased to 14.

In addition, a restructuring of responsibilities at CPSES in early 1988 has resulted in the transfer of the Regulatory Compliance Unit from the EA Section of CPE to the Nuclear Licensing Department. Renamed the Licensing Compliance Unit, it is responsible for maintaining an interface with the NRC at the CPSES site, for implementing the program to disposition regulatory issues and for developing and maintaining the Commitment Tracking System (CTS) discussed below. Transfer of the Unit to the Nuclear Licensing Department has improved the Department's efficiency in maintaining a direct interface with the NRC, coordinating responses to IE Inspection Reports and other regulatory issues, and tracking of licensing commitments.

Each of the Nuclear Licensing Units is headed by a Manager who has substantial professional nuclear experience. The Generic Licensing Manager has approximately 24 years of nuclear experience, including 10 years with the U.S. Navy nuclear program, five years with Bechtel Power Corporation in various design and licensing positions, and eight years with TU Electric in licensing positions of increasing responsibility. The Docket Licensing Manager has approximately 20 years of nuclear experience, including seven years with the U.S. Navy nuclear program, four years with another utility as an operations engineer at a nuclear plant under construction, and nine years with TU Electric in licensing positions of increasing responsibility. Prior to joining TU Electric in 1987, the Licensing Compliance Manager had nine years of nuclear experience with Brown & Root in various positions relating to procurement quality, quality engineering, administration of construction and nuclear engineering activities, and engineering assurance.

2. Licensing Programmatic Enhancements

Among the enhanced programs administered by the Nuclear Licensing Department are the tracking of licensing commitments and open NRC inspection items and the reporting of 10CFR50.55(e) deficiencies, as discussed below.

a. Tracking of Licensing Commitments

Assurance that licensing commitments are satisfied on a timely basis is currently achieved through the Licensing Commitment Resolution (LCR) program. The Nuclear Licensing Department identifies licensing commitments and other commitments (e.g., responses to CPRT findings, issues and recommendations) that require action by TU Electric and issues LCR forms to the responsible organization or organizations (e.g., Engineering and Construction, Operations, QA, CPRT). The responsible organization assigns a specific individual to interface with the licensing personnel on implementation of the commitment, provides TU Electric management and the Nuclear Licensing Department with periodic updates of commitment status and files with the Licensing Department an executed LCR form when its implementing actions are completed. The Nuclear Licensing Department maintains listings of commitments and compliance schedules, and issues to TU Electric management and responsible organizations periodic updates of the status of implementation of licensing commitments. Thus, appropriate progress is assured in complying with licensing commitments, and TU Electric management is kept fully and currently informed.

A computerized Commitment Tracking System (CTS) Data Base has been developed which identifies the licensing commitments contained in pertinent source documents, such as the FSAR, SER, SSERs, applicable NRC Regulatory Guides, IE Bulletins, Security Plan, Emergency Plan and correspondence with the NRC. It is being expanded to include the status of implementation. In order to maintain its accuracy and completeness, the data base is being controlled in accordance with Procedure NEO 4.09. It will allow rapid viewing of both ongoing commitments (i.e., those of a continuous or programmatic nature that must be incorporated into documents subject to periodic review and revision) and one-time commitments (i.e., those that can be satisfied by a specific action documented in a one-time document, such as a completed work order). With respect to each licensing commitment, the data base will provide the source document, event or commitment due date, the responsible organization and the CPSES documents that incorporate or implement the committed activity. When a revision to a CPSES document is proposed, the data base will be available as a source of licensing commitments associated with such document and appropriate action can then be taken to assure continuing compliance. Thus, the CTS will be useful in assuring that proposed revisions of CPSES documents do not inadvertently impact compliance with a previously implemented licensing commitment.

b. Tracking of Open NRC Inspection Items

TU Electric has consolidated the responsibility for tracking the closures of open NRC inspection items within the Licensing Compliance Unit. This Unit now maintains a listing of all such items, including open items, unresolved items, violations and deviations. Additionally, it identifies other items to be closed by NRC

inspectors on site, such as NRC Bulletins. This enhances TU Electric's ability to ensure timely resolution of these items.

This Unit also coordinates the preparation of documentation packages needed for presentation to NRC inspectors reviewing and closing inspection items. This central coordination assures uniform quality and completeness of the activity, further assuring the timely resolution and closure of inspection issues.

c. Reporting of 10CFR50.55(e) Deficiencies

During the past several years, TU Electric has also enhanced its procedures and its practices relating to the evaluation and reporting of 10CFR50.55(e) deficiencies.

The governing procedure (NEO 9.01) was reissued in 1986 in order to provide a more detailed process for evaluations and reporting and additional guidance for implementation. Under this procedure, a Site Coordinator designated by the Executive Vice President, NEO is responsible for receiving and documenting information that may identify a reportable condition, distributing it for evaluation, tracking the evaluation and transmitting it to the Licensing Coordinator. The Licensing Coordinator is responsible for verbally notifying and updating the NRC concerning potentially reportable conditions, for coordinating preparation of written reports and for tracking completion of commitments in 10CFR50.55(e) reports.

An evaluation for reportability is performed by the responsible TU Electric organization within the NEO Group as assigned by the Site Coordinator. The evaluation must be approved by the organization's Vice President. To provide additional assurance that appropriate reportability decisions are made, if the completed evaluation concludes that the condition is not reportable the concurrence of another Vice President within the NEO Group is also required. If the additional Vice President disagrees, the final decision is made by the Executive Vice President, NEO. If the completed evaluation recommends that the condition be considered reportable, the final decision is also made by the Executive Vice President, NEO.

These measures have provided additional assurance that deficiencies are evaluated in a prompt and controlled manner, that TU Electric management is fully aware of significant or potentially significant deficiencies and that reportability decisions are made at appropriate management levels.

V. Conclusion

TU Electric has enhanced its NEO management, organizational structure, professional staffing, procedures and programs to provide additional assurance that the validation of the CPSES design and hardware installation and the completion of construction are implemented in accordance with the highest standards of excellence and that the Project continues to comply with applicable regulatory requirements.

Management enhancements have included the restructuring of the NEO Group at the senior management level, the hiring of officers with substantial nuclear experience, and the adoption of a hierarchy of nuclear policies and procedures that provide clear direction from management specifying authority, interfaces and responsibilities. Management actions have also placed an increased emphasis on the maintenance of a "quality first" attitude on the part of CPSES personnel.

The addition of experienced management and staff, as well as the organizational restructuring of the Engineering and Construction Function and improved ECE and ECC procedures have increased assurance that CPSES systems, structures and components are designed and constructed in compliance with the licensing commitments and to support plant operation. In addition, the improved design control procedures and verification of compliance with those procedures, in conjunction with Configuration Management controls, assure that CPSES design documentation, installed hardware and Operations procedures remain consistent with each other and with the licensing commitments during the operational lifetime of CPSES.

Special programs have resulted in assuring that installation specifications, Construction procedures and QC inspection procedures are consistent with the validated design and the licensing commitments, as well as in resolving CPRT issues related to the quality of construction. The special programs are also providing assurance that various aspects of past engineering and design work (e.g., NCR/TDDR disposition, design change and documentation methods and VTMR) are in compliance with the validated design criteria and the licensing commitments, and that design changes are being documented in a consistent and controlled manner.

The addition of experienced management and staff, as well as organizational restructuring of the QA Department, has provided increased confidence that the TU Electric QA program is being, and will continue to be, implemented in accordance with the requirements of 10CFR50, Appendix B and that CPSES is constructed in accordance with the licensing commitments.

The enhancements described above represent significant portions of TU Electric's comprehensive efforts to assure that CPSES is designed and constructed in compliance with the licensing commitments.